PLANTS AND PLANTING IN MEDITERRANEAN LANDSCAPES
(VOLUME 1)

Editors
Juan José Galán Vivas
Vicente Caballer Mellado



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(VOLUMEN 1)

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Plants and Planting in Mediterranean Landscapes (Vol.1) / edUPV

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SUMMARY

The publication, "Plants and Planting in Mediterranean Landscapes", has systematically and didactically gathered information for the selection of botanic species suitable for landscape and garden designs in Mediterranean climates. Concerning the structure and in line with the above, the book defines a series of plant groups according to design criteria and then develops the introductory aspects, the specific characteristics of the species included within the group, the general conditions for their commercialization and planting, and some general criteria for their maintenance. In particular, the groups defined in this book focus on groups of long-lasting species that help define the main structural and spatial qualities of the landscape and which are ordered in 10 chapters.

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PRESENTATION

Nemesio Fernández Martínez

Director of the Higher Technical School of Agronomic engineering and Natural Environment of the Polytechnic University of Valencia

Vegetation is one of the architectural elements in landscape design together with water, landform, constructions and facilities. However, its role in the project becomes crucial as it is responsible for shaping the outer skin of the scenery. Plant materials are alive, they change with the seasons and throughout the life of the project allowing for a dynamic dimension in the landscape.

This publication on Mediterranean vegetation is an excellent selection and technical compilation of the characteristics of the main species that can be used in urban green areas. The book connects the morphological and functional characteristics of plants with their use in the design of the landscape. As a result, the organization of the chapters in this book covers the main species from trees to shrubs, distinguishing between evergreen trees, deciduous trees, conifers, palm trees and shrubs, including at the same time specific chapters for groundcover species, climbers, medicinal and aromatic plants, hedge plants, and ornamental citrus trees.

The combination of species and functional elements in the areas where they will be planted is infinite, but it should be based on the premise of the dialogue between plants, substratum and environment. The characterization and description of the species included in this book facilitate the knowledge of the living requirements of each plant and its adaptation to the place, toe conditions that should guide the designer in the adequate selection of greenery.

This publication goes beyond the teaching objectives of the Master Garden and Landscape Design of the Polytechnic University of Valencia (UPV) and offers a book of general interest for those interested in the design and management of Mediterranean landscapes. As the person responsible for the education of technicians with the ability to manage greenery in the UPV; I would like to congratulate the editors and writers of these chapters for the usefulness and accuracy of the technical contents and the technical data of each species. This achievement is the result of precise information that will facilitate the understanding of the relationship between plants, their functions, and their visual appearance.

PRESENTATION

Ana Llopis Reyna

Director of the Higher Technical School of Architecture of the Polytechnic University of Valencia

The publication “Plants and Planting in Mediterranean Landscapes (Volume 1)”, presents, in an educational and easy-to-use format, a wide collection of data on Mediterranean plant species for the use of garden and landscape designers. Along with specific botanical characteristics for the use, commercialisation and maintenance of these species, fundamental design characteristics are presented for the architectural composition of the landscape, such as color, volume, size, shape, texture, height and shade produced by the various species studied. Its use within the landscape project will allow students and professionals to choose the right species for the right place.

Although nature as a generator of life has always been a source of architectural inspiration, it has also been the object of conquest and domination. Currently, the fine line between the natural environment and the anthropic environment is becoming increasingly blurred. Architecture deals with the creation, transformation and interpretation of the inhabited environment. It is a discipline that encompasses art, ideation, design, planning, project, management and materialization and requires its own elements of composition to give shape and character to the space in different scales. The landscape architect, starting from the specific knowledge of the design elements, must be able to design and carry out highly creative landscape projects, without jeopardizing the natural environment.

Indeed, the material gathered in this publication is essential for architecture students who study and design the landscape at any academic level, no matter if it is a degree, master’s or doctorate program, as well as for professionals who work in the landscape field.

PROLOGUE

Vicente Caballer Mellado

Full professor, Founder and Director of the Master Programme in Garden and Landscape Design of the Polytechnic University of Valencia

To think that vegetation is the most important part of gardening and landscape could, at first glance, seem excessive. However, there are several and very important reasons that highlight the essential role that plants play in natural and built landscapes.

Firstly, they are living beings and each species has its own unique soil, climatic and ecological needs whose deficiencies can bring about a deficient development, or even death, of the plant, with the subsequent failure of the landscape design.

The living nature of plants has chronological implications in any project, imposing dates and times, in planting and treatments, in contrast to other types of activities and operations that can be carried out at any time of the year.

Secondly, and also because of their condition as living beings, the geometric shape and aesthetic qualities of plants evolve over time, which means that the design must be considered on a double chronological plane: the initial moment of planting and the future. Thus, the designer faces the dilemma of choosing an optimal arrangement of plants at the time of opening with fully developed specimens (if they are available in the market) or assuming and playing with the future development of younger specimens that are easier to find in the market at cheaper prices.

Thirdly, vegetation generally tends to have higher maintenance needs than the non-living materials frequently used outdoors. Therefore, when deciding on which plants to use in garden designs or reforestation processes, it is necessary to consider the future - who will care for those plants and what will be their minimum maintenance.

Finally, in a globalized world, the possibilities of choosing between innumerable species, varieties, cultivars, hybrids, and presentations available, as well as their possible combinations are limitless. Conventional species, mistakenly thought of as regional or native, should include (according to the culture of Enlightenment) other species capable of being added to the design palette in order to increase their biodiversity.

The considerations outlined above allow the elaboration of a rich scenario of possibilities for any work dealing with the systematization and study of vegetation in landscape and garden design, whose selection criteria were deemed central when writing this book.

Following the culture that embodies the Master Programme in Garden and Landscape Design in which this publication is included, the book has been conceived to respond to the real needs of professional designers when dealing with spatial and technical restrictions. Indeed, reversing the conventional order, we start from the geographical delimitation of the book to the Mediterranean and subtropical areas, to then explain the species most frequently used or suitable for them.

Unlike other works, in which the selection criterion for grouping plants is strictly botanical or alphabetical, in this book, insisting on its use for the professional landscape designer, it was decided to follow the criterion of function or role that each species can perform in the design, construction and maintenance of parks and gardens, distinguishing between different types of trees, shrubs, groundcovers or climbers.

All that is left is an acknowledgement and a wish.

An acknowledgement to the authors who, once again, have made an extraordinary effort to summarize and limit the contents of each of the chapters, renouncing to develop a more detailed or scientific publication that would have exceeded the goals of this book.

A wish for all those dedicated to the wonderful endeavor of beautifying planet Earth with the hope that this book can help them make decisions and put them into practice. I want to extend this wish also to those who are preparing themselves for it and, especially to the students of the Master in Garden and Landscape Design, for their choice and confidence in this academic project that travels through the stormy sea of innovation and social commitment.

INTRODUCTION

Juan José Galán Vivas

Coordinator of the Master Programme in Garden and Landscape Design;
Polytechnic University of Valencia

OBJECTIVE

The publication, "Plants and Planting in Mediterranean Landscapes (Volume 1)", has systematically and didactically gathered information for the selection of botanic species suitable for landscape and garden designs in Mediterranean climates.

STRUCTURE

Concerning the structure and in line with the above, the book defines a series of plant groups according to design criteria and then develops the introductory aspects, the specific characteristics of the species included within the group, the general conditions for their commercialization and planting, and some general criteria for their maintenance. In particular, the groups defined in this first volume focus on groups of long-lasting species that help define the main structural and spatial qualities of the landscape and which are ordered in the following chapters:

CHAPTER 1: BROADLEAF EVERGREEN TREES
CHAPTER 2: BROADLEAF DECIDUOUS TREES
CHAPTER 3: CONIFERS
CHAPTER 4: PALM TREES, ZAMIACEAE AND CYCADACEAE
CHAPTER 5: SHRUBS
CHAPTER 6: GROUNDCOVERS
CHAPTER 7: CLIMBERS
CHAPTER 8: MEDICINAL AND AROMATIC PLANTS
CHAPTER 9: HEDGES AND TOPIARY
CHAPTER 10: CITRUS PLANTS

The publication of this book would not have been possible without the collaboration of an invaluable team of professors and professionals who have prepared the contents of their corresponding chapters following a predetermined and common structure. This work involved the elaboration of a series of botanical datasheets explaining for each species its main morphological characteristics, ecological requirements, how the species should be used, seasonal variation, maintenance conditions, forms of supply and commercialization, and a set of illustrative images,

The aim of this publication is to provide landscape professionals and students with a practical and complete tool that, in the context of Mediterranean climates, helps them to choose plant species according to spatial, morphological, ecological, and functional criteria. This book continues in a second volume dedicated to more specific groups that include perennials, annuals and biannuals, bulbs, aquatic plants, grasses, cacti and succulents, roses, fruit trees for ornamental use, vegetables for ornamental use, ferns, weeds and ruderal vegetation, interior plants and greenhouse plants: epiphytes, orchids, and bromeliaceae.

1

BROADLEAF EVERGREEN TREES

Chapter 1 BROADLEAF EVERGREEN TREES

Subchapter 1.1 Introduction
Subchapter 1.2 Species
Subchapter 1.3 Commercialization, use and planting
Subchapter 1.4 Maintenance
Subchapter 1.5 Recommended bibliography

Subchapter 1.1 Introduction

Trees that have evergreen leaves (also referred to as persisting leaves) are those whose photosynthesis process is active all year round and whose dead leaves do not fall before new ones have been developed. However, some trees, being of evergreen leaf, in colder areas, might partially lose their foliage for a short period of time and therefore referred to as semi deciduous.

Evergreen trees together with deciduous trees, take precedence since they are undoubtedly the most notable representatives of the flora of streets, parks, and gardens; either for their size, flowers, fruits, and foliage or for the shade and sensation of coolness that they provide.

The difference between evergreen and deciduous trees must be considered when creating a garden or when choosing the most adequate species for a street or avenue, depending on whether permanent shade is required or this effect is only necessary in spring-summer, allowing the sun to penetrate the rest of the year.

In general terms, it can be stated that evergreen trees are typical of tropical and subtropical climates, while deciduous trees are characteristic of temperate and cold areas. In addition, trees with beautiful blooms are more abundant in tropical and subtropical climates.

The decision to **use a certain species** of tree for a specific case can depend on **multiple factors**, among which the following should be considered:

For its structure and external morphology

- Size or height
- Width and shape of the crown
- The greater or lesser projection of shade
- Type and colour of the leaves
- Blooming season
- Production of flowers, its color and fragrance
- Production of ornamental or undesirable fruit

For its necessities or physiological limitations

- Resistance to frost and severe cold
- Resistance to excessive heat
- Resistance to drought
- Requirement of sunlight
- Resistance to winds
- Resistance in coastal areas
- Resistance to urban contamination
- Requirements of soil, pH, texture, humidity, etc.

- Extension of its root system
- Rate of growth
- Longevity
- Resistance to infestations and diseases
- Reaction to pruning

In order to choose the most suitable tree species, it is necessary to be familiar with the characteristics of each species, a knowledge that is acquired from years of observation or through the reading of specialized publications.

In **urban gardening, the tree** (whether in streets and avenues or in urban parks), must fulfill two fundamental functions: **the aesthetic, providing beauty and harmony, and environmental, improving environmental and ecological conditions**.

Trees plays a major role in gardening. Since they define, the upper or arboreal stratum (level 3), which gives meaning and perspective to the other two strata or levels of vegetation that make up a typical green area: the shrub-like plants (level 2) and the low scrubland or groundcovers (level 1). The tree can fulfill various functions:

- Hedges through species that can withstand trimming
- Background, generally with very large species
- Highlight architectural elements
- Form groups or copses
- Form enclosures that act as an acoustic or wind barrier
- Link and unify the visual landscape along streets, between squares and other green areas
- Highlight foregrounds or frame views, for instance using small species and geometric shapes

In all cases, extensive knowledge of how each species is necessary to successfully achieve the designed purpose.

In addition, big groups can help achieve the following effects:

- Reduce temperature
- Increase atmospheric humidity
- Break or minimize winds
- Capture and absorb atmospheric dust
- Buffer and mitigate noise
- Eliminate contaminating gases and carbon dioxide
- Release oxygen
- Filter solar radiation

Subchapter 1.2 Species

This chapter outlines **27 species of evergreen or semi-evergreen trees** used in Mediterranean landscape design. They have been selected primarily for their ornamental uused in Mediterranean landscape design. They have been selected primarily for their ornamental use, botanical interest, or other characteristics. As a result, an in-depth analysis is carried out in this chapter. Firstly, a table shows the different parameters and values that have been used to describe each species. Secondly, each botanic datasheet gathers the information of each individual tree species covering botanical and ecological aspects, uses, cultivation, and other characteristics of interest, including its commercialization and maintenance. This information is complemented by photographic information, which shows the general appearance of the tree species and different morphological details.

PARAMETERS AND VALUES USED FOR THE BOTANIC DATASHEET	
TAXONOMY	
TAXONOMIC RANKS	DIVISION, SUBDIVISION, TYPE, ORDER, FAMILY
VARIETIES	VARIETIES OF INTEREST
STRUCTURE	
SHAPE	GLOBE-SHAPED/ROUND, OVAL, COLUMNAR, CONE, EXTENDED, IRREGULAR, PARASOL, FAN-SHAPED, HORIZONTAL, PALMIFORM, PENDULAR, WEEPING
HEIGHT	AS APPROPRIATE- IN METERS OR CENTIMETERS
DIAMETER	AS APPROPRIATE -IN METERS OR CENTIMETERS
TEXTURE	LEAVES>10CM= COARSE. LEAVES OR LEAFLETS BETWEEN 2-10CM= MEDIUM. LEAVES OR LEAFLETS <2CM= FINE
SHADE	LIGHT, MEDIUM, DENSE
ROOT	TAPROOT, FASCICULATE, OBLIQUE, HORIZONTAL, AERIAL, ADVENTITIOUS
MORPHOLOGY	
TRUNK	
BARK	SMOOTH, VERTICAL FISSURES, LONGITUDINAL FISSURES, DIAGONAL FISSURES; ROUGH, SCALY, CORKY WITH PLATES
COLOR OF BARK	GREY, GREENISH GREY OR BLUISH GREY,SILVER, LIGHT GREEN, YELLOWISH, LIGHT BROWN, DARK, GREEN, RED, PURPLE, YELLOW, BLACK, MARBLED, TWO-TONED, THREE-TONED, LIGHT GREY, DARK GREY
FOLIAGE	
LEAF TYPE	EVERGREEN, DECIDUOUS, SEMI-DECIDUOUS OR SEMI-EVERGREEN
LEAF SIZE	LENGTH (cm)
SIZE OF LEAFLET SHAPE	LENGTH (cm)
COLOR OF UPPER SIDE (US)	PALE GREEN, LIGHT GREEN, DARK GREEN, BLUE/GREEN, GREY, PURPLE; PALE; YELLOW; VARIEGATED
COLOR OF LOWER SIDE (LS)	PALE GREEN, LIGHT GREEN, DARK GREEN, BLUE/GREEN, GREY PURPLE, PALE, YELLOW, VARIEGATED, RUST COLORED, SILVER
TEXTURE OF UPPER SIDE (US)	GLOSSY, ROUGH, GLABROUS, TOMENTOSE, HAIRY, ROUGH, SCALY, VISCOSE
TEXTURE OF LOWER SIDE (LS)	GLOSSY, ROUGH, GLABROUS, TOMENTOSE, HAIRY, ROUGH, SCALY, VISCOSE
COMPOUND LEAF	NO COMPOUND LEAVES YES. IMPARIPINNATE, PARIPINNATE, TRIFOLIATE, PALMATE, PALMIFORM, PALM, PINNATE, BIPINNATE
HARDNESS	CORIACEOUS, SOFT, SUCCULENT
ARRANGEMENT	OPPOSITE, ALTERNATE, WHORLED, ROSETTE
VENATION	PINNATE, PALMATE, PARALLEL, RETICULATE, ARCUATE, A3 MAIN VEINS
LEAF SHAPE	ROUNDED, LINEAR, LANCEOLATE, FALCATE, OVAL, OBLONG, ELLIPTIC, DELTOID, RHOMBOID, SPATULATE, ACICULAR GROUPS OF 2, ACICULAR GROUPS OF 3, ACICULAR GROUPS OF 5, ACICULAR GROUPS, ACICULAR IN 1 PLANE, ACICULAR IN SPIRAL, SCALE, PALMATE 7 LOBES, PALMATE 5 LOBES- PALMATE 3 LOBES, POLYMORPHIC, PANDURIFORM, PINNATIFIDA, SAGITATE, RENIFORM, CORDATE, ORBICULAR, OBOVATE, OBLANCEOLATE, LIRATE, HASTATE, RUNCINATE
LEAF MARGIN	ENTIRE, CILIATE, DENTATE, CRENATE, SERRATE, DOUBLY SERRATE, LOBED, DOUBLE LOBED

APEX	ACUTE, CUSPIDATE, OBTUSE, RETUSE, MUCRONATE
LEAF BASE	ATTENUATE, CORDATE, ROUNDED, CUNEATE, OBLIQUE, SAGITATE, AURICULATE, HASTATE, ASYMMETRIC
PETIOLE	LONG, SHORT, SESSILE, WIDE
FLOWER	
SIZE	CM OR MM
TYPE	UNISEX, HERMAPHRODITE
REPRODUCTION	MONOECIOUS, DIOECIOUS, HERMAPHRODITE, POLYGAMY, SYNOICOUS, STERILE
FLOWERING	SOLITARY, INFLORESCENCE IN CORYMB, IN CYMOSE, IN RACEME, IN SPIKE, IN UMBEL, IN CATKIN, IN SPADIX, IN FLORET OR CAPITULUM, IN PANICLE (+ INFLORESCENCE SIZE (IN CM OR MM))
FRAGRANCE	YES, NO, UNPLEASANT
FRUIT	
SIZE	IN CM OR MM
TYPE	FOLLICLE, PLURIFOLLICLE, LEGUME, LOMENT, SAMARA, DOUBLE SAMARA, PLURISAMARA,CAPSULE, ACHENE, TETRACHENE, POLYACHENE, NUT, ACORN, SYCONIUM, HESPERIDIUM, SOROSIS, BERRY, RACEME, POME, BALAUSTA, DRUPE, STROBILUS, PSEUDO STROBILUS, CONE
EDIBLE FRUIT	YES, NO
COLOR	RED, GREEN, YELLOW, BROWN, BLACK, PALE, WHITE, PURPLE
FRUITING SEASON	INTERVAL OF MONTHS: JAN, FEB, MAR, APR, MAY, JUN, JUL, AGO, SEP, OCT, NOV, DEC
PARAMETERS AND VALUES USED IN THE BOTANIC DATASHEET	
DEVELOPMENT	
GROWTH	VERY SLOW, SLOW, MEDIUM, FAST, VERY FAST
LONGEVITY	<25 YEARS, 25 YEARS, 50 YEARS, 75 YEARS, 100 YEARS, 150 YEARS, 200 YEARS, 250 YEARS, 300 YEARS, >300 YEARS
ECOLOGY	
CLIMATE	
ALTITUDE	INTERVAL OF ALTITUDE / ELEVATION ABOVE SEA LEVEL
IRRIGATION	++HIGH, MODERATE, LOW; ++LOW (very low/low < 350 mm. Very high/high > 750 mm)
MINIMUM TEMPERATURE AND INTERNATIONAL CLASSIFICATION	MINIMUM TEMPERATURES: DEGREES CELSIUS **CLASSIFICATION ACCORDING TO EUROPEAN REGULATION**: (SEE MAP) G2____ HOT GREENHOUSES IN SOUTHERN EUROPE G1____ COLD GREENHOUSES IN SOTHERN EUROPE H5____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM 0ºC TO -5ºC H4____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM -5ºC TO -10ºC H3____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM -10ºC TO -15ºC H2____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM -15ºC TO -20ºC H1____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM -20 ºC **CLASSIFICATION INTERNATIONAL REGULATIONS.** ACCORDING TO MINIMUM TEMPERATURE RANGES Z1____SUPPORT MINIMUM TEMPERATURES OF -50ºC Z2____ SUPPORT MINIMUM TEMPERATURES OF -50ºC TO -40ºC Z3____ SUPPORT MINIMUM TEMPERATURES OF -40ºC TO -30ºC Z4____ SUPPORT MINIMUM TEMPERATURES OF -30ºC TO -20ºC Z5____ SUPPORT MINIMUM TEMPERATURES OF -20ºC TO -10ºC Z6____ SUPPORT MINIMUM TEMPERATURES OF -10ºC TO -0ºC Z7____ SUPPORT MINIMUM TEMPERATURES OF -0ºC TO 10ºC Z8____ SUPPORT MINIMUM TEMPERATURES OF 10ºC TO 20ºC Z9____ SUPPORT MINIMUM TEMPERATURES OF 20ºC TO 30ºC Z10___ SUPPORT MINIMUM TEMPERATURES OF 30ºC TO 40ºC Z11___ SUPPORT MINIMUM TEMPERATURES OF MORE THAN 40ºC

EXPOSURE TO SUNLIGHT	FULL SUN, FULL-SHADE, PARTIAL SHADE, SHADE
DROUGHT RESISTANCE	YES, NO, MODERATE
RESISTANCE TO FROST	YES, NO, MODERATE
SOIL	
OPTIMUM PH	ALL TYPES, NEUTRAL, ACIDIC, BASIC OR ALKALINE (OR INTERVAL OF PH)
FERTILITY LEVEL	FERTILE, MODERATE, POOR
TEXTURE OF SOIL	SANDY, SILT OR LOAMY, CLAYEY, SANDY/LOAMY, CLAYEY/ LOAM, ALL TYPES
DRAINAGE	HIGH, MODERATE, LOW
RESISTANCE TO SALT	YES, NO, MODERATE
RESISTANCE TO LIME	YES, NO, MODERATE
USES	
RESISTANCES	
COASTAL	1st LINE, 2ND LINE, NO, MODERATE
POLLUTION	HIGH, MODERATE, LOW
WIND	HIGH, MODERATE LOW
USE	
IN SLOPES **IN LINES** **ON RIVERBANKS** **AS WIND BREAKERS** **IN HEDGES** **IN FIELD BORDERS** **IN GROUPS** **ISOLATED**	YES, NO
PARAMETERS AND VALUES USED IN THE BOTANIC DATASHEET	
NOTES OF INTEREST	
SPACING	MINIMUM RECOMMENDED DISTANCE BETWEEN PLANTS: M (METERS), CM (CENTIMETERS)
PLANTING AND PLANT HEALTH	
PLANTING AND PLANT HEALTH	
CALENDAR	
CHROMATIC CALENDAR	FOLIAGE, FLOWERING, FRUITING SEASON: the color white represented with grey or black cell
CULTIVATION CALENDAR	SOWING, PLANTING, PRUNING
TREATMENTS CALENDAR	FUNGICIDES, PESTICIDES, FERTILIZERS, HERBICIDES
COMMERCIALIZATION	
PRESENTATION	RD (BARE ROOT), CT (CONTAINER or POT (in liters), CE (ROOT BALL), CEY (ROOT BALL IN GYPSUM),ROOT BALL IN MESH
STEM GIRTH (TREES)	CM (usually measured at 1 meter above ground) or Year/Years
HEIGHT (in SHRUBS, CONIFERS AND PALM TREES)	CM, M

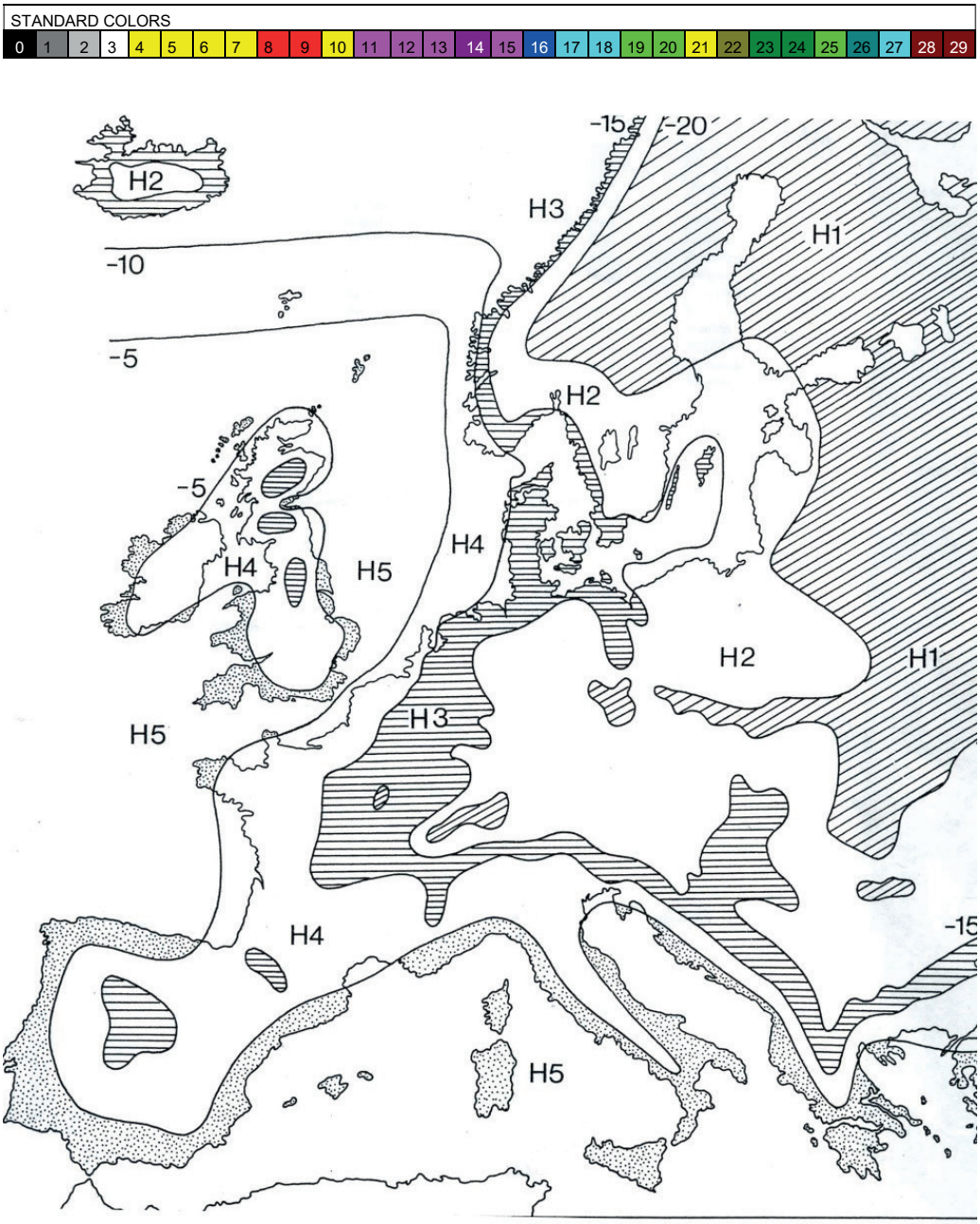


Figure 1.2.1: Thermic classification according to European regulations

LIST OF BROADLEAF EVERGREEN TREE SPECIES DESCRIBED IN THE DATASHEETS

1. *Acacia dealbata*
2. *Acacia saligna (Acacia cyanophylla)*
3. *Brachychiton acerifolius*
4. *Brachychiton populneus*
5. *Casuarina equisetifolia*
6. *Cinnamomum camphora*
7. *Coccoloba uvifera*
8. *Cocculus laurifolius*
9. *Eucalyptus camaldulensis*
10. *Eucalyptus ficifolia*
11. *Eucalyptus globulus*
12. *Ficus elastica*
13. *Ficus lyrata*
14. *Ficus macrophylla*
15. *Ficus microcarpa (Ficus nitida)*
16. *Ficus rubiginosa*
17. *Grevillea robusta*
18. *Lagunaria patersonii*
19. *Ligustrum lucidum*
20. *Magnolia grandiflora*
21. *Phytolacca dioica*
22. *Quercus ilex subsp. ilex*
23. *Quercus ilex subsp. ballota*
24. *Quercus suber*
25. *Schinus molle*
26. *Schinus terebinthifolius*
27. *Spathodea campanulata*

Acacia — *Acacia dealbata* Link

BROADLEAF EVERGREEN

MIMOSA COMÚN	MIMOSA COMUNA	SILVER WATTLE	MIMOSA BLANCHISSANT
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE

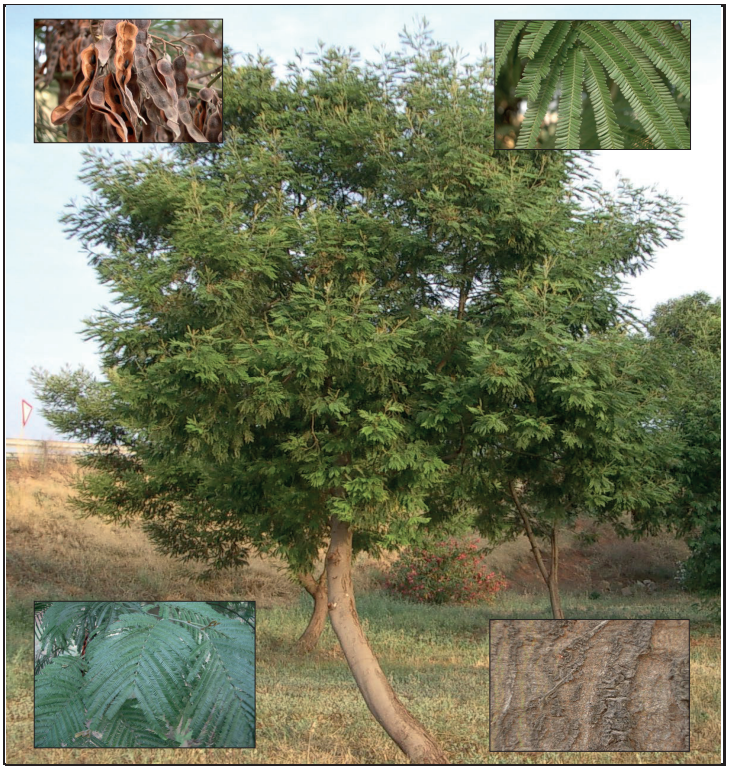
Shape	Height	Diameter
ROUND	6-15 M	4-6 M
Texture	**Shade**	**Root**
FINE	SUN/ PARTIAL SHADE	OBLIQUE

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	FABALES
FAMILY:	MIMOSODICEAE

VARIETIES

MORPHOLOGY

Trunk	Bark: SMOOTH/FISSURED	Color: GREEN-GRAY
Leaf	COMPOUNDS: BIPINNATE	
EVERGREEN	HARDNESS: SOFT	
SIZE: LEAF: 20CM	ARRANGEMENT: ALTERNATE	
LEAFLET: 0.3CM	VENATION: PINNATE	
COLOR: US: BLUE/GREEN	SHAPE: PARIPINNATE	
LS: BLUE/GREEN	MARGIN: CILIATE	
TEXTURE: US: Tomentose	APEX: ROUND	
LS: Tomentose	LEAF BASE: ROUNDED	
	PETIOLE: SHORT	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE: ♂M 3 MM	Flowering: RACEME (10 cm)	Fragrant: YES
Fruit	Type: FLATTENED POD	Color: BROWN
SIZE: 5-8 CM	Edible: NO	Fruiting season: JUN-JUL
Growth	Rate: FAST	Longevity: 25 YEARS



ECOLOGY

Climate	Temperature: -9ºC,H4,Z6	Drought resistant: YES
ALTITUDE: 0-100	Sun exposure: FULL	Frost resistant: MODERATE
IRRIGATION: LOW		
Soil	Texture: SANDY	Salt resistant: NO
Ph: 5-7.5	Drainage: MODERATE	Lime resistant: MODERATE
FERTILITY: POOR		

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	YES	LINE:	NO
POLLUTION:	MODERATE	RIVERBANKS:	NO	WINDBREAKERS:	NO
WIND:	LOW	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Native to South East Australia and Tasmania. Cultivated for its ornamental value or in dunes. This species is naturalized and invasive, particularly after fires. Its beautiful flowering in the middle of winter makes this species singular for this season. Its branches are fragile and may pose a risk to pedestrians and vehicles.

SPACING: 5m

PLANTING AND PLANT HEALTH

Propagation by seed and cuttings. It can be attacked by polyphagous mealybugs,such as *A spidiotus hederae, Icerya purchasi*, etc.,that may appear on leaves, trunks or fruits. These mealybugs emit molasses on which sooty molds (black) grow, forming a blackish layer on leaves, branches and trunk. Treatments with *Methyl-pirimiphos*, *Chlorpyrifos* or some phosphorous product (*Diazinon, Fenitrothion, Phentoate)* obtain good results. A fungicide with a Copper (Cu) base should be applied to fight against sooty molds.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
								x	x	x	x

Sowing Planting Pruning x

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
CT		100/125
CT		125/150
CT		150/175
CT		175/200
CT		200/250
CT	6-8	
CT	8-10	
CT	10-12	
CT	12-14	
CT	14-16	
RB	20-25	

Acacia — *Acacia saligna* (Labill.) H.L. Wendl.

BROADLEAF EVERGREEN

MIMOSA AZUL (SPANISH) | MIMOSA BLAVA (VALENCIAN) | BLUE-LEAF WATTLE (ENGLISH) | MIMOSA BLEUTÉ (FRENCH)

STRUCTURE		
Shape: PENDULAR/IRREGULAR	Height: 3-8 M	Diameter: 4-6 M
Texture: COARSE	Shade: PARTIAL SHADE	Root: OBLIQUE

DIVISION:	SPERMATOPHYTES
SUBDIVISION	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	FABALES
FAMILY:	MIMOSOIDEAE

VARIETIES

MORPHOLOGY		
Trunk	Bark: SMOOTH/FISSURED	Color: GRAY/RED
Leaf EVERGREEN; SIZE: LEAF:10/20cm; COLOR: US:LIGHT GREEN LS:LIGHT GREEN; TEXTURE: US:SMOOTH LS:SMOOTH	COMPOUNDS: NO; HARDNESS: SOFT; ARRANGEMENT: ALTERNATE; VENATION: PINNATE; SHAPE: LINEAR/LANCEOLATE; MARGIN: ENTIRE; APEX: SHARP; LEAF BASE: ACUTE; PETIOLE: SHORT	
Flower SIZE: ♂M 10MM	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
	Flowering: RACEME (15-20 CM)	Fragrant: YES
Fruit SIZE: 5-14 CM	Type: LEGUME	Color: BROWN
	Edible: NO	Fruiting season: JUN-JUL
Growth	Rate: FAST	Longevity: 25 YEARS

ECOLOGY		
Climate ALTITUDE: 0-100; IRRIGATION: LOW	Temperature: -6ºC,H4,Z6	Drought resistant: YES
	Sun exposure: FULL SUN	Frost resistant: MODERATE
SOIL pH: 5-9; FERTILITY: POOR	Texture: LOAMY/SANDY	Salt resistant: YES
	Drainage: MODERATE	Lime resistan: YES

USES				
Resistance		Applications		
COASTAL:	1ST LINE	SLOPES: NO	LINE:	NO
POLLUTION:	HIGH	RIVERBANKS: NO	BREAKERS:	NO
WIND:	LOW	GROUPS: YES	ISOLATED:	YES



POINTS OF INTEREST

Native to the Western Australia and Tasmania. Cultivated for its ornamental value and in coastal dunes; occasionally naturalized. It is the most frequently cultivated species, especially in coastal areas and green spaces that accompany roads (roundabouts, islets, road curves, etc.).

SPACING: 5 M

PLANTING AND PLANT HEALTH

Propagation by seed and cuttings. It can be attacked by polyphagous mealybugs, such as *A.spidiotus hederae*, *Icerya purchasi*,.. that may appear on leaves, trunks or fruits. These cochineals emit molasses on which sooty molds (black) grow, forming a blackish layer on leaves, branches and trunk. Treatments with *Methyl-pirimiphos*, *Chlorpyrifos* or some phosphorous product (*Diazinon*, *Fenitrothion, Phentoate*) produce good results. A Copper base (Cu) fungicide should be applied to fight against sooty molds.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
								X	X	X	X	X	X	X	X	X	X	X	X	X	X

Sowing | Planting | Pruning (X)

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
CT		80/100
CT		100/125
CT		175/200
CT		250/300
CT		250-300
CT	6-8	
CT/RB	8-10	
CT/RB	10-12	
CT/RB	12-14	
CT/RB	14-16	
CT	16-18	
CT	18-20	
CT	20-25	

Brachychiton *Brachychiton acerifolius* (A. Cunn.) F.J. Muell.

Broadleaf evergreen

ÁRBOL DEL FUEGO SPANISH | ARBRE DEL FOC VALENCIAN | FLAME-TREE ENGLISH | B. À FEUILLES D'ERABLE FRENCH

STRUCTURE		
Shape: CONE	Height: 10-15 M	Diameter: 4-6 M
Texture: COARSE	Shade: PARTIAL	Root: OBLIQUE

DIVISION:	SPERMATOPHYTES
SUBDIVISON:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDE:	MALVALES
FAMILY:	STERCULIACEAE

VARIETIES

MORPHOLOGY		
Trunk	Bark: VERTICALLY FISSURED	Color: GREEN/GRAY
Leaf	COMPOUND: NO	
SEMI-DECIDUOUS	HARDNESS: CORIACEOUS	
SIZE: LEAF: 30CM	INSERTION: ALTERNATE	
	VENATION: PALMATE	
	SHAPE: PALMATE 5/7 LOBES	
COLOR: US:MED. GREEN	MARGIN: LOBED	
LS:MED. GREEN	APEX: SHARP	
TEXTURE: US:GLOSSY	BASE: CORDATE	
LS:GLOSSY	PETICOLE: LONG	
Flower	Type: UNISEXUAL	Reproduction: MONOECIOUS
SIZE: ♂/F 15MM	Flowering: PANICLE (40CM)	Fragrant: NO
♀/M 15 MM		
Fruit	Fruit: FOLLICLE	Color: BLACK
SIZE: 10-15CM	Edible: NO	Fruiting season: SEP-OCT
Growth	Rate: FAST	Longevity: 100 YEARS

ECOLOGY		
Climate	Temperature: -3ºC,H5,Z6	Drought resistant: MODERATE
ALTITUDE: 0-100	Sun exposure: SUN /PARTIAL SHADE	Frost resistant: MODERATE
IRRIGATION: MODERATE		
Soil	Texture: SANDY	Salt resistant: NO
pH: 5.5-8.5	Drainage: MODERATE	Lime resistant: YES
FERTILITY: MODERATE		

USES			
Resistances		Applications	
COASTAL: 2ND LINE		SLOPES: NO	LINE: YES
POLLUTION: MODERATE		RIVERBANKS: NO	WINDBREAKERS: YES
WIND: MODERATE		GROUPS: YES	ISOLATED: YES



POINTS OF INTEREST

Native to Australia. The lack of water in summer can cause defoliation, so a moderate irrigation programme is recommended. It does not flower for a few years (generally 6 to 10 years) and then it begins to produce trilobed leaves. Its spectacular flowering and appearance make this tree a focal point of attention in any green space or as a street tree. The specific name refers to the similarity between the leaves of this species and those of the *Acer genus*. It can be used (when young) as an indoor plant. In the Canary Islands, *Brachychiton x roseus Guymer* is occasionally cultivated, a hybrid form between *B. acerifolius* and *B. populneus*, with leaves similar to those of the latter and red flowers.

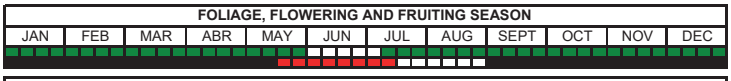
SPACING: 5 M

PLANTING AND PLANT HEALTH

This specimen is very easy to grow but requires a high irrigation programme. It easily propagates growing from seeds which are collected from the trees when the fruits are fully ripe and begin to open. It should be noted that the hairs that surround the seeds are quite irritating and uncomfortable, so care must be taken when handling. Seedbeds planted in March-April provide the following year with 50/60 cm tall plants suitable for rearing in the nursery for 2/3 more years until they reach commercial sizes. It can be transplanted successfully to root ball.

CHROMATIC CALENDAR

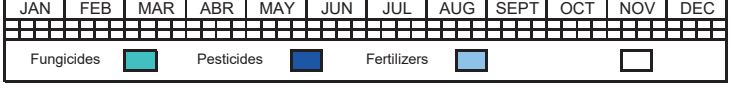
FOLIAGE, FLOWERING AND FRUITING SEASON



CULTIVATION CALENDAR



TREATMENT CALENDAR



COMMERCIALIZATION

Presentation	Girth(cm)	Height (cm)
CT		50/60
CT		150/175
CT		175/200
CT		200/250
CT		250/300
CT		300/350
CT	12-14	
CT	14-16	
CT	16-18	
CT/RB	18-20	
CT/RB	20-25	
CT/RB	25-30	
CT/RB	30-35	

Brachychiton *Brachychiton populneus* (schott & Endl.) R. Br.

BROADLEAF EVERGREEN

ÁRBOL BOTELLA	BRAQUIQUÍTON	KURRAJONG	BRACHYCHITON
SPANISH	VALENCIAN	ENGLISH	FRENCH

Structure		
Shape: CONE	Height: 10-15 M	Diameter: 4-6 M
Texture: MEDIUM	Shade: MEDIUM	Root: TAPROOT

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDÓNS
ORDER:	MALVALES
FAMILY:	ESTERCULIÁCEAS

VARIETIES

OCCIDENTALIS BENTH (*B. gregrii* F. J. Muell.)

MORPHOLOGY

Trunk	Bark: FISSURED	Color: GREENISH GRAY
LEAF SEMI DECIDUOUS; SIZE: LEAF: 5-7CM; COLOR: US:MID GREEN, LS: MID GREEN; TEXTURE: US:GLOSSY, LS:GLOSSY	COMPOUND: NO HARDNESS: SOFT INSERTION: ALTERNATE VENATION: PINNATE SHAPE: LANCEOLATE MARGIN: ENTIRE APEX: ACCUMINATE LEAF BASE: ROUNDED PETIOLE: LONG	
Flower SIZE: ♂/M 10MM, ♀/F 10MM	Type: UNISEXUAL	Reproduction: MONOECIOUS
	Flowering: PANICLE (4 CM)	Fragrance: NO
Fruit SIZE: 4-8 CM	Type: CAPSULE	Color: BLACK
	Edible: NO	Fructing season: SEP-OCT
Growth	Rate: MODERATE	Longevity: 100 YEARS



ECOLOGY

Climate ALTITUDE: 0-100M; IRRIGATION: MODERATE	Temperature: -6ºC,H4,Z6	Drought resistant: MODERATE
	Sun exposure: SUN/PARTIAL SHADE	Frost resistant: MODERATE
Soil pH: 5.5-8.5; FERTILITY: MODERATE	Texture: SANDY	Salt resistant: NO
	Drainage: MODERATE	Lime resistant: YES

USES

Resistance		Applications			
COASTAL:	2ND LINE	SLOPES:	NO	LINE:	YES
POLLUTION:	HIGH	RIVERBANKS:	NO	WINDBREAKER:	YES
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

This species is native to Australia. It is a hardy species, needing warm environments. In Australia the foliage is used to feed cattle. When a young plant, it can be used as an indoor plant. In the city, its main application is as a street tree. In gardens, it can be used as a shade tree. Its specific name refers to the similarity of its leaves with those of some poplar species of the *Populus* genus. In the Canaries, *Brachychiton x roseus* Guymer is rarely cultivated rather a hybrid form between *B. acerifolius* and *B. populneus*, with leaves similar to those of the latter and red flowers. It is the most widespread species, within the genus and can be found along the entire Spanish coast.

SPACING: 5 M

PLANTING AND PLANT HEALTH

This species is easy to grow although it has high water demands. Propagation from seed, which is collected when the fruits are fully ripe and begin to open. The hairs that surround the seeds are quite irritating and uncomfortable, so proper precautions must be taken when handling the fruits. The seedbeds made in March-April provide the following year with 50/60 cm tall plants suitable for breeding in a nursery for 2/3 more years until they reach commercial measurements. They can be successfully transplanted into root ball.

CHROMATIC CALENDAR

Datasheet (Foliage, Flowering and Fruiting season)

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
		X	X	X	X	X	X	X	X	X	

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Girth	Height(cm)
CT (tray)	1 sapling (1/0)	
CT/ RB		150/175
CT/RB		200/250
CT/RB		300/350
CT/RB		400/450
CT/RB		500/550
CT/RB		550/600
CT/RB	14-16	
CT/RB	18-20	
CT/RB	20-25	
CT/RB	30-35	
CT/RB	40-45	
CT/RB	45-50	

Casuarina

Casuarina equisetifolia L.

BROADLEAF EVERGREEN

CASUARINA SPANISH	CASUARINA VALENCIAN	HORSETAIL TREE ENGLISH	FILAO FRENCH

STRUCTURE		
Shape: CONE	Height: 15-35 M	Diameter: 4-6 M
Texture: FINE	Shade: PARTIAL	Root: TAP ROOT

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	FAGALES
FAMILY:	CASUARINAEAE

VARIETIES

MORPHOLOGY		
Trunk	Bark: SCALY	Color: DARK BROWN
Leaf: EVERGREEN; SIZE: LEAF: 0.1; COLOR: US:DARK GREEN, LS:DARK GREEN; TEXTURE: US:TOMENTOSE, LS:TOMENTOSE	COMPOUND: NO; HARDNESS: SOFT; INSERTION: VERTICLE; VENATION: 1 CENTRAL VEIN; SHAPE: TRIANGULAR; MARGIN: ENTIRE; APEX: SHARP; LEAF BASE: ROUNDED; PETICOLE: SESSILE	
Flower: SIZE AND FLOWERING: ♂ SPIKE (4 CM); ♀F 1 CM CATKIN	Type: UNISEXUAL	Reproduction: MONOECIOUS; Fragrant: NO
FRUIT: SIZE: 1-2.4 CM	Type: SAMARA; Edible: NO	Color: BROWN; Fruiting season: AUG-OCT
GROWTH	Rate: FAST	Longevity: 100 YEARS

ECOLOGY		
CLIMATE: ALTITUDE: 0-100; IRRIGATION: LOW	Temperature: -6°C,H4,Z6; Sun exposure: FULL; Texture: ALL TYPES	Drought resistant: YES; Frost resistant: YES; Salt resistant: MODERATE
SOIL: pH: 5.5-8.5; FERTILITY: POOR	Drainage: MODERATE	Lime resistant: MODERATE

USES				
Resistances		Applications		
COASTAL:	1st LINE	SLOPES: NO	LINE:	YES
POLLUTION:	HIGH	RIVERBANKS: NO	WINDBREAKERS:	YES
WIND:	HIGH	GROUPS: YES	ISOLATED:	YES



POINTS OF INTEREST

Native to Northern and Northeastern Australia, and from Southeastern Asia to the Pacific Islands. The specific name(*equisetifolia*) alludes to the similarity of the articulated twigs with the leaves of the horsetail (*Equisetum sp*.). *Casuarina* alludes to the resemblance that the pendulous branches of these trees have with the feathers of the cassowary, a bird of the genus *Casuarinus*. Its wood is used in doors, fences and carvings. The bark contains tannins. It has been applied in traditional medicine to combat diarrhea and even, in ancient times, dysentery. Species used as a windbreaker and in areas near the sea.

SPACING : 8M

PLANTING AND PLANT HEALTH

Casuarinas are appreciated both as ornamental trees in parks and gardens and for reforestation in warm areas. They do not tolerate bare root transplanting. As it is a tall tree, it is not recommended for small gardens or for planting in narrow streets. Propagation by seed.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
	x	x	x	x	x	x	x	x	x	x	x

Sowing Planting Pruning x

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Girth cms)	Height (cms)
CT (tray)	2 years (2/0)	
CT		150-175
CT		175-200
CT		250-300
CT		350-400
CT	18-20	
CT	20-25	
CT	25-30	
RB		400/450
RB		500/550
RB		600/700
RB		700/800
RB		800/900

Cinnamomum *Cinnamomum camphora* (L.) Siebold

BROADLEAF EVERGREEN

ÁRBOL DEL ALCANFOR	CAMFORER	CAMPHOR TREE	CAMPHORIER
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Shape	Height	Diameter
EXTENDED	8-35 M	8-10 M
Texture	Shade	Root
MEDIUM	FULL	OBLIQUE

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	LAURALES
FAMILY:	LAURACEAE

VARIETIES

MORPHOLOGY		
Trunk	Bark: ROUGH	Color: YELLOWISH/BROWN
Leaf	COMPOUND: NO	
EVERGREEN	HARDNESS: SUBCORIACEOUS	
SIZE: LEAF: 6-12.5	ARRANGEMENT: ALTERNATE	
	VENATION: PINNATE	
	SHAPE: OVAL/ELLIPTICAL	
COLOR: US:DK GREEN	MARGIN: ENTIRE	
LS:MID GREEN	APEX: CUSPIDATE/ACUMINATE	
TEXTURE: US:GLOSSY	LEAF BASE: ACUTE	
LS:GLOSSY	PETICOLE: LONG	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE: ♂/M 2 MM	Flowering: PANICLE (5 CM)	Fragrant: NO
Fruit	Type: DRUPE	Color: BLACK
	Edible: NO	Fruiting season: SEP-NOV
SIZE: 0.7-1 CM		
Growth	Rate: MODERATE	Longevity: 100 YEARS



ECOLOGY		
Climate	Temperature: -3ºC,H5,Z6	Drought resistant: MODERATE
ALTITUDE: 0-300	Sun Exposure: SUN/PARTIAL SHADE	Frost resistant: MODERATE
IRRIGATION: LOW		
Soil	Texture: SANDY	Salt resistant: NO
pH: 5-7.5	Drainage: MODERATE	Lime resisant: NO
FERTILITY: MODERATE		

USES				
Resistances		Applications		
COASTAL:	NO	SLOPES: NO	LINE:	NO
POLLUTION:	LOW	RIVERBANKS: NO	WINDBREAKERS:	YES
WIND:	HIGH	GROUPS: NO	ISOLATED:	YES

POINTS OF INTEREST

Native to China, Taiwan and Japan. Its specific name means camphor. It does not tolerate the continental climate, therefore its plantation is preferably restricted to areas near the Mediterranean coast. Its wood is very fragrant, rot-proof, easy to polish and used for furniture, cabinetry and interior finishes of buildings. By distillation of its wood, camphor is obtained and can beused in medicine and as an antiseptic. The ability of this wood to repel insects has prompted its use for boxes and chests, where valuable objects are kept. It can be confused with *Cocculus laurifolius* , but it is easy to differentiate since the leaf veins of the "camphor tree" are at a certain distance from the leaf blade, while in the *cocculus* they start from the leaf sheath.

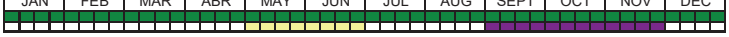
SPACING: 12M

PLANTING AND PLANT HEALTH

Propagation by seed, which must be cleaned of the pulp and sown as soon as possible since their germination power is short. It is resistant to pests and diseases.

CHROMATIC CALENDAR

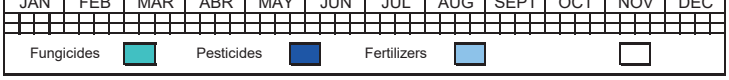
FOLIAGE, FLOWERING AND FRUITING SEASON



CULTIVATION CALENDAR



TREATMENT CALENDAR



COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
CT3		60/80
CT10		100/125
CT50		150/175
CT50		175/200
CT240		250/300
CT30	8-10	
CT30	10-12	
CT50	12-14	
CT50	14-16	
CT140	18-20	
CT140	20-25	
CT500	40-45	
CT1000	60-70	

Coccoloba

Coccoloba uvifera (L.) L.

BROADLEAF EVERGREEN

UVA DE PLAYA	RAÏM DE MAR	SEA GRAPE/BAY GRAPE	RAISINIER
Spanish	Valencian	English	French

STRUCTURE		
Shape: ROUND	Height: 5-9 M	Diameter: 4-6 M
Texture: COARSE	Shade: FULL	Root: OBLIQUE

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	POLYGONALES
FAMILY:	POLTGONACEAE

VARIETIES

MORPHOLOGY		
Trunk	Bark: SMOOTH	Color: GRAY
Leave: EVERGREEN; SIZE: LEAF: 7-25CM; Leaflet: NO; COLOR: US:BLUE/GREEN; LS:MID GREEN; TEXTURE: US: GLOSSY; LS:GLOSSY	COMPOUND: NO; HARDNESS: CORIAEOUS; ARRANGMENT: ALTERNATE; VENATION: PINNATE; SHAPE: ROUND; MARGIN: ENTIRE; APEX: ROUNDED; LEAF BASE: CORDATE; PETIOLE: SHORT	
Flower: SIZE: ♂/M 6 MM; ♀/F 6 MM	Type: UNISEXUAL; Flowering: RACEME (20-30 CM)	Reproduction: DIOECIOUS; Fragrant: YES
Fruit: SIZE: 1-2 CM	Type: DRUPE; Edible: YES	Color: PURPLE; Fruiting season: SEP-DEC
Growth	Rate: FAST	Longevity: 10 YEARS

Ecology		
Climate: ALTITUDE: 0-100; IRRIGATION: LOW	Temperature: 6ºC,G1,Z7; Sun exposure: FULL SUN	Drought resistant: YES; Frost resistant: NO
Soil: pH:; FERTIILITY: POOR	Texture: SANDY; Drainage: MODERATE	Salt resistant: YES; Lime resistant: MODERATE

USES			
Resistances		Applications	
COASTAL: 1ST LINE		SLOPES: NO	LINE: YES
POLLUTION: MODERATE		RIVERBANKS: NO	WIND BREAKERS: YES
WIND: HIGH		GROUPS: YES	ISOLATED: YES



POINTS OF INTEREST

Native to the Antilles, Bahamas and tropical South America. Its specific name means grape producer. Apparently, it was the first plant that Christopher Columbus noticed when he first set foot on the beaches of America. Its wood is hard, very heavy, and is sometimes used in construction and in the manufacture of furniture. The bark contains tannins used in tanning. The roots and bark are used in folk medicine against diarrhea and dysentery. It produces a reddish sap that is used to dye and was used as ink, serving the first colonizers. Its fruits are sweet and edible, and can be eaten raw or in jams, and when fermented it produces a drink similar to wine. Resistant to seawater spray. Recommended for coastal gardens.

SPACING : 5M

PLANTING AND PLANT HEALTH

Propagation by seed. This species is resistant to pests and diseases.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
		x	x	x	x	x	x	x	x	x	x

Sowing | Planting | Pruning x

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
Commerialized in the Canary Islands		

Cocculus *Cocculus laurifolius* (Robx) DC.

BROADLEAF EVERGREEN

CÓCULO	CÒCUL	MOONSEED	COCULE
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Shape	Height	Diameter
EXTENDED/IRREGULAR	5-10 M	5-8 M
Texture	Shade	Root
COARSE	FULL	HORIZONTAL

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	RANUNCULALES
FAMILY:	MENISPERMUM

VARIETIES

MORPHOLOGY		
Trunk	Bark: SMOOTH/FISSURED	Color: LIGHT BROWN
LEAF	COMPOUND: NO	
EVERGREEN	HARDNESS: SUB-CORIACEOUS	
SIZE: LEAF:10-15CM	ARRANGEMENT: ALTERNATE	
	VENATION: PINNATE	
	SHAPE: OBLONG/LANCEOLATE	
COLOR: US:DARK GREEN	MARGIN: ENTIRE	
LS:DARK GREEN	APEX: ACUMINATE/CUSPIDATE	
TEXTURE: US: GLOSSY	LEAF BASE: ACUTE	
LS:GLOSSY	PETIOLE: SHORT	
Flower	Type: UNISEXUAL	Reproduction: DIOECIOUS
SIZE: ♂/M 4 MM	Flowering: PANICLE (5 CM)	Fragrant: NO
♀/F 4 MM		
Fruit	Type: DRUPE	Color: BLACK
	Edible: NO	Fruiting season: SEPT-NOV
SIZE: 0.6 CM		
Growth	Rate: SLOW	Longevity: 100 YEARS



ECOLOGY		
Climate	Temperature: -15ºC,H2,Z5	Drought resistant: NO
ALTITUDE: 500-800	Sun exposure: SUN/SHADE	Frost resistant: YES
IRRIGATION: HIGH		
Soil	Texture: SANDY	Salt resistant: NO
pH: 5.5-7.5	Drainage: MODERATE	Lime resistant: NO
FERTILITY: MODERATE		

USES				
Resistances		Applications		
COASTAL: NO		SLOPES: NO	LINE: NO	
POLLUTION: MODERATE		RIVERBANKS: NO	WINDBREAKERS: NO	
WIND: LOW		GROUPS: YES	ISOLATED: YES	

POINTS OF INTEREST

Native to tropical and subtropical Eastern Asia, from India and the Himalayas to China and Japan, Southern Indonesia. Its specific name alludes to the resemblance of its leaves to those of the laurel (*Laurus nobilis*) . It is cultivated for the ornamental value of its foliage. It can be confused with the "camphor tree" (*Cinnamomum camphora*), but it is easy to differentiate since the nerves of the "coculus" start from the leaf base, while in the "camphor tree" they do so at a certain distance from it. Cultivated in coastal areas with a temperate climate. Stems and leaves contain a toxic substance similar to the curare used by the indigenous people of South America to poison their weapons. In the Himalayas, Malaysia and India, local people throw cocculus leaves into rivers to stupify the fish that remain on the surface of the water making them easier to catch.

SPACING: 10M

PLANTING AND PLANT HEALTH

It is typical of temperate zones of the Asian mountains, from where its cultivation has spread throughout the temperate zones of the Northern hemisphere. In the areas where it is spontaneous, it colonizes moderately humid mountain areas but with a long period of summer drought. In the Iberian lands, its planting and cultivation must be carried out in deep and humid soils, even if the environment is dry. It multiplies by means of seeds although in Spain (due to the scarcity of existing specimens) it is difficult to obtain them. Propagation is by a cutting of the wood of the year with leaves.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
x	x	x	x	x	x	x	x				x	x	x	x

Sowing Planting Pruning x

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation (L)	Girth(cm)	Height (cm)
CT (3)		
CT (7)		
CT (15)		
CT (25)		
CT (50)		
CT (85)		
CT (230)		
CT (500)		

Reduced commercialization

Eucalyptus *Eucalyptus camaldulensis* Dehnh.

BROADLEAF EVERGREEN

EUCALIPTO ROJO (SPANISH) · E. DE FULLES ESTRETES (VALENCIAN) · RIVER RED GUM (ENGLISH) · EUCALYPTUS ROUGE (FRENCH)

STRUCTURE		
Shape: OVAL/IRREGULAR	Height: 30-50 M	Diameter: 10 M
Texture: COARSE	Shade: PARTIAL	Root: TAPROOT

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	MYRTALES
FAMILY:	MYRTACEAE

VARIETIES

MORPHOLOGY		
Trunk	Bark: SMOOTH/PLATES	Color: TRICOLOR
Leaf EVERGREEN SIZE: LEAF: 12-22cm COLOR: US:MID GREEN, LS :MID GREEN TEXTURE: US:SMOOTH, LS:SMOOTH	COMPOUND: NO HARDNESS: CORIACEOUS ARRANGEMENT: ALTERNATE VENATION: PINNATE SHAPE: LANCEOLATE MARGIN: ENTIRE APEX: ACUMINATE/CUSPIDATE LEAF BASE: ACUTE PETIOLE: SHORT	
Flower SIZE: ♂/M 1.2 CM, ♀/F	Type: HERMAPHRODITE Flowering: UMBEL I(2.5 CM)	Reproduction: HERMAPHRODITE Fragrant: YES
Fruit SIZE: 0.5-0.8 CM	Type: CAPSULE Edible: NO	Color: BROWN Fruiting: AUG-SEP
Growth	Rate: FAST	Longevity: 200 YEARS

ECOLOGY		
Climate ALTITUDE: 0-200 IRRIGATION: LOW	Temperature: -9ºC,H4,Z6 Sun exposure: FULL	Drought resistant: MODERATE Frost resistant: MODERATE
Soil pH: 5.5-8.5 FERTILTY: POOR	Texture: ALL TYPES Drainage: HIGH	Salt resistant: MODERATE Lime resistant: MODERATE

USES			
Resistances		Applications	
COASTAL: 1ST LINE		SLOPES: YES	LINE: YES
POLLUTION: MODERATE		RIVERBANKS: YES	WINDBREAKERS: YES
WIND: HIGH		GROUPS: YES	ISOLATED: YES



POINTS OF INTEREST

Native to Australia, where it can be found throughout most of the country, except for a small area in the South West. In Spain it is the most cultivated species of eucalyptus. Its trunk excretes a sap-like liquid called red gum, used for medicinal purposes. Its wood is very hard, strong and durable, being used for poles in wet areas, shipbuilding, railway sleepers, bridges and for paper pulp, and it is also a good fuel. It is a honey plant. Apparently, the leaves are eaten by goats when no other forage can be found. The specific name alludes to the Italian garden of Camalduli (Naples), from where the species seems to have been first described.

SPACING: 10M

PLANTING AND PLANT HEALTH

Propagation by seed. Due to its great growth and its aggressiveness, it is not recommended for small gardens nor near buildings. It needs large spaces to be able to develop freely. The *"Phoracantha semipunctata"* beetle creates galleries in trunks and branches causing the death of specimens of any age. The fight against this insect can only be preventive and is based on keeping the specimens vigorous since the females only lay their eggs on weakened or diseased trees. The species is also attacked by defoliating insects such as *Gonipterus scutellatus* and polyphagous mealybugs such as *Quadraspidiotus perniciosus*.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
		X	X	X	X	X	X	X	X	X	X

Sowing · Planting · Pruning (X)

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides · Pesticides · Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
CT		125-150
CT		150-175
CT		175-200
CT		200-250
CT		250-300
RB	6-8	
RB	18-20	
RB	20-25	
RB	25-30	
RB	30-35	
RB	35-40	
RB	40-45	
RB	45-50	

Eucalyptus *Eucalyptus ficifolia* F. J. Muell.

BROADLEAF EVERGREEN

EUCALIPTO ROJO (SPANISH) · EUC. FLORS VERMELLES (VALENCIAN) · SCARLET-FLOWERED GUM (ENGLISH) · GOMMIER ROUGE (FRENCH)

STRUCTURE		
Shape: OVAL/ IRREGULAR	Height: 7-15 M	Diameter: 4-6 M
Texture: COARSE	Shape: PARTIAL	Root: TAPROOT/HORIZONTAL

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	MYRTALES
FAMILY:	MYRTACEAE

VARIETIES

MORPHOLOGY		
Trunk	Bark: ROUGH	Color: LIGHT GRAY
Leaf	COMPOUND: NO	
EVERGREEN	HARDNESS: CORIACEOUS	
SIZE: LEAF: 7-14CM	ARRANGEMENT: ALTERNATE	
	VENATION: PINNATE	
	SHAPE: LANCEOLATE	
COLOR: US: DK GREEN	MARGIN: ENTIRE	
LS: DK GREEN	APEX: ACUMINATE/CUSPIDATE	
TEXTURE: US: SMOOTH	LEAF BASE: ATENUATE	
LS: SMOOTH	PETIOLE: SHORT	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE: ♂/M 4 CM	Flowering: CORYMB/UMBEL	Fragrant: YES
Fruit	Type: CAPSULE	Color: RED
	Edible: NO	Fruiting season: SEP-OCT
SIZE: 2-5 CM		
Growth	Rate: MODERATE	Longevity: 125 YEARS

ECOLOGY		
Climate	Temperature: -3ºC,H5,Z6	Drought resistant: NO
ALTITUDE: 0-400	Sun exposure: FULL	Frost resistant: MODERATE
IRRIGATION: MODERATE		
Soil	Texture: CLAYEY	Salt resistant: MODERATE
pH: 5-7.5	Drainage: MODERATE	Lime resistant: MODERATE
FERTILITY: MODERATE		

Uses				
Resistances		Applications		
COASTAL: 2nd LINE	SLOPES: NO	LINE: YES		
POLLUTION: MODERATE	RIVERBANKS: NO	WINDBREAKERS: YES		
WIND: MODERATE	GROUPS: YES	ISOLATED: YES		



POINTS OF INTEREST

Native to South Western Australia. Its wood is pale yellow, heavy, strong and durable. It is a beautiful ornamental tree, especially for its spectacular reddish flowering. Its specific name alludes to the resemblance of its leaves to those of a ficus (*Ficus sp* .).

SPACING: 6M

PLANTING AND PLANT HEALTH

Propagation by seed. Due to its medium size, it is an ideal species for gardens and as a stree tree. The "*Phoracantha semipunctata*" beetle creates galleries in trunks and branches causing the death of specimens of any age. The fight against this insect can only be preventive and is based on keeping the specimens vigorous since the females only lay their eggs on weakened or diseased trees. The species is also attacked by defoliating insects such as *Gonipterus scutellatus* and polyphagous mealybugs such as *Quadraspidiotus perniciosus* .

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
		x	x	x	x	x	x	x	x	x	x

Sowing Planting Prune x

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
CT		175/200
CT		200/250
CT		250/300

Eucalyptus — *Eucalyptus globulus* Labill.

BROADLEAF EVERGREEN

EUCALIPTO BLANCO (SPANISH) · EUCALIPTUS COMÚ (VALENCIAN) · SOUTHERN BLUE GUM (ENGLISH) · GOMMIER BLEU (FRENCH)

STRUCTURE

Shape	Height	Diameter
OVAL/IRREGULAR	30-55 M	10 M
Texture	**Shade**	**Root**
COARSE	PARTIAL	TAPROOT-HORIZONTAL

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	MYRTALES
FAMILY:	MYRTACEAE

VARIETIES

MORPHOLOGY

Trunk	Bark: ROUGH	Color: GRAY
Leaf	COMPOUND: NO	
EVERGREEN	HARDNESS: CORIACEOUS	
SIZE: LEAF:8-35CM	ARRANGEMENT: ALTERNATE	
	VENATION: PINNATE	
COLOR: US:BLUE GREEN	SHAPE: LANCEOLATE/FALCATE	
LS:BLUE GREEN	MARGIN: ENTIRE	
TEXTURE: US:SMOOTH	APEX: ACUMINATE/CUSPIDATE	
LS:SMOOTH	LEAF BASE: ATENUATE	
	PETIOLE: LONG	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE: ♂/M 3-4 CM	Flowering: SINGLE/UMBEL	Fragrant: YES
Fruit	Type: CAPSULE	Color: LIGHT GREEN
SIZE: 1.8-2.5 CM	Edible: NO	Fruit season: NOV-DEC
Growth	Rate: FAST	Longevity: 200 YEARS



ECOLOGY

Climate	Temperature: -6ºC,H4,Z6	Drought resistant: MODERATE
ALTITUDE: 0-400	Sun exposure: FULL	Frost resistant: MODERATE
IRRIGATION: MODERATE		
SOIL	Texture: LOAMY/SANDY	Salt resistant: MODERATE
pH: 5-7.5	Drainage: MODERATE	Lime resistant: MODERATE
FERTILITY: POOR		

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	YES	LINE:	YES
POLLUTION:	MODERATE	RIVERBANKS:	YES	WINDBREAKERS:	YES
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Native to Southern Victoria, in Australia, and the island of Tasmania, where it grows associated with other species of the same genus. It is one of the most cultivated eucalyptus in Spain. Highly recommended tree to reforest poor and eroded soils and to fix dunes. Its wood is yellowish brown, heavy, strong and durable, being used in shipbuilding, farming tools and paper pulp. Essential oils for pharmacy and perfumery are extracted from the leaves. In popular medicine it is used as an antiseptic, against colds, as a healing agent, etc. the branches scare away insects, and houses can be fumigated with the burnt leaves.

SPACING: 10M

PLANTING AND PLANT HEALTH

Propagation by seed. Due to its great growth and its aggressiveness, it is not recommended for small gardens or near buildings. It needs large spaces to be able to develop freely. The *"Phoracantha semipunctata"* beetle creates galleries in trunks and branches causing the death of specimens of any age. The fight against this insect can only be preventive and is based on keeping the specimens vigorous since the females only lay their eggs on weakened or diseased trees. The species is also attacked by defoliating insects such as *Gonipterus scutellatus* and polyphagous mealybugs such as *Quadraspidiotus perniciosus*.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
		X	X	X	X	X	X	X	X	X	X

Sowing Planting Pruning X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
CT		100/125
CT		125/150
CT		150/175
CT		175/200
CT		200/250
CT		250/300
CT	6-8	
CT	8-10	
CT	10-12	
CT	12-14	

Ficus — *Ficus elastica* Roxb. ex Hornem.

BROADLEAF EVERGREEN

ÁRBOL DEL CAUCHO	FICUS DE CAUTXÚ	INDIAN RUBBER TREE	CAOUTCHOUC
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Shape: ROUND	Height: 30 M	Diameter: 15-20 M
Texture: COARSE	Shade: FULL	Root: OBLIQUE

		VARIETIES
DIVISION:	SPERMATOPHYTES	
SUBDIVISION:	ANGIOSPERMS	*DECORA*
TYPE:	DICOTYLEDONS	*RUBRA*
ORDER:	URTICALES	*VARIEGATA*
FAMILY:	MORACEAE	*ROBUSTA*

MORPHOLOGY		
Trunk	Bark: SMOOTH	Color: GRAY
Leaf EVERGREEN	COMPOUND: NO	
	HARDNESS: CORIACEOUS	
	ARRANGEMENT: ALTERNATE	
SIZE: LEAF:20-25 CM	VENATION: PINNATE	
	SHAPE: ELIPTICAL	
COLOR: US:DK GREEN	MARGIN: ENTIRE	
LS:DK GREEN	APEX: ACUMINATE	
TEXTURE: US:GLOSSY	LEAF BASE: ROUND	
LS:GLOSSY	PETIOLE: SHORT	
Flower	Type: UNISEXUAL	Reproduction: MONOECIOUS
SIZE: ♂ ♀	Flowering	Fragrant: NO
Fruit	Type: SYCONIUM	Color: YELLOW/GREEN
SIZE: 1 CM	Edible: NO	Fruiting season: JUN-JUL
Growth	Rate: FAST	Longevity: 200 YEARS



ECOLOGY		
Climate	Temperature: -0ºC,H5,Z7	Drought resistant: NO
ALTITUDE: 0-100	Sun exposure: SUN/PARTIAL SHADE	Frost resistant: NO
IRRIGATION: HIGH		
Soil	Texture: LOAMY/SANDY	Salt resistant: MODERATE
pH: 5-7.5	Drainage: MODERATE	Lime resistant: MODERATE
FERTILITY: MODERATE		

USES					
Resistances		Applications			
COASTAL:	2nd LINE	SLOPES:	NO	LINE:	YES
POLLUTION:	MODERATE	RIVERBANKS:	NO	WINDBREAKERS:	YES
WIND:	MODERATE	GROUPS:	YES	ISOLATED	YES

POINTS OF INTEREST

Native to the Himalayas and as far as the Malay peninsula, Sumatra and Java. This species is ideal as an indoor plant. There are different commercialized cultivars. Cultivated outdoors, good specimens can be seen in the Canary Islands and in the peninsular Mediterranean coast. *Elastica*, is related to rubber and therefore logically alluding to the fact that rubber was made from it. The emission of aerial roots is one of the most remarkable botanical characteristics of the *genus*. These aerial roots are projected from the branches to the ground, penetrating it like any root and serving as a support for the crown which, in this way, can extend to reach considerable dimensions. Another of its peculiarities is the presence of milky sap (latex).

SPACING: 12 M

PLANTING AND PLANT HEALTH

Although ficuses can be propagated by seeds, cuttings and air layering are the most common methods. The cuttings can be apical and from the stem, with a terminal shoot and a leaf or a bud and a leaf, respectively. The rooting method requires temperatures of 28-30 ºC. Air layering is the simplest multiplication method, since it does not require the indicated temperatures. The cultivation of ficuses in general is not difficult; They require fertile and loose soils with medium environmental humidity and sunny exposures, sheltered from the cold. Whiteflies are frequent in the species, and can be controlled with Diazinon and Fenitrothion. Mealybugs such as *Quadraspidiotus perniciosus* often attack various species of the *genus* and can be treated with *Chlorpyrifos, Methyl-pirimiphos* or some phosphorous product (Fenitrothion, Diazinon, etc.)

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
								x x x x	x x x x		

Sowing — Planting — Pruning x

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides — Pesticides — Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
CT		40/50
CT		125/150
CT		150/175
CT		175/200
CT		200/250

Ficus — *Ficus lyrata* Warb.

BROADLEAF EVERGREEN

FICUS DE LA LIRA	FICUS LIRA	BANJO FIG	CAOUTCHOUC LYRE
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Shape: ROUND	Height: 8-12 M	Diameter: 5-10 M
Texture: COARSE	Shade: FULL	Root: OBLIQUE

DIVISION:	SPERMTOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	URTICALES
FAMILY:	MORACEAE

VARIETIES

MORPHOLOGY		
Trunk	Bark: SMOOTH/FISSURED	Color: GRAY
Leaf: EVERGREEN; SIZE: LEAF: 45-50 CM; COLOR: US:MID GREEN, LS:MID GREEN; TEXTURE: US:GLOSSY, LS:GLOSSY	COMPOUND: NO; HARDNESS: CORIACEOUS; ARRANGEMENT: ALTERNATE; VENATION: PINNATE; SHAPE: PANDURATE; MARGIN: ENTIRE; APEX: ROUND; LEAF BASE: CORDATE; PETIOLE: SHORT	
Flower: SIZE: ♂ ♀	Type: UNISEXUAL; Flowering	Reproduction: MONOECIOUS; Fragrant: NO
Fruit: SIZE: 2.5-3 cm	Type: SYCOMIUM; Edible: YES	Color: GREEN AND WHITE; Fruiting season: JUN-JUL
Growth	Rate: MODERATE	Longevity: 200 YEARS

ECOLOGY		
Climate: ALTITUDE: 0-100; IRRIGATION: ++HIGH	Temperature: +6ºC,G1,Z7; Exposure to sun: SHADE/PARTIAL	Drought resistant: NO; Frost resistant: NO
pH: 5-7.5; FERTILITY: FERTILE	Texture: SANDY; Drainage: MODERATE	Salt resistant: NO; Lime resistant: NO

USES					
Resistances		Applications			
COASTAL:	2nd LINE	SLOPES:	NO	LINE:	YES
POLLUTION:	LOW	RIVERBANKS:	NO	WINDBREAKERS:	YES
WIND:	LOW	GROUPS:	NO	ISOLATED:	YES



POINTS OF INTEREST

Native to tropical Western Africa. Species widely used as an indoor plant although in the Canary Islands and in parts of the Mediterranean coast and when cultivated outdoors, it reaches considerable sizes. Its specific name alludes to the lyre shape of its leaves. The emission of aerial roots is one of the most remarkable botanical characteristics of the genus. These aerial roots project the branches to the ground, penetrating it like any root and serving as a support for the crown which, in this way, can extend to reach considerable dimensions. Another of its peculiarities is the presence of milky sap (latex). As a young plant, it can be used as a potted indoor plant.

SPACING: 8 M

PLANTING AND PLANT HEALTH

Although ficuses can be propagated by seeds, cuttings and air layering are the most common methods. The cuttings can be apical and from the stem, with a terminal shoot and a leaf or a bud and a leaf, respectively. The rooting method requires temperatures of 28-30 ºC. Air layering is the simplest propagation method, since it does not require the indicated temperatures. The cultivation of ficuses in general is not difficult; They basically require fertile and loose soils with moderate environmental humidity and sunny exposures, sheltered from the cold. It is not usually affected by pests or diseases. Pruning or regular maintenance is not required.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
								X	X	X	X	X	X	X	X	X	X	X	X		

Sowing Planting Pruning x

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation (L)	Girth (cm)	Height (cm)
CT (3)		40/60
CT (3)		60/80
CT (10)		80/100
CT (15)		100/125
CT (25)		125/150
CT (50)		150/175
CT (50)		175/200

Ficus *Ficus macrophylla* Desf. ex Pers.

BROADLEAF EVERGREEN

HIGUERA AUSTRALIANA (SPANISH) | Ficus macrophylla (VALENCIAN) | Moreton Bay Fig/Australian Banyan (ENGLISH) | Figuier de la baie de Moreton (FRENCH)

STRUCTURE		
Shape: EXTENDED	Height: 60-70 M	Diameter: 15-40 M
Texture: COARSE	Shade: FULL	Root: OBLIQUE/AERIAL

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONEAES
ORDER:	URTICALES
FAMILY:	MORACEAE

VARIETIES

SUB SPECIES - "COLUMARIS"

MORPHOLOGY		
Trunk	Bark: SMOOTH	Color: GRAY
Leaf: EVERGREEN; SIZE: LEAF:20-30CM; COLOR: US:DK GREEN, LS:RUST/RED; TEXTURE: US:SMOOTH, LS:TOMENTOSE	COMPOUND: NO; HARDNESS: CORIACEOUS; ARRANGEMENT: ALTERNATE; VENATION: PINNATE; SHAPE: OVAL/ELIPTICAL; MARGIN: ENTIRE; APEX: ACUMINATE; LEAF BASE: ROUND; PETIOLE: LONG	
Flower: SIZE: ♂ ♀	Type: UNISEXUAL	Reproduction: MONOECIOUS
		Fragrant: NO
Fruit: SIZE: 1-2.5 CM	Type: SYCONIUM	Color: PURPLE/YELLOW
	Edible: NO	Fruiting season: JUL-OCT
Growth	Rate: FAST	Longevity: >300 YEARS

ECOLOGY		
Climate: ALTITUDE: 0-100; IRRIGATION: HIGH	Temperature: 0ºC,H5,Z7	Drought resistant: NO
	Sun exposure: SUN/PARTIAL SHADE	Frost resistant: NO
Soil: pH: 5-7.5; FERTILITY: FERTILE	Texture: SANDY	Salt resistant: NO
	Drainage: MODERATE	Lime resistant: NO

USES				
Resistances		Applications		
COASTAL: 1st LINE	SLOPES: NO	LINE: YES		
POLLUTION: LOW	RIVERBANKS: NO	WINDBREAKERS: YES		
WIND: MODERATE	GROUPS: YES	ISOLATED: YES		



POINTS OF INTEREST

Native to Australia. Frequent in cities throughout the Mediterranean area, where it reaches considerable sizes. Its specific name means large leaves. The emission of aerial roots is one of the most notable botanical characteristics of the genus and especially of this species. The aerial roots project from the branches to the ground, penetrating it like any root and serving as a support for the crown which, in this way, can extend to reach considerable dimensions. The presence of milky sap (latex) is another of its peculiarities. The wood is brittle and as a result, strong winds tend to tear large branches.

SPACING: 15 M

PLANTING AND PLANT HEALTH

Propagated by cuttings and air layering. The cuttings can be apical and from the stem, with a terminal shoot and a leaf or a bud and a leaf, respectively. Air layering is the simplest propagation method. The cultivation of ficuses in general is not difficult. Fertile and loose soils with moderate environmental humidity and sunny exposures is required and shelter from the cold. It should not be planted near buildings or constructions due to its vigorous development over the years. As a young plant, it can be used as a potted indoor plant. White flies are frequent in the species and can be controlled with Fenitrotion. Mealybugs such as *Quadraspidiotus perniciosus* often attack various species of the *genus*. It can be treated with *Chlorpyrifos*, or some phosphorous product.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
								X	X	X	X

Sowing | Planting | Pruning (X)

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height(cm)
CT		100/125
CT		150/175
CT		250/300
CT		300/350
CT	8-10	
CT	14-16	
CT	16-18	
CT/RB	18-20	
CT/RB	20-25	
CT/RB	25-30	
CT/RB	35-40	
CT/RB	40-45	
CT/RB	45-50	

Ficus — *Ficus microcarpa* L.f.

BROADLEAF EVERGREEN

LAUREL DE LA INDIA	FICUS DE L'ÍNDIA	INDIAN LAUREL	LAURIER D'INDIE
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Shape: ROUND	Height: 7-20 M	Diameter: 15 M
Texture: COARSE	Shade: FULL	Roots: OBLIQUE/AERIAL

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	URTICALES
FAMILY:	MORACEAE

VARIETIES
HAWAII

MORPHOLOGY		
Trunk	Bark: SMOOTH	Color: LIGHT GRAY
Leaf: EVERGREEN; SIZE: LEAF: 4-16CM, LEAFLET: NO; COLOR: US:DK GREEN, LS:MID GREEN; TEXTURE: US:GLOSSY, LS:GLOSSY	COMPOUND: NO; HARDNESS: CORIACEOUS; ARRANGEMENT: ALTERNATE; VENATION: PINNATE; SHAPE: OVAL/ELIPTICAL; MARGIN: ENTIRE; APEX: ACUMINATE; LEAF BASE: ATENUATE; PETIOLE: SHORT	
Flower: SIZE: ♂ ♀	TYPE: UNISEXUAL	Reproduction: MONOECIOUS
	Flowering	Fragrant: NO
Fruit: SIZE: 0.8-1 CM	Type: SYCONIUM	Color: PURPLE
	Edible: NO	Fruiting season: JUL-AUG
Growth	Rate: FAST	Longevity: 200 YEARS

ECOLOGY		
Climate	Temperature: 0ºC,H5,Z7	Drought resistant: MODERATE
ALTITUDE: 0-100	Sun exposure: SUN/PARTIAL SHADE	Frost resistant: NO
IRRIGATION: MODERATE		
Soil	Texture: LOAM/SAND	Salt resistant: MODERATE
pH: 5-8.5	Drainage: MODERATE	Lime resistant: MODERATE
FERTILITY: MODERATE		

USES			
Resistances		Applications	
COASTAL: 1st LINE	SLOPES: NO	LINE: YES	
POLLUTION: MODERATE	RIVERBANKS: NO	WINDBREAKERS: YES	
WIND: MODERATE	GROUPS: YES	ISOLATED: YES	



POINTS OF INTEREST

Native to South and Southeast Asia and as far as Malaysia, Melanesia, the Pacific and Australia. It is a species with a certain morphological variability, for which some varieties have been recognized. In the Canary Islands it reaches spectacular dimensions, being frequent also in the Mediterranean coast. Its specific name means small leaf. Pruning in topiary is succesful, giving it geometric and capricious shapes. The presence of milky sap (latex) is another of its peculiarities. It is ideal as a shade tree for pathways and avenues, although it has the inconvenience of raising pavements. Its wood is brittle.

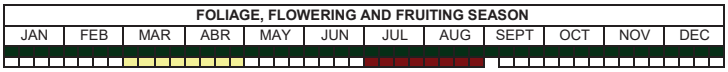
SPACING: 10 M

PLANTING AND PLANT HEALTH

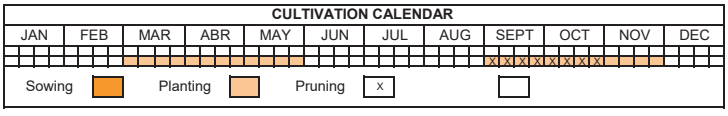
It is propagated by cuttings and air layering. The cuttings can be apical and from the stem, with a terminal shoot and a leaf or a bud and a leaf, respectively. Air layering is the simplest propagation method. The cultivation of ficuses in general is not difficult. Fertile and loose soils with moderate environmental humidity and sunny exposures are required and shelter from the cold. It should not be planted near buildings or constructions due to its powerful root system. White flies are frequent in the species and can be controlled with Fenitrotion. Mealybugs such as *Quadraspidiotus perniciosus* often attack various species of the genus and can be treated with *Chlorpyrifos*, *Methyl-pirimiphos*, or some phosphorous product (Diazinon, Fenitrothion, Phentoate).

CHROMATIC CALENDAR

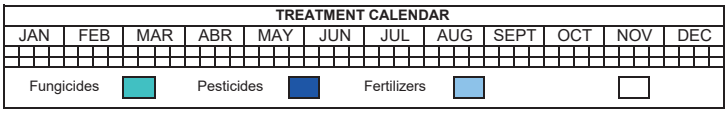
FOLIAGE, FLOWERING AND FRUITING SEASON



CULTIVATION CALENDAR



TREATMENT CALENDAR



COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
CT		125/150
CT		175/200
CT		250/300
CT		300/350
CT/RB	10-12	
CT/RB	14-16	
CT/RB	16-18	
CT/RB	18-20	
CT/RB/CEY	20-25	
CT/RB/RB CEY	30-35	
CT/RB/RB in CEY	35-40	
CT/RB	45-50	
CTRB	50-60	

Ficus — *Ficus rubiginosa* Desf. ex Vent.

BROADLEAF EVERGREEN

LAUREL DE LA INDIA	FICUS DE L'ÍNDIA	INDIAN LAUREL	LAURIER D'INDE
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Shape	Height	Diameter
ROUND	8-12 M	6-10 M
Texture	Shade	Root
COARSE	FULL	OBLIQUE/AERIAL

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	URTICALES
FAMILY:	MORACEAE

VARIETIES

AUSTRALIS

MORPHOLOGY		
Trunk	Bark	Color
	SMOOTH	LIGHT GRAY
LEAF	COMPOUND:	NO
	HARDNESS:	CORIACEOUS
EVERGREEN	ARRANGEMENT:	ALTERNATE
SIZE: LEAF:7-15cm	VENATION:	PINNATE
	SHAPE:	OVAL/ROUND
COLOR: US:DK GREEN	MARGIN:	ENTIRE
LS:RUST/RED	APEX:	ROUND
TEXTURE: US:GLOSSY	LEAF BASE:	ROUND
LS:HAIRY	PETIOLE:	SHORT
FLOWER	Type	Reproduction
	UNISEXUAL	MONOECIOUS
SIZE: ♂	Flowering	Fragrant
♀		NO
Fruit	Type	Color
	SYCONIUM	GREEN/YELLOW
	Edible	Fruiting season
SIZE: 1-1.5 CM	NO	JUL-AUG
Growth	Rate	Longevity
	MEDIUM	200 YEARS



ECOLOGY		
Climate	Temperature	Drought resistant
	0ºC,H5,Z7	NO
ALTITUDE: 0-100	Sun exposure	Frost resistant
IRRIGATION: MODERATE	SHADE/PARTIAL	NO
Soil	Texture	Salt resistant
	SANDY	MODERATE
pH: 5-7.5	Drainage	Lime resistant
FERTILITY: FERTILE	MODERATE	MODERATE

USES				
Resistances		Applications		
COASTAL:	1ST LINE	SLOPES:	NO	LINE: YES
POLLUTION:	LOW	RIVERBANKS:	NO	WINDBREAKER: YES
WIND:	MODERATE	GROUPS:	YES	ISOLATED: YES

POINTS OF INTEREST

Native to Australia, where it can be bushy or large. It is a strangling fig tree that manages to develop on other plants, growing its roots in such a way that it kills the tree on which it lives. Frequent in the Canary Islands and throughout the Mediterranean coast, where notable specimens can be seen. There is a variegated form and other glabrous forms without any tomentum (hair) in leaves and fruits (*Australis*). Its specific name means rust, alluding to the color of the lower surface of the leaves. The emission of aerial roots is one of the most notable botanical characteristics of the genus and especially of this species. The trees project from aerial roots from the branches to the ground, penetrating it like any root and serving as a support for the crown.

SPACING: 10 M

PLANTING AND PLANT HEALTH

Propagated by cuttings and air layering. The cuttings can be apical and from stem, with a terminal shoot and a leaf or a bud and a leaf, respectively. Air layering is the simplest propagation method. The cultivation of ficuses in general is not difficult; They basically require fertile and loose soils with moderate environmental humidity and sunny exposures, sheltered from the cold. It should not be used near houses because it is too dark. It can be used, when young, as a potted indoor plant, especially the variegated form. Pruning should be light. White flies are frequent in the species, and can be controlled with Fenitrotion. Mealybugs such as *Quadraspidiotus perniciosus* often attack various species of the *genus* and can be treated with *Chlorpyrifos,* etc.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
								x	x	x	x

Sowing Planting Pruning x

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
CT		150/175
CT		200/250
CT		250/300
CT/RB	10-12	
CT/RB	12-14	
CT/RB	14-16	
CT/RB	16-18	
CT/RB	18-20	
CT/RB	20-25	
CT/RB	30-35	
CT/RB	40-45	
CT/RB	45-50	
CT/RB	50-60	

Grevillea *Grevillea robusta* A. Cunn. ex R. Br.

BROADLEAF EVERGREEN

ROBLE AUSTRALIANO (SPANISH) | GREVIL.LEA (VALENCIAN) | SILK-OAK (ENGLISH) | CHÊNE D'AUSTRALIE (FRENCH)

STRUCTURE		
Shape: CONE	Height: 10-30 M	Diameter: 6-8 M
Texture: COARSE	Shade: PARTIAL	Root: TAPROOT

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	PROTEALES
FAMILY:	PROTEACEAE

VARIETIES

MORPHOLOGY		
Trunk	Bark: FISSURED/VERTICAL	Colour: DARK GRAY
LEAF EVERGREEN; SIZE: LEAF:20-30CM; COLOR: US:DK GREEN LS:SILVER; TEXTURE: US:SMOOTH LS:HAIRY	COMPOUND: BIPINNATE; HARDNESS: SOFT; ARRANGEMENT: ALTERNATE; VENATION: PINNATE; SHAPE: PINNATIFID; MARGIN: ENTIRE; APEX: SHARP; LEAF BASE: ATENUATE; PETIOLE: SHORT	
Flower SIZE: ♂/M 10 MM	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
	Flowering: RACEME (10-15 CM)	Fragrant: NO
Fruit SIZE: 2 CM	Fruit: FOLLICLE	Color: BLACK
	Edible: NO	Fruiting season: SEP-OCT
Growth	Rate: FAST	Longevity: 125 YEARS

ECOLOGY		
Climate ALTITUDE: 0-100; IRRIGATION: LOW	Temperature: -6ºC,H4,Z6	Drought resistan: MODERATE
	Sun exposure: SUN/ PARTIAL SHADE	Frost resistant: MODERATE
Soil pH: 5-7.5; FERTILITY: POOR	Texture: LOAMY/SANDY	Salt resistant: NO
	Drainage: MODERATE	Lime resistant: NO

USES				
Resistances		Applications		
COASTAL:	2ND LINE	SLOPES: NO	LINE:	YES
POLLUTION:	MODERATE	RIVERBANKS: NO	WINDBREAKER:	YES
WIND:	MODERATE	GROUPS: YES	ISOLATED:	YES



POINTS OF INTEREST

Native to Australia, in the state of Queensland (Northeast Australia), on the coastal mountain slopes of the Great Dividing Range. The wood is similar to that of true oaks. This species is highly appreciated in carpentry and joinery and is used for furniture covering and to make quality furniture. It is a very ornamental tree due to its striking flowers and strange silvery leaves. In its country of origin, it has been successfully used as a tree for reforestation.

SPACING: 8 M

PLANTING AND PLANT HEALTH

Propagation by seed which must be collected as soon as they mature, as they will be dispersed by the wind within a few days. It is used as a potted indoor plant and as a street tree,isolated, and in parks and gardens. It should not be planted near buildings due to its great growth potential. This species is common in cities with tropical and subtropical climates, as well as on the Mediterranean coast and Galicia. It does not usually present health problems.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
		x	x	x	x	x				x	x

Sowing Planting Pruning x

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
CT/RB		125/150
CT/RB		150/175
CT/RB		175/200
RB		200/250
RB		250/300
RB		300/350
CT	8-10	
CT	10-12	
CT	12-14	
CT	14-16	
CT	16-18	
CT	18-20	
CT	20-25	

Lagunaria — *Lagunaria patersonii* (Andrews) G. Don

BROADLEAF EVERGREEN

PICA-PICA (SPANISH) · LAGUNÀRIA (VALENCIAN) · AUSTRALIAN TULIP-TREE (ENGLISH) · KETMIE DEPATERSON (FRENCH)

STRUCTURE		
Shape: CONE	Height: 10-15 M	Diameter: 4-6 M
Texture: COARSE	Shade: FULL	Root: TAPROOT

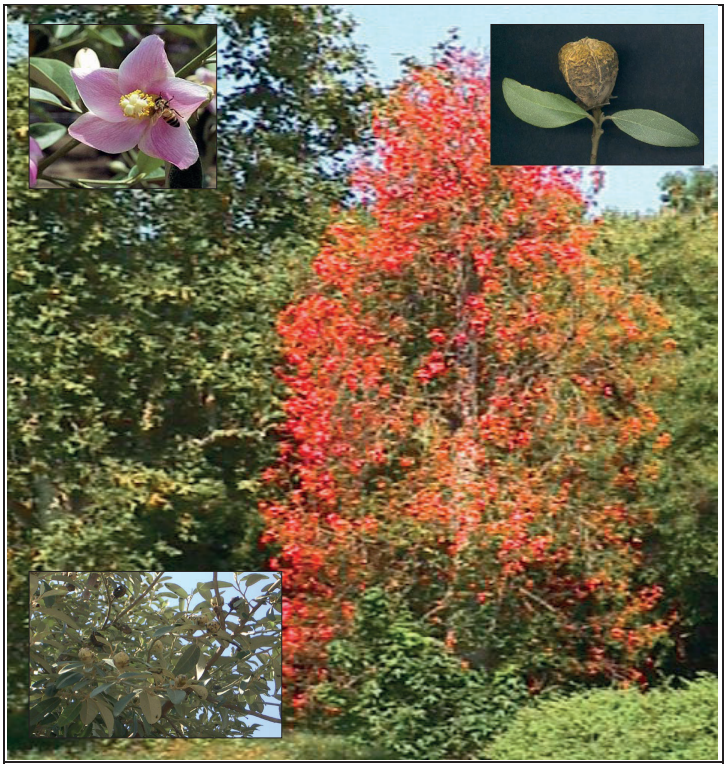
DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	MALVALES
FAMILY:	MALVACEAE

VARIETIES
ROYAL PURPLE

MORPHOLOGY		
Trunk	Bark: FISSURED/LONG	Color: DARK GRAY
Leaf EVERGREEN SIZE: LEAF:7-14CM COLOR: US:DK GREEN, LS: SILVER TEXTURE: US: SMOOTH, LS:HAIRY	COMPOUND: NO HARDNESS: CORIACEOUS ARRANGEMENT: ALTERNATE VENATION: PINNATE SHAPE: OBLONG/LANCEOLATE MARGIN: ENTIRE APEX: SHARP LEAF BASE: ROUND PETIOLE: SHORT	
Flower SIZE: ♂/M 3-6 MM	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
	Flowering: ISOLATED	Fragrant: YES
Fruit SIZE: 4 CM	Type: CAPSULE	Color: BROWN
	Edible: NO	Fruiting season: SEPT-NOV
Growth	Rate: FAST	Longevity: 100 YEARS

ECOLOGY		
Climate ALTITUDE: 0-200 IRRIGATION: LOW	Temperature: -6ºC,H4,Z6	Drought resistan: MODERATE
	Sun exposure: FULL	Frost resistant: MODERATE
Soil pH: 5.5-8.5 FERTILITY: MODERATE	Texture: ALL TYPES	Salt resistant: YES
	Drainage: LOW	Lime resistant: YES

USE				
Resistances		Applications		
COASTAL:	1ST LINE	SLOPES: NO	LINE:	YES
POLLUTION:	HIGH	RIVERBANKS: NO	WINDBREAKER:	NO
WIND:	MODERATE	GROUPS: NO	ISOLATED:	YES



POINTS OF INTEREST

Native to the islands of Norfolk and Lord Howe in Australia. *Lagunaria* alludes to the resemblance to *Lagunaea*, an ancient genus of the same family, now included in *Hibiscus*. *Patersonii,* in honor of the Scottish botanist and explorer William Paterson, who reportedly first sent seeds of this plant to England. The wood of this tree, although dense and of good quality, is not commercialized and therefore has no use. Very resistant to seawater spray and therefore recommended for coastal plantations. It tolerates pruning. The open fruit can pose risks to people with skin allergies. Its use in Spain as an ornamental tree is scarce, recommending its planting in areas with a warm climate.

SPACING: 6M

PLANTING AND PLANT HEALTH

Propagation by seed or cuttings. It is easy to grow. This species requires sunny exposures and well-drained soils, thus blooming more abundantly. Young plants must be protected from the cold. It does not usually suffer from pests or diseases.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
		x	x	x	x	x	x	x	x	x	x

Sowing Planting Pruning x

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
CT		50/60
CT		80/100
CT		100/125
CT		150/175
CT		175/200
CT		200/250
CT		250/300
CT/RB	6-8	
CT/RB	8-10	
CT/RB	10-12	
CT/RB	12-14	
CT/RB	14-16	
RB	16-18	

Ligustrum

BROADLEAF EVERGREEN

Ligustrum lucidum Ait.

ALIGUSTRE LUSTROSO	TROANA ARBÒRIA	SHINING PRIVET	TROÈNE À FEUILL.
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Shape: ROUND	Height: 3-15 M	Diameter: 3-5 M
Texture: COARSE	Shade: FULL	Root: OBLIQUE

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	LAMIALES
FAMILY:	OLEACEAE

VARIETIES

AUREO MARGINATUM
COMPACTUM
MACROPHYLLUM
MIRCOPHYLLUM

MORPHOLOGY

Trunk	Bark: SMOOTH	Color: DARK GRAY
Leaf: EVERGREEN; SIZE: LEAF:7.5-15CM; COLOR: US:DK GREEN, LS:MID GREEN; TEXTURE: US:GLOSSY, LS:GLOSSY	COMPOUND: NO HARDNESS: CORIACEOUS ARRANGEMENT: OPPOSITE VENATION: PINNATE SHAPE: OVAL/LANCEOLATE MARGIN: ENTIRE APEX: ACUMINATE LEAF BASE: CUNEATE PETIOLE: SHORT	
Flower: SIZE: ♂/M 5 MM	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
	Flowering: PANICLE (15 CM)	Fragrant: YES
Fruit: SIZE: 0.8-1.2 CM	Type: DRUPE	Color: BLACK
	Edible: NO	Fruiting season: SEP-OCT
Growth	Rate: FAST	Longevity: 25 YEARS

ECOLOGY

Climate	Temperature: -15ºC, H2,Z5.	Drought resistant: MODERATE
ALTITUDE: 0-300	Sun exposure: PARTIAL SHADE	Frost resistant: YES
IRRIGATION: MODERATE		
Soil	Texture: SANDY	Salt resistant: MODERATE
pH: 5.5-8.5	Drainage: HIGH	Lime resistant: MODERATE
FERTILITY: POOR		

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	NO	LINE:	YES
POLLUTION:	HIGH	RIVERBANKS:	NO	WINDBREAKER:	NO
WIND:	HIGH	GROUPS:	YES	ISOLATED:	YES



POINTS OF INTEREST

Native to China and Korea. The Latin name *Ligustrum* means to bind or tie. The young twigs (due to thier flexibility) were used to tie bundles. *Lucidum*, from the Latin, means lustrous, brilliant, alluding to the brightness of its green leaves. In China, a wax produced by certain insects on the branches of this tree is marketed. The wood is creamy white, with a fine and homogeneous texture, without prominent grain, very hard, resistant and flexible. It is considered to be of medium quality and is used to make tool handles, turned objects and stakes. Widely used as street trees. It tolerates pruning and cutting. Its glabrous buds clearly differentiate it from its other related species, *Ligustrum japonicum* Thunb., which has hairy buds.

SPACING: 4M

PLANTING AND PLANT HEALTH

Propagation by seed and its varieties by grafting. Some defoliating insects attack the species. Mealybugs such as *Quadraspidiotus perniciosus* often attack various species of the genus. It can be treated with *Chlorpyrifos*, *Methyl-pirimiphos* or some phosphorous product (Fenitrothion, Diazinon, etc.). The specific phytopathogenic bacterium *Pseudomonas syringae* subspieces *savastanoi* can attack the tree, causing a slow and progressive degeneration and eventual death. (Treatment: preventive, based on the selection of healthy plant material).

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
		x	x	x	x	x	x	x	x	x	

Sowing Planting Pruning x

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
CT (tray)	1 year (2/0)	40/50
CT		60/80
CT/RB		80/100
CT/RB		125/150
RB		200/250
RB		300/350
RB		400/450
RB		550/600
CT/RB	8-10	
CT/RB	12-14	
CT/RB	14-16	
RB	20-25	
RB	25-30	

Magnolia — *Magnolia grandiflora* L.

BROADLEAF EVERGREEN

MAGNOLIO (SPANISH) · MAGNÒLIA (VALENCIAN) · EVERGREEN MAGNOLIA (ENGLISH) · M. À GRANDES FLEURS (FRENCH)

STRUCTURE		
Shape: CONE	Height: 15-30 M	Diameter: 5-8 M
Texture: COARSE	Shade: FULL	Root: TAPROOT

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	MAGNOLIALES
FAMILY:	MAGNOLIACEAES

VARIETIES

GALISSONNIÉRE
EXMOUTH
NANNETHESIS
GOLIATH

MORPHOLOGY		
Trunk	Bark: SCALY	Color: GRAY
Leaf	COMPOUND: NO	
EVERGREEN	HADRNESS: CORIACEOUS	
SIZE: LEAF:12-20CM	ARRANGEMENT: ALTERNATE	
	VENATION: PINNATE	
	SHAPE: ELLIPTICAL/OVAL	
COLOR: US:DK GREEN	MARGIN: ENTIRE	
LS:RUST/RED	APEX: SHARP	
TEXTURE: US:GLOSSY	LEAF BASE: ROUND	
LS:HAIRY	PETIOLE: SHORT	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE: ♂/M 250 MM	Flowering: ISOLATED	Fragrant: YES
Fruit	Type: PLURIFOLLICLE	Color: BROWN
SIZE: 10 CM	Edible: NO	Fruiting season: OCT-NOV
Growth	Rate: SLOW	Longevity: 100 YEARS

ECOLOGY		
Climate	Temperature: -18ºC,H2,Z5	Drought resistant: NO
ALTITUDE: 100-500	Sun exposure: HALF SHADE	Frost resistant: YES
IRRIGATION: HIGH		
Soil	Texture: SANDY	Salt resistant: NO
pH: 4-7.5	Drainage: HIGH	Lime resistant: NO
FERTILITY: FERTILE		

USES				
Resistances		Applications		
COASTAL: 2ND LINE		SLOPES: NO	LINE: YES	
POLLUTION: MODERATE		RIVERBANKS: NO	WINDBREAKER: NO	
WIND: LOW		GROUPS: YES	ISOLATED: YES	



POINTS OF INTEREST

Native to the Southeastern United States. The specific name means "large-flower". Its wood is finely textured. It contracts when dry becoming hard and rigid and therefore easy to turn. It is used in cabinetmaking (indoor furniture only) and for tool handles. Its bark has medicinal properties. In past geological times it was common in Europe. It is easily confused (particularly when it does not flower) with species of the *Ficus* genus, especially *Ficus macrophylla*. Tree of great ornamental value due to its size, its evergreen foliage and its very aromatic fragrance.

SPACING: 8M

PLANTING AND PLANT HEALTH

Propagation by seed, cuttings or grafts. Sowing can be done in the fall with unstratified seed or in the spring with seed that has been stratified over the winter. Newly born seedlings need shade for most of the summer. The multiplication by stake (somewhat delicate) is the most used commercially. Specimens from seed flower after twenty years, while those obtained by vegetative multiplication flower after five years. Its transplant is delicate, and must be done in spring and autumn, since any root breakage can lead to infection by pathogenic fungi. Tolerates formative pruning. No health problems.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
x	x	x	x	x	x	x	x	x	x	x	x

Sowing Planting Pruning x

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
CT		60/80
CT		80/100
CT/RB		100/125
CT/RB		150/175
CT/RB		200/250
CT/RB		300/350
CT/RB		350/400
CT/RB		450/500
CT/RB		500/550
RB	12-14	
RB	14-16	
RB	16-18	
RB	20-25	

Phytolacca *Phytolacca dioica* L.

BROADLEAF EVERGREEN

OMBÚ SPANISH | BELLAOMBRA VALENCIAN | UMBRA/OMBÚ ENGLISH | BELOMBRA FRENCH

STRUCTURE		
Shape: EXTENDED	Height: 8-20 M	Diameter: 6-12 M
Texture: COARSE	Shade: FULL	Root: HORIZONTAL

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	CARYOPHYLLALES
FAMILY:	PHYTOLACCACEAES

VARIETIES

MORPHOLOGY		
Trunk	Bark: FISSURED/ LONG	Color: YELLOWISH
Leaf	COMPOUND: NO	
SEMI- EVERGREEN	HARDNESS: CORIACEOUS	
SIZE: LEAF: 15 CM	ARRANGEMENT: ALTERNATE	
	VENATION: PINNATE	
	SHAPE: OBLONG	
COLOR: US:MID GREEN	MARGIN: ENTIRE	
LS:LIGHT GREEN	APEX: SHARP	
TEXTURE: US:SMOOTH	LEAF BASE: ROUND	
LS:SMOOTH	PETIOLE: LONG	
Flower	Type: UNISEXUAL	Reproduction: DIOECIOUS
SIZE: ♂/M 2MM 2MM	Flowering: RACEME (5-15 CM)	Fragrant: NO
Fruit	Type: BERRY	Color: YELLOW
SIZE: 1 CM	Edible: NO	Fruiting season: AUG-JAN
Growth	Rate: VERY FAST	Longevity: >300 YEARS

ECOLOGY		
Climate	Temperature: -6ºC,H4,Z6	Drought resistant: MODERATE
ALTITUDE: 0-100	Sun exposure: FULL	Frost resistant: MODERATE
IRRIGATION: LOW	Texture: LOAMY/SANDY	Salt resistant: MODERATE
Soil	Drainage: MODERATE	Lime resistant: MODERATE
pH: 5.5-9		
FERTILITY: POOR		

USES				
Resistances		Applications		
COASTAL:	1ST LINE	SLOPES: NO	LINE:	NO
POLLUTION:	HIGH	RIVERBANKS: NO	WINDBREAKER:	YES
WIND:	HIGH	GROUPS: YES	ISOLATED:	YES



POINTS OF INTEREST

Native to Paraguay, Southern Brazil, Uruguay and Northern Argentina. Its specific name refers to the separation of male and female flowers on different plants. Female trees are usually smaller, have more nodes, and are more twisted than male trees. The trunk has a high water content, giving the wood an inconsistent character which is formed by a structure of hardened fibers, without the typical growth rings of woody plants. Its branches break easily. Its root system is very powerful and characteristic, so it should not be planted near buildings or in paved areas. The stems and leaves contain active ingredients that cause drastic excretion that can cause irritation. The berries and seeds are toxic, causing digestive disorders.

SPACING: 15M

PLANTING AND PLANT HEALTH

Propagation by seed and cuttings. The fruits are collected from the tree and soaked in water to release the seeds. Once extracted and dried, seeds can be planted or stored, maintaining their germentation capabilites for at least one year. No known pests or diseases affect this plant.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
x	x	x	x	x	x	x	x	x	x	x	x

Sowing | Planting | Pruning x

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height(cm)
CT		150/175
CT		200/250
BR	8-10	
BR	10-12	
BR/CT/RB	12-14	
BR/CT/RB	14-16	
BR/CT/RB	16-18	
BR/CT/RB	18-20	
CT/RB	20-25	
CT/RB	25-30	
CT/RB	30-35	
CT/RB	40-45	
CT/RB	50-60	

Quercus — *Quercus ilex* sub spieces. *ballota* (Desf.) Samp.

BROADLEAF EVERGREEN

CARRASCA (SPANISH) · CARRASCA (VALENCIAN) · EVERGREEN OAK/HOLLY OAK (ENGLISH) · CHÊNE À GLANS DOUX (FRENCH)

STRUCTURE		
Shape: ROUND/ELLIPTIC	Height: 8-12 M	Diameter: 8-10 M
Texture: FINE	Shade: FULL	Root: TAPROOT

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	FAGALES
FAMILY:	FAGACEAES

VARIETIES

MORPHOLOGY		
Trunk	Bark: FISSURED/VERTICAL	Color: DARK BROWN
Leaf EVERGREEN; Size: LEAF: 2-5CM; COLOR: US:DK GREEN LS:GRAY; TEXTURE: US: SMOOTH LS:HAIRY	COMPOUND: NO; HARDNESS: CORIACEOUS; ARRANGEMENT: ALTERNATE; VENATION: PINNATE; SHAPE: ROUND/ELLIPTIC; MARGIN: DENTATE; APEX: ROUND; LEAF BASE: ROUND; PETIOLE: SHORT	
Flower	Type: UNISEXUAL	Reproduction: MONOECIOUS
SIZE and TYPE: ♂/M 3 MM CATKIN (7 CM); ♀/F 5 MM ISOLATED		Fragrant: NO
Fruit Size: 3-4 CM	Type: ACORN	Color: BROWN
	Edible: YES	Fruiting season: OCT-NOV
Growth	Rate: SLOW	Longevity: >300 YEARS

ECOLOGY		
Climate	Temperature: -18ºC,H2,Z5	Drought resistant: YES
ALTITUDE: 0-1400	Sun exposure: SUN/PARTIAL SHADE	Frost resistant: YES
IRRIGATION: LOW		
Soil	Texture: LOAMY/CLAYEY	Salt resistant: NO
pH: 5.5-8.5	Drainage: MODERATE	Lime resistant: YES
FERTILITY: POOR		

USES				
Resistances		Applications		
COASTAL: 2ND LINE		SLOPES: YES	LINE: YES	
POLLUTION: HIGH		RIVERBANKS: NO	WINDBREAKER: YES	
WIND: HIGH		GROUPS: YES	ISOLATED: YES	



POINTS OF INTEREST

Native to the Mediterranean Region; being the most genuine representative of the Mediterranean landscape. This subspecies can be found in continental, subcontinental or coastal Mediterranean areas and always under fairly hot and dry climatic condtions. It often constitutes extensive forests, many times destroyed to allocate the land to rainfed crops, vineyards, etc. or to plantations of other forest species. Noble tree that gives a pleasant shade. It sprouts like its related subspecies. Acorns are sweet and edible. Currently they are used for feeding pigs. Dense and compact wood of light reddish color, durable, heavy and elastic. It can tolerate topiary. It can cause allergies. This species is of great ornamental value.

SPACING: 6 M

PLANTING and PLANT HEALTH

Propagation by seed. Does not tolerate the transplant in the first phases of its life. Small plants tolerate the cover provided by their thick canopy well. In sunny places with a warm climate, it should be protected during the first two or three years; later it can be exposed to the sun, high temperatures and prolonged droughts. It is usually attacked by certain insects, especially bark beetles (Treatment: preventive and *Alphacipermethrin*) and leaf-miner moths (treatment: *Alphacipermethrin, Deltamethrin, Fenitrothion*), and sooty mold-type fungi (Treatment: products with Copper Oxychloride). Oak galls on leaves are sometimes frequent.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
x	x	x	x	x	x	x				x	x

Sowing Planting Pruning x

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Girth (cms)	Height (cm)
CT (tray)	1 year (1/0)	
CT (tray)	2 years (2/0)	
CT	Bush	20/30
CT	Bush	30/40
CT	Bush	40/50
CT	Bush	50(60
CT	Bush	60/80
CT	Bush	80/100
CT	Bush	100/125
CEY	12-14	
CEY	14-16	
CEY	16-18	
CEY	18-20	

Quercus

Quercus ilex subsp. *ilex* *L.*

BROADLEAF EVERGREEN

ENCINA	ALZINA	HOLM OAK	CHÊNE-VERT
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE

Shape	Height	Diameter
ROUND/ELLIPTIC	8-27 M	8-10 M
Texture	**Shade**	**Root**
MEDIUM	FULL	TAPROOT

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONEAES
ORDER:	FAGALES
FAMILY:	FAGACEAES

VARIETIES

MORPHOLOGY

Trunk	Bark: FISSURED VERTICAL	Color: DARK BROWN
Leaf	COMPOUND: NO	
EVERGREEN	HARDNESS: CORIACEOUS	
SIZE: LEAF: 4-9CM	ARRANGEMENT: ALTERNATE	
	VENATION: PINNATE	
	SHAPE: LANCEOLATE	
COLOR: US:DARK GREEN	MARGIN: ENTIRE OR DENTATED	
LS:LIGHT GREEN	APEX: SHARP	
TEXTURE: US:SMOOTH	LEAF BASE: ROUND	
LS:HAIRY	PETIOLE: SHORT	
Flower	Type: UNISEXUAL	Reproduction: MONOECIOUS
TYPE and SIZE: ♂/M 3 MM	CATKIN (7 cm)	Fragrant: NO
♀/F 5 MM	ISOLATED	
Fruit	Type: ACORN	Color: BROWN
SIZE: 2-3 CM	Edibe: NO	Fruiting season: OCT-NOV
Growth	Rate: SLOW	Longevity: >300 YEARS



ECOLOGY

Climate	Temperature: -15ºC,H2,Z5	Drought resistant: MODERATE
ALTITUDE: 0-1200	Sun exposure: SUN/ PARTIAL SHADE	Frost resistant: YES
IRRIGATION: LOW		
Soil	Texture: ALL TYPES	Salt resistant: NO
pH: 5.5-8.5	Drainage: MODERATE	Lime resistant: YES
FERTILITY: POOR		

USES

Resistances		Applications			
SEA:	1ST LINE	SLOPES:	YES	LINE:	YES
POLLUTION:	HIGH	RIVERBANKS:	NO	WINDBREAKER:	YES
WIND:	HIGH	GROUP:	YES	ISOLATED:	YES

POINTS OF INTEREST

Native to the Mediterranean region. Coastal or sub-coastal areas with a temperate and somewhat humid Mediterranean climate, rarely inland. This subspecies is ideal for forming forests since isolation can provoke their destruction. It is considered a noble tree that gives a pleasant shade. It stoically supports pruning, since in its wild state it regrows from the root after fires, felling, etc. Acorns are bitter but will lose this characteristic if roasted. Dense and compact wood of light reddish color, durable, heavy and elastic. It is used to manufacture tools and in the construction of carts. Good wood for hydraulic works. Its firewood produces good fuel and good charcoal. Its bark is rich in tannins. Tolerates topiary. It can cause allergies. This species is of great ornamental value.

SPACING: 6M

PLANTING AND PLANT HEALTH

Propagation by seed. Does not tolerate transplanting in the first phases of its life. Small plants tolerate the cover provided by their dense canopy well. In sunny places with a warm climate, it should be protected during the first two or three years; later it can be exposed to the sun, high temperatures and prolonged droughts. It is usually attacked by certain insects, especially bark beetles (Treatment: preventive and Alphacipermethrin) and leaf miner caterpillars (Treatment: *Alphacipermethrin, Deltamethrin, Fenitrothion*), and sooty mold-type fungi (Treatment: products with Copper Oxychloride). Oak galls on leaves are sometimes frequent.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
x	x	x	x	x	x	x				x	x

Sowing Planting Pruning x

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Girth (cms)	Height (cms)
CT (tray)	1 year (1/0)	15
CT (5L)	Bush	60/80
CT (10L)	Bush	80/100
CT (30L)	Bush	125/150
CEY/CT	8-10	250/300
CEY/CT	10-12	250/300
CEY/CT	12-14	250/300
CEY/CT	14-16	250/300
CEY/CT	16-18	250/300
CEY/CT	18-20	250/300
CEY/CT	20-25	250/300
CEY/CT	25-30	300/400
CT (1500L)	Sample	400/500

Quercus

Quercus suber L.

BROADLEAF EVERGREEN

ALCORNOQUE	SURERA	CORK OAK	CHÊNE-LIÈGE
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Shape: IRREGULAR	Height: 8-15 M	Diameter: 6-8 M
Texture: MEDIUM	Shape: FULL	Root: TAPROOT

DIVISION:	SPERMATOPHYTE
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	FAGALES
FAMILY:	FAGACEAES

VARIETIES

MORPHOLOGY		
Trunk	Bark: SCALY	Color: LIGHT GRAY
Leaf EVERGREEN; SIZE: LEAF: 3-6CM; COLOR: US:DARK GRAY, LS:GRAY; TEXTURE: US:SMOOTH, LS:HAIRY	COMPOUND: NO; HARDNESS: CORIACEOUS; ARRANGEMENT: ALTERNATE; VENATION: PINNATE; SHAPE: OVAL TO OBLONG; MARGIN: DENTATE; APEX: SHARP; LEAF BASE: ROUND; PETIOLE: SHORT	
Flower	Type: UNISEXUAL	Reproduction: MONOECIOUS
SIZE and TYPE: ♂/M 3 MM CATKIN (7 CM); ♀/F 5 MM ISOLATED		Fragrant: NO
Fruit SIZE: 1.5-3 CM	Type: ACORN	Color: BROWN
	Edible: NO	Fruiting season: SEP-FEB
Growth	Rate: SLOW	Longevity: >300 YEARS

ECOLOGY		
Climate	Temperature: -15ºC,H2,Z5	Drought resistant: YES
ALTITUDE: 0-1200	Sun exposure: SUN/HALF SHADE	Frost resistant: YES
IRRIGATION: MODERATE		
Soil	Texture: LOAMY/SANDY	Salt resistant: NO
pH: 5-7.5	Drainage: MODERATE	Lime resistant: NO
FERTILITY: MODERATE		

USES				
Resistances		Applications		
COASTAL: 2ND LINE		SLOPES: YES	LINE: YES	
POLLUTION: LOW		RIVERBANKS: NO	WINDBREAKER: YES	
WIND: HIGH		GROUPS: YES	ISOLATED: YES	



POINTS OF INTEREST

Native to the Western Mediterranean region. It forms forests, often of considerable extension, on siliceous soils, preferably loose and permeable, in cool and sheltered areas. Its bark has often been used as an astringent and, on an industrial scale, it is used to make stoppers and other cork objects. Its acorns are used to feed livestock, particularly pigs. Heavy, hard wood, useful for barrel-making and shipbuilding. Tree of great ornamental value.

SPACING: 7M

PLANTING AND PLANT HEALTH

Propagation by seed. Does not tolerate the transplant in the first phases of its life. Small plants tolerate the cover provided by their canopy well. In sunny places with a temperate climate, it should be protected during the first two or three years and subsequently exposed to sunlight, although in minimum humidity conditions. It is usually attacked by certain insects, especially bark beetles (Treatment: preventive and Alphacipermethrin) and leaf miner caterpillars (Treatment: *Alphacipermethrin, Deltamethrin, Fenitrothion*), and sooty mold-type fungi (Treatment: products with Copper Oxychloride).

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
x	x	x	x	x	x	x	x			x	x	x	x

Sowing Planting Pruning x

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Girth (cms)	Height (cms)
CT (tray)	1 year (0/1)	
CT	Bush	60/80
CT	Bush	80/100
CT	Bush	125/150
CEY/RB	16-18	
CEY/RB	18-20	
CEY/RB	20-25	
CEY/RB	25-30	
CEY/RB	30-35	
CEY/RB	35-40	
CEY/RB	50-60	
CEY/RB	70-80	
CEY/RB	90-100	

Schinus *Schinus molle* L.

BROADLEAF EVERGREEN

FALSO PIMENTERO	PEBRER FALS	CALIFORNIA PEPPER-TREE	FAUX POIVRIER
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Shape	Height	Diameter
PENDULAR	6-15 M	4-6 M
Texture	Shade	Root
MEDIUM	PARTIAL	OBLIQUE

DIVISION:	SPERMATOPHYTE
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	SAPINDALES
FAMILY:	ANACARDIACEAES

VARIETIES

MORPHOLOGY		
Trunk	Bark: ROUGH	Color: DARK BROWN
Leaf EVERGREEN	COMPOUND: IMPARIPINNATE HARDNESS: SOFT ARRANGEMENT: ALTERNATE VENATION: PINNATE SHAPE: LANCEOLATE MARGIN: SERRATE APEX: CUSPIDATE/ACUMINATE LEAF BASE: ROUND PETIOLE: SHORT	
SIZE: LEAF: 25-30CM LEAFLET: 3-6CM COLOR: US: MID GREEN LS: MID GREEN TEXTURE: US: GLOSSY LS: GLOSSY		
Flower SIZE AND TYPE ♂/M 2 MM ♀/F 2 MM	Type: UNISEXUAL Flowering: PANICLE (15 CM)	Reproduction: DIOECIOUS Fragrant: NO
Fruit SIZE: 0.5-0.7 CM	Type: DRUPE Edible: NO	Color: RED Fruiting season: AUG-DEC
Growth	Rate: FAST	Longevity: 100 YEARS

ECOLOGY		
Climate	Temperature: -6ºC,H4,Z6	Drought resistant: MODERATE
ALTITUDE: 0-800 IRRIGATION: LOW	Sun exposure: SUN/PARTIAL SHADE	Frost resistant: MODERATE
Soil	Texture: ALL TYPES	Salt resistant: MODERATE
pH: 5.5-8.5 FERTILITY: POOR	Drainage: LOW	Lime resistant: MODERATE

USES					
Resistances		Applications			
COASTAL:	2nd LINE	SLOPES:	NO	LINE:	YES
POLLUTION:	MODERATE	RIVERBANKS:	NO	WINDBREAKER:	NO
WIND:	HIGH	GROUPS:	NO	ISOLATED:	YES



POINTS OF INTEREST

Native to the South American subcoast between northern Chile to Colombia and beyond, with the exception of very hot and humid areas. Its specific name *Schinus Molle* comes from its native Peruvian name. The fruit contains a volatile oil whose aroma is reminiscent of pepper and therefore used as a subtitute. In Mexico a strong liquor called *copalote* is obtained by fermenting the fruits with *pulque* for one or two days. Some natives of South America use the essential oil of the fruits and leaves for medicinal purposes. Bark decoction is used for the cleansing of pets. The wood has some uses. From the sap, a kind of chewing gum is obtained. Its weeping appearance and leafy crown make it attractive as an isolated shade tree.

SPACING: 8M

PLANTING AND PLANT HEALTH

Propagation by seed and cuttings. It can be attacked by mealybugs, especially *Ceroplastes rusci* and *Ceroplastes sinensis*. Treat with chlorinated or phosphorous pesticides.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
X	X	X	X	X	X	X	X	X	X		

Sowing Planting Pruning X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Heigth (cm)
CT	4-6	
CT	6-8	
CT/RB	8-10	
CT/RB	10-12	
CT/RB	12-14	
CT/RB	14-16	
CT/RB	16-18	
CT/RB	18-20	
CT/RB	20-25	
CT/RB	25-30	
CT		150/175
CT		200/250
CT		250/300

Schinus — *Schinus terebinthifolius* Raddi.

BROADLEAF EVERGREEN

PIMENTERO DEL BRASIL (SPANISH) · FALS TEREBINT (VALENCIAN) · BRAZILIAN PEPPER-TREE (ENGLISH) · ', À FEUILLESDETÉRÉBINTH (FRENCH)

STRUCTURE		
Shape: OVAL	Height: 5-10 M	Diameter: 4-6 M
Texture: MEDIUM	Shade: FULL	Root: OBLIQUE

DIVISION:	SPERMATOPHYTE
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	SAPINDALES
FAMILY:	ANACARDIACEAES

VARIETIES

MORPHOLOGY		
Trunk	Bark: FISSURED	Color: DARK BROWN
Leaf EVERGREEN SIZE: LEAF:12-40CM LEAFLET:6-8CM COLOR: US:DK GREEN LS:MID GREEN TEXTURE: US:GLOSSY LS:SMOOTH	COMPOUND: IMPARIPINNATE HARDNESS: CORIACEOUS ARRANGEMENT: ALTERNATE VENATION: PINNATE SHAPE:: ELLIPTIC/OBLONG MARGIN: SERRATE APEX: SHARP LEAF BASE: ROUND PETIOLE: SHORT	
Flower SIZE: ♂/M 2 MM ♀/F 2 MM	Type: UNISEXUAL Flowering: PANICLE (15 CM)	Reproduction: DIOECIOUS Fragrant: NO
Fruit SIZE: 0.5-1 CM	Type: DRUPE Edible: NO	Color: RED Fruiting season: AUG-DEC
Growth	Rate: MODERATE	Longevity: 100 YEARS

ECOLOGY		
Climate ALTITUDE: 0-800 IRRIGATION: LOW	Temperature: -3ºC,H5,Z6 Exposure to sun: SUN/HALF SHADE	Drought resistant: MODERATE Frost resistant: MODERATE
Soil pH: 5-8.5 FERTILITY: POOR	Texture: LOAMY/SANDY Drainage: LOW	Salt resistant: MODERATE Lime resistant: MODERATE

USES					
Resistances		Applications			
COASTAL:	1ST LINE	SLOPE:	NO	LINE:	YES
POLLUTION:	MODERATE	RIVERBANKS:	NO	WINDBREAKER:	YES
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	YES



POINTS OF INTEREST

Native to Brazil, Argentina and Paraguay. Its specific name *Schinus terebinthifolius* means terebinth leaf, corresponding to another deciduous tree of the same family *Pistacia terebinthus*. The foliage and fruits are used to make garlands at Christmas. Apparently, in South America a resin called *balm of the missions* is obtained from the trunk. The leaves and bark have medicinal properties. Sometimes it needs formative pruning to achieve a compact and regular crown. Due to its small size, it is suitable as a street tree primarily on narrow sidewalks.

SPACING:7M

PLANTING AND PLANT HEALTH

Propagation by seed. It can be attacked by mealybugs, especially *Ceroplastes rusci* and *Ceroplastes sinensis*. Treat with chlorinated or phosphorous pesticides.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
X	X	X	X	X	X	X	X	X	X	X	X

Sowing Planting Pruning X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
CT	6-8	
CT	8-10	
CT	10-12	
CT	12-14	
CT	14-16	

Spathodea *Spathodea campanulata* Beauv.

BROADLEAF EVERGREEN

TULIPERO DEL GABÓN SPANISH | ARB. TULIPES AFRICÀ VALENCIAN | AFRICAN FLAME TREE ENGLISH | LE TULIPIER DE GABON FRENCH

STRUCTURE		
Shape: OVAL	Height: 10-25 M	Diameter: 8-12 M
Texture: COARSE	Shade: PARTIAL	Root: OBLIQUE

DIVISION:	SPERMATOPHYTE
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	LAMIALES
FAMILY:	BIGNONIACEAES

VARIETIES

MORPHOLOGY		
Trunk	Bark: ROUGH	Color: GREENISH GRAY
Leaf: SEMI -EVERGREEN; SIZE: LEAF: 65CM, LEAFLET: 8-12; COLOR: US:DK GREEN, LS:PALE GREEN; TEXTURE: US:ROUGH, LS:ROUGH	COMPOUND: IMPARIPINNATE; HARDNESS: CORIACEOUS; ARRANGEMENT: OPPOSITE; VENATION: PINNATE; SHAPE: ELLIPTIC; MARGIN: ENTIRE; APEX: CUSPIDATE; LEAF BASE: ASYMMETRIC; PETIOLE: SHORT	
Flower: SIZE: ♂/M 7-9 CM	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
	Type: RACEME (40 CM)	Fragrant: NO
Fruit: SIZE: 15-25 CM	Type: CAPSULE	Color: WHITE
	Edible: NO	Fruiting season: SEP-OCT
Growth	Rate: FAST	Longevity: 200 YEARS

ECOLOGY		
Climate: ALTITUDE: 0-100; IRRIGATION: MODERATE	Temperature: 6ºC,G1,Z7	Drought resistant: NO
	Sun exposure: SUN/HALF SHADE	Frost resistant: NO
Soil: pH: 5.5-8.5; FERTILITY: FERTILE	Texture: LOAMY/SANDY	Salt resistant: MODERATE
	Drainage: HIGH	Lime resistant: MODERATE

USES				
Resistances		Applications		
COASTAL:	2ND LINE	SLOPES: NO	LINE:	YES
POLLUTION:	MODERATE	RIVERBANKS: NO	WINDBREAKER:	NO
WIND:	MODERATE	GROUPS: NO	ISOLATED:	YES



POINTS OF INTEREST

Native to tropical Africa and widely cultivated in all the tropics and subtropics of the world. In Spain it is grown in the Canary Islands where it can even be used as a street tree. In the Peninsula its plantation is scarce (Malaga, Seville, etc.). Its specific name *Spathodea campanulata* refers to the shape of its flower (bell-shaped); one of its most ornamental features is when it is in full bloom.

SPACING: 8M

PLANTING AND PLANT HEALTH

Propagation by seed and cuttings. As this species is sensitive to cold, its planting should be restricted to subtropical areas such as the Canary Islands and some areas of the Mediterranean coast where frost does not occur. It can be attacked by insects, fungi and bacteria.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
		x	x	x	x	x	x	x	x	x	x

Sowing | Planting | Pruning x

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
Commercialized in the Canary Islands		

Subchapter 1.3 Commercialization, use and planting

COMMERCIALIZATION AND USE

Evergreen trees can be classified depending on the structure of their branches:

I. Trees whose branches start from the ground level
II. Trees whose crowns start after a clear trunk
    IIA. Without a clear leader
    IIB With a central leader (pyramid-shaped)
III. Leafy trees
    IIIA. Multiple trunks
    IIIB. Single trunk

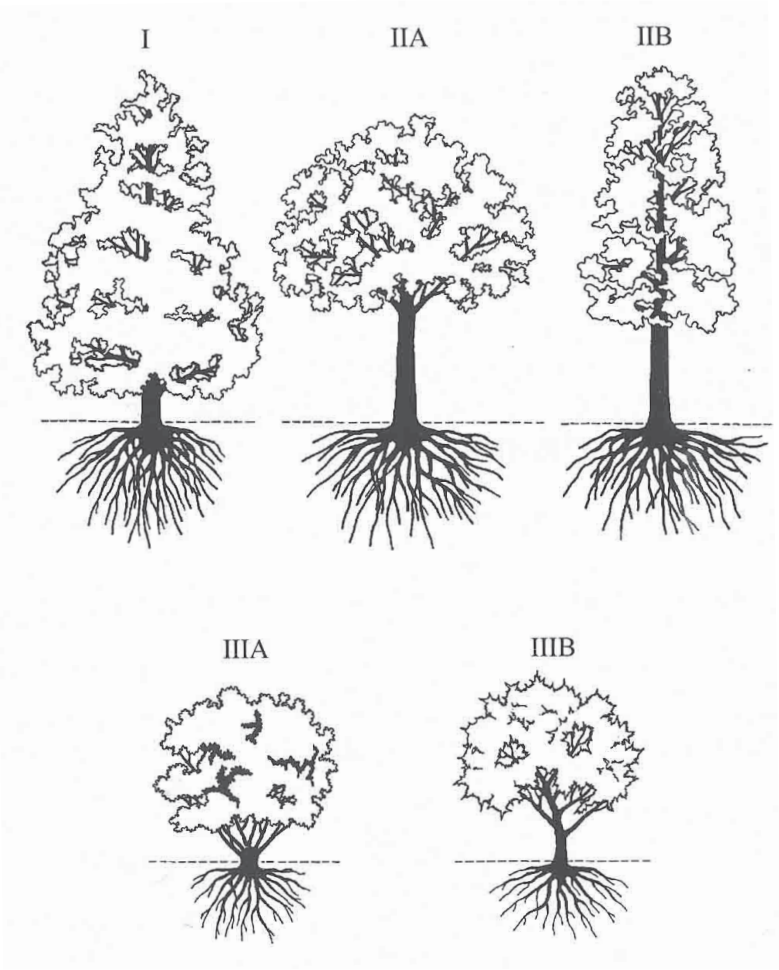


Figure 1.3.1: Typology of evergreen trees (Source: NTJ 07E)



Figure 1.3.2: Shapes of trees. Extended, pyramidal, cone-shaped, weeping, round, palmiform, columnar

Trees that have crowns can be classified according to the height of their free trunk up to the point of the start of the crown:

- **Tree with tall crown**, should have a trunk height free of lateral branches and be greater than 250 cm. Uses: avenues and public roads.
- **Trees with medium size crown**, should have a trunk height free of lateral branches and be between 225 and 250 cm. Uses: paths in parks and gardens.
- **Tree with low crowns**, should have a trunk height free of lateral branches and be less than 225 cm. Uses: gardens and green areas with no pedestrian access.

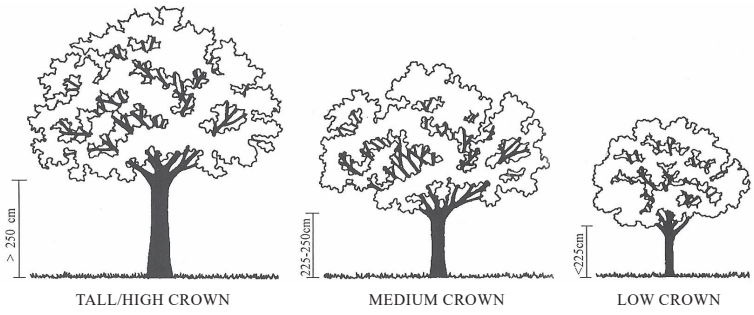


Figure 1.3.3: Crown heights dependig on the location of the tree (Source: NTJ 07E)

Specific and authenticity of tree variety

Selected trees must have suitable identity and purity in relation to the type or species to which they belong. If the intention is to commercialize them, it must be done so with a reference to the cultivar including its correct genetic purity.

General conditions of cultivation

Evergreens can be grown in fields or be containerized.

Trees should be cultivated in line with the necessities of species-variety, age, and future use. The roots of trees grown in open fields should be pruned periodically.

In cases where the trees are containerized, recipients that reduce the risk of a spiraling root effect should be used. In any case, trees grown in containers (except for those that grow slowly) should be repotted to larger ones at least every two years before spiraling occurs.

The spacing in planting must be proportional to the needs of each species and variety, their age, and to the mechanization system used.

When referring to trees with pyramidal crowns, the thinning out or the progressive elimination of the lower branches must not exceed the lower third of the tree at any time. See Figure 4.

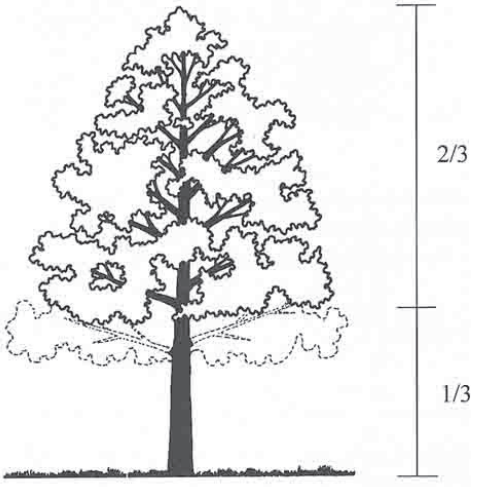


Figure 1.3.4: Crown raising in a tree with pyramidal crown (Source: NTJ 07E)

Multi-trunk trees can be obtained by training at the base or by planting different plants within a single planting pit or container. In the first case, the different structural branches must start from a maximum height of 50 cm above ground level.

Grafts and rootstocks

Grafting can take place in the upper or lower part of the tree. The aim of top grafting is to obtain spherical or pendulous shapes, cultivars that are not vigorous or where forming a straight trunk is problematic.

Root Pruning

The quality of a tree cultivated in the field depends on the number of times it has been root pruned before it has been uprooted for commercialization. In trees with a taproot system, it is important to limit the vertical growth of the taproot in order to promote the growth of secondary roots.

The first root pruning must be done when the plantlet of the seedling is transferred to the field. The uprooting of a tree for its commercialization cannot be considered a root pruning operation. Table 1.3.1 shows the number of root pruning according to the girth of the trunk in branched or crowned trees.

GIRTH (perimeter) in cm	Minimum number of root prunings
6-8	1
8-10	1
10-12	1
12-14	2
14-16	2
16-18	2
18-20	2
20-25	2
25-30	3
30-35	3
35-40	3
40-45	4
45-50 or more	4

Table 1.3.1: Number of root pruning operations according to the girth of the trunk

Evergreen trees cultivated in the field should be root pruned with temporal frequency according to their size, as outlined in Table 1.3.2. They must be arranged so that further root pruning can take place.

The space between the plants should be proportional to the needs of the species or varieties. Specimen trees should have been pruned at least twice and for girths greater than 30 cm, three times... For girths greater than 40 cm, the tree should have been at least three times

Girth	Frequency of root pruning
< 20 cm	3-5 years
> 20 cm	5-6 years

Table 1.3.2: Approximate frequency to prune trees cultivated in the field according to their girth (perimeter of the trunk)

Dimensions and proportions

Commercialized evergreens are classed according to the girth of their trunk measured 1 meter over the level of the ground or the neck of the root (1.30 m in monumental, large or listed as specimen trees). In addition, they should be measured according to their total height.

For a tree with multiple trunks, the total girth is the sum of the individual girths

In all plants, there should be a ratio between the total height and the girth of the trunk, which depends on the species or variety and can vary according to the growing conditions in different climatic zones.

The height, and width of the crown, the length of the branches, the branching out, and the foliage must correspond to the age of the individual according to the species or variety in well-balanced proportions. If applicable, this should also be applied to the ratio between rootstock and graft with regard to the trunk and crown.

Trees must have a crown proportionate to the thickness of the trunk and have a minimum of three structural branches balanced between them.

Roots should be well developed and proportionate according to the species or variety, age, ground conditions and growth. The root system should be balanced and proportionate to the size of the root ball or the container.

Evergreen trees are classed according to the girth of the trunk:

Girth in cm	
6-8 cm	20-25 cm
8-10 cm	25-30 cm
10-12 cm	30-35 cm
12-14 cm	35-40 cm
14-16 cm	40-45 cm
16-18 cm	45-50 cm
18-20 cm	from 50 cm, by tens

Table 1.3.3: Classification of trees according to trunk girth

Measurement of the underground part

The size of the root ball must be proportional to the type of growth and structure of the species or variety, the development of the plant, and the soil conditions.

Evergreen trees supplied with a root ball must have minimum dimension based on the following formulas:

Width of root ball (cm) = Average of the type of girth range (cm) x 2

Depth of root ball (in cm) = width of root ball (in cm) x 1.2

If evergreen trees are supplied in a container, the container must have a volume proportional to the size of the plant. The minimum volume of the container in relation to the girth is expressed in the following table:

Girth in cm	Minimum volume of container in liters	Minimum width of container in cm
6-8	10	25
8-10	10	25
10-12	15	30
12-14	15	30
14-16	25	35
16-18	35	40
18-20	50	45
20-25	80	50

Table 1.3.4: Minimum recommended volume of container in relation to width

General specifications of supply

Ornamental evergreens can only be commercialized by authorized suppliers and must always comply with the specifications outlined in this chapter.

In Spain, the conditions for the supply of plant material are described in NTJ 07A: CALIDAD GENERAL (chapter 4.6).

In the case of supplying ornamental evergreens that must be commercialized with an ornamental label, reference must be made on the delivery note of the cultivar to which they belong, if applicable. This cultivar should be:

- Of common knowledge within the sector and protected in agreement with the provisions relating to the protection of plant varieties, or officially registered voluntarily or otherwise.
- Registered in the list drawn up by the supplier, with its detailed description and the corresponding denominations. This list must be made available to the official body in charge.

Each cultivar should be labeled in accordance with accepted international standards.

The lists prepared by the suppliers, mentioned above, must include the following:

- The name of the cultivar and, if applicable, its most common synonyms.
- The description of the cultivar, at least according to the most important characteristics.
- All available data on the characteristics that differentiate the cultivar from others that might be similar to it.
- The indications of the conservation of the cultivar and of the reproduction system used.

The last two points should not be applied by suppliers whose activity is limited to the commercialization of reproductive material and ornamental plants.

The quality criteria must refer to both the aerial and subterranean part.

Presentations of the root system

Evergreens can be supplied with root balls or containerized, capable of maintaining the development of new roots within the root ball. In exceptional cases, some species can be supplied bare root.

Quality of the subterranean part

The root system must be well developed and correspond, both in shape and size, to the characteristics of the species or variety, to the age of the tree, as well as to the characteristics of the soil or substrate where it has been grown. In the case of root systems with a tap root, it must have sufficient functional secondary roots and must maintain a length of at least 20 cm.

Quality of aerial part

The supplied evergreen trees must be correctly formed and structured, with adequate branching. They should be supplied with a proportionate volume of healthy foliage. In this way, the total height, the crown height, the density of the foliage, the girth of the trunk, as well as the number, distribution, width and length of the branches must correspond to the growth and aesthetic characteristics of the plant species or cultivar to which they belong, to the desired shape and to the age of the plant.

Crowned trees much have a balance between the trunk and crown.

In grafted trees, the graft should be correctly attached to the rootstock. Crowns formed by grafting must also give rise to a crown centered on the axis of the trunk, be well developed, and display the characteristics of the cultivar.

Trees with pyramid-shaped crowns should keep at least 2/3 of the total height of the original crown even after the removal of the lower branches during the lifting of the crown.

In the formative pruning, the cuts must clean and properly oriented and shoots should be removed.

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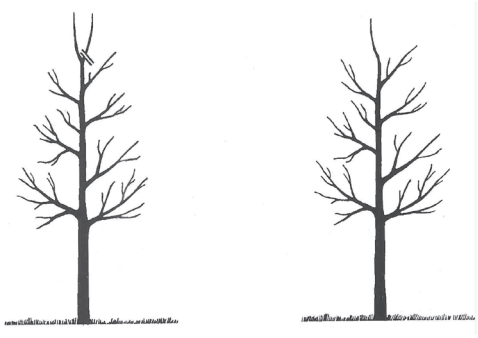

Figure 1.3.5: Removing codominant branches (NTJ 07D)

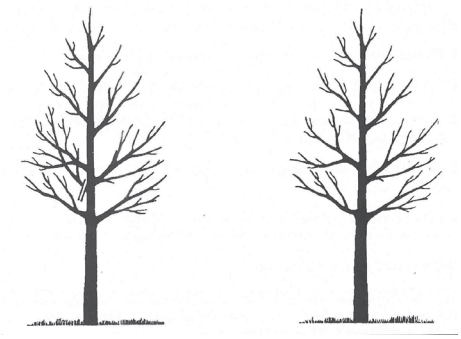

Figure 1.3.6: Removing abnormal branches (NTJ 07D)

Trees (especially those used for alignment) must have neither co-dominant nor abnormal branches (forked branches) on their main axis. When training through formative pruning, branching out levels must always be respected. See Figures 1.3.5 and 1.3.6.

Branched trees from their base must be fully foliaged from top to bottom and side branches evenly distributed along the trunk.

Crown trees must have a branch structure within its crown typical of the species or variety. The crown must be well formed and have a proportionate volume with respect to the girth of the trunk.

Trees with a pyramid shape should have only one central leader.

Round or pendulous crown trees should not be pyramid shaped. Fastigiated cultivars should have a single straight trunk.

When supplying trees for sculptural purposes, special shapes such as twisted, forked, leaning or multiple trunks may be desirable. In these cases, the batches do not have to be homogeneous.

Specifications for trees used in streets

Crown trees designated for planting in streets usually require a tall or medium crown. Care must be taken so that the main branches are not excessive.

Crown tree specifications used for alignments must indicate the height of the crown and relating to the dimensions, species or variety of the tree, so that the crown is well balanced with the trunk. Each batch supplied must have uniformity in the girth in the total height, in the height of the crown and in its volume and structure. If it corresponds to the species or variety of the tree supplied, the trunks must be single, straight, and vertical.

Trees supplied with root ball

The root ball should be solid and have a well-developed root system.

The root ball must be protected with non-galvanized wire mesh, with a basket of the same material, degradable organic fabric or with reinforced plaster and must be tied with suitable degradable material. In the case of specimen trees, the root ball must be protected with non-galvanized wire mesh, a basket of the same material, reinforced plaster, or in a wooden bucket and must be tied with suitable degradable material. The protective materials must not be damaged during delivery. See Figure 1.3.7

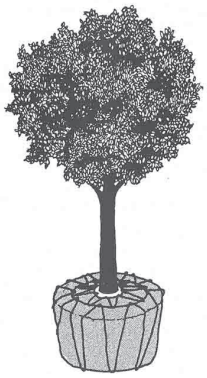

Figure 1.3.7: Tree supplied with root ball (source: NTJ 07E)

Only those materials that decompose before a year and a half after planting and do not affect the subsequent growth of the tree and its root system will be allowed as protection or tying materials for the root ball and will not be necessarily removed in the planting.

It is not recommended to supply trees with root balls that have a sectioned root with a diameter greater than 3 cm on their periphery.

The supply of trees with root ball must be done at least one growing season after the date of the last pruning.

Trees supplied in containers

A containerised evergreen should have been transplanted and grown long enough for new roots to develop in such a way that the root ball will hold its shape inside the container and remain compact when removed. Roots should not show symptoms of spiraling and should not protrude significantly through drainage holes.

Container-grown evergreens should be sold based on plant size and container volume.

The container should be rigid enough to support the shape of the root ball, protecting the root mass during transport.

The tree should be centered in the container and have enough substrate relative to the volume of the container.

Container-grown trees or evergreen trees, which have not been in a container long enough for the root system to have had a suitable development are unacceptable.

The supply of evergreen trees grown on non-degradable mesh should not be allowed.

Period of supply

The appropriate planting time depends on the type of supply (root ball or container), the type of tree (evergreen or semi leaf), the species, the climate of both the planting site and the nursery, the weather and the type of maintenance that is planned to be carried out.

Planting should be done preferably when the roots of the tree are dormant, avoiding the critical period of sprouting, which depends on the species and the climatic conditions of the place. It is also not recommended to plant in unfavorable weather conditions, such as frost, heavy rain, snowfall, or on days with strong winds or excessively high temperatures.

Supplying trees in containers or plastered root balls facilitates handling and the possibility of planting throughout the year.

Plant health

The trees must be healthy, mature, and sufficiently hardened so that their roots and future development are not compromised.

Trees cannot show defects caused by diseases, pests, physiopathologies, nutritional deficiencies, or phytotoxicity due to phytosanitary treatments that reduce the value or qualification for use. They must be substantially free (at least by visual observation) from harmful organisms and diseases, or signs or symptoms thereof, which significantly affect and reduce the value of their use as ornamental trees.

The trees should not have any burns or injuries in the bark, apart from the normal ones produced during formative pruning. There should be no broken branches or twigs and the foliage should not be damaged or dry. The twigs as well as the roots must present a good turgidity.

The roots must not be damaged or show signs of rot. The substrates of the plants, both those supplied in containers and in root balls, must be free of weeds, especially for perennial plants.

The evergreen trees supplied must comply with current legislation on plant health, especially when referring to harmful organisms and diseases that significantly affect quality; to quarantine harmful organisms that may not be present in any nursery; and ornamental trees that need a plant health passport and/or commercial label.

Planting design

The planting of any evergreen trees must be carried out from a project that specifies the species or cultivar, the type of supply (root ball or container), the size of the plant (girth or height), the type of branch structure (pyramid-shaped, crown lift or branched from the base, etc.), the setting or distance of planting, the number of specimens, the planting system and time, and its location on the design layout.

Once all the civil works have been carried out, the **plant layout** can be transferred to the site, that is, the placement of each plant can be initiated. This will be done by drawing or marking everything on the

ground (including ground that will already have its final shape, its undulations, etc.), marking the limits with plaster lines. Stakes can be used to mark the exact point where trees can be placed. By following a series of fundamental operations, the planting of the species can now take place by following a series of operations:

- Digging the planting pit
- Soil conditioning
- Placement
- Training (if necessary)
- First irrigation
- Mulching (if necessary)

NOTE: For successful planting, great care must be taken in this process.

Profiling the terrain and soil conditioning

When dealing with planting of trees in a park, garden or in a landscaped area, the modeling and profiling of the land must be carried out prior to the planting process (as we have already seen), and the conditioning of the soil. Ensuring a suitable profile will guarantee successful planting.

If the soil is compact and to avoid water logging resulting in the premature death of newly planted trees, improving its texture, structure and permeability is recommended. If excessively compact, sub soiling should be done in the planting area. If a crust forms on the soil surface, a soil scarification must be carried out.

If the physical-chemical conditions of the soil are not adequate, a soil amendment must be carried out with the addition of materials that favor fertility, porosity, drainage, and moisture retention.

As a guide, it is accepted that a garden soil has an adequate proportion of the main components of the soil when it contains:

- 20-30 % clay
- 50-65 % sand and silt
- Less than 10 % of lime
- 2-10 % of topsoil or humus

On the other hand, those with more than 30% clay will be considered clayey, those with more than 70% sand are too sandy, and those with more than 10% lime will be considered alkaline or basic.

However, each plant has its own ideal balance. For example, soil for grass should be sandy, etc.

Other soil characteristics to consider are its chemical properties (the different chemical elements important in the soil or the pH). Some plants live in neutral soil, others in alkaline or basic soils while other need acidic soil.

The minimum depth of turned over and fertile soil is 50 cm.

If stones are present, it may be necessary remove them.

If stumps are present, it may be necessary to use a stump remover.

If weeds are present, it may be necessary to use remove them.

Opening planting pits

Opening planting pits must be prepared in advance to favor the weathering of the soil and its conditioning.

Below are the necessary stages for opening planting pits:

a) Mark the placement of the plant outlined in the project
b) Take into consideration aerial service networks, built elements, and urban furniture (streetlamps, signs etc.), existing vegetation etc.
c) Locate possible presence of underground services (water, electricity...)
d) Take into consideration ground condition (rocky outcrops, excess of stones, presence of foreign materials...)
e) Place the plant in situ
f) Reposition the plant according to desired orientation etc.
g) Mark the new position if necessary
h) Decide appropriate opening method (manual or mechanic)
i) Make the planting pit
j) Gather together the useful material from the excavation to reuse when planting
k) Materials from the excavation that cannot be used must be discarded correctly

The planting pit must be proportional to the tree that is going to be planted. It will be wide and deep enough to accommodate the entire root ball or root system, providing more room for future development.

Minimum dimensions of planting pits

For trees supplied with a root ball or in a container, the diameter of the pit should be as large as possible, at least twice (or even three times) as wide as that of the root ball. The depth of the holes or tree pit should be approximately equal to the height of the root ball.

Shape of planting pits

The shape of the pit can be cylindrical, truncated conical, cubic, parallelepiped or a truncated pyramid. In compact soils, it is convenient that the volume excavated in the upper part is considerably greater than that of the lower part.

Regarding planting pits, their width should correspond to the diameter of the hole and its depth to the depth of the root system or root ball. Its length should be that of the line of plants. In some cases, the pits of double diameter can be made for a double alignment or staggered planting.

When planting lines of trees, trenches are recommended rather than individual holes.

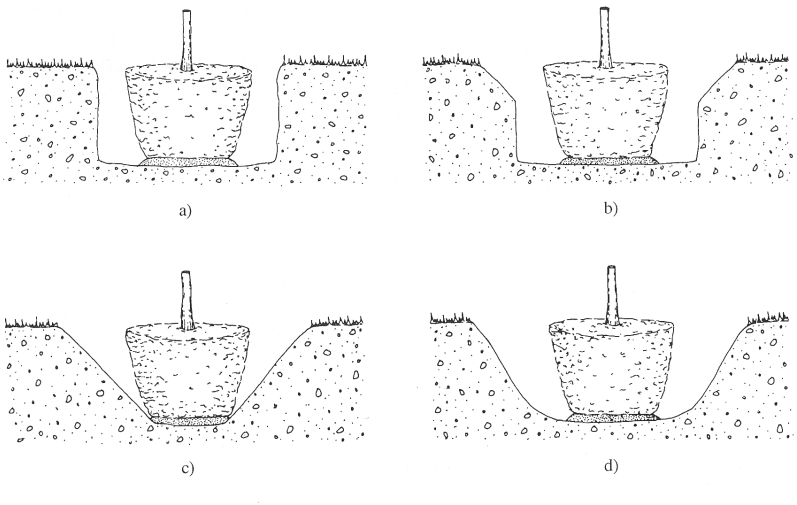

Figure 1.3.8: Different types of planting pits (Source: NTJ 08C)

Draining and aeration

When planting in soils that are clayey, have little drainage, compact and with physical-chemical characteristics that hinder aeration, porosity, permeability or infiltration of water into the soil or in the case of planting species susceptible to root suffocation, it is advisable to install a **drainage system** made up of pipework, drains, drainage tubes, special pieces and layers of gravel, which allows the water to drain to lower positions or towards the sewer.

The drainage tube should be placed at the bottom of the pit around the root zone, forming a circle, and should be filled with washed gravel. A T-type connector should be attached to a collector tube that collects the water away from the tree. A layer of aggregate about 7 cm thick must be placed on the drainage pipe, with an intermediate grading between that of the subsoil and that of the filling earth. See figure 1.3.9.

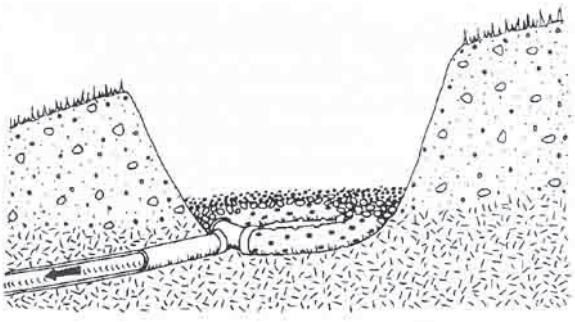

Figure 1.3.9: Drainage pipe (source: NTJ 08C)

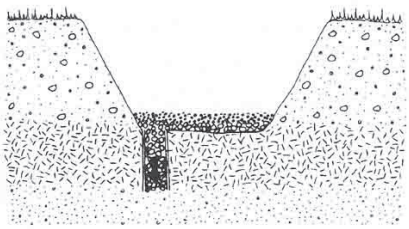

Figure 1.3.10: Vertical drainage (source: NTJ 08C)

In asphyxiating soils or in new plantations in roadside, tree pits, continuous pits, roadside flowerbeds, etc., corrugated aeration tubes will be placed.

Planting trees in container or root ball

Great care must be taken so that the root ball does not break or damage is done to the roots.

Planting steps are as follows:

1. Protect the pipes with anti-weed fabric.
2. Fill the pit to the height of where the plant will be placed.
3. Remove the plant from the pot if necessary.
4. Proceed to:
    - If the plant is protected with metal mesh, cut the wire collar and remove the upper part to avoid the risk of strangulation.
    - If the plant is in plaster, remove the clay from the lower part and perforate the sides.
    - If the plant comes with a root ball with biodegradable material, it does not need to be removed.
5. Place the plant in the pit making sure that there are no foreign objects.
6. Place the plant vertically in the desired position without burying the root collar, allowing it to stabilize.
7. If necessary, reconsider the line position.
8. Fill the pit to half its depth.
9. Tap down on the soil.
10. Fill in the rest of the pit with backfill.
11. Tap down lightly on the soil again.

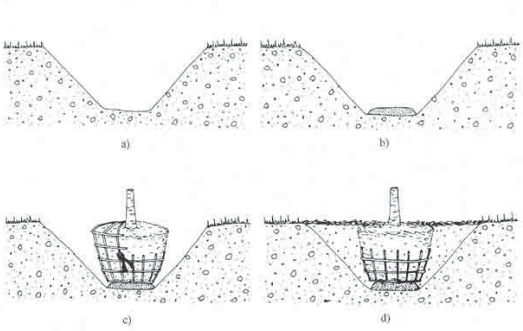

Figure 1.3.11: Planting steps for trees with root balls (Fuente: NTJ 08C)

Staking

Trees that are not stable must be staked until they take root (approximately two years).

The role of staking is to:

- Prevent movements that can break the root.
- Stabilize plants while they take root.

How to carry out staking correctly:

- The aerial part of the plant nor the roots must not be damaged (especially the root ball).
- Stakes must be placed prior to filling the planting pit.
- It must resist strong winds.
- It must be resistant to vandalism, hits and pulling that may occur in the planting area.
- It must not put people at risk.
- If the stakes need to be attached to the trunk and branches, elastic and non-abrasive material must be used.

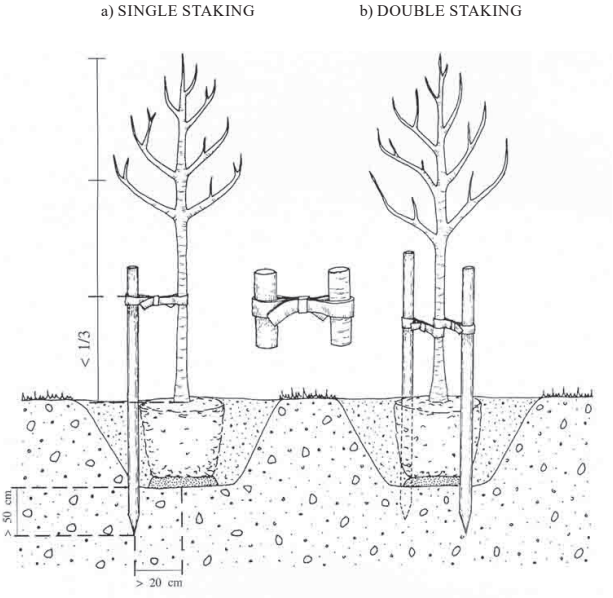

Figure 1.3.12: Examples of single and double staking (source: NTJ 08C)

Filling the planting pit

Soil will be added in stages to avoid air pockets.

In this operation and depending on the characteristics of the material removed when digging the pit, the following practicalities can be identified:

Using the material removed from the planting pit:

• Good for the correct development of the roots	Direct use
• Reasonable development of roots	Mix with fertile soil or similar and fertilizers
• Incorrect development of roots	Replace with fertile soil. The excavated soil should be disposed of correctly.

A shallow pit should be created to retain enough water.

Irrigation after planting. Once the planting has been carried out, the planting pit should be filled with a large amount of water so that the root system is completely wet. The soil must be at field capacity. Irrigation must be done at low pressure to ensure no loss of soil.

Mulching

The surface area of soil around the newly planted tree should be covered with approximately a 10 cm layer of mulch.

The purposes of mulching are:

- Protects the roots from extreme temperatures.
- Preserves the humidity of the soil under the mulching area.
- Increases water infiltration around the root collar.
- Increases aeration of the soil around the root collar.
- Provides organic matter to the soil
- Reduces the presence of weeds
- Promotes the growth of microorganisms
- Reuses the discarded materials (what is left from pruning)
- Protects the base of the tree from possible damage during the mowing of grass or weeding

Most common materials used for mulching are:

- Crushed tree bark or what is left from pruning
- Nut shells
- Sand and gravel
- Balls of expanded clay
- Straw and dead leaves

After adding the mulch and careful not to cover the root collar, it is recommended to water abundantly to make the surface compact and reduce scattering by wind and rain.

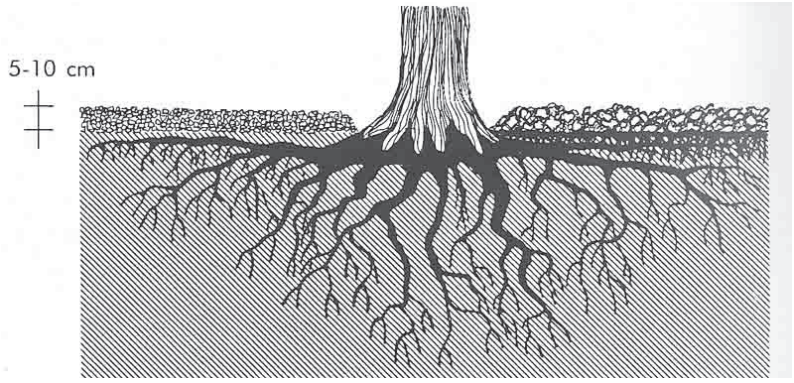

Figure 1.3.13: Mulching (Source: planting. Practical manual for its correct application COITAC)

Planting period. The correct time for planting depends on the type of supply (root ball or container), the type of tree (evergreen, semi-evergreen, deciduous leaf), the species, the climate conditions of where the plant will be placed as well as at the nursery, the weather and the type of maintenance that is expected to be carried out. Table 5 is a guide for the planting time under normal conditions.

Planting should be carried out preferably when the tree is in its dormant stage, avoiding the critical period of sprouting, which depends on the species and the climatic conditions of the place. It is also not recommended to plant in unfavorable weather conditions, such as frost, heavy rain, snowfall or on days with strong winds or excessively high temperatures.

Supply of trees cultivated in containers or prepared in root balls in gypsum facilitates handling and the possibility of planting throughout the year.

FACTOR TO CONSIDER			PLANTING PERIOD											
Origin of species	**Area of planting**	**Type of supply**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Trees from Mediterranean or warm climate	Mediterranean	Evergreen leaf with root ball												
		Evergreen leaf with container												
Trees from subtropical climate	Mediterranean	Evergreen leaf with root ball												
		Evergreen leaf with container												
Trees from Mediterranean or subtropical	Subtropical	Evergreen leaf with root ball												
		Evergreen leaf with container												

Preferred time

Complementary

Table 1.3.5: Preferred periods for planting evergreen trees (Source: NTJ 08C)

CLASSIFICATION OF EVERGREEN TREES ACCORDING TO STRUCTURE AND TYPE OF GROWTH (Source NTJ 07E)

Evergreen trees can be organized based on their final size, growth rate and type of branching structure, according to the following classification:

1: Large or medium sized trees of rapid growth
2: Large or medium sized trees of medium to slow growth
3: Small trees

r: Trees with branches at base
c: Crown lift
f: Pyramidal crown lift
a: Leafy trees

This list includes some species with semi-deciduous foliage or that behave as evergreen in subtropical climate areas and as deciduous in temperate climate zones.

SCIENTIFIC NAME	SYNONYMS	FAMILY	CLASSIFICATION
Acacia baileyana F. Muell.		Mimosaceae	3 c/a
Acacia cyclops A. Cunn. ex G. Don		Mimosaceae	3 c/a
Acacia dealbata Link		Mimosaceae	3 c/a
Acacia decurrens (J.C. Wendl.) Willd.		Mimosaceae	3 c/a
Acacia x *hanburyana* Winter ex Berger		Mimosaceae	3 a
Acacia longifolia (Andrews) Willd.		Mimosaceae	3 c/a
Acacia mearnsii De Wild.	*A. mollissima* auct. non Willd.	Mimosaceae	3 c/a
Acacia melanoxylon R. Br.		Mimosaceae	1 f
Acacia podalyriifolia G. Don		Mimosaceae	3 c/a
Acacia pubescens (Vent.) R. Br.		Mimosaceae	3 c/a
Acacia pycnantha Benth.		Mimosaceae	3 c/a
Acacia retinodes Schltdl.		Mimosaceae	3 c/a
Acacia salicina Lindl.		Mimosaceae	3 c/a
Acacia saligna (Labill.) H. L. Wendl.	*A. cyanophylla* Lindl.	Mimosaceae	3 c/a
Acacia spectabilis A. Cunn. ex Benth.		Mimosaceae	3 c/a
Acacia stenophylla A. Cunn. ex Benth.		Mimosaceae	3 c/a
Acca sellowiana (O. Berg) Burret	*Feijoa sellowiana* O. Berg	Myrtaceae	3 c/a
Acer oblongum Wall. ex DC.		Aceraceae	3 c
Agonis flexuosa (Willd.) Sweet		Myrtaceae	3 r/c/f
Albizia lophantha (Willd.) Benth.	*A. distachya* (Vent.) Macbr.	Mimosaceae	3 c/a
Aleurites moluccana (L.) Willd.		Euphorbiaceae	2 c
Allocasuarina verticillata (Lam.) L.A.S. Johnson	*Casuarina stricta* Aiton	Casuarinaceae	1 r/f
Annona cherimola Mill.		Annonaceae	3 c/a

Apollonias barbujana (Cav.) Bornm.	*A. canariensis* (Willd.) Nees	Lauraceae	2 r
Arbutus andrachne L.		Ericaceae	3 c/a
Arbutus canariensis Veill.		Ericaceae	3 r
Arbutus unedo L.		Ericaceae	3 c/a
Bauhinia purpurea L.		Caesalpiniaceae	3 c/a
Brachychiton acerifolius A. Cunn. ex F. Muell.		Sterculiaceae	1 f
Brachychiton discolor F. Muell.	*B. luridus* C. Moore ex F. Muell.	Sterculiaceae	1 f
Brachychiton populneus (Schott & Endl.) R. Br.	*Sterculia diversifolia* G. Don	Sterculiaceae	1 f
Brachychiton rupestris (Lindl.) K. Schum.		Sterculiaceae	1 f
Buxus balearica Lam.		Buxaceae	3 c/a
Callistemon viminalis (Sol. & Gaertn.) G. Don ex Loud.		Myrtaceae	3 c/a
Calodendrum capense (L. f.) Thunb.		Rutaceae	3 c
Camellia japonica L.		Theaceae	3 c/a
Camellia reticulata Lindl.		Theaceae	3 c/a
Camellia sasanqua Thunb.		Theaceae	3 c/a
Carica papaya L.		Caricaceae	3 f
Casimiroa edulis La Llave		Rutaceae	3 c
Casuarina cunninghamiana Miq.		Casuarinaceae	1 r/f
Casuarina equisetifolia J.R. Forst. & G. Forst.		Casuarinaceae	1 r/f
Ceratonia siliqua L.		Caesalpiniaceae	2 c/a
Cinnamomum camphora (L.) Sieb.		Lauraceae	2 c
Citrus aurantiifolia (Christm.) Swingle		Rutaceae	3 c
Citrus aurantium L.		Rutaceae	3 c
Citrus limon (L.) Burm. f.		Rutaceae	3 c/a
Citrus maxima (Burm.) Merr.	*C. grandis* Osbeck	Rutaceae	3 c
Citrus medica L.		Rutaceae	3 c/a
Citrus x *paradisi* Macfad.		Rutaceae	3 c
Citrus reticulata Blanco	*C. deliciosa* Ten.	Rutaceae	3 c
Citrus sinensis (L.) Osbeck		Rutaceae	3 c
Coccoloba uvifera (L.) Jacq.		Polygonaceae	3 r/a
Cocculus laurifolius (Roxb.) DC.		Menispermaceae	3 c/a
Cornus capitata Wall.		Cornaceae	3 r/a
Corynocarpus laevigatus J.R. Forst. & G. Forst.		Corynocarpaceae	2 r/f
Dombeya x *cayeuxii* André		Sterculiaceae	3 r/a
Dombeya tiliacea (Endl.) Planch.		Sterculiaceae	3 r/a
Dovyalis caffra (Hook. f. & Harvey) Warb.	*Aberia caffra* Hook. f. & Harvey	Flacourtiaceae	3 r/a
Drimys winteri J.R. Forst. & G. Forst.		Winteraceae	3 r/a
Erica arborea L. (en Canarias)		Ericaceae	3 r/a

SCIENTIFIC NAME	SYNONYMS	FAMILY	CLASSIFICATION
Eriobotrya japonica (Thunb.) Lindl.		Rosaceae	3 c
Eucalyptus camaldulensis Dehnh.	*E. rostrata* Schltdl.	Myrtaceae	1 r/f
Eucalyptus cinerea F. Muell. ex Benth.		Myrtaceae	1 c/f
Eucalyptus citriodora Hook.		Myrtaceae	1 c
Eucalyptus ficifolia F. Muell.		Myrtaceae	2 c
Eucalyptus globulus Labill.		Myrtaceae	1 r/f
Eucalyptus gomphocephala DC.		Myrtaceae	1 r/f
Eucalyptus gunnii Hook. f.		Myrtaceae	1 r/f
Eucalyptus occidentalis Endl.		Myrtaceae	1 r/f
Eucalyptus polyanthemos Schauer		Myrtaceae	1 r/f
Eucalyptus robusta Sm.		Myrtaceae	1 r/f
Eucalyptus viminalis Labill.		Myrtaceae	1 r/f
Eugenia uniflora L.		Myrtaceae	3 r/a
Ficus altissima Blume		Moraceae	1 c
Ficus benghalensis L.		Moraceae	1 c
Ficus benjamina L.		Moraceae	2 r/c/f
Ficus cyathistipula Warb.		Moraceae	3 c/f/a
Ficus drupacea Thunb. var. *pubescens* (Roth) Corner	*F. mysorensis* Heyne ex Roth	Moraceae	1 c
Ficus elastica Roxb. ex Hornem.		Moraceae	1 c
Ficus lyrata Warb.		Moraceae	2 c/f
Ficus macrophylla Desf. ex Pers.	*F. magnolioides* Borzí	Moraceae	1 c
Ficus microcarpa L. f.	*F. retusa* L., *F. nitida* auct. non Thunb.	Moraceae	1 c
Ficus religiosa L.		Moraceae	2 c
Ficus rubiginosa Desf. ex Vent.		Moraceae	1 c
Grevillea robusta A. Cunn. ex A119R. Br.		Proteaceae	1 r/f
Hakea laurina R. Br.		Proteaceae	3 c/a
Heteromeles arbutifolia (Aiton) M. Roem.		Rosaceae	3 r/a
Hura crepitans L.		Euphorbiaceae	1 c
Ilex aquifolium L.		Aquifoliaceae	3 r/a
Ilex canariensis Poir.		Aquifoliaceae	3 r/a
Ilex pernyi Franch.		Aquifoliaceae	3 r/a
Ilex platyphylla Webb & Berthel.	*I. perado* Aiton ssp. *platyphylla* (Webb & Berthel.) Tutin	Aquifoliaceae	3 r/a
Lagunaria patersonii (Aiton) G. Don		Malvaceae	1 r
Laurus azorica (Seub.) Franco	*L. canariensis* Webb & Berthel.	Lauraceae	1 f
Laurus nobilis L.		Lauraceae	3 r/f/a
Leucaena leucocephala (Lam.) de Wit	*L. glauca* (L.) Benth.	Mimosaceae	3 r/f/a
Ligustrum lucidum W.T. Aiton		Oleaceae	3 c/a
Litchi chinensis Sonn.		Sapindaceae	3 r/c

SCIENTIFIC NAME	SYNONYMS	FAMILY	CLASSIFICATION
Lithraea molleoides (Vell.) Engl.		Anacardiaceae	3 r/a
Luma apiculata (DC.) Burret		Myrtaceae	3 r/a
Macadamia tetraphylla L.A.S. Johnson		Proteaceae	1 c
Magnolia grandiflora L.		Magnoliaceae	2 r/f
Mammea americana L.		Clusiaceae	2 c
Mangifera indica L.		Anacardiaceae	1 c/f
Manilkara zapota (L.) Van Royen	*Achras zapota* L.	Sapotaceae	2 c
Melaleuca armillaris (Sol. & Gaertn.) Sm.		Myrtaceae	3 r/a
Melaleuca ericifolia Sm.		Myrtaceae	3 r/a
Meryta denhamii Seem.		Araliaceae	3 f
Metrosideros excelsa Sol. ex Gaertn.	*M. tomentosa* A. Rich.	Myrtaceae	2 c/a
Michelia doltsopa Buch.-Ham. ex DC.		Magnoliaceae	2 c
Myoporum tenuifolium G. Forst.	*M. acuminatum* R. Br.	Myoporaceae	3 r/a
Myrica cerifera L.		Myricaceae	3 r/a
Myrica faya Aiton		Myricaceae	3 r/a
Nothofagus menziesii (Hook. f.) Oerst.		Fagaceae	2 c
Olea europaea L.		Oleaceae	2 c
Oreopanax capitatus (Jacq.) Decne. & Planch.		Araliaceae	3 r/a
Oreopanax nymphaeifolius (Lind. ex Hibb.) Gentil		Araliaceae	3 c
Parkinsonia aculeata L.		Caesalpiniaceae	3 c/a
Persea americana Mill.		Lauraceae	2 c/f
Persea indica (L.) Spreng.		Lauraceae	2 r/c/f
Phillyrea latifolia L.	*P. media* L.	Oleaceae	3 r/a
Photinia nussia (Decne.) Kalkman	*Stranvaesia nussia* Decne.	Rosaceae	3 c/a
Photinia serratifolia (Desf.) Kalkman	*P. serrulata* Lindl.	Rosaceae	3 c/a
Phytolacca dioica L.		Phytolaccaceae	1 c
Picconia excelsa (Aiton) DC.	*Notelaea excelsa* (Aiton) Webb	Oleaceae	3 r
Pistacia lentiscus L.		Anacardiaceae	3 r/c/a
Pittosporum coriaceum Dryand. ex Aiton		Pittosporaceae	3 r/c/a
Pittosporum phillyreoides DC.		Pittosporaceae	3 c
Pittosporum tenuifolium Banks & Sol. ex Gaertn.		Pittosporaceae	3 r/c/a
Pittosporum undulatum Vent.		Pittosporaceae	3 r/c/a
Prunus caroliniana (Mill.) Aiton		Rosaceae	2 r/c/a
Prunus laurocerasus L.	*Laurocerasus officinalis* Roem.	Rosaceae	3 r/c/a
Prunus lusitanica L. ssp. *hixa* (Willd.) Franco	*Laurocerasus lusitanica* (L.) Roem. ssp. *hixa* (Willd.) Kunkel	Rosaceae	2 c/f
Prunus lusitanica L. ssp. *lusitanica*	*Laurocerasus lusitanica* (L.) Roem. ssp. *lusitanica*	Rosaceae	3 r/c/a
Psidium guajava L.		Myrtaceae	3 c/a
Psidium littorale Raddi var. *longipes* (O. Berg) McVaugh	*P. cattleianum* Salisb.	Myrtaceae	3r/f/a

SCIENTIFIC NAME	SYNONYMS	FAMILY	CLASSIFICATION
Quercus ilex L.		Fagaceae	2 c/f
Quercus polymorpha Cham. & Schltdl.		Fagaceae	2 c/f
Quercus rotundifolia Lam.	*Q. ilex* L. ssp. *ballota* (Desf.) Samp.	Fagaceae	2 c/f
Quercus suber L.		Fagaceae	2 c/f
Quercus virginiana Mill.		Fagaceae	2 c/f
Quillaja saponaria Molina		Rosaceae	3 r/a
*Radermachera sinica (*Hance) Hemsl.		Bignoniaceae	1 r
Sapindus saponaria L.		Sapindaceae	3 c
Schefflera actinophylla (Endl.) Harms	*Brassaia actinophylla* Endl.	Araliaceae	3 r/f/a
Schefflera elegantissima (Veitch ex Mast.) Lowry & Frodin	*Dizygotheca elegantissima* (Veitch ex Mast.) R. Vig. & Guillaum.	Araliaceae	3 r/c/a
Schinus lentiscifolius Marchand		Anacardiaceae	3 c/a
Schinus molle L.		Anacardiaceae	1 c
Schinus polygamus (Cav.) Cabrera	*S. dependens* Ort.	Anacardiaceae	3 c/a
Schinus terebinthifolius Raddi		Anacardiaceae	3 c
Senna spectabilis (DC.) Irwin & Barneby	*Cassia spectabilis* DC.	Caesalpiniaceae	3 c
Sophora microphylla Aiton		Fabaceae	3 c/a
Sophora secundiflora (Ortega) Lag.		Fabaceae	3 c/a
Spathodea campanulata P. Beauv.		Bignoniaceae	1 c
Stenocarpus sinuatus Endl.		Proteaceae	3 r/c
Syzygium cuminii (L.) Skeels		Myrtaceae	2 r/f
Syzygium jambos (L.) Alston		Myrtaceae	3 r/f
Syzygium paniculatum Gaertn.	*Eugenia myrtifolia* Sims	Myrtaceae	3 r/c/a
Tabebuia pallida (Lindl.) Miers		Bignoniaceae	3 c
Tamarindus indica L.		Caesalpiniaceae	1 c/f
Tecoma x smithii W. Watson		Bignoniaceae	3 r/a
Tecoma stans (L.) Juss. ex HBK.		Bignoniaceae	3 r/a
Thevetia peruviana (Pers.) K. Schum.	*T. neriifolia* A. Juss. ex Steud.	Apocynaceae	3 r/a
Umbellularia californica (Hook. & Arn.) Nutt.		Lauraceae	3 r/a
Visnea mocanera L. f.		Theaceae	3 r/a

Subchapter 1.4 Maintenance

The general goals for maintenance of ornamental evergreen trees in greens spaces and streets are as follows:

- Achieve and maintain an adequate structure and development of the trees in the environment in which they are located (main purpose).

- Provide greater beauty to the trees and their surroundings (aesthetic purpose).

Trees must be maintained so that they do not create any risk to people, property or interfere with public safety.

The tree must be respected as much as possible, considering its own characteristics and those of the planting site (climatic, location, edaphic, plant pathology, landscape, and urban planning).

Before carrying out tree maintenance, the objectives must be clearly predefined by the corresponding technical manager in the maintenance program, in agreement with the tree management plan. The various operations to be applied, their management, and costs must be considered.

Maintenance operations

The specific operations recommended to maintain trees planted in tree pits, green spaces, landscaped areas or flower beds are specified below.

1. Technical inspection

2. Pruning:

- Formative pruning
    - Training to form the trunk
    - Training to form the structure
    - Pruning for crown raising
    - Pruning for safety for overhead service lines
- Maintenance pruning
    - Trimming back
    - Pruning for security
    - Pruning to thin out
    - Pruning to reduce the crown
    - Pruning to restore and reshape
    - Spur pruning
- Architectural pruning:
    - Geometric trimming/pruning
    - Pollarding
- Specific pruning/trimming
    - Pruning flower bearing trees
- According to location
    - Pruning street trees
    - Pruning trees in green areas

3. Intervention in the soil
- Scarification
- Soil decompaction
- Vertical aeration
- Partial substitution
- Fertilising
- Mulching
- Weeding

4. Irrigation

5. Preventive phytosanitary treatments

6. Corrective and curative phytosanitary treatments

7. Treating injuries

8. Maintaining an artificial foundation

9. Removing dead or dangerous trees

10. Removing stumps

11. Reposition or substitution of dead trees

12. Cleaning the tree pit

Recommended maintenance programme

The maintenance operations to be carried out depend on the species, the location, the function, the age, etc. The following tables give some standard maintenance guidelines, which in general, should be followed whenever possible. In some cases, an analysis of the specific needs of the specimen or group of specimens should be carried out to clarify operations and their periodicity.

The frequency of maintenance is a variable that depends on the species, the conditions of the location of the specimen (climate, microclimate, soil, urban setting, etc.) and on the planting conditions. The technicians responsible for maintenance must develop specific or differentiated maintenance programs for the different species of trees, establishing the frequency or periodicity of the various operations.

The following tables outline the recommended maintenance programs for trees planted in pits, paved areas, or on roadsides and for trees planted in landscaped areas or in flower beds.

RECOMMENDED MAINTENANCE PROGRAM FOR TREES IN TREE PITS	
Maintenance Procedure	**Frequency guidelines**
1. Technical inspection	Annual or immediately after one incident
2. Pruning	The frequency of maintenance pruning for street trees is high, so it is necessary, in addition to an adequate choice of species, a selection of healthy specimens, a correct planting and a formative pruning (before, in the nursery, and after planting)
3. Soil intervention - Scarification - Fertilizing - Mulching - Weeding - Other interventions in the soil	When decided by technical inspectors When decided by technical inspectors Annual Biannual or according to needs When decided by technical inspectors
4. Watering	According to needs and location, especially during the first Years and after planting
5. Preventive phytosanitary treatments	According to location and treatment
6. Corrective and curative phytosanitary treatments	When decided by technical inspectors and depending on the treatment
7. Treating injuries	When decided by technical inspectors
8. Maintaining artificial foundations	Annual and after incidents
9. Removing dead or dangerous trees	When decided by technical inspectors
10. Removing stumps	When necessary

Table 1.4.1. Maintenance for trees in tree pits

RECOMMENDED MAINTENANCE PROGRAM FOR TREES IN OPEN AREAS		
	Maintenance procedure	Frequency guidelines
1.	Technical inspection	Annual and immediately after incident
2.	Pruning/trimming	Although the frequency of maintenance pruning of trees in open areas is low, often only occasional, it is also important to choose the right species for the given location, to select healthy specimens, and to make a correct planting and formative pruning (before, in the nursery, and after planting) In general, post-planting formative pruning in open areas is less important compared to urban trees in tree pits
3.	Interventions in the soil - Scarification - Fertilizing - Mulching - Weeding - Other interventions in the soil	When decided by technical inspectors When decided by technical inspectors Annual Annual or according to needs When decided by technical inspectors
4.	Irrigation	According to needs and location, especially during the first years and after planting
5.	Preventive phytosanitary treatments	According to location and treatment
6.	Corrective and curative phytosanitary treatments	When decided by technical inspectors and depending on treatment
7.	Weeding	When decided by technical inspectors
8.	Maintaining artificial foundations	When decided by technical inspectors
9.	Removing dead or dangerous trees	When decided by technical inspectors
10.	Removing stumps	When decided by technical inspectors

Table 1.4.2. Maintenance for trees in open areas

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2

BROADLEAF DECIDUOUS TREES

Chapter 2 BROADLEAF DECIDUOUS TREES

Subchapter 2.1 Introduction
Subchapter 2.2 Species
Subchapter 2.3 Commercialization
Subchapter 2.4 Maintenance

Subchapter 2.1 Introduction

Puis Font Quer, in his dictionary of botany, defines broadleaf plants as those that have abundant leaves and branches.

According to this definition, broadleaf trees can be ideal for: providing shade, hiding views, as a noise buffer etc.

Broadleaf plants can be deciduous or evergreen, the latter being mostly tropical and subtropical.

Deciduous trees are characteristic of temperate and cold climates. Leaves fall with the onset of cold in autumn and deciduous trees spend the winter leafless, which protects them from the rigors of winter by reducing their activity during short and cold days.

However, there are some that in temperate climates shed their leaves very late in the winter and the falling leaves almost coincide with the spring budding.

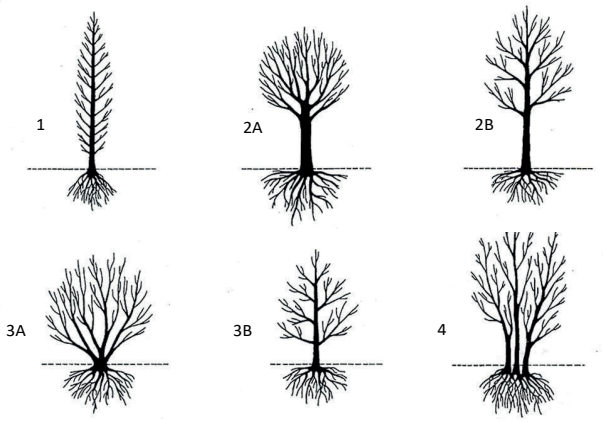
During the sprouting of deciduous trees, in the spring, buds take the nutritional resources (stored up from the previous summer season) from the plant itself (branches, trunk or roots). As a result, these plants need to store resources correctly and therefore a healthy plant is required. The root system must not be damaged, and the crown must be in perfect condition (high vitality and no pruning).

In conditions that are not suitable for correct sprouting, such as severe pruning, root breakage due to incorrect plant pitting the tree, deciduous trees planted in subtropical climates, etc. the tree suffers various problems that progressively weaken it and make it more vulnerable to diseases and pests. In particular, with severe pruning, the reserves found in the branches are lost and the spring budding weakens the plant. Similarly, with root breakage, the plants lose their reserves, stability, and capacity to absorb water and nutrients. In addition, with late autumns and early springs, plants accumulate reserve substances late and poorly. As a result, the trees have fewer reserves. If this accumulation is due to pruning or breakage it makes the situation worse.

Species selection

When selecting a broadleaf, the aesthetics as well as its use, should be taken into consideration. The following issues should be considered:

- The size of the species (confirm size and shape and ensure its adaptability to the place where it will be planted).



1. Trees with branches from the ground level
2. Standard trees or with crowns
   2A. With crown from the cross
   2B With a central leader (pyramid shaped)
3. Bushy trees
   3A. Multiple trunks
   3B. Single trunk
4. Group of trees

Figure 2.1.1.: Typology of trees with deciduous leaves (NTJ07D, C.O.I.T.A.P.A.C.)

- The color and texture of the leaves, trunks, and branch structure, presence of fruits throughout the winter…
- Production of big leaves and fruits cause litter as well as well as an increasing in the risk of slipping and falling for pedestrians
- Functioning and climatic requirements of each species in a particular city or location
- All normal factors affecting the selection of plant species



Figure 2.1.2.: *Jacaranda mimosifolia, Tipuana tipu, Cercis siliquastrum, Ulmus pumilla, Sophora japonica, Ginkgo biloba*... different species that give us a wide and diverse range of textures, colors, and characteristic appearance.

Subchapter 2.2 Species

This chapter describes **31 species of deciduous trees** used in garden and landscape design They have been chosen based on their ornamental use, botanical interest, and other characteristics which make them of special interest in this chapter.

Firstly, a table shows the different parameters and values that have been used to describe each species. Secondly, each botanic datasheet gathers the information of each individual tree species covering botanical and ecological aspects, uses, cultivation, and other characteristics of interest, including its commercialization and maintenance. This information is complemented by photographic information, which shows the general appearance of the tree species and different morphological details.

PARAMETERS AND VALUES USED IN THE BOTANIC DATASHEET	
TAXONOMY	
TAXONOMIC RANKS	DIVISION, SUBDIVISION, TYPE, ORDER, FAMILY
VARIETIES	OTHER VARIETIES OF INTEREST
STRUCTURE	
SHAPE	GLOBE-SHAPED, ROUNDED, OVAL, COLUMNAR, CONE, EXTENDED, IRREGULAR, PARASOL, FAN-SHAPED, HORIZONTAL, PALMIFORM, PENDULAR, WEEPING
HEIGHT	AS APPROPRIATE- IN METERS OR CENTIMETERS
DIAMETER	AS APPROPRIATE -IN METERS OR CENTIMETERS
TEXTURE	TEXTURE: LEAVES>10CM= COARSE. LEAVES OR LEAFLETS BETWEEN 2-10CM= MEDIUM. LEAVES OR LEAFLETS <2CM= FINE
SHADE	LIGHT, FULL, DENSE
ROOT	TAPROOT, FASCICULATE , OBLIQUE, HORIZONTAL, AERIAL, ADVENTITIOUS
MORPHOLOGY	
TRUNK	
BARK	SMOOTH, VERTICAL FISSURES, LONGITUDINAL FISSURES, DIAGONAL FISSURES; ROUGH, SCALY, CORKY WITH PLATES
COLOR OF BARK	GREYS; GREEN/GREY OR BLUE/GREY. SILVER; LIGHT GREEN, YELLOW, LIGHT BROWN, DARK, GREEN, RED; RED. PURPLE; YELLOW; BLACK; MARBLED; TWO-TONED; THREE-TONED; LIGHT GREY, DARK GREY
LEAF	
TYPE	EVERGREEN, SEMI-EVERGREEN DECIDUOUS, SEMI-DECIDUOUS
SIZE OF LEAF	LENGTH OF LEAF (cm)
SIZE OF LEAFLET	LENGTH OF LEAFLET (cm)
COLOR OF UPPER SIDE	PALE GREEN, LIGHT GREEN, DARK GREEN , BLUE/GREEN, GREY, PURPLE; PALE; YELLOW; VARIEGATED
COLOR OF LOWER SIDE	GREEN, LIGHT GREEN, DARK GREEN, BLUE/GREEN, GREY PURPLE; PALE; YELLOW; VARIEGATED; RUST COLORED; SILVER
TEXTURE OF UPPER SIDE	SHINY, ROUGH, GLABROUS, TOMENTOSE, HAIRY, ROUGH, SCALY, VISCOSE
TEXTURE OF LOWER SIDE	SHINY, ROUGH, GLABROUS, TOMENTOSE, HAIRY, ROUGH, SCALY, VISCOSE
COMPOUNDS	NO COMPOUND LEAVES YES. COMPOUNDS: IMPARIPINNATE, PARIPINNATE, TRIFOLIATE, PALMATE, PALMIFORM, PALM, PINNATE, BIPINNATE
HARDNESS	CORIACEOUS, SOFT, SUCCULENT, HARD
ARRANGEMENT	OPPOSITE, ALTERNATE, WHORLED, VERTICAL
VENATION	PINNATE, PALMATE, PARALLEL, RETICULATE, ARCUATE, A3 MAIN VEINS
SHAPE	ROUNDED, LINEAR, LANCEOLATE, FALCATE, OVAL, OBLONG, ELLIPTIC, DELTOID, RHOMBOID, SPATULATE, ACICULAR GROUPS 2, ACICULAR GROUPS 3, ACICULAR GROUPS 5, ACICULAR GROUPS, ACICULAR IN 1 PLANE, ACICULAR IN SPIRAL, SCALY, PALM 7 LOBES, PALM 5 LOBES-PALM 3 LOBES, POLYMORPHIC; PANDURIFORM; PINNATIFID, SAGITATE, RENIFORM, CORDATE, ORBICULAR, OBOVATE, OBLANCEOLATE, LIRATE, HASTATE, RUNCINATE
LEAF MARGIN	WHOLE, CILIATE, DENTATE, CRENATE, SERRATED, DOUBLE SERRATED, LOBED, DOUBLE LOBED
APEX	ACUTE, CUSPIDATE, OBTUSE, RETUSE, MUCRONATE
LEAF BASE	ATTENUATE, CORDATE, ROUNDED, ASYMMETRIC, CUNEATE, OBLIQUE, SAGITATE, HASTATE
PETIOLE	LONG, SHORT, SESSILE, WIDE
FLOWER	
SIZE	HERMAPHRODITE (MALE/FEMALE FLOWERS): (CM OR MM)
TYPE	UNISEX, HERMAPHRODITE
REPRODUCTION	MONOECIOUS, DIOECIOUS, HERMAPHRODITE, POLYGAMY, SYNOICOUS, STERILE
FLOWERING	SINGLE, INFLORESCENCE IN CORYMB, CYMOSE, RACEME, SPIKE, UMBEL, CATKIN, SPADIX, FLORET OR CAPITULUM, PANICLE (+ INFLORESCENCE SIZE (IN CM OR MM)
FRAGRANCE	YES, NO, UNPLEASANT

FRUIT	
SIZE	IN CM OR MM
TYPE	FOLLICLE, PLURIFOLLICLE, LEGUME, LOMENT, SAMARA, DOUBLE SAMARA, PLURISAMARA , CAPSULE, POLYATHENE, TETRACHENE, NUT, ACHENE; SYCONIUM, HESPERIDIUM, PLURISAMARA, ACORN, COMPOUND FRUIT, PLURIFOLLICLE, BERRY, RACEME, POME, BALAUSTA, DRUPE, CONIFER CONE, PSEUDO CONIFER, CONE, PINE
EDIBLE FRUIT	YES, NO
COLOR OF FRUIT	RED, GREEN, YELLOW, BROWN, BLACK, PALE, WHITE, PURPLE
FRUITING SEASON	INTERVAL OF MONTHS: JAN, FEB, MAR, APR, MAY, JUN, JUL, AGO, SEP, OCT, NOV, DEC
PARAMETERS AND VALUES USED IN THE BOTANIC DATASHEETS	
DEVELOPMENT	
GROWTH	SLOW, VERY SLOW, MEDIUM, FAST, VERY FAST
LONGEVITY	<25 YEARS, 25 YEARS, 50 YEAR, 75 YEARS, 100 YEARS, 150 YEARS, 200 YEARS, 250 YEARS, 300 YEARS, >300 YEARS
ECOLOGY	
CLIMATE	
ALTITUDE	NATURAL HEIGHT OF THE PLANT: interval of sea level altimetry
IRRIGATION	++HIGH, MODERATE, LOW, ++LOW (very low/low < 350 mm; Very high/high > 750 mm)
MINIMUM TEMPERATURE AND INTERNATIONAL CLASSIFICATION	MINIMUM TEMPERATURES: DEGREES CELSIUS CLASSIFICATION ACCORDING TO EUROPEAN REGULATION: (SEE MAP) G2____ HOT GREENHOUSES IN SOUTHERN EUROPE G1____ COLD GREENHOUSES IN SOTHERN EUROPE H5____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM OºC TO -5ºC H4____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM -5ºC TO -10ºC H3____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM -10ºC TO -15ºC H2____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM -15ºC TO -20ºC H1____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM -20 CLASSIFICATION INTERNATIONAL REGULATIONS. ACCORDING TO MINIMUM TEMPERATURE RANGES Z1____SUPPORT MINIMUM TEMPERATURES OF -50ºC Z2____ SUPPORT MINIMUM TEMPERATURES OF -50ºC TO -40ºC Z3____ SUPPORT MINIMUM TEMPERATURES OF -40ºC TO -30ºC Z4____ SUPPORT MINIMUM TEMPERATURES OF -30ºC TO -20ºC Z5____ SUPPORT MINIMUM TEMPERATURES OF -20ºC TO -10ºC Z6____ SUPPORT MINIMUM TEMPERATURES OF -10ºC TO -0ºC Z7____ SUPPORT MINIMUM TEMPERATURES OF -0ºC TO 10ºC Z8____ SUPPORT MINIMUM TEMPERATURES OF 10ºC TO 20ºC Z9____ SUPPORT MINIMUM TEMPERATURES OF 20ºC TO 30ºC Z10___ SUPPORT MINIMUM TEMPERATURES OF 30ºC TO 40ºC Z11___ SUPPORT MINIMUM TEMPERATURES OF MORE THAN 40ºC
EXPOSURE TO SUNLIGHT	FULL SUN, FULL SHADE, SHADE, PARTIAL SHADE
DROUGHT RESISTANCE	YES, NO; MODERATE
FROST RESISTANCE	YES, NO; MODERATE
SOIL	
PH OPTIMUM	PH: ALL TYPES- NEUTRAL, ACID, BASIC (OR INTERVAL OF PH)
LEVEL OF FERTILITY	FERTILE, AVERAGE, POOR
TEXTURE OF SOIL	SAND, SLIT OR LOAMY, CLAY, SANDY LOAM, CLAY LOAM - ALL TYPES
DRAINAGE	HIGH, MODERATE, LOW
RESISTANCE TO SEA	YES, NO, MODERATE
RESISTANCE TO LIME	YES, NO, MODERATE

USES	
RESISTANCES	
COASTAL	1ST LINE, 2ND LINE, NO
POLLUTION	HIGH, MODERATE, LOW
WIND	HIGH, MODERATE, LOW
APPLICATIONS	
IN SLOPES **IN LINES** **ON RIVERBANKS** **AS WINDBREAKERS** **IN HEDGES** **IN FIELD BORDERS** **IN GROUPS** **ISOLATED**	YES, NO
PARAMETERS AND VALUES USED IN THE BOTANIC DATASHEET	
SPACING	MINIMUM RECOMMENDED DISTANCE BETWEEN PLANT: M, CM
PLANTING AND PLANT HEALTH	
PLANTING AND PLANT HEALTH	
CALENDARS	
CHROMATIC CALENDAR	FOLIAGE, FLOWERING, FRUITING SEASON: the color white represented with grey or black cell
CULTIVATION CALENDAR	SOWING, PLANTING, PRUNING
TREATMENTS CALENDAR	FUNGICIDES, PESTICIDES, FERTILIZERS, HERBICIDES
COMMERCIALIZATION	
PRESENTATION	BR (BARE ROOT); CT (CONTAINER or POT (LITERS); CE (ROOT BALL); CEY (ROOT BALL IN GYPSUM), ROOT BALL IN MESH
STEM GIRTH(TREE)	GIRTH (perimeter): CM or years, or SAMPLE, or shrubs (in tree species)
HEIGHT (SHRUBS, CONIFERS AND PALMS)	HEIGHT: CM, M

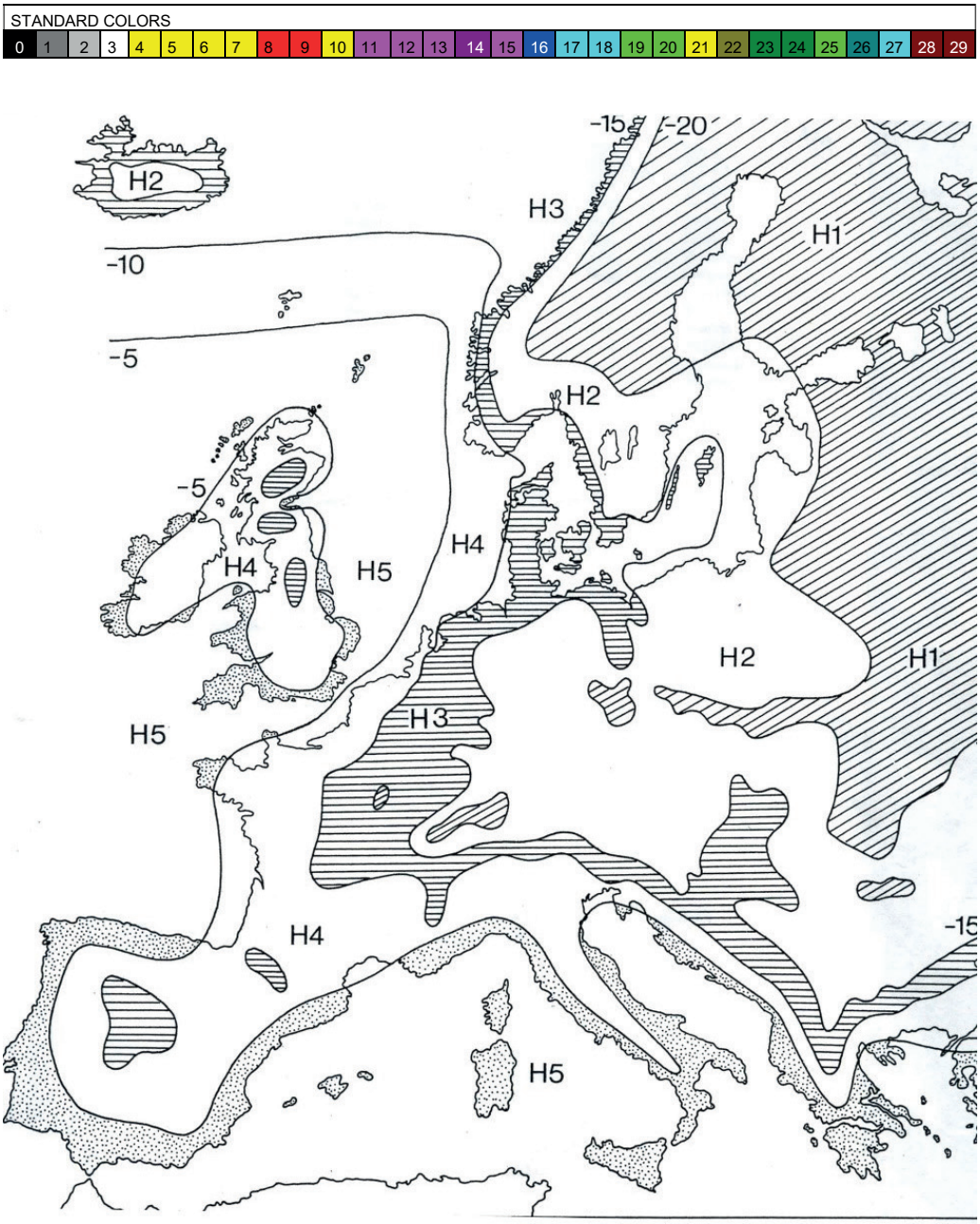


Figure 2.2.1: Thermal classification map according to European regulations

LIST OF DECIDUOUS TREE SPECIES DESCRIBED

1. *Acer campestre*
2. *Aesculus hippocastanum*
3. *Ailanthus altissima*
4. *Albizia julibrissin*
5. *Bauhinia variegata*
6. *Catalpa bignonioides*
7. *Celtis australis*
8. *Cercis siliquastrum*
9. *Chorisia speciosa*
10. *Crataegus monogyma*
11. *Eleagnus angustifolia*
12. *Erythrina crista-galli*
13. *Fraxinus ornus*
14. *Gingko biloba*
15. *Gleditsia triacanthos*
16. *Jacaranda mimosifolia*
17. *Koelreuteria paniculata*
18. *Lagerstroemia indica*
19. *Malus floribunda*
20. *Melia azedarach*
21. *Morus alba*
22. *Paulownia tomentosa*
23. *Plananus hispanica*
24. *Populus alba*
25. *Prunus cerasifera pisardii*
26. *Pterocarya fraxinifolia*
27. *Robinia pseudoacacia*
28. *Sophora japonica*
29. *Tamarix ramosissima*
30. *Tipuana tipu*
31. *Ulmus pumila*

ACER

BROADLEAF DECIDUOUS

Acer campestre L.

ARCE COMÚN (SPANISH) · AURÓ BLANC (VALENCIAN) · FIELD MAPLE (ENGLISH) · ERABLE CHAMPÉTRE (FRENCH)

STRUCTURE		
Shape: ROUND	Height: 15-20 M	Diameter: 6-7 M
Texture: MEDIUM	Shade: PARTIAL	Root: HORIZONTAL

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	SAPINDALES
FAMILY:	ACERACEAE

VARIETIES

ALBO-VARIEGATUM, COMPACTUM
PENDULUM, PULVERULENTUM

MORPHOLOGY		
Trunk	Bark: FISSURED	Color: DARK BROWN
Leaf DECIDUOUS; SIZE: LEAF: 3-8CM; COLOR: US: DARK GREEN, LS: DARK GREEN; TEXTURE: US: GLOSSY, LS: GLOSSY	COMPOUND: NO; HARDNESS: SOFT; ARRANGEMENT: OPPOSITE; VENATION: PALMATE; SHAPE: PALMATE 5 LOBED; MARGIN: ENTIRE; APEX: ROUND; LEAF BASE: CORDATE; PETIOLE: LONG	
Flower SIZE: 2 MM	Type: UNISEXUAL; Flowering: CORYMB 3-5CM	Reproduction: HERMAPHRODITE; Fragrant: NO
Fruit SIZE: 3-4CM	Type: SAMARA; Edible: NO	Color: GREEN/BROWN; Fruiting season: SEP-NOV
Growth	Rate: MEDIUM	Longevity: 100

ECOLOGY		
Climate	Temperature: -20,H1,Z4	Drought resistant: YES
ALTITUDE: 400-1600	Sun exposure: FULL	Frost resistant:
IRRIGATION: MODERATE		
Soil	Texture: LOAMY/SANDY	Salt resistant: NO
pH: 6-7´5	Drainage: MODERATE	Lime resistant: YES
FERTILITY: MODERATE		

USES				
Resistances		Applications		
COASTAL:	2ND LINE	SLOPES: YES	LINE:	YES
POLLUTION:	MODERATE	RIVERBANKS: NO	WINDBREAKER:	YES
WIND:	HIGH	GROUPS: YES	ISOLATED:	YES







POINTS OF INTEREST

Found in Europe and in the center and Sothern Spain. The branches and young shoots have been used as livestock feed. The sap is milky white and the tree sprouts when pruned. The cultivation of this little tree has a long ethnobotanical and gardening tradition. Its wood is highly valued in carpentry. Used for hedges and making bonsai.

SPACING: 4-6M

PLANTING AND PLANT HEALTH

Easy to transplant. It is quite resistant to pests and diseases nevertheless, it can sometimes be affected by aphids and mealybugs that generate molasses.
Abiotic diseases: Due to very compacted soil, its growth and development are diminished.
Biotic diseases: *Nectria cinnabarina* (coral spot) *Verticillium dahliae* (verticilium wilt). Affected branches should be pruned.
Pests: No known pests that seriously affect it, although aphids and mealybugs are common. Prevention and curative treatments can be carried out with fungicides and pesticides.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

Planting Pruning x

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
BR	6/8	200-250
BR	8/10	200-250
BR	10/12	250-300
BR	12/14	250-300
BR	14/16	300-350
BR	16/18	300-350
BR	18/20	300-350
BR	20/25	350-400
CT	8/10	250-300
CT	16/18	250-300
CT	20/25	300-350
CT	30/35	350-400

AESCULUS *Aesculus hippocastanum* L.

BROADLEAF DECIDUOUS

CASTAÑO DE INDIAS	CASTANYER D´INDIA	HORSE-CHESTNUT	MARRONNIER D´INDE
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE

Shape	Height	Diameter
OVAL	25-30 M	8-12 M
Texture	**Shade**	**Root**
COARSE	FULL	HORIZONTAL

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	SAPINDALES
FAMILY:	HIPPOCASTANACEAE

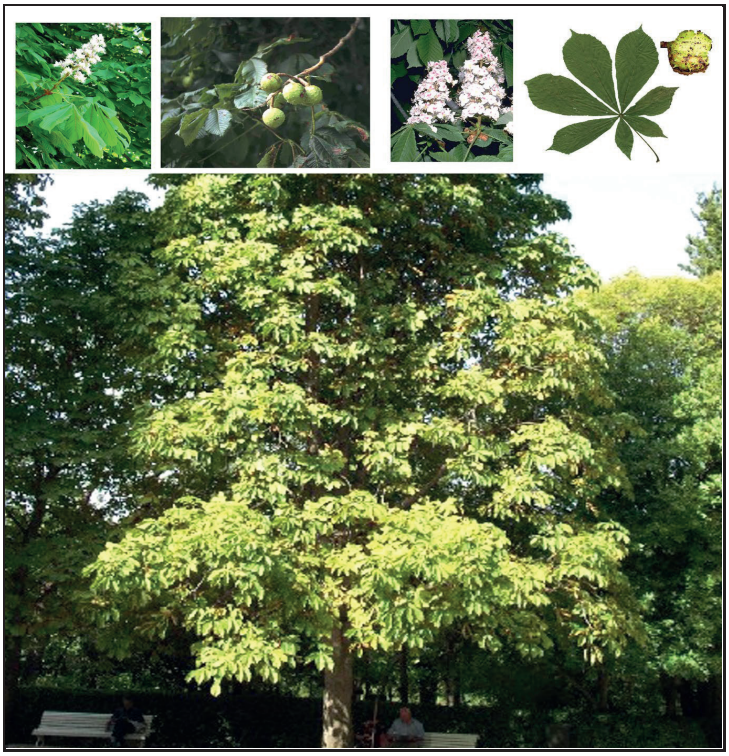
VARIETIES

BAUMANNII

PYRAMIDALIS

MORPHOLOGY

Trunk	Bark: FISSURED	Color: DARK BROWN
Leaf	COMPOUND: YES. PALMATE	
DECIDUOUS	HARDNESS: CORIACEOUS	
SIZE: LEAF:20-30CM	ARRANGEMENT: ALTERNATE	
LEAFLET:20-30 CM	VENATION: PALMATE	
COLOR: US:DARK GREEN	SHAPE: PALMATE 5 LOBES	
LS:YELLOW/GREEN	MARGIN: DENTATE	
TEXTURE: US: GLOSSY	APEX: SHARP	
LS : ROUGH	LEAF BASE: ROUND	
	PETIOLE: LARGE	
Flower	Type: UNISEXUAL	Reproduction: HERMAPHRODITE
SIZE: 2CM	Flowering: PANICLE (15-25CM)	Fragrance: NO
Fruit	Type: CAPSULE/POD	Color: DARK BROWN
SIZE: 4-5CM	Edible: NO	Fruiting season: AUG-OCT
Growth	Rate: MEDIUM	Longevity: 150 YEARS



ECOLOGY

Climate	Temperature: -29ºC,H1,Z4	Drought resistant: NO
ALTITUDE: 100-1200M	Sun exposure: SHADE/PARTIAL	Frost resistant: Z.5
IRRIGATION: MODERATE		
Soil	Texture: LOAMY/CLAYEY	Salt resistant: MODERATE
pH: NEUTRAL	Drainage: MODERATE	Lime resistant: MODERATE
FERTILITY: MODERATE		

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	NO	LINE:	YES
POLLUTION:	MODERATE	RIVERBANKS:	NO	WINDBREAKER:	YES
WIND:	MODERATE	GROUP:	YES	ISOLATED:	YES

POINTS OF INTEREST

Native to the Balkans and the Caucasus. Leaf waste block drains and the large leaves that fall on the ground together with water can cause problems. It is a difficult tree to grow in peripheral areas without other pioneer trees that can give them shade. They require high humidity and a high irrigation programme. Seeds of this tree were bought by Clusio in Constantinople in 1576. It was planted in Vienna and from there was distributed to the rest of Europe. Its seed is anti-inflammatory and causes the narrowing of blood vessels. It is used against varicose veins, phlebitis and hemorrhoids, with a bitter taste and a toxic character, it was used to fight a disease in horses. The bark is used as an antipyrectic. In Spain it has been cultivated since the beginning of the 18th century.

SPACING: 6-8M

PLANT AND PLANT HEALTH

Without proper humidity and irrigation their leaves might fall in the middle of summer. (This abiotic disease is called socarrina). In children's areas or urban parks, it is advisable to use double-flowered varieties that do not produce fruits. A new pest has appeared for this species, the horse chestnut leaf miner moth (*Cameraria ohridella*), which causes serious damage to the trees. Among possible fungi that can attack this tree are,*Guignardia aesculi,* with symptoms similar to socarrina but with black dots on the leaves, cankers of the bark *(Nectria cinnabarina*) and xylophagous fungi that affect pruning cuts.

CHROMATIC CALENDAR

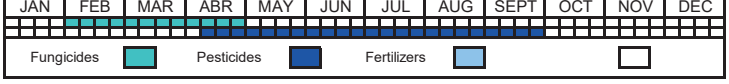
FOLIAGE, FLOWERING AND FRUITING SEASON



CULTIVATION CALENDAR



TREATMENT CALENDAR



COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
BR	8-10	250-300
BR	10-12	250-300
CT	12-14	250-300
CT	14-16	300-350
CT	16-18	300-350
CT	18-20	350-400
CT	25-30	350-400
RB	10-12	300-350
RB	16-18	300-350
RB	25-30	350-400
RB	35-40	400-450
RB	45-50	450-500

AILANTHUS

Ailanthus altissima (Mill.) Swingle

BROADLEAF DECIDUOUS

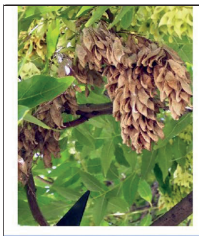
ARBOL DEL CIELO, ALIANTO (SPANISH) · AILANT (VALENCIAN) · TREE OF HEAVEN (ENGLISH) · FAUX VERNIS DU JAPON (FRENCH)

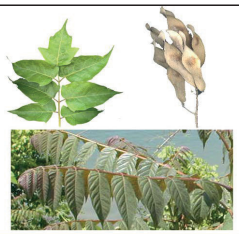
STRUCTURE		
Shape: IRREGULAR	Height: 20-25 M	Diameter: 10-12 M
Texture: COARSE	Shade: PARTIAL	Root: HORIZONTAL

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	SAPINDALES
FAMILY:	SIMAROUBACEAE

VARIETIES

MORPHOLOGY		
Trunk	Bark: SMOOTH/ROUGH	Color: GRAY-BROWN
Leaf	COMPOUND: YES. IMPARIPINNATE	
DECIDUOUS	HARDNESS: SOFT	
SIZE: LEAF: 40-60CM	ARRANGEMENT: ALTERNATE	
LEAFLET: 8-12CM	VENATION: PINNATE	
COLOR: US: LIGHT GREEN	SHAPE: LANCEOLATE	
LS: LIGHT GREEN	MARGIN: WHOLE	
TEXTURE: US: SMOOTH	APEX: SHARP	
LS: SMOOTH	LEAF BASE: ROUND	
	PETIOLE: LONG	
Flower	Type: UNISEXUAL	Reproduction: DIOECIOUS-HERMA.
SIZE AND TYPE: ♂/M 7-8MM PANICLE (20CM)		Fragrant: NO
♀/F 7-8MM PANICLE (20CM)		
Fruit	Type: SAMARA	Color: BROWN
SIZE: 4 X 1 CM	Edible: NO	Fruiting season: SEP-OCT
Growth	Rate: FAST	Longevity: 50 YEARS






ECOLOGY		
Climate	Temperature: -15ºC,H2,Z5	Drought resistan: YES
ALTITUDE: 200-800	Sun exposure: FULL	Frost resistant: Z.7.5
IRRIGATION: LOW		
Soil	Texture: LOAMY	Salt resistant: YES
pH: ALL TYPES	Drainage: MODERATE	Lime resistant: YES
FERTILITY: POOR		

USES				
Resistances		Applications		
COASTAL:	1ST LINE	SLOPES: YES	LINE:	YES
POLLUTION:	HIGH	RIVERBANKS: YES	WINDBREAKER:	YES
WIND:	HIGH	GROUPS: YES	ISOLATED:	YES

POINTS OF INTEREST

Native to Northern China. It is common in the Iberian Peninsula area since the 19th century when it was already naturalized in Spain, appearing to be indigenous and forming thickets. It is a beautiful tree with notable landscape interest. Although it is incomprehensibly berated, together with the beauty of its leaves that provide an undoubted tropical aspect, we must add all the advantages it offers in the consolidation of slopes, erosion control, etc. and other functions in which no other tree would be able to thrive. This species is indeed very popular among landscapers. Due to its hardiness and easy regrowth, it is the ideal species for problematic areas. The leaves and male flowers give off an unpleasant odour.

SPACING: 4-6M

PLANTING AND PLANT HEALTH

With the formative pruning of some young specimens in clumps at ground level, they achieve a special landscape effect, where the leaves of the *Ailanthus* offer their tropical appearance at eye-level of the passer-by. Its resistance to pollution, extremely poor soil, heat, and drought makes it adaptable to the city and the countryside. As a positive and negative quality, this tree is an invasive species. The large number of seeds it produces and their subsequent germination cause problem in certain areas. Abiotic diseases: lack of sun and low soil moisture cause the plant to weaken and produce fewer flowers.

Biotic diseases: cankers of the bark (*Nectria cinnabarina*),and Verticillium wilt (*Verticillium dahliae*) make it necessary to prune the affected branches. Among the pests, mealybugs and aphids are

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Planting Pruning X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
BR	8-10	250-300
BR	10-12	250-300
BR	12-14	300-350
BR	14-16	300-350
BR	16-18	300-350
BR	18-20	350-400
BR	20-25	350-400
BR	25-30	400-450
CT	16-18	300-350
CT	18-20	350-400
CT	20-25	400-450
CT	25-30	450-500

ALBIZIA

Albizia julibrissin Durazz.

BROADLEAF DECIDUOUS

ACACIA DE CONSTANTINOPLA (SPANISH) · ACÀCIA TAPERERA (VALENCIAN) · SILK TREE (ENGLISH) · ARBRE DE SOIE (FRENCH)

STRUCTURE		
Shape: FAN SHAPED	Height: 5-10 M	Diameter: 8-10 M
Texture: MEDIUM	Shade: PARTIAL	Root: OBLIQUE

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	FABALES
FAMILY:	MIMOSACEAE

VARIETIES

OMBRELLACT

MORPHOLOGY		
Trunk	Bark: SMOOTH	Color: GRAYISH BROWN
Leaf: DECIDUOUS	COMPOUND: BIPINNATE	
SIZE: LEAF: 10-15CM; LEAFLET:0.7-1CM	HARDNESS: SOFT	
COLOR: US: LIGHT GREEN; LS: LIGHT GREEN	ARRANGEMENT: ALTERNATE	
TEXTURE: US: SMOOTH; LS : SMOOTH	VENATION: PINNATE	
	SHAPE: OBLONG	
	MARGIN: ENTIRE	
	APEX: CUSPIDATE	
	LEAF BASE: ACUTE	
	PETIOLE: LONG	
Flower: SIZE AND TYPE: 5CM	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
	Flowering: UMBEL (15CM)	Fragrant: YES
Fruit: SIZE: 15 CM	Type: LEGUME	Colour: BROWN
	Edible: NO	Flowering season: SEPT-DEC
Growth	Rate: FAST	Longevity: 50 YEARS



ECOLOGY		
Climate: ALTITUDE: 100-1000M; IRRIGATION: LOW	Temperature: -10ºC,H3,Z5	Drought resistant: YES
	Sun exposure: FULL	Frost resistant: YES
Soil: pH: ALL TYPES; FERTILITY: POOR	Texture: LOAMY/SANDY	Salt resistant: NO
	Drainage: MODERATE	Lime resistant: YES

USES				
Resistances		Applications		
COASTAL:	2ND LINE	SLOPES: NO	LINE:	YES
POLLUTION:	MODERATE	RIVERBANKS: NO	WINDBREAKER:	NO
WIND:	MODERATE	GROUPS: YES	ISOLATED:	YES

POINTS OF INTEREST

Native to Asia, from Iran to China and Japan. Strong frosts can cause injuries. It is fast-growing but short-lived. Due to the size when fully grown,it is not suitable for alignments next to facades but can be used for boulevards. The abudance of pink flowers makes it of great ornamental interest. The fallen flowers and fruit create litter and therefore pose a risk to pedestrians. The bark is used to make a paste for the skin.

SPACING: 4 M

PLANTING AND PLANT HEALTH

It is rarely affected by pests or diseases and along with its rapid growth, it prospered throughout the Mediterranean area. Its cultivation is simple and has unlimited possibilites. Planting does not give problems and stakes must be used. Pruning can be done until it has flowers however take into consideration that this will cause a decrease in its flowering capacity. It does not require pruning, unless it has been planted incorrectly, in which case, if it is due to proximity to buildings, it will be annual.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
		X	X	X	X					X	X

Planting Pruning X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
CT	6-8	200-250
CT	8-10	200-250
CT	10-12	200-250
CT	12-14	250-300
CT	14-16	250-300
CT	16-18	250-300
CT	18-20	300-350
CT	20-25	300-3350
CT	25-30	350-400
CT	30-35	350-400
RB	25-30	350-400
RB	30-35	350-400

BAUHINIA

Bauhinia variegata L.

BROADLEAF DECIDUOUS

PATA DE VACA ,ARBOL DE LAS ORQUIDEAS	BAUHÍNIA	ORCHID TREE	ARBRE DE LES ORQUÍDIES
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Shape	Height	Diameter
ROUND	7-10 M	6-8 M
Texture	Shade	Root
COARSE	PARTIAL	OBLIQUE

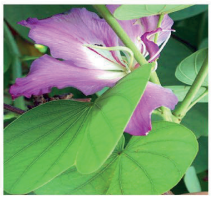
DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	FABALES
FAMILY:	LEGUMINOSAE

VARIETIES

CANDIDA

MORPHOLOGY

Trunk	Bark: SMOOTH	Color: BROWN
Leaf	COMPOUND: NO	
	HARDNESS: CORIACEOUS	
DECIDUOUS	ARRANGEMENT: ALTERNATE	
SIZE: Leaf: 6-20CM	VENATION: PALMATE	
	SHAPE: OBCORDATE	
COLOR US: LIGHT GREEN	MARGIN: ENTIRE	
LS: DARK GREEN	APEX: BILOBED	
TEXTURE: US: GLOSSY	LEAF BASE: ROUND	
LS: TOMENTOSE	PETIOLE: LONG	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE: 4-6CM	Flowering: RACEME(40CM)	Fragrant: YES
Fruit	Type: LEGUME	Color: BROWN
SIZE: 20-30 CM	Edible: YES	Fruiting season: SEP-OCT
Growth	Rate: MEDIUM	Longevity: 50 YEARS







ECOLOGY

Climate	Temperature: -7ºC,H4,Z6	Drought resistant: MODERATE
ALTITUDE: O-200M	Sun exposure: FULL	Frost resistant: NO
IRRIGATION: 500		
Soil	Texture: SANDY	Salt resistant: NO
pH: NEUTRAL	Drainage: YES	Lime resistant: YES
FERTILITY: MODERATE		

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	NO	LINE	YES
POLLUTION:	LOW	RIVERBANKS:	NO	WINDBREAKER	NO
WIND:	LOW	GROUPS:	YES	ISOLATED	YES

POINTS OF INTEREST

Native to Asia (India and China) and widely cultivated in the Mediterranean basin and on the Canary Islands. The bright pink flowering of the tree makes it a spectacular specimen. It is aptly named 'Variegata' species (of many colours) due to the colors of the petals. The flowers and fruits are edible. The bark is medicinal and used for dyeing. The wood is of high quality.

SPACING: 4-6M

PLANTING AND PLANT HEALTH

This species is not affected by serious pests and diseases. It has low resistance to cold, frost and salt. Planting and transplanting are difficult therefore it is recommended to plant at the right times and monitor the first irrigation. Dry ends are usually a sign of burning as a result of the salty wind coming from the sea.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Planting Pruning X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
CT-30	10-12	200-250
CT-45	12-14	250-300

CATALPA

Catalpa bignonioides Walter

BROADLEAF DECIDUOUS

CATALPA, ÁRBOL DE LAS TROMPETAS (SPANISH) | CATALPA (VALENCIAN) | INDIAN BEAN TREE (ENGLISH) | CATALPA COMMUN (FRENCH)

STRUCTURE		
Shape: ROUND	Height: 12-15 M	Diameter: 8-10 M
Texture: COARSE	Shade: FULL	Root: OBLIQUE

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	SCROPHULARIALES
FAMILY:	BIGNONIACEAE

VARIETIES

MORPHOLOGY		
Trunk	Bark: ROUGH	Color: DARK BROWN
Leaf	COMPOUND: NO	
DECIDUOUS	HARDNESS: SOFT	
SIZE: LEAF: 10-20CM	ARRANGEMENT: OPPOSITE	
	VENATION: PINNATE	
	SHAPE: OVAL	
COLOR US: LIGHT GREEN	MARGIN: ENTIRE	
LS: LIGHT GREEN	APEX: CUSPIDATE	
TEXTURE: US: GLOSSY	LEAF BASE: CORDATE	
LS: TOMENTOSE	PETIOLE: LONG	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE: 3-5CM	Flowering: PANICLE 15-20 CM	Fragrant: NO
Fruit	Fruit: CAPSULE/POD	Color: LIGHT BROWN
SIZE: 25-40CM	Edible: NO	Fruiting season: SEP-OCT
Growth	Rate: FAST	Longevity: 75 YEARS

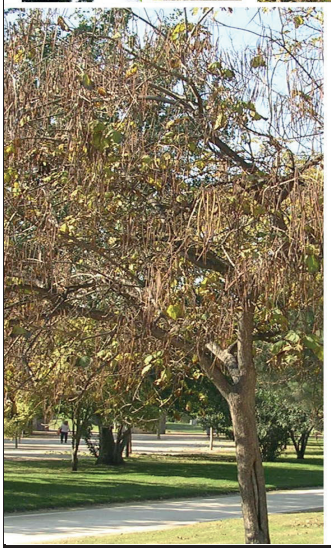
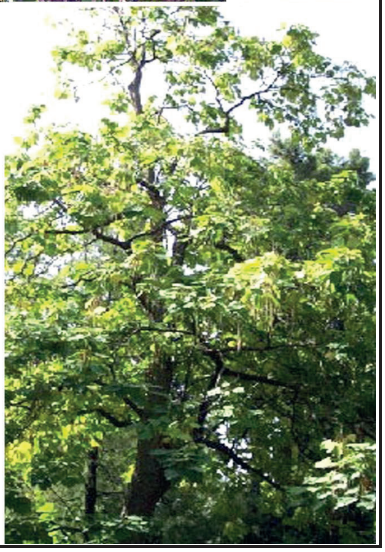
ECOLOGY		
Climate	Temperature: -20ºC,H1,Z5	Drought resistant: MODERATE
ALTITUDE: 200-1000M	Sun exposure: SUN/PARTIAL SHADE	Frost resistant: YES
IRRIGATION: 700		
Soil	Texture: LOAMY	Salt resistant: NO
pH: 5-8.5	Drainage: MODERATE	Lime resistant: NO
FERTILITY: MODERATE		

USES				
Resistance		Applications		
COASTAL:	MODERATE	SLOPES: NO	LINE:	YES
POLLUTION:	MODERATE	RIVERBANKS: YES	WINDBREAKER:	NO
WIND:	MODERATE	GROUPS: YES	ISOLATED:	YES







POINTS OF INTEREST

Native to Eastern U.S.A. It grows on the banks of rivers. In autumn, winter and the flowering season, it has decorative white flowers with long hanging fruits. Its short life must be taken into consideration when used as a street tree. The bark, pods and seeds have medicinal properties. The wood is soft.

SPACING: 4-6M

PLANTING AND PLANT HEALTH

Transplanting of this tree must be carried out in winter and it roots relatively easy. Since this species of tree has soft wood, pruning can lead to the formation of cavities and therefore must be avoided It is important to keep in mind the conditions of its natural habitat; those that are disimilar are not recommended. It is sensitive to abiotic diseases such as lack of moisture or soil problems. It is affected by common pests and diseases (*oidium* and *cochineal*) of ornamental plants and therefore should not be placed in car parks where molasses can dirty cars.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
X	X	X	X	X	X					X	X	X	X	X	X

Planting Pruning X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height(cm)
BR	10-12	200-250
BR	12-14	200-250
BR	14-16	250-300
BR	16-18	250-300
BR	18-20	250-300
BR	20-25	300-350
BR	25-30	300-350
CT-15	8-10	200-250
CT-15	10-12	250-300
CT-25	12-14	300-350

CELTIS

Celtis australis L.

BROADLEAF DECIDUOUS

ALMEZ	LLIDONER,ALIGONERO	EUROPEAN HACKBERRY	MICOCOULIER
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE

Shape	Height	Diameter
OVOID	15-25M	12-14M
Texture	**Shade**	**Root**
MEDIUM	FULL	HORIZONTAL

DIVISION: SPERMAPHRODITES
SUBDIVISION: ANGIOSPERMS
TYPE: DICOTYLEDONS
ORDER: ROSALES
FAMILY: ULMACEAE

VARIETIES

MORPHOLOGY

Trunk	Bark: SMOOTH	Color: LIGHT GRAY
Leaf	COMPOUND: NO	
DECIDUOUS	HARDNESS: CORIACEOUS	
SIZE: Leaf: 6-12CM	ARRANGEMENT: ALTERNATE	
	VENATION: PINNATE	
	SHAPE: ELLIPTIC	
COLOR: US: DARK GREEN	MARGIN: DENTATE	
LS: LIGHT GREEN	APEX: SHARP	
TEXTURE: US: GLOSSY	LEAF BASE: ROUND	
LS: TOMENTOSE	PETIOLE: LONG	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE: 0,8-1CM	Flowering: SINGLE	Fragrant: NO
Fruit	Type: DRUPE	Color: BROWN
SIZE: 0.6-0.8CM	Edible: YES	Fruiting season: SEP-OCT
Growth	Rate: MEDIUM	Longevity: >200 YEARS







ECOLOGY

Climate	Temperature: -23ºC,H1,Z4	Drought resistant: MODERATE
ALTITUDE: 0-1200	Sun exposure: SUN	Frost resistant: YES
IRRIGATION: 350MM		
Soil	Texture: LOAMY/SANDY	Salt resistant: MODERATE
pH: 5-8.5	Drainage: MODERATE	Lime resistant: YES
FERTILITY: MODERATE		

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	YES	LINE:	YES
POLLUTION:	HIGH	RIVERBANKS:	YES	WINDBREAKER:	YES
WIND:	HIGH	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Due to its majestic size and the grayish color of the trunk, it is a very architectural tree. Priovides good shade. Suitable for large rows, but the planting frame must be monitored since it develops a large crown as it matures. It is a low maintenance tree and protects against erosion and is widely used in Mediterranean gardens. It has high resistance to wind. It can be used for hedge rows. With a correct root system, the adult tree is highly resistant to drought. The fruit (a small, dark-purple berry-like drupe) is edible and very useful to enhance the birdlife being the blackbirds that eat them the most. The berries taste like honey and were used to make sweet wine. Found on the borders of the Mediterranean Region. In the Peninsula it is frequent in the mild climate zone of the east and south, being scarce in Castilla, Aragón and Extremadura.

SPACING: 8-10M

PLANTING AND PLANT HEALTH

Its wood is elastic, flexible, with a large amount of yellowish-white sapwood and greyish-brown heartwood with not very marked growth rings, it was used for tool handles. Due to its tenacity and elasticity, it is highly appreciated among carpenters. Pruning cuts generate cavities over time.Regarding abiotic diseases: they are resistance to cold, although suffer from late frosts. Biotic diseases: *Ganoderma lucidum* (a red-coloured fungi), affects live trees, causes the decay of the roots and the base of the trunk, increasing the risk of falling branches and breaking the trunk at the height of the collar. Mycoplasma, affects a certain number of hackberries causing a discoloration on the leaves, similar to chlorosis nevertheless it is not a fatal disease. It is not seriously affected by pests.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Planting Pruning X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
CT	6-8	200-250
CT	8-10	200-250
CT	12-14	200-250
CT	14-16	250-300
CT	16-18	250-300
CT	18-20	300-350
CT	20-25	350-400
CT	25-30	400-450
CT	30-35	450-500
CT-50	12-14	250-300
CT-70	14-16	300-350
CT-80	16-18	350-400

CERCIS *Cercis silicuastrum* L.

BROADLEAF DECIDUOUS

ÁRBOL DEL AMOR (SPANISH) · ARBRE DE L´AMOR (VALENCIAN) · REDBUD, JUDAS TREE (ENGLISH) · GAINIER SILIQUASTRE (FRENCH)

STRUCTURE		
Shape: OVOID	Height: 5-10 M	Diameter: 8-10 M
Texture: MEDIUM	Shade: PARTIAL	Root: HORIZONTAL

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	FABALES
FAMILY:	LEGUMINOSAE

VARIETIES

ALBA

MORPHOLOGY		
Trunk	Bark: ROUGH/FISSURED	Color: DARK BROWN
Leaf DECIDUOUS; Size: LEAF: 8-12CM; COLOR: US: DARK GREEN, LS: DARK GREEN; TEXTURE: US: GLOSSY, LS: GLOSSY	COMPOUND: NO HARDNESS: SOFT INSERTION: ALTERNATE VENATION: PALMATE SHAPE: ROUND MARGIN: ENTIRE APEX: ROUND LEAF BASE: ROUND PETIOLE: LONG	
Flower SIZE: 1.5-2CM	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
	Flowering: RACEME12-15CM	Fragrant: NO
Fruit SIZE: 6-10CM	Type: LEGUME	Color: BROWN
	Edible: NO	Fruiting season: SEP-OCT
Growth	Rate: MEDIUM	Longevity: 100-120 YEARS



ECOLOGY		
Climate ALTITUDE: 200-1200M; IRRIGATION: 600MM	Temperature: -23ºC,H1,Z4	Drought resistant: HIGH
	Sun exposure: SUN	Frost resistant: YES
Soil pH: 6.5-9; FERTILITY: MODERATE	Texture: LOAMY/SANDY	Salt resistant: NO
	Drainage: MODERATE	Lime resistant: YES

USES				
Resistances		Applications		
COASTAL: MODERATE		SLOPES: YES	LINE: YES	
POLLUTION: HIGH		RIVERBANKS: YES	WINDBREAKER: NO	
WIND: MODERATE		GROUPS: YES	ISOLATED: YES	

POINTS OF INTEREST

Native to Eastern Mediterranean region (Southern Europe and Western Asia), on the banks of streams and forming low copses. Suitable for gardens (*C. Canadensis* is the most used). Its flowering provides a pleasant chromatic impact. The fruits are decorative and last all winter. Suitable for alignments of small streets as long as there are no sidewalks or cars since successive pests cause the emission of molasses. This species has been used in Mediterranean gardens since ancient times. The flowers; with a sweet and acid flavour, are used in salads or pickled in vinegar like capers. Its wood is of poor quality. It has low resistance to sea salt.

SPACING: 4-6M

PLANTING AND PLANT HEALTH

It has an extended root system. The fruits have been used as astringents. Transplanting is complicated and must be done in its vegetative period. Abiotic diseases: lack of sun and low humidity in the soil cause the tree to weaken and therefore produce fewer flowers.
Biotic diseases: cankers of the bark (*Nectria cinnabarina)* and Verticillium wilt (*Verticillium dahliae*) It is necessary to prune affected branches. Among pests, mealybugs and aphids can cause the production of molasses in the plant and can pose safety risks to pedestrians.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
x	x	x	x	x	x	x	x			x	x	x	x	x	x

Planting Pruning x

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Girth(cm)	Height (cm)
CT	6-8	150-200
CT	8-10	200-250
CT	10-12	200-250
CT	12-14	200-250
CT	14-16	250-300
CT	16-18	250-300
CT	18-20	250-300
CT	20-25	300-350
CT-15	6-8	200-250
CT-50	12-14	250-300
CT-70	18-20	300-350
CT-230	25-30	350-400

CHORISIA

BROADLEAF DECIDUOUS

Chorisia speciosa A. St.-Hil.

PALO BORRACHO (SPANISH) | CORISIA (VALENCIAN) | FLOSS-SILK TREE (ENGLISH) | L' ARBRE DE SOIE DENTAIRE (FRENCH)

STRUCTURE		
Shape: OVOID	Height: 8-10 M	Diameter: 6-8 M
Texture: COARSE	Shade: PARTIAL	Root: TAPROOT

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	MALVALES
FAMILY:	BOMBACACEAE

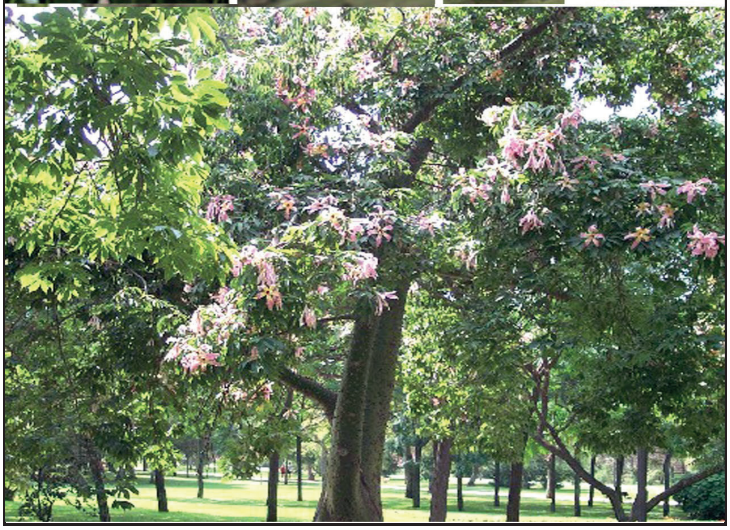
VARIETIES

MORPHOLOGY

Trunk	Bark: ROUGH WITH SPINES	Color: GREEN
Leaf: DECIDUOUS; SIZE: LEAF: 15CM, LEAFLET: 5CM; COLOR: US: LIGHT GREEN, LS: LIGHT GREEN; TEXTURE: US:SMOOTH, LS: SMOOTH	COMPOUND: YES. PALMATE HARDNESS: SOFT ARRANGEMENT: ALTERNATE VENATION: PINNATE SHAPE: PALMATE MARGIN: ENTIRE APEX: SHARP LEAF BASE: ACUTE PETIOLE: SHORT	
Flower: SIZE: 15CM	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
	Flowering: SINGLE	Fragrant: YES
Fruit: SIZE: 20CM	Type: CAPSULE	Color: BROWN
	Edible: NO	Fruiting season: SUMMER
Growth	Rate: FAST	Longevity: 140-160 YEARS







ECOLOGY

Climate: ALTITUDE: 0-200; IRRIGATION: 800	Temperature: -1ºC,H5,Z6	Drought resistant: NO
	Sun exposure: SUN/PARTIAL SHADE	Frost resistant: NO
Soil: Ph: 6-8.5; FERTILITY: LOW	Texture: SANDY	Salt resistant: NO
	Drainage: YES	Lime resistant: YES

USES

Resistances		Applications			
COASTAL:	1ST LINE	SLOPES:	MOD	LINE:	YES
POLLUTION:	NO	RIVERBANKS:	MOD	WINDBREAKER:	NO
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Native to tropical and subtropical deciduous forests of Argentina, Bolivia and Brazil. Spectacular pink bloom. The trunk is decorative for its green color and is covered with spines to prevent animals from climbing it. Care must be taken with these spines. The base of the trunk is thick, proof of periods of drought. It is used as a notable specimen for its exotic and unique features.

SPACING: 6-8M

PLANTING AND PLANT HEALTH

Transplants should be done in spring and fall and are relatively easy. This tree has soft wood that is used to make canoes and paper pulp. It is resistant to known pests and diseases. Pruning weakens the specimens and eventually causes cavities.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Planting | Pruning (X)

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
CT-15	6-8	150-200
CT-30	8-10	200-250
CT-30	10-12	250-300

CRATAEGUS

Crataegus monogyna Jacq.

BROADLEAF DECIDUOUS

ESPINO ALBAR, MAJUELO	ARC BLANC, ESPINALB	COMMON HAWTHORN	AUBÉPRINE À 1 STYLE
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Shape: SPHERICAL	Height: 5- 8M	Diameter: 3-4 M
Texture: MEDIUM	Shape: MEDIUM	Root: TAPROOT

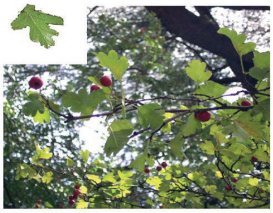
DIVISION:	PERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	FABALES
FAMILY:	ROSACEAE

VARIETIES

MORPHOLOGY		
Trunk	Bark: FISSURED	Color: DARK GRAY
Leaf DECIDUOUS; SIZE: LEAF: 2-4CM; COLOR: US:LIGHT GREEN LS:LIGHT GREEN; TEXTURE: US:CORIACEOUS LS:CORIACEOUS	COMPOUND: NO HARDNESS: FINE ARRANGEMENT: ALTERNATE VENATION: PINNATE SHAPE: OBOVATE MARGIN: ENTIRE APEX: TRUNCATE LEAF BASE: ATTENUATE PETIOLE: MEDIUM	
Flower SIZE: 1CM	Type: HERMAPHRODITE Flowering: CORYMB (3CM)	Reproduction: HERMAPHRODITE Fragrance: YES
Fruit SIZE: 1CM	Type: DRUPE Edible: YES	Color: DARK RED Fruiting season: SEP-OCT
Growth	Rate: MODERATE	Longevity: 200-250 YEARS

ECOLOGY		
Climate ALTITUDE: 0-1200 M; IRRIGATION: 750	Temperature: -23ºC,H1,Z4 Sun exposure: SUN/PARTIAL SHADE	Drought resistant: MODERATE Frost resistant: YES
Soil pH: 5-8.5; FERTILITY: LOW	Texture: LOAMY Drainage: MODERATE	Salt resistant: YES Lime resistant: YES

USES				
Resistances		Applications		
COASTAL:	2ND LINE	SLOPES: YES	LINE:	MOD
POLLUTION:	HIGH	RIVERBANKS: YES	WINDBREAKER:	MOD
WIND:	HIGH	GROUPS: YES	ISOLATED:	YES









POINTS OF INTEREST

Native to Europe, North Africa and Asia. Requires a slightly humid climate. Since ancient times, it has been used as an ornamental tree. Its white spring flowering is spectacular. Fruiting is also very decorative. Used for enclosures, topiary, in Mediterranean, alpine and medieval gardens.

SPACING: 4M

PLANTING AND PLANT HEALTH

It is sensitive to fungi (fire blight and rust), bacteria and pests (aphids and red spider mites). Given its low growth pruning is not necessary. Transplants are difficult and must be done when plant is dormant. Care must be taken, due to the presence of thorns along the trunk and twigs.

CHROMATIC CALENDAR

Datasheet (Foliage, Flowering and Fruiting Season)

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AIG	SEPT	OCT	NOV	DEC

Planting Pruning X

Treatment

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
CT	6-8	175-200
CT	8-10	175-200
CT	10-12	200-250
CT	12-14	200-250
CT	14-16	250-300
BR	6-8	175-200
BR	16-18	200-250
BR	18-20	250-300
RB	6-8	175-200
RB	8-10	175-200
RB	10-12	200-250
RB	14-16	250-300

ELAEAGNUS

Elaeagnus angustifolia L.

BROADLEAF DECIDUOUS

ARBOL DEL PARAISO	ARBRE DEL PARADÍS	RUSSIAN OLIVE	OLIVIER DE BOHÊME
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Shape: IRREGULAR	Height: 7-10 M	Diameter: 6-8 M
Texture: MEDIUM	Shade: PARTIAL	Root: HORIZONTAL

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER	ROSALES
FAMILY:	ROSACEAE

VARIETIES

CASPICA

MORPHOLOGY		
Trunk	Bark: ROUGH/FISSSURED	Color: DARK BROWN
Leaf: DECIDUOUS; SIZE: LEAF: 3-8CM; COLOR: US: LIGHT GREEN, LS: LIGHT GREEN; TEXTURE. US: GLOSSY, LS: SCALY	COMPOUND: NO; HARDNESS: SOFT; ARRANGEMENT: ALTERNATE; VENTATION: PINNATE; SHAPE: LANCEOLATE; MARGIN: ENTIRE; APEX: SHARP; LEAF BASE: ACUTE; PETIOLE. SHORT	
Flower: SIZE: 0.8-1CM	Type: HERMAPHRODITE; Flowering: ISOLATED	Reproduction: HERMAPHRODITE; Fragrant: YES
Fruit: SIZE: 1-2CM	Type: ACHENE; Edible: NO	Color: RED; Fruiting season: AUG-OCT
Growth	Rate: FAST	Longevity: 80-100 YEARS








ECOLOGY		
Climate: ALTITUDE: 200-2000M; IRRIGATION: 250	Temperature: -43ºC,H1,Z2; Sun exposure: SUN	Drought resistant: HIGH; Frost resistant: HIGH
Soil: pH: 5-8.5; FERTILITY: POOR	Texture: LOAMY; Drainage: MODERATE	Salt resistant: YES; Lime resistant: YES

USES				
Resistances		Applications		
COASTAL:	1ST LINE	SLOPES: YES	LINE:	NO
POLLUTION:	HIGH	RIVERBANKS: NO	WINDBREAKER:	NO
WIND:	YES	GROUPS: YES	ISOLATED:	YES

POINTS OF INTEREST

Found in low, rocky and poor mountain area of temperate Asian countries (including the Gobi desert). It has become naturalized in Spain. It can sometimes present itself as multi-trunk (many shoots emerge). Suitable for landscaped gardens with large spaces. The presence of spines and the somewhat irregular growth of its branches means that it should not be used in passageways or children's areas. It provides a pleasant chromatic impact with its silver leaves, fine texture and the color of its trunk. It is very resistant and requires little care. It tends to branch out from below, its slightly pendulous, very open branches and somewhat anarchic growth make it unsuitable for alignments and walkways. It can be planted by the sea as is resistant to wind. It is used for arid areas, to fix dunes and slopes, etc. In the United States, it is used to separate different parking areas and for highway medians strips. In winter it also presents landscape interest (trunk, lasting fruits etc.) *E pungens* and its varieties can be used to form hedges

SPACING: 4-6M

PLANTING AND PLANT HEALTH

Trunks are not always single (many shoots emerge). Pruning is usually necessary due to its type of growth, it supports strong pruning well because it sprouts vigorously but forms cavities. The fruit is edible and favors the presence of birds. If branches are affected by biotic diseases such as bark cankers (*Nectria cinnabarina*) they must be pruned. This species is prone to Verticillium wilt (*Verticillium Spp.*), *Armillaria mellea*,(honey fungus) *Phytophthora Spp* (water molds) and *Pythium Spp* (genus of parasitic oomycetes) especially in compact soils with excess water. This species can be affected by cochineal.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Planting Pruning X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesiticides Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
BR	6-8	200-250
BR	8-0	200-250
BR	10-12	250-300
BR	12-14	250-300
BR	14-16	250-300
BR	16-18	300-350
BR	18-20	300-350
BR	20-25	300-350
BR	25-30	350-400
RB	10-12	200-250
RB	12-14	200-250
RB	14-16	250-300

ERYTHRINA

Erythrina crista-galli L.

BROADLEAF DECIDUOUS

ERITRINA, PICO DE GALLO (SPANISH) · ERITRINA CRESTA DE GALL (VALENCIAN) · CEIBO (ENGLISH) · ÉRYTHRINE CRÊTE DE COQ (FRENCH)

STRUCTURE		
Shape: EXTENDED	Height: 8-12 M	Diameter: 8-10 M
Texture: COARSE	Shade: FULL	Root: OBLIQUE

DIVISION:	SPERMAPHRODITES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	FABALES
FAMILY:	LEGUMINOSAE

VARIETIES

MORPHOLOGY		
Trunk	Bark: ROUGH	Color: DARK DROWN
Leaf DECIDUOUS; SIZE: LEAF: 30CM, LEAFLET: 10CM; COLOR: US: LIGHT GREEN, LS: LIGHT GREEN; TEXTURE: US: SMOOTH, LS: SMOOTH	COMPOUND: TRIFOLIATE; HARDNESS: SOFT; ARRANGEMENT: ALTERNATE; VENATION: PINNATE; SHAPE: OVAL-LANCEOLATE; MARGIN: ENTIRE; APEX: ACUTE; LEAF BASE: ROUND; PETIOLE: LONG	
Flower SIZE: 5CM	Type: HERMAPHRODITE; Flowering: RACEME (30CM)	Reproduction: HERMAPHRODITE; Fragrant: NO
Fruit SIZE: 15-20CM	Type: LEGUME; Edible: NO	Color: DARK BROWN; Fruiting season: SEP-OCT
Growth	Rate: FAST	Longevity: 100 YEARS

ECOLOGY		
Climate ALTITUDE: 200-600M; IRRIGATION: 600MM	Temperature: -7°C,H4,Z6	Drought resistant: MODERATE
	Sun exposure: SUN	Frost resistant: NO
Soil pH: 5-8.5; FERTILITY: MODERATE	Texture: LOAMY	Salt resistant: NO
	Drainage: MODERATE	Lime resistant: YES

USES		
Resistances	Applications	
COASTAL: 2ND LINE	SLOPES: MOD	LINE: MOD.
POLLUTION: MODERATE	RIVERBANKS: NO	WINDBREAKER: NO
WIND: NO	GROUPS: YES	ISOLATED: YES



POINTS OF INTEREST

Native to Brazil, Argentina, Uruguay. Can be found in Mediterranean climate zones with light droughts. The growth of this tree species is difficult to control when used as a street tree and as a result can create problems for nearby houses. It looks exotic for its spectacular intense red bloom.

SPACING: 8M

PLANTING AND PLANT HEALTH

The stems are spiny. Transplants are difficult and should be done in late winter. It is sensitive to common garden insects, fungi and bacteria.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Planting | Pruning: x

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
CT-9	6-8	100-125
CT-15	8-10	125-150
CT-30	10-12	150-175
CT-50	12-14	175-200
CT-70	16-18	200-250
CT-140	30-35	300-400
CT-230	35-40	400-450
CT-230	40-45	400-450
CT-230	45-50	450-500
CT-230	50-60	450-500

FRAXINUS

BROADLEAF DECIDUOUS

Fraxinus ornus L.

FRESNO DE FLOR	FREIX DE FLOR	FLOWERING ASH	FRÊNE À FLEURS
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Shape: ROUND	Height: 8-10 M	Diameter: 6-8 M
Texture: COARSE	Shade: PARTIAL	Root: AERIAL

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	LAMINALES
FAMILY:	OLEACEAE

VARIETIES

MECZEK

ROTUNDIFOLIA

MORPHOLOGY

Trunk	Bark: FISSURED	Color: DARK BROWN
Leaf: DECIDUOUS; SIZE: LEAF:20-30CM, LEAFLET: 5-10CM; COLOR: US: LIGHT GREEN, LS: LIGHT GREEN; TEXTURE: US: SMOOTH, LS: TOMENTOSE	COMPOUND: IMPARIPINNATE; HARDNESS: SOFT; ARRANGEMENT: OPPOSITE; VENATION: PINNATE; SHAPE: LANCEOLATE; MARGIN: DENTATE; APEX: ACUTE; LEAF BASE: ROUND; PETIOLE: LONG	
Flower; SIZE: 1CM	Type: HERMAPHRODITE; Flowering: PANICLE 15-20CM	Reproduction: HERMAPHRODITE; Fragrant: YES
Fruit; SIZE: 2.5CM	Type: SAMARA; Edible: YES	Color: LIGHT BROWN; Fruiting season: SEP-OCT
Growth	Rate: SLOW	Longevity: 140 YEARS









ECOLOGY

Climate; ALTITUDE: 100-900; IRRIGATION: 700	Temperature: -17ºC,H2,Z5; Sun exposure: SUN/PARTIAL SHADE	Drought resistant: MODERATE; Frost resistant: YES
Soil; pH: 5-7.5; FERTILITY: MODERATE	Texture: LOAMY/SANDY; Drainage: MODERATE	Salt resistant: NO; Lime resistant: NO

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	YES	LINE:	YES
POLLUTION:	YES	RIVERBANKS:	YES	WINDBREAKER:	YES
WIND:	YES	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Native to Southern Europe and Eastern Mediterranean region. It usually forms green forests in summer. In Spain they can be found in the mountainous areas of the east of the Valencian Region. The flowers are spectacular and the fruits remain on the tree all winter. Used to regenerate slopes and as a defense against erosion and protection against the wind. It is fragrant in flowering season and in autumn. The falling leaves create a carpet on the ground. Used in Mediterranean, Moorish and picturesque gardens. Manna (a sweet substance) is extracted from its sap and is used as mild laxative.

SPACING: 4-6M

PLANTING AND PLANT HEALTH

Transplanting is easy and should be carried out at the end of winter. Sensitive to bacteria and some insects, although they do not greatly affect it. This species can cause allergies and therefore must be monitored and be planted away from schools and hospitals.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Planting Pruning X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
BR	8-10	200-250
BR	10-12	200-250
BR	12-14	250-300
BR	14-16	250-300
BR	16-18	300-350
BR	18-20	300-350
BR	20-25	350-400
RB	14-16	300-350
RB	16-18	300-350
RB	18-20	350-400
RB	20-25	350-400
RB	25-30	400-450

GINKGO

BROADLEAF DECIDUOUS

Ginkgo biloba Kaempf. Ex L.

GINKGO SPANISH	GINKGO VALENCIAN	MAIDENHAIR TREE ENGLISH	ARBRE AUX 40 ÉCUS FRENCH

STRUCTURE		
Shape: PYRAMIDAL	Height: 20-30 M	Diameter: 6-8 M
Texture: MEDIUM	Shade: PARTIAL	Root: TAPROOT/OBLIQUE

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	GYMNOSPERMS
TYPE:	PINOPSIDA
ORDER:	GINKGOALES
FAMILY:	GINKGOACEAE

VARIETIES

PYRAMIDALIS

MORPHOLOGY

Trunk	Bark: ROUGH	Color: BROWNISH GRAY
Leaf: DECIDUOUS; SIZE: LEAF: 6-8CM; COLOR: US: LIGHT GREEN, LS: LIGHT GREEN; TEXTURE: US: SMOOTH, LS: SMOOTH	COMPOUND: NO; HARDNESS: CORIACEOUS; ARRANGEMENT: ALTERNATE; VENATION: DICHOTOMOUS; SHAPE: FAN; MARGIN: CRENATE; APEX: ROUND; LEAF BASE: ACUTE; PETIOLE: LONG	
Flower	Type: UNISEXUAL	Reproduction: DIOECIOUS
SIZE AND TYPE: ♂/M 4CM, ♀/F 5CM	CATKIN; SOLITARY(2/3 FLOWERS)	Fragrant: NO
Fruit; SIZE: 2.5-3.5CM	Type: PSEUDODRUPE	Color: YELLOW
	Edible: YES	Fruiting season: SEP-OCT
Growth	Rate: MEDIUM	Longevity: 400-500 YEARS









ECOLOGY

Climate; ALTITUDE: 300-1100; IRRIGATION: 1000	Temperature: -23ºC,H1,Z4	Drought Resistant: MODERATE
	Sun exposure: H4	Frost resistant: YES
Soil; pH: 5-8.5; FERTILITY: MODERATE	Texture: LOAMY	Salt resistant: NO
	Drainage: MODERATE	Lime resistant: YES

USES

Resistances		Applications			
COASTAL:	NO	SLOPES:	MOD	LINE:	YES
POLLUTION:	MODERATE	RIVERBANKS:	MOD	WINDBREAKER:	YES
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Native to China. Few natural specimens are known. It is a mythological tree with a religious meaning and as such was preserved next to the places of prayer in deep China. The deep yellow fall coloration of these trees is impressive. In landscape design it is used for its size, the texture of its leaves and the light green coloration of its leaves during its vegetative period and its autumn color. Its use is associated with oriental exoticism and religious symbology. The flowers of little landscape value are yellowish, and the fruits emit an unpleasant odor, so planting male trees is avoided in order to prevent fertilization of female flowers.

SPACING: 8-10M

PLANTING AND PLANT HEALTH

Transplanting can be problematic and must be carried out in its dormant stage. This tree is considered a living fossil and therefore lacks known pests and diseases and its parasites have disappeared. Wood fungi can affect it due to pruning cuts or root cuts (although this occurs only in adult trees).

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Planting Pruning x

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
RB	6-8	200-250
RB	8-10	250-300
RB	10-12	300-350
RB	12-14	300-350
RB	14-16	350-400
RB	16-18	350-400
RB	18-20	350-400
RB	20-25	400-450
RB	25-30	400-450
RB	30-35	500-600
RB	35-40	600-700

GLEDITSIA *Gleditsia triacanthos* L.

BROADLEAF DECIDUOUS

ACACIA DE TRES ESPINAS (SPANISH) · ACÀCIA DE TRES PUNXES (VALENCIAN) · HONEY LOCUST (ENGLISH) · FÉVIER D´AMERIQUE (FRENCH)

STRUCTURE		
Shape: OVOID	Height: 15-20 M	Diameter: 8-10 M
Texture: COARSE	Shade: PARTIAL	Root: HORIZONTAL

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOYILEDONS
ORDER:	FABALES
FAMILY:	LEGUMINOSAE

VARIETIES
INERMIS
SKYLINE
SUNBURST

MORPHOLOGY		
Trunk	Bark: FISSURED VERTICAL	Color: GRAY/BROWN
Leaf	COMPOUND: YES, BIPINNATE	
	HARDNESS: SOFT	
DECIDUOUS	ARRANGEMENT: ALTERNATE	
SIZE: LEAF:20-30CM	VENATION: PINNATE	
LEAFLET:2-3CM	SHAPE: ELLIPTIC	
COLOR. US: LIGHT GREEN	MARGIN: DENTATE	
LS: LIGHT GREEN	APEX: ROUND	
TEXTURE: US: SMOOTH	LEAF BASE: ROUND	
LS: SMOOTH	PETIOLE: LONG	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE: 0.2CM	FLOWERING: RACEME -7CM	Fragrant: NO
Fruit	Type: LEGUME	Color: BROWN
SIZE: 15-20CM	Edible: YES	Fruiting season: SEP-OCT
Growth	Rate: MEDIUM	Longevity: 200 YEARS






ECOLOGY		
Climate	Temperature: -23ºC,H1,Z4	Drought resistant: YES
ALTITUDE: 200-1000	Sun exposure: SUN	Frost resistant: YES
IRRIGATION: 600		
Soil	Texture: LOAMY	Salt resistant: YES
pH: 5-9	Drainage: MODERATE	Lime resistant: YES
FERTILITY: POOR		

USES				
Resistances		Applications		
COASTAL:	2ND LINE	SLOPES: YES	LINE:	YES
POLLUTION:	YES	RIVERBANKS: YES	WINDBREAKER:	MOD
WIND:	MODERATE	GROUPS: YES	ISOLATED:	YES

POINTS OF INTEREST

Native to Central and Eastern North America. This species was introduced in Spain in the 18th century. It is an ornamental tree for its foliage similar to fern. It has yellowish-gold coloration in autumn. Its winter fruits have a special colour and texture and on windy days the seeds, when shaken provide an interesting sound. Thrives in partial shade. The most important problem is its spines, except for the "Inermis" variety. Widely used for its hardiness as a street tree in tree pits, as a defensive hedge and in landscape restorations (areas with mine waste, slope protection...). The wood is used in carpentry. The seed mucilage can be used for creams, etc. The fruits have been used as food for cattle, they have laxative effects. As a periodical species, it usually gives abundant fruits every 3-5 years.

SPACING: 8 m

PLANTING AND PLANT HEALTH

Plant resistant to common pests and diseases and to all known abiotic diseases. It can sometimes be attacked by cochineal and red spider. In the United States they present a problem between 12 and 20 years of age with *Thyronectria austro-americana*, a facultative saprophytic fungus, that in its parasitic phase, causes damage to the tree. This has resulted in them not being placed in transit areas and have even been uprooted in those same areas. The symptoms of this fungus are the yellowing or wilting of leaves and discoloration of the trunk or branches. The bark of the affected area takes on an orange-brown hue, cracks and fruiting bodies emerge. This disease is associated with pruning wounds or “stress” due to severe drought. It is a sprouting plant and easy to plant and transplant.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Planting Pruning X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
BR	6-8	200-250
BR	12-14	250-300
BR	16-18	250-300
BR	18-20	300-350
BR	20-25	350-400
BR	25-30	400-450
RB	8-10	200-250
RB	16-18	300-350
RB	18-20	300-350
RB	20-25	350-400
RB	25-30	400-450
RB	30-35	450-500

JACARANDA

Jacaranda mimosifolia D. Don

BROADLEAF DECIDUOUS

JACARANDA, PALISANDRO (SPANISH) | XICRANDE (VALENCIAN) | FERN TREE (ENGLISH) | FLAMBOYANT BLEU (FRENCH)

STRUCTURE		
Shape: OVOID	Height: 8-12 M	Diameter: 6-8 M
Texture: COARSE	Shade: FULL	Root: OBLIQUE

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	LAMINALES
FAMILY:	BIGNONIACEAE

VARIETIES

MORPHOLOGY		
Trunk	Bark: SMOOTH	Color: GRAY-BROWN
Leaf: SEMI-EVERGREEN; SIZE: LEAF: 80CM, LEAFLET:1CM; COLOR: US: LIGHT GREEN, LS: LIGHT GREEN; TEXTURE: US: SMOOTH, LS: TOMENTOSE	COMPOUND: YES. BIPINNATE HARDNESS: SOFT ARRANGEMENT: OPPOSITE VENATION: PINNATE SHAPE: LANCEOLATE MARGIN: ENTIRE APEX: SHARP LEAF BASE: ACUTE PETIOLE: SHORT	
Flower: SIZE: 4-5CM	Type: HERMAPHRODITE Flowering: PANICLE (-30 CM)	Reproduction: HERMAPHRODITE Fragant: NO
Fruit: SIZE: 10-12CM	Type: CAPSULE/POD Edible: NO	Color: DARK BROWN Fruiting season: SEP-DEC
Growth	Rate: MEDIUM	Longevity: 100 YEARS

ECOLOGY		
Climate: ALTITUDE: 200-600; IRRIGATION: MOD/LOW	Temperature: -9ºC,H4,Z6 Sun exposure: SUN/PARTIAL	Drought resistant: MODERATE Frost resistant: NO
Soil: pH: 6-8.5; FERTILITY: MODERATE	Texture: LOAMY Drainage: YES	Salt resistant: NO Lime resistant: NO

USES				
Resistances		Applications		
COASTAL: 2ND LINE		SLOPES: NO	LINE: YES	
POLLUTION: MODERATE		RIVERBANKS: NO	WINDBREAKER: MOD	
WIND: NO		GROUPS: YES	ISOLATED: YES	






POINTS OF INTEREST

Native to South America, in the humid forests of Argentina and Bolivia. Flowering occurs while the tree is still young and occurs before budding. This particular species offers an exotic effect in any garden and is commonly used in Mediterranean gardens. It requires little maintenance and has good resistance to lime and pollution. It offers an important chromatism with its spectacular purple blooms. Its leaves produce a "fern effect".

SPACING: 8-10 M

PLANTING AND PLANT HEALTH

It resists current pests and diseases well. Repotting is difficult and should be done in spring and fall. Pruning weakens the specimens and eventually causes cavities.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Planting | Pruning (X)

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
CT-15	10-12	200-250
CT-30	12-14	200-250
CT-50	14-16	250-300
CT-50	16-18	250-300
CT-50	18-20	300-350
CT-50	20-25	300-350
CT-80	25-30	350-400
CT-240	30-35	400-450

KOELREUTERIA

Koelreuteria paniculata Laxm.

BROADLEAF DECIDUOUS

JABONERO DE LA CHINA (SPANISH) · SAPINDE DE LA XINA (VALENCIAN) · PRIDE OF INDIA (ENGLISH) · SAVONNIER (FRENCH)

STRUCTURE		
Shape: ROUND	Height: 8-10 M	Diameter: 5-6 M
Texture: COARSE	Shade: PARTIAL	Root: OBLIQUE

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	SAPINDALES
FAMILY:	SAPINDACEAE

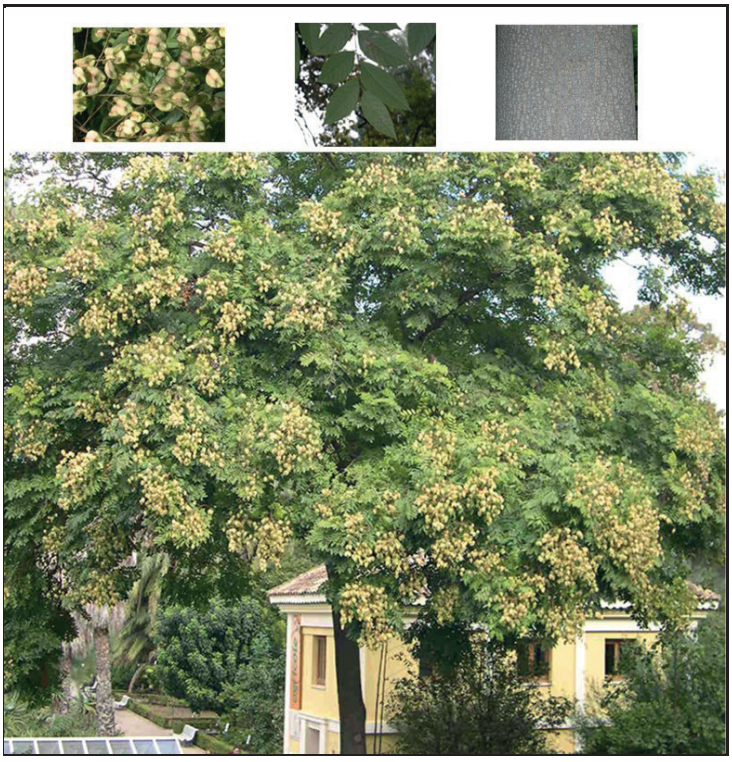
VARIETIES

FASTIGIATA

MORPHOLOGY		
Trunk	Bark: ROUGH	Color: DARK GRAY
Leaf DECIDUOUS; SIZE: LEAF: 30-35CM, LEAFLET: 3-8CM; COLOR: US: DARK GREEN, LS: LIGHT GREEN; TEXTURE: US:SMOOTH, US:TOMENTOSE	COMPOUND: IMPARIPINNATE; HARDNESS: SOFT; ARRANGEMENT: ALTERNATE; VENATION: PINNATE; SHAPE: OVAL; MARGIN: SERRATE/CRENATE; APEX: SHARP; LEAF BASE: ROUND; PETIOLE: LONG	
Flower SIZE: 3CM	Type: HERMAPHRODITE; Flowering: PANICLE-30-40CM	Reproduction: HERMAPHRODITE; Fragrant: NO
Fruit SIZE: 4-5CM	Type: CAPSULE/POD; Edible: NO	Color: YELLOW; Fruiting season: AUG-SEP
Growth	Rate: SLOW	Longevity: 120 YEARS

ECOLOGY		
Climate ALTITUDE: 200-1000M; IRRIGATION: 800	Temperature: -17ºC,H2,Z5; Sun exposure: SUN	Drought resistant: HIGH; Frost resistant: YES
Soil pH: 4-9; FERTILITY: MODERATE	Texture: LOAMY; Drainage: MODERATE	Salt resistant: NO; Lime resistant: YES

USES				
Resistances		Applications		
COASTAL: 2ND LINE	SLOPES: NO	LINE: YES		
POLLUTION: MODERATE	RIVERBANK: NO	WINDBREAKER: NO		
WIND: MODERATE	GROUPS: YES	ISOLATED: YES		



POINTS OF INTEREST

Native to China and introduced in Japan. It requires a humid and cool climate. Suitable for gardens as it provides a pleasant chromatic impact when it flowers in the summer months. The elegance of its leaves, the colour of its flowers, the persistence of its fruits (all winter), its reddish sprouting and its yellow autumn coloration make for a very decorative species. It has good possibilities in small and medium-sized street trees as well as in groups or as an isolated tree. It is a coloured landmark and requires low maintenance. It is widely used in Mediterranean gardens. It has a somewhat ungainly appearance and irregular growth when young. The flowers were used for dyeing (they also have medicinal properties) and the seeds for making necklaces. The leaves were eaten in times of famine.

SPACING: 6-8 M

PLANTING AND PLANT HEALTH

Made of soft and fibrous wood, it rots easily and is not suitable for severe pruning. The wood of old branches breaks easily. During the first years (3-4) from planting, it has a very high water demand. Transplanting is difficult. Abiotic diseases include lack of sun and some diseases due to excess water in the soil cause the plant to weaken and die prematurely. Biotic diseases are bark cankers (*Nectria cinnabarina*), Verticillium wilt (*Verticillium* spp.), *Armillaria mellea* (honey fungus), *Phytophthora* spp (water mold). and *Pythium* Spp(a type of parasite). Affected branches must be pruned. Pests: there are no known pests that seriously affect it.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Planting Pruning X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height(cm)
BR	6-8	200-250
BR	8-10	200-250
BR	10-12	250-300
BR	12-14	250-300
BR	14-16	250-300
BR	16-18	300-350
BR	18-20	300-350
BR	20-25	350-400
RB	8-10	250-300
RB	14-16	300-350
RB	18-20	350-400
RB	20-25	400-450

LAGERSTROEMIA

BROADLEAF DECIDUOUS

Lagerstroemia indica L.

ÁRBOL DE JUPITER (SPANISH) · LAGERSTRÈMIA (VALENCIAN) · QUEEN'S CRAPE MYRTLE (ENGLISH) · LILAS D'ETÉ (FRENCH)

STRUCTURE		
Shape: OVAL	Height: 5-10M	Diameter: 4-6M
Texture: MEDIUM	Shade: PARTIAL	Root: TAPROOT

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	MYRTALES
FAMILY:	LYTHRACEAE

VARIETIES

COCCINEA , NIVEA
RED IMPERATOR , ROSEA
ROSEA NOVA , RUBRA MAGNIFICA
SUPERVIOLACEA

MORPHOLOGY		
Trunk	Bark: SCALY	Color: GRAYISH RED
Leaf: DECIDUOUS; SIZE: 2.5-7CM; COLOR: US:GLOS.DK. GREEN, LS:GLOS.DK. GREEN; TEXTURE: US: SMOOTH, LS : SMOOTH	COMPOUND: NO HARDNESS: CORIAEOUS ARRANGEMENT: OPPOSITE-ALTERNATE VENATION: PINNATE SHAPE: OVAL MARGIN: ENTIRE APEX: ROUNDED LEAF BASE: ROUNDED PETIOLE: SHORT	
Flower: SIZE AND TYPE: 3-4CM	Tipo de flor: HERMAPHRODITE	Reproduction: HERMAPHRODITE
	Type: PANICLE -15-20CM	Fragrance: NO
Fruit: SIZE: 8-12MM	Type: CAPSULE	Color: BROWN
	Edible: NO	Fruiting season: SEPT-NOV
Growth	Rate: FAST	Longevity: 80-100 YEARS

ECOLOGY		
Climate: ALTITUDE: 200-400M; IRRIGATION: 800	Temperature: -12ºC,H3,Z5	Drought resistant: MODERATE
	Sun exposure: SUN/PARTIAL SHADE	Frost resistant: YES
Soil: pH: 5-8; FERTILITY: MODERATE	Texture: LOAMY	Salt resistant: NO
	Drainage: YES	Lime resistant: YES

USES					
Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	NO	LINE:	YES
POLLUTION:	MODERATE	RIVERBANKS:	NO	WINDBREAKER:	NO
WIND:	NO	GROUPS:	YES	ISOLATED:	YES



POINTS OF INTEREST

Native to China and Korea in areas of subtropical deciduous forests. This species has been introduced since ancient times in India. Used as a small street tree for its summer flowers (ranging from deep pink to purple) and for the color of the bark lasting throughout the year. It is used as a landmark for its chromatic intensity or for the interest of its trunk. It requires little soil and offers an exotic quality. Used in Mediterranean, exotic and oriental-style gardens.

SPACING: 4M

PLANTING AND PLANT HEALTH

Easy to transplant and has good wood. Due to its growth and development it requires little pruning, except for when flower pruning is needed. Although it resists pests and diseases well, shady and humid places can provoke powdery mildew.

CHROMATIC CALENDAR

Datasheet (Foliage, Floration and Fruiting season)

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
CT	8-10	80-100
CT	10-12	100-120
CT	12-14	120-150
CT	14-16	150-175
CT	16-18	175-200
RB	8-10	80-100
RB	10-12	100-125
RB	12-14	125-50
RB	14-16	150-75
RB	16-18	175-200
RB	18-20	200-250
RB	18-20	250-300

MALUS

Malus floribunda Siebold ex Van HHoutte

BROADLEAF DECIDUOUS

MANZANO DE JAPÓN (SPANISH) | POMERA DE JAPÓ (VALENCIAN) | SHOWY CRABAPPLE (ENGLISH) | POMMIER DU JAPON (FRENCH)

STRUCTURE		
Shape: OVAL	Height: 6-8 M	Diameter: 4-6 M
Texture: COARSE	Shade: PARTIAL	Root: OBLIQUE

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	ROSALES
FAMILY:	ROSACEAE

VARIETIES

MORPHOLOGY		
Trunk	Bark: FISSURED	Color: DARK BROWN
Leaf: DECIDUOUS; SIZE: LEAF: 4-5CM; COLOR: US:DARK GREEN, LS: LIGHT GREEN; TEXTURE: US: SMOOTH, LS:TOMENTOSE	COMPOUND: NO; HARDNESS: CORIACEOUS; ARRANGEMENT: ALTERNATE; VENATION: PINNATE; SHAPE: OVAL; MARGIN: DENTATE; APEX: ACUTE; LEAF BASE: ROUND; PETIOLE: SHORT	
Flower: SIZE: 2-4 CM	Type: HERMAPHRODITE; Flowering: CORYMB ,10-15CM	Reproduction: HERMAPHRODITE; Fragrant: YES
Fruit: SIZE: 2.3CM	Type: POME; Edible: YES	Color: GREEN-RED; Fruiting season: JUN-JUL
Growth	Rate: FAST	Longevity: 100 YEARS









ECOLOGY			
Climate: ALTITUDE: 600-1200; IRRIGATION: 1000	Temperature: -29ºC,H1,Z4	Drought resistant: MODERATE	
	Sun exposure: SUN	Frost resistant: YES	
Soil: pH: 6-8.5; FERTILITY: MODERATE	Texture: LOAMY	Salt resistant: NO	
	Drainage: MODERATE	Lime resistant: YES	

USES				
Resistances		Applications		
COASTAL:	NO	SLOPES:	NO	LINE: YES
POLLUTION:	NO	RIVERBANKS:	YES	WINDBREAKER: NO
WIND:	MODERATE	GROUPS:	YES	ISOLATED: YES

POINTS OF INTEREST

Native to Japan (green forest areas in summer). Flowers are very showy and spectacular, albiet brief. The fruits are very decorative and have enormous educational potential. This species offers an exotic effect in any garden and has a remarkable landscape value. It is widely used to create Japanese and exotic gardens.

SPACING: 4m

PLANTING AND PLANT HEALTH

Transplanting is easy and should be carried out in the winter months. Good resistance to pruning. It is sensitive to pests and diseases. The mollasses produced by these aphids can dirty cars and roads.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Planting | Pruning: X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height(cm)
BR	8-10	175-200
BR	12-14	175-200
BR	14-16	200-250
BR	16-18	200-250
BR	18-20	200-250
BR	20-25	300-350
CT	10-12	175-200
CT	12-14	175-200
CT	14-16	200-250
CT	16-18	250-300
CT	18-20	300-350
CT	20-25	300-350

MELIA

BROADLEAF DECIDUOUS

Melia azedarach L.

MELIA, CINAMOMO SPANISH | MÈLIA VALENCIAN | CHINABERRY TREE ENGLISH | LILAS DES INDES FRENCH

STRUCTURE

Shape	Height	Diameter
ROUND	10-14 M	6-8 M
Texture	**Shade**	**Root**
COARSE	PARTIAL	OBLIQUE

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	SAPINDALES
FAMILY:	MELIACEAE

VARIETIES

MORPHOLOGY

Trunk	Bark: FISSURED	Color: REDDISH BROWN
Leaf	COMPOUND: BIPINNATE	
DECIDUOUS	HARDNESS: CORIACEOUS	
SIZE: LEAF: 35-90CM	ARRANGEMENT: ALTERNATE	
LEAFLET: 4CM	VENATION: PINNATE	
COLOR: US: LIGHT GREEN	SHAPE: OVAL	
LS: DARK GREEN	MARGIN: SERRATED	
TEXTURE: US: SMOOTH	APEX: CUSPIDATE/ACUMINATE	
LS: TOMENTOSE	LEAF BASE: ACUTE	
	PETIOLE: LONG	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE: 2CM	Flowering: PANICLE 15-20CM	Fragrant: YES
Fruit	Type: DRUPE	Color: YELLOW
SIZE: 1-10CM	Edible: NO	Fruiting season: SEP-NOV
Growth	Rate: VERY FAST	Longevity: 80 YEARS






ECOLOGY

Climate	Temperature: -13ºC,H3,Z4	Drought resistant: YES
ALTITUDE: 200-600	Sun exposure: SUN	Frost resistant: YES
IRRIGATION: LOW		
Soil	Texture: LOAMY/SANDY	Salt resistant: YES
Ph: 5-8.5	Drainage: LOW	Lime resistant: YES
FERTILITY: POOR		

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	MOD	LINE:	YES
POLLUTION:	MODERATE	RIVERBANKS:	NO	WINDBREAKER:	NO
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Native to deciduous forest areas in subtropical Asia. Interesting street tree for its bearing, size, flowering and fragrance. The fruit lasts all winter. The flower is bluish in color and boasts abundant bloom. It was already used to provide shade in the Middle Ages for the donkeys that powered the waterwheels. The leaves were used to make dye and the seeds to make rosary beads. The color intensity is interesting. In Asia it is a sacred and mythological tree. The fruits are poisonous and give off an unpleasant smell.

SPACING: 6-8M

PLANTING AND PLANTING HEALTH

This species can be planted and transplanted easily. It has good resistance to pests and diseases known in gardening. It does not tolerate pruning well.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Planting Pruning X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
RB	6-8	175-200
RB	8-10	175-200
RB	10-12	200-250
RB	12-14	200250
RB	14-16	250-300
RB	16-18	250-300
RB	18-20	300-350
RB	20-25	300-350
RB	25-30	350-400
RB	30-35	400-450

MORUS

BROADLEAF DECIDUOUS

Morus alba L.

MORERA BLANCA	MORERA BLANCA	WHITE MULBERRY	MÚRIER BLANC
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Shape: OVAL/ROUND	Height: 12-14 M	Diameter: 6- M
Texture: COARSE	Shape: FULL	Root: HORIZONTAL

DIVISION:	SPERMATOPHYTE
SUBDIVISION:	ANGIOSPERM
TYPE:	DICOTYLEDONEAE
ORDER:	URTICALES/ROSALES
FAMILY:	MORACEAE

VARIETIES

FRUITLESS, PLATANIFOLI, KAGAYAMAE
KAGAYAMAE STERILE, TORTUOSA
MULTICAULIS, LACINIATA
PENDULA, CATHAYANA

MORPHOLOGY		
Trunk	Bark: FISSURED	Color: BROWN/GRAY
Leaf: DECIDUOUS; SIZE: LEAF:7-15CM; COLOR: US: DARK GREEN, LS: LIGHT GREEN; TEXTURE: US: ROUGH, LS: ROUGH	COMPOUND: NO HARDNESS: CORIACEOUS ARRANGEMENT: ALTERNATE VENATION: PINNATE SHAPE: OVAL MARGIN: DENTATE APEX: SHARP LEAF BASE: CORDATE PETIOLE: LONG	
Flower: SIZE: 1.5 CM	Type: UNISEXUAL Flowering: CATKIN	Reproduction: Monoecious/Dioecious Fragrant: NO
Fruit: SIZE: 2-3CM	Type: SOROSIS/COMPOUND Edible: YES	Color: RED/BLACK Fruiting season: MAY-JUN
Growth	Rate: FAST	Longevity: 100 years

ECOLOGY		
Climate: ALTITUDE: 0-1000; IRRIGATION: MODERATE	Temperature: -34ºC,H1,Z3 Sun exposure: SUN	Drought resistant: HIGH Frost resistant: YES
Soil: pH: 5-8.5; FERTILITY: MODERATE	Texture: LOAMY Drainage: MODERATE	Salt resistant: YES Lime resistant: YES

USES				
Resistances		Applications		
COASTAL:	2ND LINE	SLOPES:	NO	LINE: YES
POLLUTION:	YES	RIVERBANKS:	YES	WINDBREAKER: YES
WIND:	MODERATE	GROUPS:	YES	ISOLATED: YES



POINTS OF INTEREST

Native to the humid and temperate forests of China. The flowers are white and leaves are large and shiny. It is a good shade tree that links with the surrounding areas. It eventually creates umbracles. It requires low maintenance. Used in Arab, Mediterranean and Japanese gardens. It is an invasive species and very hardy. Its roots are used to obtain dye. Its fruits are diuretic. Its leaves are a source of food for silkworms.

SPACING: 4-6M

PLANTING AND PLANT HEALTH

Transplants easily. It resists pests and diseases well. Although it produces good wood, when severely pruned, it eventually forms cavities quickly shortening its life-span. Fruiting varieties creates litter and therefore the fruitless varieties are recommended.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Planting Pruning x

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
BR	8-10	200-250
BR	10-12	200-250
BR	12-14	250-300
BR	14-16	250-300
BR	16-18	300-350
BR	18-20	300-350
BR	20-25	350-400
BR	25-30	400-450
RB	20-25	350-400
RB	25-30	350-400
RB	30-35	400-450
RB	35-40	450-500

PAULOWNIA

Paulownia tomentosa (Thunb.) Steud.

BROADLEAF DECIDUOUS

PAULONIA	PAULÒNIA	EMPRESS TREE	PAULOWNIA
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Shape: ROUND	Height: 15-18 M	Diameter: 6-8 M
Texture: COARSE	Shade: FULL	Root: TAPROOT

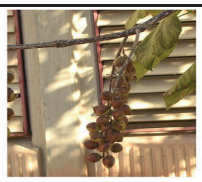
DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	LAMINALES
FAMILY:	PAULOWNINACEAE

VARIETIES

MORPHOLOGY

Trunk	Bark: ROUGH	Color: GRAY
Leaf	COMPOUND: NO	
	HARDNESS: SOFT	
DECIDUOUS	ARRANGEMENT: OPPOSITE	
SIZE: LEAF: 15-25CM	VENATION: PINNATE	
	SHAPE: OVAL	
COLOR: US: DARK GREEN	MARGIN: ENTIRE	
LS: LIGHT GREEN	APEX: ACUMINATE/CUSPIDATE	
TEXTURE: US: SMOOTH	LEAF BASE: CORDATE	
LS: TOMENTOSE	PETIOLE: LONG	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE AND TYPE: 2-3CM	Flowering: PANICLE-30-40CM	Fragrant: YES
Fruit	Type: CAPSULE /POD	Color: DARK GRAY
SIZE: 3-5CM	Edible: NO	Fruiting season: SEP-OCT
Growth	Rate: FAST	Longevity: 200-240 YEARS








ECOLOGY

Climate	Temperature: -10ºC,H3,Z6	Drought resistant: MODERATE
ALTITUDE: 200-600	Sun exposure: SUN	Frost resistant: YES
IRRIGATION: 800		
Soil	Texture: LOAMY/CLAYEY	Salt resistant: NO
pH: 5-8.5	Drainage: MODERATE	Lime resistant: YES
FERTILITY: MODERATE		

USES

Resistances		Applications			
COASTAL:	NO	SLOPES:	NO	LINE:	YES
POLLUTION:	MODERATE	RIVERBANKS:	NO	WINDBREAKERS:	YES
WIND:	NO	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Suitable for gardens as an isolated tree or in a group and to recreate Mediterranean and Baroque gardens. Its flowers provide a pleasant chromatic impact. It is a decorative plant due to the elegance and size of its leaves, the colour of its flowers and the persistence of its fruits (all winter). It can be used as a shrub. If planted young it can be pruned at ground level (10cm) each year to obtain a shrub with large decorative leaves. Its leaf density is medium and it provides very pleasant shade.This species is not suitable for coastal, mountain areas or strong winds. It can be used as a street tree due to its medium size, but keeping in mind that it requires sun and some humidity.

SPACING: 4-6M

PLANTING AND PLANT HEALTH

The root system is deep and significant and transplanting is possible. Resistant to pests and diseases. Abiotic diseases include very compact soil since it weakens growth and development. Biotic diseases are leaf spots (two types of fungi) and affected leaves must be removed from the ground. This species is also affected by mildew. The wood fungi that most affect it are those of the Polyporus genus. No known pests seriously affect it.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting seaosn

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Planting Pruning x

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
BR	12-14	200-250
BR	14-16	200-250
BR	16-18	250-275
BR	18-20	275-300
BR	20-25	275-300
BR	25-30	300-350
BR	30-35	350-400
RB	6-8	150-175
RB	8-10	175-200
RB	20-25	200-250
RB	25-30	250-300
RB	30-35	350- 400

PLATANUS *Platanus hispanica*

BROADLEAF DECIDUOUS

PLÁTANO DE SOMBRA (SPANISH) | PLÀTAN DE CARRER (VALENCIAN) | LONDON PLANE (ENGLISH) | PLAT A FEUILLES D´ÉRABLE (FRENCH)

STRUCTURE		
Shape: OVAL	Height: 20-30 M	Diameter: 10-14 M
Texture: COARSE	Shade: FULL	Root: OBLIQUE

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	PROTEALES
FAMILY:	PLATANACEAE

VARIETIES
PYRAMIDALIS

MORPHOLOGY		
Trunk	Bark: SCALY	Color: PALE/GREEN GRAY
Leaf: DECIDUOUS; SIZE: LEAF: 15-25CM; COLOR: US: GREEN, LS: LIGHT GREEN; TEXTURE: US: SMOOTH, LS:TOMENTOSE	COMPOUND: NO; HARDNESS: CORIACEOUS; ARRANGEMENT: ALTERNATE; VENATION: PALMATE; SHAPE: PALMATE; MARGIN: DENTATE; APEX: SHARP; LEAF BASE: ROUND; PETIOLE: LONG	
Flower: SIZE: ♂/F 1CM CAPSULE /POD; ♀/M 1CM CAPSULE /POD	Type: UNISEXUAL	Reproduction: MONOECIOUS; Fragrant: NO
Fruit: SIZE: 2-3CM	Type: ACHENE; Edible: NO	Color: BROWN; Fruiting Season: SEP-OCT
Growth	Rate: FAST	Longevity: 300-400






ECOLOGY		
Climate: ALTITUDE: 200-1800; IRRIGATION: HIGH	Temperature: -23ºC,H1,Z4; Exposure to sun: SUN	Drought resistant: MODERATE; Frost resistant: YES
Soil: pH: 5-8.5; FERTILITY: MODERATE	Texture: LOAMY; Drainage: MODERATE	Salt resistant: NO; Lime resistant: YES

USES					
Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	MOD	LINE:	YES
POLLUTION:	YES	RIVERBANKS:	YES	WINDBREAKER:	YES
WIND:	HIGH	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

This species is a hybrid of P. *orientalis* and P. *occidentalis*, although the idea that it is a variety of P. *orientalis* is increasingly being accepted. It has been widely used as a street tree in large and wide avenues and boulevards. Currently, with a large number of species found in cities, its cultivation must cease due to the presence of a new disease that produces summer defoliations similar to those that occur in autumn.The tree cannot recover from this disease and eventually loses its vitality. Its foliage offers great shade. In autumn, the leaves shine with their characteristic ochre color.

SPACING: 12-14M

PLANTING AND PLANT HEALTH

The tomentose young leaves and dispersing seeds can cause allergies and also provoke breathing difficulties for people with asthma. One of the most important diseases that affects this species is the anthracnose (difficult to solve) and the powdery mildew. Both these diseases weaken the tree and if infected when young, they can die. In adults, the vitality of the crown decreases, producing sprouts that are closer to the trunk. Although pruning does not seriously affect it, it weakens reserve substances that are necessary to ward off the diseases mentioned above.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Planting | Pruning: X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height(cm)
BR	8-10	250-300
BR	10-12	250-300
BR	12-14	300-350
BR	14-16	300-350
BR	16-18	350-400
BR	18-20	350-400
BR	20-25	400-450
BR	25-30	450-500
BR	45-50	500-600
RB	40-45	600-700
RB	45-50	600-700
RB	50-60	700-800

POPULUS

BROADLEAF DECIDUOUS

Populus alba L.

ALAMO BLANCO (SPANISH) · ÀLBER (VALENCIAN) · WHITE POPLAR (ENGLISH) · AUBE, PEUPLIER BLANC (FRENCH)

STRUCTURE		
Shape: OVAL	Height: 20-25 M	Diameter: 6-8 M
Texture: MEDIUM	Shade: PARTIAL	Root: HORIZONTAL

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	SALICALES
FAMILY:	SALICACEAE

VARIETIES

BOLLEANA
NIVEA, RAKET, ROUMI
CANESCENS, DENUDATA
PYRAMIDALIS

MORPHOLOGY		
Trunk	Bark: SMOOTH	Color: GRAYISH WHITE
Leaf	COMPOUND: NO	
DECIDUOUS	HARDNESS: CORIACEOUS	
SIZE: LEAF: 6-12CM	ARRANGEMENT: ALTERNATE	
	VENATION: PINNATE	
	SHAPE: OVAL,DELTOID	
COLOR: US:DARK GREEN	MARGIN: DENTATE	
LS: WHITE	APEX: ROUND	
TEXTURE: US: SMOOTH	LEAF BASE: ROUND	
LS:TOMENTOSE	PETIOLE: SHORT	
Flower	Type: UNISEXUAL	Reproduction: DIOECIOUS
SIZE AND TYPE: ♂/M 8CM	CATKIN	Fragrant: NO
♀/F 3-6CM	CATKIN	
Fruit	Type: CAPSULE/POD	Color: LIGHT BROWN
SIZE: 5MM (10CM)	Edible: NO	Fruiting season: MAR-MAY
Growth	Rate: FAST	Longevity: 120-140



ECOLOGY		
Climate	Temperature: -29ºC,H1,Z4	Drought resistant: MODERATE
ALTITUDE: 0-1300	Sun exposure: SUN/PARTIAL SHADE	Frost resistant: YES
IRRIGATION: HIGH		
Soil	Texture: SANDY	Salt resistant: YES
pH: 5-8.5	Drainage: MODERATE	Lime resistant: YES
FERTILITY: LOW		

USES				
Resistances		Applications		
COASTAL: 2nd LINE		SLOPES: YES	LINE: YES	
POLLUTION: MODERATE		RIVERBANK: YES	WINDBREAKER: YES	
WIND: YES		GROUPS: YES	ISOLATED: YES	

NOTES OF INTEREST

Native to Central and Southern Europe, near Asia and North Africa, in humid and cool areas. Used for its varied chromatic effect, for its trunk and leaves according to the season of the year (both during the vegetative period and for its autumn color). The cottony seeds are bothersome, but are only found on the female trees. The male flowers carry pollen, which can cause allergies in some people. The chromatic intensity of autumn can be spectacular. The fall of autumn leaves create litter and therefore can pose a risk for pedestrians. It protects against soil erosion and is used in riverbank areas. It can be used to recreate ancient, medieval, Moorish, landscape gardens, etc. The flower is inconspicuous. The male flower is pinkish in color and the female is greenish yellow. It blooms before budding.

SPACING: 4M

PLANTING AND PLANT HEALTH

This species is easy to transplant specially during the winter months. Although it is attacked by pests and diseases, these problems do not limit its growth or development and should not be treated. Due to the type of wood, the tree should not be pruned as cavities immediately appear that shorten the life of tree and provokes the fall of branches or the trunk itself breaking. It should not be used as a street tree except in parks. Due to its short life and possible risks, they should be placed far from busy urban areas.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Planting ▭ Pruning X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides ▭ Pesticides ▭ Fertilizers ▭

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
BR	14-16	250-300
BR	16-18	250-300
BR	18-20	300-350
BR	20-25	350-400
BR	25-30	400-450
CT	10-12	200-250
CT	12-14	200-250
CT	14-16	250-300
CT	16-18	300-350
CT	18-20	350-400
CT	20-25	400-450
CT	25-30	450-500

PRUNUS

Prunus cerasifera Ehrh. var. *atropurpurea*

BROADLEAF DECIDUOUS

CIRUELO MIROBOLÁN (SPANISH) | PRUNERA de F. Vermelles (VALENCIAN) | PURPLE CHERRY PLUM (ENGLISH) | PRUNIER DE PISSARD (FRENCH)

STRUCTURE		
Shape: ROUND	Height: 3-6 M	Diameter: 3-5 M
Texture: MEDIUM	Shade: FULL	Root: HORIZONTAL

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	ROSALES
FAMILY:	ROSACEAE

VARIETIES
NIGRA

MORPHOLOGY		
Trunk	Bark: SMOOTH	Color: DARK BROWN
Leaf DECIDUOUS; SIZE: LEAF: 4-7CM; COLOR: US:PURPLE, LS: PURPLE; TEXTURE: US: SMOOTH, LS: ROUGH	COMPOUND: NO; HARDNESS: CORIACEOUS; ARRANGEMENT: ALTERNATE; VENATION: PINNATE; SHAPE: OVAL; MARGIN: SERRATE; APEX: SHARP; LEAF BASE: ROUND; PETIOLE: SHORT	
Flower SIZE: 3-5CM	Type: HERMAPHRODITE; Flowering: SOLITARY	Reproduction: HERMAPHRODITE; Fragrant: NO
Fruit SIZE: 2-3CM	Type: DRUPE; Edible: YES	Color: RED; Fruiting season: JUL-SEP
Growth	Rate: FAST	Longevity: 80 YEARS

ECOLOGY		
Climate ALTITUDE: 200-1000; IRRIGATION: HIGH	Temperature: -23ºC,H1,Z4; Sun exposure: SUN/PARTIAL	Drought resistant: MODERATE; Frost resistant: YES
Soil pH: 5-8,5; FERTILITY: MODERATE	Texture: LOAMY/SANDY; Drainage: MODERATE	Salt resistant: NO; Lime resistant: YES

USES				
Resistances		Applications		
COASTAL: MODERATE		SLOPES: NO	LINE: MOD	
POLLUTION: YES		RIVERBANKS: NO	WINDBREAKER: YES	
WIND: MODERATE		GROUPS: YES	ISOLATED: YES	



POINTS OF INTEREST

Native to the Balkan Peninsula and Crimea. The purple variety is specific to horticultural. Due to its size, in general, it is a good street tree. However, given the fact its fruit creates litter when it falls and in addition to producing mollasses if infected by pests, it is not suitable for urban streets. Its use should be restricted to parks and gardens. In landscape design, it is used for the exotic color of its leaves and its early spring flowering (it blooms before it sprouts). It is a plant that can be used as a hedge, offering the same characteristics as a tree but in an architectural form. It is also possible to use it as a windbreaker, however being deciduous, in winter it will not be as effective.

SPACING: 5M

PLANTING AND PLANT HEALTH

Transplanting is easy. It requires little soil. Certain branches and twigs may have thorns or spines and therefore should not be used in children's areas. Pests and diseases must be monitored since they disfigure the tree and due to the molasses produced by the pests may dirty areas and cars. Therefore, it should not be placed in parking areas, terraces and busy sidewalks.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Planting | Pruning: x

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
RB	6-8	200-225
RB	8-10	225-250
RB	10-12	225-250
RB	12-14	250-300
RB	14-16	250-300
RB	16-18	300-250
RB	30-35	350-400
CT7	4-6	100-125
CT12	6-8	125-150
CT15	8-10	150-200
CT25	10-12	200-250

PTEROCARYA

Pterocarya fraxinifolia (Poir.) Spach

BROADLEAF DECIDUOUS

NOGAL DE NUECES ALADAS (SPANISH) · NOGUERA DEL CAUCAS (VALENCIAN) · CAUCASIAN WING-NUT (ENGLISH) · PTÉROCARYA DU CAUCASE (FRENCH)

STRUCTURE		
Shape: OVAL	Height: 14-16 M	Diameter: 8-12 M
Texture: COARSE	Shape: FULL	Root: OBLIQUE

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	JUGLANDALES
FAMILY:	JUGLANDACEAE

VARIETIES

MORPHOLOGY

Trunk	Bark: FISSURED	Color: GRAY
Leaf	COMPOUND: YES. IMPARIPINNATE	
	HARDNESS: CORIACEOUS	
DECIDUOUS	ARRANGEMENT: ALTERNATE	
SIZE. LEAF: 20-40CM	VENATION: PINNATE	
LEAFLET: 5-10CM	SHAPE: OBLONG	
COLOR: US: DARK GREEN	MARGIN: DENTATE	
LS: DARK GREEN	APEX: SHARP	
TEXTURE: US: SMOOTH	LEAF BASE: ROUND	
LS:TOMENTOSE	PETIOLE: LONG	
Flower	Type: UNISEXUAL	Reproduction: MONOECIOUS
SIZE AND TYPE: ♂/M 12CM	CATKIN	Fragrant: YES
♀/F 5CM	CATKIN30-50CM	
Fruit	Type: NUT	Color: LIGHT BROWN
SIZE: 1-30CM	Edible: NO	Fruiting season: SEP-OCT
Growth	Rate: VERY FAST	Longevity: 140 YEARS






ECOLOGY

Climate	Temperature: -23ºC,H1,Z4	Drought resistant: LOW
ALTITUDE: 600-1000	Sun exposure: SUN/PARTIAL SHADE	Frost resistant: YES
IRRIGATION: HIGH		
Soil	Texture: SANDY	Salt resistant: NO
pH: 6-8.5	Drainage: MODERATE	Lime resistant: YES
FERTILITY: MODERATE		

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	NO	LINE:	MOD
POLLUTION:	YES	RIVERBANKS:	YES	WINDBREAKER:	YES
WIND:	NO	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Native to Northern Iran, Caucasus in humid forest areas. The flower is a greenish colour. It is a very beautiful deciduous tree, both for its size and for its yellowish-brown autumn coloration. Widely used in parks and gardens as a shade tree or to create a tunnel effect in streets and lower the temperature up to 5ºC under the canopy. In winter, the great density of branches and the fruits that remain, cut the wind so it feels less cold. In California and in most of the United States, it is planted in poorly aerated, compact soils close to areas with water. It is also widely used to form visual and sound bariers due to its low and abundant ramification and thickness of branches and leaves. In winter it displays the structure of a tree and the fruits that remain hanging.

SPACING: 10-12M

PLANTING AND PLANT HEALTH

Medium density wood and somewhat brittle. Wounds close quickly. It can have codominance problems, so double leader and the emission of an abundance of sprouts that become very vigorous should be monitored and controlled through formative and maintenance pruning. Its root system is very invasive and aggressive, so it should NOT be used in small gardens or in narrow and medium-sized streets. The seeds produce an important taproot.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Planting Pruning X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
CT	8-10	175-200
CT	10-12	175-200
CT	12-14	175-200
CT	14-16	200-225
CT	16-18	200-225
CT	18-20	225-250
CT	20-25	250-300
CT	25-30	300-350
CT	30-35	350-400
RB	10-12	200-225
RB	16-18	225-250
RB	18-20	250-275

ROBINIA

BROADLEAF DECIDUOUS

Robinia pseudoacacia L.

ACACIA SPAINISH | FALSA ACÀCIA VALENCIAN | BLACK LOCUST ENGLISH | ROBINIER FAUX-ACACIA FRENCH

STRUCTURE

Shape	Height	Diameter
OVAL	15-20 M	6-8 M
Texture	**Shade**	**Root**
COARSE	PARTIAL	HORIZONTAL

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	FABALES
FAMILY:	LEGUMINOSAE

VARIETIES

PYRAMIDALIS

UNIFOLIA

UMBRACULIFERA

MORPHOLOGY

Trunk	Bark: FISSURED	Color: BROWN/GRAY
Leaf	COMPOUND: IMPARIPINNATE	
DECIDUOUS	HARDNESS: SOFT	
SIZE: LEAF: 15-20CM	ARRANGEMENT: ALTERNATE	
LEAFLET: 2-3CM	VENATION: PINNATE	
COLOR: US: DARK GREEN	SHAPE: OVAL	
LS:LIGHT GREEN	MARGIN: ENTIRE	
TEXTURE: US: SMOOTH	APEX: ROUND	
US: SMOOTH	LEAF BASE: ROUND	
	PETIOLE: LONG	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE: 2CM	Flowering: RACEME 15 CM	Fragrant: YES
Fruit	Type: LEGUME	Color: GRAY/BROWN
SIZE: 5-12CM	Edible: YES	Fruiting season: SEP-OCT
Growth	Rate: FAST	Longevity: 70-90 YEARS











ECOLOGY

Climate	Temperature: -23ºC,H1,Z4	Drought resistant: YES
ALTITUDE: 200-1600	Sun exposure: SUN	Frost resistant: YES
IRRIGATION: 600		
Soil	Texture: LOAMY	Salt resistant: NO
pH: 4-8.5	Drainage: LOW	Lime resistant: YES
FERTILITY: LOW		

USES

Resistances		Applications			
COASTAL:	2nd LINE	SLOPES:	YES	LINE:	YES
POLLUTION:	YES	RIVERBANKS:	MOD	WINDBREAKER:	MOD
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	MOD

POINTS OF INTEREST

Native to Central and Eastern U.S.A. The flower is white, very fragrant and abundant. In many countries, it is one of the most extensively used as trees streets and in municipal gardens. They are suitable for forming groups due to their size and semi-oriental exoticism. Provide light shade. The inflorescence fills the air with its delicious fragrance and creates a carpet of color on the ground. The autumn coloration of the leaf is yellow and in winter its branches show us its light and sinuous structure. It has a fine texture. It is used for reforesting areas due to its developed and extended root system being capable of controlling erosion thanks to its numerous shoots. Like all legumes, it has bacteria in the roots that fix nitrogen. As they grow poorly in the shade or if planted in very narrow streets, they will have poor growth development.

SPACING: 4-6M

PLANTING AND PLANT HEALTH

Transplanting is easy. Biotic diseases: Nectria Spp.(canker), Phytophthora Spp (water mold). Abiotic diseases: heavy and moist soil. Pests: leafminers without major consequences. Oak galls produced by insects. Trunk miners are very dangerous. The tree must be maintained with a single trunk. They have a tendency to split. The wood is strong, heavy, fibrous, elastic and hard (similar to ash and elm), although the branches are brittle. It is affected by saprophytic fungi (*Phellium robiniae*). Cavity treatment should not be applied. The use of a very rich substrate can produce undesireable quick growth and therefore when windy, branches break and old or weak trees will fall.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Planting Pruning X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
BR	6-8	200-225
BR	8-20	225-250
BR	10-12	250-300
BR	12-14	250-300
BR	30-35	300-400
RB	16-18	250-300
RB	18-20	250-300
RB	20-25	300-350
RB	25-30	300-350
CT12	6-8	200-225
CT15	8-10	225-250
CT25	12-14	250-300

SOPHORA

Sophora japonica L.

BROADLEAF DECIDUOUS

ACACIA DEL JAPÓN (SPANISH) · ACÀCIA DEL JAPÓ (VALENCIAN) · JAPANESE PAGODA TREE (ENGLISH) · SOPHORA DU JAPON (FRENCH)

STRUCTURE		
Shape: ROUND	Height: 15-20 M	Diameter: 6-8 M
Texture: COARSE	Shade: FULL	Root: OBLIQUE

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	FABALES
FAMILY:	LEGUMINOSAE

VARIETIES

PENDULA

COLUMNARIS

MORPHOLOGY		
Trunk	Bark: FISSURED	Color: BROWN/GRAY
Leaf	COMPOUND: YES. IMPARPINNATE	
DECIDUOUS	HARDNESS: SOFT	
SIZE: LEAF:15-25CM	ARRANGEMENT: ALTERNATE	
LEAFLET:3-4CM	VENATION: PINNATE	
COLOR: US:DARK GREEN	SHAPE: LANCEOLATE	
LS:LIGHT GREEN	MARGIN: ENTIRE	
TEXTURE: US: SMOOTH	APEX: SHARP	
LS:TOMENTOSE	LEAF BASE: ROUND	
	PETIOLE: LONG	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE: 1CM	Flowering: PANICLE 15-30CM	Fragrant: NO
Fruit	Type: LEGUME	Color: GREEN
SIZE: 6-8CM	Edible: NO	Fruiting season: OCT-NOV
Growth	Rate: MEDIUM	Longevity: 120-140







ECOLOGY		
Climate	Temperature: -23ºC,H1,Z4	Drought resistant: MODERATE
ALTITUDE: 0-1100	Sun exposure: SUN	Frost resistant: YES
IRRIGATION: MODERATE		
Soil	Texture: LOAM/SAND	Salt resistant: NO
pH: 4-8.5	Drainage: LOW	Lime resistant: YES
FERTILITY: LOW		

USES				
Resistances		Applications		
COASTAL:	2ND LINE	SLOPES:	NO	LINE: YES
POLLUTION:	YES	RIVERBANKS:	NO	WINDBREAKER: YES
WIND:	MODERATE	GROUPS:	YES	ISOLATED: YES

POINTS OF INTEREST

Native to East Asia, China and Korea and eventually introduced in Japan. The flowers are creamy white in color. Widely used as a street tree and often poorly planted and inappropriately placed (due to its size) in large number of streets with narrow sidewalks. In summer it shows its excellence as a shade tree and adds color and aroma to the general layout of the garden. It is also used in oriental garden designs, as a singular element, on meadows and on golf courses (the exotic variety S.J. "pendula"). In China and Japan they use the flowers, bark and leaves to extract a yellow dye. Allergic reaction to this tree are unknown. Its flowers are melliferous. The falling fruits create litter.

SPACING: 8-10M

PLANTING AND PLANT HEALTH

Easy to transplant in the months of dormant stage. Its wood is not affected by moths and is used in cabinetmaking. Pests: Not generally affected. On occasions mealybugs and aphids will attack but without causing any serious problems. Diseases: can be affected by bark canker and is sensitive to fusarium (a type of fungi/saprobe). In areas such as historical parks where Armillaria mellea (honey fungus) can be found, the tree must be monitored. Although it tolerates strong pruning relatively well, it can cause cavities and the poorly settled emerging branches tend to fall on windy days or when they become loaded over time, generating the beginning of the pruning cycle and producing general decay. As a result, it drastically shortens the specimen's life, which eventually implies new investments and added costs to the project.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Planting ■ Pruning X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides ■ Pesticides ■ Fertilizers ■

COMMERCIALIZATION

Presentation	Girth(cm)	Height (cm)
BR	6-8	175-200
BR	10-12	200-225
BR	12-14	225-250
RB	14-16	225-250
RB	16-18	250-300
RB	18-20	300-350
RB	20-25	350-400
CT15	6-8	175-200
CT15	8-10	200-225
CT25	10-12	225-250

TAMARIX

Tamarix ramosissima Ledeb.

BROADLEAF DECIDUOUS

TARAY ROSA	TAMARIU PENTANDRE	FIVE-STAMEN TAMARISK	TAMARIX D'ÉTÉ
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE

Shape	Height	Diameter
ROUND	2-5M	2-3M
Texture	**Shade**	**Root**
FINE	LIGHT	TAPROOT

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	VIOLALES
FAMILY:	TAMARICACEAE

VARIETIES

PINK CASCADE
ROSEA
RUBRA

MORPHOLOGY

Trunk	Bark: SMOOTH	Color: REDDISH BROWN
Leaf	COMPOUND: NO	
	HARDNESS: CORIACEOUS	
DECIDUOUS	ARRANGEMENT: TIGHTLY OVERLAPPING	
SIZE: LEAF:1.5-4MM	VENATION: NEEDLED	
	SHAPE: SCALE /LANCEOLATE	
COLOR: US: BLUE/GREEN	MARGIN: DENTATE	
LS: BLUE/GREEN	APEX: ACUTE	
TEXTURE: US: ROUGH	LEAF BASE: CORDATE	
LS : ROUGH	PETIOLE: SESSILE	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE: 2MM	Flowering: SPIKED -12-100CM	Fragrance: NO
Fruit	Type: CAPSULE	Color: LIGHT BROWN
Size: 4-6MM	Edible: NO	Fruiting season: SEPT-OCT
Growth	Rate: FAST	Longevity: 50-70 YEARS









ECOLOGY

Climate	Temperature: -23ºC,H1,Z4	Drought resistant: YES
ALTITUDE: 0-800	Sun exposure: SUN	Frost resistant: YES
IRRIGATION: 500		
Soil	Texture: SANDY	Salt resistant: YES
pH: 6-9	Drainage: MODERATE	Lime resistant: YES
FERTILITY: LOW		

USES

Resistances		Applications			
COASTAL:	1ST LINE	SLOPES:	YES	LINE:	YES
POLLUTION:	LOW	RIVERBANKS:	YES	WINDBREAKER:	MOD
WIND:	HIGH	GROUPS:	MOD	ISOLATED:	YES

POINTS OF INTEREST

Native to Southeastern Europe, central and western Asia, in humid, salty and sandy areas, in addition to coastal lagoons and river areas. Widely used with other species of the genus *tamarix* in non-shaded groups or lines near the sea due to its high resistance to salinity. The flower is white or pink and the shrub or small tree can end up fully covered. since this particular species does not provide shade, it is used as a street tree, and therefore other species should be included.

SPACING: 4M

PLANTING AND PLANT HEALTH

Transplanting is easy in the winter months. It shows good resistance to all kinds of pests or diseases. Pruning does not present any real difficulty as it sprouts very well. Its wood is light and very flexible. Branches should not be allowed to grow low or long to prevent damage or deterioration as a result of vandalism. Sometimes referred to as *Tamarix pentandra* in nurseries.

CHROMATIC CALENDAR

Datasheet (Foliage, Flowering and Fruiting season)

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Planting Pruning x

Treatments Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Girth	Height (cm)
BR	6-8	100-125
BR	8-10	125-150
BR	10-12	125-150
BR	12-14	150-175
BR	14-16	150-175
BR	16-18	150-175
BR	18-20	175-200
BR	20-25	175-200
CT	10-12	125-150
CT	12-14	150-175
CT	18-20	175-200
CT	20-22	175-200

TIPUANA

Tipuana tipu

BROADLEAF DECIDUOUS

PALO ROSA	ACÀCIA DE FLOR GROGA	TIPU TREE	TIPUANA
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE

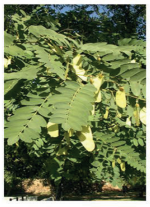
Shape	Height	Diameter
ROUND	10-15M	6-8M
Texture	**Shade**	**Root**
THICK	DENSE	OBLIQUE

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	FABALES
FAMILY:	LEGUMINOSAE

VARIETIES

MORPHOLOGY

Trunk	Bark: FISSURED	Color: BROWN/GRAY
Leaf	COMPOUND: YES	
SEMI DECIDUOUS	HARDNESS: SOFT	
SIZE: LEAF: 30CM	ARRANGEMENT: ALTERNATE	
LEAFLET: 3CM	VENATION: PINNATE	
COLOR: US: DARK GREEN	SHAPE: LANCEOLATE	
LS: LIGHT GREEN	MARGIN: ENTIRE	
TEXTURE: US: SMOOTH	APEX: EMARGINATED	
LS: TOMENTOSE	LEAF BASE: ROUNDED	
	PETIOLE: SHORT	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE AND TYPE: ♂/M 3CM PANNICLE (30CM)		Fragrance: NO
♀/F E2		
Fruit	Flowering: LEGUMES	Color: LIGHT BROWN
SIZE: 8CM	Edible: NO	Fruiting season: JUL -NOV
Growth	Rate: FAST	Longevity: 80-100 YEARS








ECOLOGY

Climate	Temperature: -9ºc	Drought resistant: MODERATE
ALTITUDE: 200-400M	Sun exposure: SUN/PARTIAL SHADE	Frost resistant: NO
IRRIGATION: MOD/LOW		
Soil	Texture: LOAMY	Salt resistant: NO
pH: 6-8.5	Drainage: MODERATE	Lime resistant: YES
FERTILITY: MODERATE		

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	MOD	LINE:	MOD
POLLUTION:	MODERATE	RIVERBANKS:	MOD	WINDBREAKER:	NO
WIND:	MODERATE	GROUPS:	MOD	ISOLATED:	MD

POINTS OF INTEREST

Native to the green forests of Bolivia and Argentina during summer months. Used as a street tree (in rows) or as an isolated specimen for its beautiful chromaticism and for the carpet effect when flowers and fruits fall to the ground. Its produces spectacular reddish yellow flowering.

SPACING: 5-7M

PLANTING AND PLANT HEALTH

Transplants are easy. Planting should take place in spring and summer. These plants are very hardy in most conditions. Pruning weakens the specimens and causes the eventual appearance of cavities. Shows good resistance to pests and diseases.

CALENDAR

Datasheet (Foliage, Flowering and Fruiting Season)

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Planting Pruning x

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizer

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
CT-30	16-18	180-200
CT-50	18-20	200-250
CT-50	20-25	250-300
CT-70	25-30	300-350
CT-140	30-35	300-350
CT-230	35-40	350-400
CT-230	40-45	400-450
CT-230	45-50	450-500
CT-230	45-50	450-500

ULMUS

BROADLEAF DECIDUOUS

Ulmus pumila L.

OLMO DE SIBERIA	OM DE SIBÈRIA	DWARF ELM	ORME DE SIBÉRIE
Spanish	VALENCIAN	English	French

STRUCTURE

Shape	Height	Diameter
OVAL	10-12	8-10
Texture	**Shade**	**Root**
MEDIUM	DENSE	HORIZONTAL

DIVISION:	SPERMATOPHYTE
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	URTICALES
FAMILY:	ULMACEAE

VARIETIES

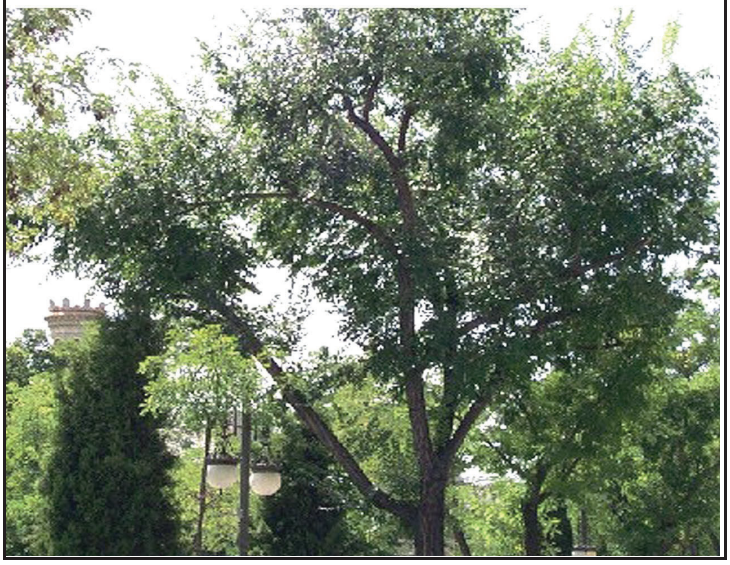
LATIFOLIA
BERARDII
PENDULA , ARBOREA
UMBRACULIFERA

MORPHOLOGY

Trunk	Bark: ROUGH	Color: GRAY
Leaf	COMPOUND: NO	
DECIDUOUS	HARDNESS: CORIACEOUS	
Size: LEAF: 5-8CM	ARRANGEMENT: ALTERNATE	
	VENATION: PINNATE	
	SHAPE: OVAL	
COLOR: US:LIGHT GREEN	MARGIN: SERRATE	
LS: GREEN	APEX: ACCUMINATE	
TEXTURE: US:SMOOTH	LEAF BASE: OBLIQUE	
LS: ROUGH	PETIOLE: SHORT	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
Size: 1-2CM	Flowering: GLOMERULE	Fragrance: NO
Fruit	Type: SAMARA (POD)	Color: LIGHT BROWN
Size: 2-3CM	Edible: YES	Fruiting season: APRIL-MAY
Growth	Rate: FAST	Longevity: 60-80 YEARS







ECOLOGY

Climate	Temperature: -23ºC,H1,Z4	Drought resistant: MODERATE
ALTITUDE: 200-1600	Sun exposure: SUN/PARTIAL SHADE	Frost resistant: YES
IRRIGATION: 500		
Soil	Texture: SANDY	Salt resistant: YES
pH: 4-8.5	Drainage: MODERATE	Lime resistant: YES
FERTILITY: MODERATE		

USES

Resistances		Applications			
COASTAL:	NO	SLOPES:	YES	LINE:	MOD
POLLUTION:	YES	RIVERBANKS:	MOD	WINDBREAKER	MOD
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

This species is native in Siberia and Northern China, in areas with a humid mountain climate. It has inconspicuous pink flowers and copious fruiting that when they fall form a carpet on the ground. The species spread like weeds throughout the tree. It can also be used in hedge rows. Suitable for erosion control, and as a windbreaker but not in cities or heavily visited parks and gardens. It should not be used as a street tree in cities due to poorly controlled growth and when pruned, cavities quickly appear causing branches to fall. The pruning process must be carefully monitored.

SPACING: 4-6M

PLANTING AND PLANT HEALTH

Its root system is quite superficial.This characteristic along with the raised crown that is created as a result of inadequate pruning, the tree is likely to tip over. Pruning the leaf wounds along the trunk that later form cavities will eventually cause branches to fall. It shows good resistance to Dutch elm disease however it is affected by elm leaf beetle, leafminer caterpillars and mealybugs. This species is greatly affected by wood fungi producing cavities in the trunk.

CHROMATIC CALENDAR

Datasheet (Foliage, Flowering and Fruiting Season)

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Planting Pruning x

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
BR	6-8	175-200
BR	8-10	175-200
BR	10-12	200-225
BR	12-14	200-250
BR	14-16	200-250
BR	16-18	250-300
BR	18-20	250-300
BR	20-25	300-350
BR	25-30	350-400
BR	30-35	400-450

Subchapter 2.3 Commercialization

COMMERCIALIZATION

- The presentation of the root system of broadleaf deciduous trees are as follows: bare root, root ball, container, and gypsum root ball
- With bare roots, the group of roots will have a minimum diameter equal to the median of the class or girth of the trunk x 3.
- The minimum diameter of the root ball will also be equal to the median of the girth or class of the trunk x 3. The depth of the root ball will be the diameter of the root ball x 0.7.
- For trees supplied in a container, the container will have a minimum volume related to the girth of the tree, according to the following table:

Girth or perimeter of the trunk in cm	Minimum volume of container (litres)
6-8	15
8-10	15
10-12	25
12-14	25
14-16	35
16-18	35
18-20	50
20-25	50

Table 2.3.1: Minimum volume of container in relation to girth of the trunk (Source: NTJ 08)

Each of these types has its planting dates and of course its prices. However, there are certain species of deciduous broadleaf trees that do not allow for bare root (see Table below):

Albizia julibrisim
Bauhinia sp.
Celtis sp.
Cercis siliquastrum
Chorisia speciosa
Erythrina sp.
Ginkgo biloba
Jacaranda mimosifolia
Lagerstroemia sp.
Tamarix sp.
Tipuana tipu

Table 2.3.2: Deciduous broadleaf species that do not allow for bare root transplants (Source: NTJ 08)



Figure 2.3.1:Transport of bare root trees ready for planting

Like the rest of the trees, we must choose the broadleaf species in the nursery according to their girth or their girth and height, but never only their height.

The dimensions and proportions of deciduous trees are similar to those for broadleaf evergreen trees. The table below displays the classification according to girth (trunk perimeter measured at a height of 1 meter from the ground):

Girth (perimeter of the trunk at a height of 1 meter over the ground level)	
6-8 cm	20-25 cm
8-10 cm	25-30 cm
10-12 cm	30-35 cm
12-14 cm	35-40 cm
14-16 cm	40-45 cm
16-18 cm	45-50 cm
18-20 cm	From 50 cm for every 10 cm

Table 2.3.3: Standard girths for broadleaf deciduous trees (Source: NTJ 08)

Plant health, documentation and labelling for broadleaf deciduous trees will follow the same guidelines as for broadleaf evergreen trees. Each tree will be marked with a coloured ribbon indicating its girth class:

6-8 cm blue	14-16 cm blue	25-30 cm blue	45-50 cm blue
8-10 cm yellow	16-18 cm yellow	30-35 cm yellow	50-60 cm yellow
10-12 cm red	18-20 cm red	35-40 cm red	60-70 cm red
12-14 cm white	20-25 cm white	40-45 cm white	70-80 cm white

Table 2.3.4: Labelling according to girth (Source: NTJ 08)

The project and the budget for planting must consider the planting season and the prices. If bare root presentation is chosen due to its low cost, there is a risk that the works will be delayed until spring and therefore casualties among deciduous trees might occur.

Late planting (late spring and summer) of deciduous trees even when planting them in root balls, containers, or gypsum root balls, should be carefully monitored. Deciduous trees do not cope with heat very well and even if planting is carried out meticulously, they might end up developing small roots resulting in a weak plant.

The trunks of the trees must be monitored in the nursery. They must be conical, the girth at the height of the neck of the plant should be greater than the girth at 1.30 m in height and the terminal bud of the tree should be present.

One factor to consider is the root pruning process in the nursery. Root pruning consists of making a pit in the soil at a certain distance around the tree in the nursery to prune its roots (without necessarily having to move it) to favour the growth of new roots. The root pruning process frequency will be:

- From 3 to 5 years, for trees with a girth of less than 20 cm
- From 5 to 6 years, for trees with a girth greater than 20

Girth (perimeter of the trunk) in cm	Nº minimum root pruning	Nº recommended
6-8	1	1
8-10	1	2
10-12	1	2
12-14	1	2
14-16	1 – 2	2
16-18	2	2
18-20	2	3
20-25	2	3
25-30	2 – 3	3
30-35	3	3
35-40	3 – 4	4
40-45	4	4
45-50 or more	4	4 or more

Table 2.3.5: Labelling according to girth (Source: NTJ 08)

For the rest of the considerations, consult the plant supply specifications.

Supply conditions for deciduous trees are similar to those of evergreen trees, except for trees supplied in bare root.

Deciduous trees supplied in bare root will have a well-branched root system, not excessively pruned, and without symptoms of dehydration. The crown will be clear maintaining the balance between the aerial part and the subterranean part.

PLANTING

Planting in its definitive place, is the tree's first stage of life and therefore it is essential to carry out this operation with great care.



Figure 2.3.2: Preparation of the root ball



Figure 2.3.3: Planting bare root

Depending on the presentation chosen, the planting period will differ and therefore must be respected (see Botanic Datasheets in subchapter 2.2).

Planting involves a series of operations:

- **Transportation of the plant from the nursery:**This should be carried out in optimal conditions avoiding any wind damage (whether cold or warm) to the plant.

- **Land preparation**: The steps are similar to those of evergreen trees.

- **Storage of the plant in the destination**: If planting cannot be carried out immediately, it must be stored adequately.



Figure 2.3.4: Bare root plants ready for planting



Figure 2.3.5: Drilling machine

- **Preparation of planting pits:** follow the same recommendations as those for broadleaf evergreen trees. A tree of average height needs at least 5m3 of soil for its roots.

- **Staking**: Minimum three wooden stakes are recommended. The aim is to protect the tree and avoid undesired movements or vandalism. The stakes must prevent movements that damage the young roots that are formed after planting or transplanting, as well as fix the small root balls so that trees do not overturn on windy days. The stakes must be placed away from the trunk to reduce chafing.



Figure 2.3.6: Staking of deciduous tree in a street

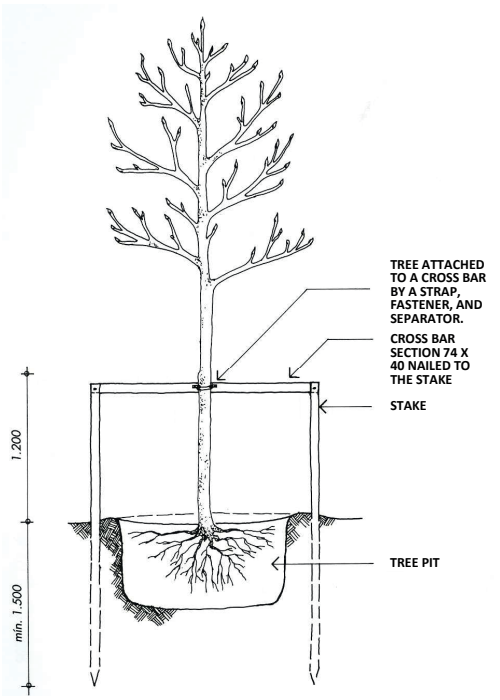


Figure 2.3.7: Staking

- **Straps:** Used to tie the tree to the stakes or cross bars. They must be biodegradable (disappear or stop fulfilling its function after the second year) so that the tree can sway in the wind and form an adequate root system. The strap must allow the movements and changes of the tree due to temperature and humidity and the movements of sap. Young trees have little bark and tie pressure can affect their growth (cambium formation).

- **Draining material:** Both gravel at the bottom and vertical or horizontal pipes, as indicated in the planting project.

- **Mixed substrate:** Have it ready to add once the drainage material, stakes, and plant have been placed.

- **Irrigation (tank, hydrant, dripper, etc.)**: Schedule an initial and rapid irrigation within the area. A circular soil ridge must be made around the tree to create a micro-basin. This ridge mut be located around the planting pit.



Figure 2.3.8: Irrigation ring with drip nozzles around the tree

- **Mulching**: 10 to 15 cm thick and away from the trunk. It protects the substrate from drying out and prevents weeds from developing. Its presence avoids brush cutters and lawnmowers from getting too close therefore protecting the tree.

Bare Root Tree Planting

Procedure to follow:

- Fill the pit up to the level on which the roots will settle.

- Remove damaged roots.

- If necessary, submerge the roots in a mixture of clay, organic fertilizer, water (root bath) or just water.

- Position the plant in the pit spreading the roots so that they are distributed as much as possible without bending. The plant will be centred and vertical. It should be at the same level as when it was planted in the nursery.

- If appropriate, place the stake or stakes.

- Fill the pit with soil mixed with mulch and compost/manure, gently tread the soil every 30 cm so it can settle.

- Level and form a soil ridge around the pit to create a micro-basin for irrigation purposes.

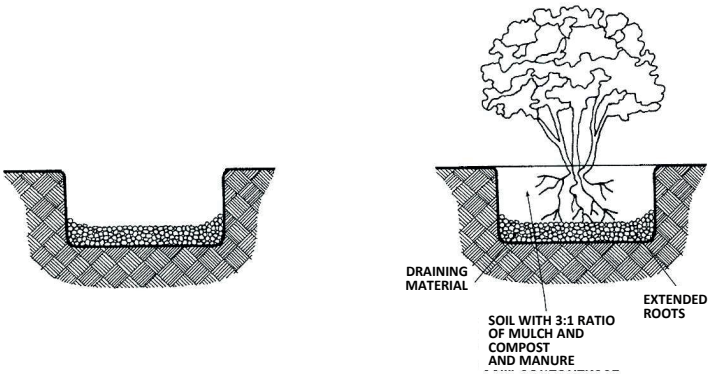


Figure 2.3.9: Bare root planting

Distances

Trees must be planted at least 9m from street crossings, 4.5 m from passageways and one-way roads, and no closer than 3m from a utility pole.

- Spacing between trees will be:
- Large trees: 12-18m
- Medium trees: minimum of 10 m
- Small trees: minimum of 6 m

Planting and Irrigation

At the time of planting, damaged roots, and roots with inadequate growth (coiled) will be removed.

Water every other day at 190-230 litres for average root ball sizes of 75-130 cm in well-drained soil and thereafter 380 litres weekly for the rest of the growing season. In the following season, continue watering only if the weather is dry and hot and, of course, be aware of wilting and leaf health.

FACTORS TO CONSIDER			PLANTING PERIOD											
Origin of species	**Climatic conditions**	**Type of supply**	J	F	M	A	M	J	J	A	S	O	N	D
Trees from Mediterranean or warm climates.	Mediterranean	Deciduous in bare root	■	■	■								■	■
		Deciduous in root ball	■	■	■	■	■					■	■	■
		Deciduous in container	■	■	■	■	■	■	■	■	■	■	■	■
From subtropical climates	Mediterranean	Deciduous in root ball			■	■	■	■			■	■	■	
		Deciduous in container	■	■	■	■	■	■	■	■	■	■	■	■
From Mediterranean or subtropical climates	Subtropical	Deciduous in root ball	■	■	■	■	■	■	■	■	■	■	■	■
		Deciduous in container	■	■	■	■	■	■	■	■	■	■	■	■

Preferred time: ■ Complementary time: ■

Table 2.3.6: Calendar for planting deciduous trees (Source: NTJ 08C)

Subchapter 2.4 Maintenance

Maintenance operations are similar to those described for evergreen trees in Chapter 1

Pruning

Pruning is the most important maintenance task to be carried out as it affects the safety of citizens. Maintenance pruning depends on the phase of the tree.

Young stage

- Carry out the formative pruning defined in the project: crown lifting, crown thinning, …
- It will be necessary to remove dry, broken, low, diseased branches.
- Remove unwanted growth (inwards, horizontal, crossed branches, etc.).
- Continue the typical formative pruning of each species.
- Continue with specific formative pruning to address specific problems encountered in each site: lampposts, balconies, power lines, …
- Eliminate labels, stakes (this is not a priority) and straps (this is critical) both to the trunk and those that hold the tree to the ground.

Adult stage

- Remove suckers (not all) with inadequate growth and shoots from the root or from the base of the trunk (young phase and early adulthood).
- Eliminate all dry branches.
- Remove diseased branches, torn, broken, …
- Eliminate old stubs, stumps, and malformations. The calluses of the wounds and developing branches should not be pruned and the already formed calluses should be respected.

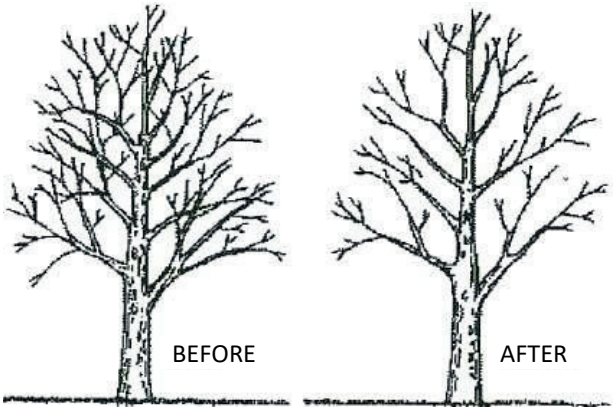


Figure 2.4.1: Thinning out the tree

- When two branches compete with each other, eliminate the weakest and worst-placed one (only in the young stage).
- Restore previous faulty pruning (young and adult).
- In case of excess weight in branches settled in cavities, once an evaluation is carried out, remove these branches by thinning and/or shortening.

- In case of friction between two branches, the weaker one should be eliminated or made lighter and, if they are similar and in good condition, they can be joined by means of a rigid screw or separated, thinned out, shortened, and strapped separately.
- Branches in 'V' (these forks are usually weak), so the weaker or worse placed branch of the two should be removed up to the meeting point of the branches (young stage).
- The lower twigs of trunks and branches should never be completely pruned, as secondary growth will not form correctly and as a result, roots will suffer and the tree will weaken.

Aeration

It is advisable to aerate the soil where the roots settle at some point in the tree's life. This will avoid the interruption of gaseous exchange in the root system due to the compaction of the soil as a consequence of trampling or rain.



Figure 2.4.2: Aeration of soil

Irrigation

It is recommended not to water a tree in its adult state. The root system will find the water-table or the places where rainwater accumulates to satisfy its needs.

The presence of an irrigation system makes the tree dependant on it forever. Therefore, if the tree species is well chosen, the tree will only need irrigation in the first years of its life and in very harsh summer months. Once the tree is established, it should not require extra water supply, and this should be considered in the maintenance budget.

When working with adult street trees, irrigation in tree pits should be avoided except in extreme droughts.



Figure 2.4.3: Temporary drip system after planting

Construction works

Construction works can greatly affect already established trees, especially broadleaf trees, with their large leaves exposed to the heat of summer.

Every construction work must have a specification that respects not only the tree trunk and its crown, but also its entire underground root system.

The trunk must be protected and at least all the soil that is under the projection of the crown of the tree itself, as this is where the root system is found. Soil compaction is by far the most common way construction works can damage, harm, and kill trees.

Earthworks

This process is by far the most harmful in the life of trees both when is implies the removal or addition of soil.

Soil removal implies root breakage, roots that dry up, and in broadleaf trees with a high evapotranspiration means decreased vitality and predictable death.

Adding soil is a common practice, however burying the trunk and its entire root system is equally harmful since the water will not reach the rootlets correctly and they will suffocate due to lack of oxygen.

3
CONIFERS

Chapter 3 CONIFERS

Subchapter 3.1 Introduction
Subchapter 3.2 Species (standard datasheet)
Subchapter 3.3 Commercialization
Subchapter 3.4 Maintenance
Subchapter 3.5 Bibliography

Subchapter 3.1 Introduction

Taxonomy

Conifers are seed plants (spermatophyte or phanerogamous division) belonging to the group of gymnosperms and therefore characterized by having:

- seminal primordia (ovules) naked on carpel leaves
- less reduced gametophytes than in angiosperms
- more primitive xylem and phloem than in angiosperms
- flowers are less differentiated than in angiosperms

In addition:

- **Arboreal habit**, or more rarely shrubby, with monopodic growth, the main axis grows more than the secondary ones, which allows them to surpass many other plants. In their places of origin, they can reach 80 m in height by 8 in trunk diameter. They have resin canals.

- **Numerous branches**, usually well arranged in superimposed whorls, mainly in young plants, and sometimes clearly differentiated into macroblasts (elongated branches) and brachyblasts (branches with very short internodes and limited growth). See figure 3.1.1

According to this definition, conifers can be ideal for: providing shade, hiding views, as a noise buffer etc.

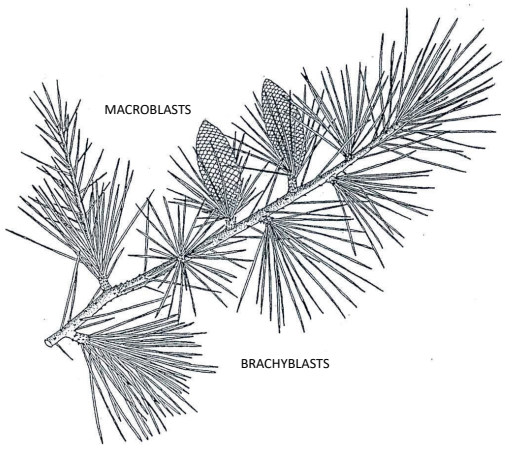


Figure 3.1.1: Macroblasts and brachyblasts in *Cedrus*. According to F.J. Esteras

- **Relatively small and numerous leaves**, generally evergreen (multi-annual) or rarely deciduous (*Larix, Taxodium*, etc.), ± coriaceous and ± xeromorphic (with thick cuticle, thick epidermis, hypodermis with thick walls and sunken stomata). They may be:

For their shape:

- acicular (*Pinus*). Fig.3.1.2-A
- scale-like (cupressaceae). Fig.3.1.2-B
- flat and lanceolate (*Podocarpus, Cephalotaxus*). Fig. 3.1.2-C and D.

By its position on the stem:

- alternate (*Podocarpus, Cephalotaxus*). Fig. 3.2-C and D.
- opposite (cupressaceae), being able to have:
  - "cupressoid" arrangement (*Cupressus*). Fig. 3.1.2-E.
  - "thuja" disposition (*Calocedrus*). Fig. 3.1.2-F.
- whorled (juniperoid, as in some *Juniperus*, the so-called "junipers"). Fig. 3.1.2-G.
- fasciculated (*Cedrus, Pinus*). Fig. 3.1.2-H and A.

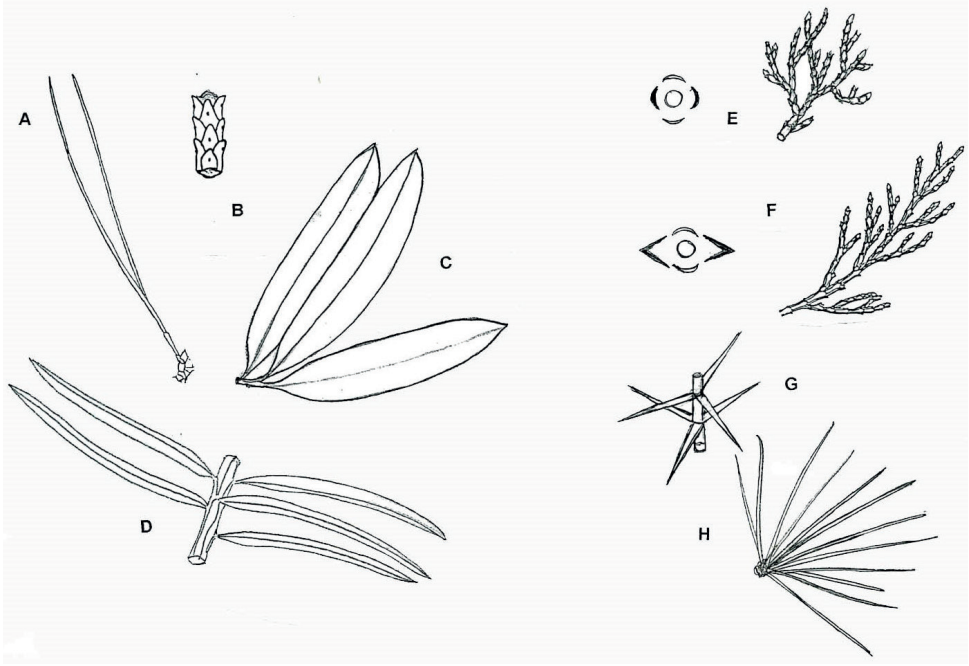


Figure 3.1.2: Shape and position of conifer leaves A) acicular (*Pinus*); B) scale -like (*Cupressus*); C) flat (*Podocarpus*); D) flat (*Cephalotaxus*); E) "cupressoid" position in *Cupressus*; F) "thuja" position in *Calocedrus*; G) whorled position, "juniperoid" leaf, in *Juniperus*; H) fasciculate leaf in *Cedrus*. According to F.J. Esteras.

- **Flowers are always unisexual**, with monoecious distribution or more rarely dioecious. (*Araucaria, Juniperus*), are strobiliform groups of special leaves (*sporophylls*).

- Strobilus ♂ (androstrobilus), solitary or in apical groups, made up of stamens (microsporophylls), of highly variable size and shape, and generally arranged in a helical fashion. Each sporophyll carries between 2-15 pollen sacs (sporangia) on its underside. Frequently the pollen (microspore) is anemogamous, it has 2 air vesicles to favor its buoyancy and therefore improve its dissemination capacity. See Figure 3.1.3.

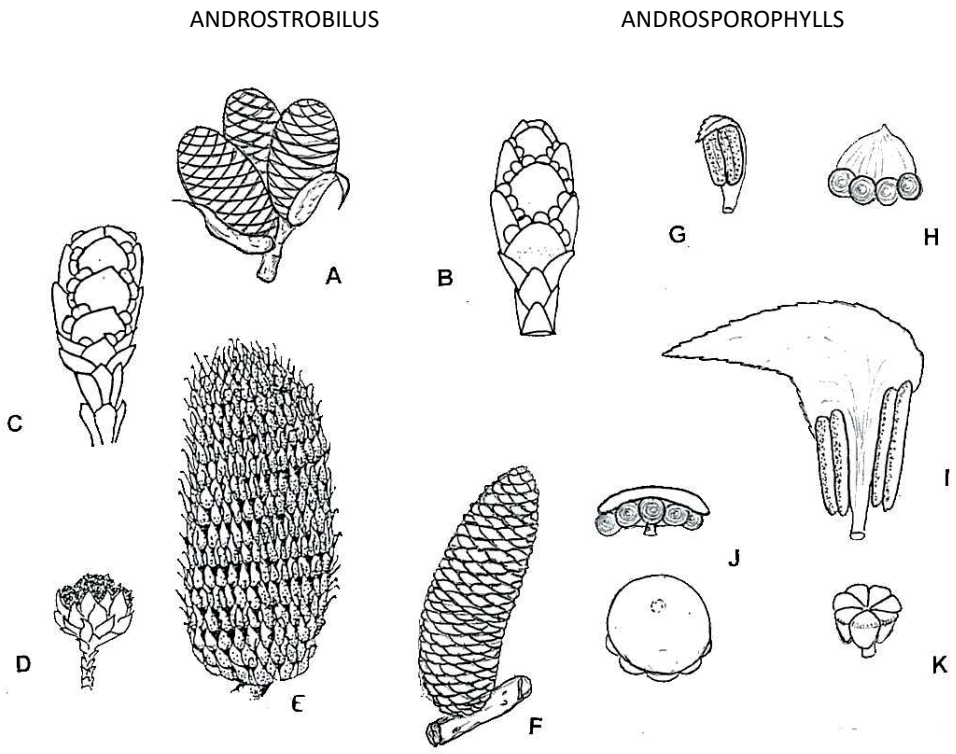


Figure 3.1.3: Androstrobilus and androsporophylls in conifers. A) *Pinus*; B) *Cupressus*; C) *Calocedrus*; D) *Cephalotaxus*; E) *Araucaria*; F) *Cedrus*; G) *Pinus*; H) *Junipers*; I) *Araucaria*; J) *Cupressus*; K) *Taxus*. E taken from Scagel. Those remaining are according to F.J. Esteras.

- Strobili ♀ (gynostrobili), solitary and axillary, woody or fleshy, dehiscent or not, erect with deciduous scales or pendulous with persistent scales, and made up of (see Figure 3.1.4):

  · Fruiting leaves (macrosporophylls) that are consumed in the formation of the seminal primordia (ovules).
  · Seminiferous scales or ovuliferous scales, which are responsible for protecting the ovules.
  · Tectrix bracts, in whose axil are located the seminiferous scales and the fruitful leave. These are arranged in a helix or in whorls and which are ± welded to the seminiferous scale (sometimes they are not even distinguishable). They can be included or exserted, depending on how they appear (or not) between the seminiferous scales. Figure 3.1.4. A' and D'.

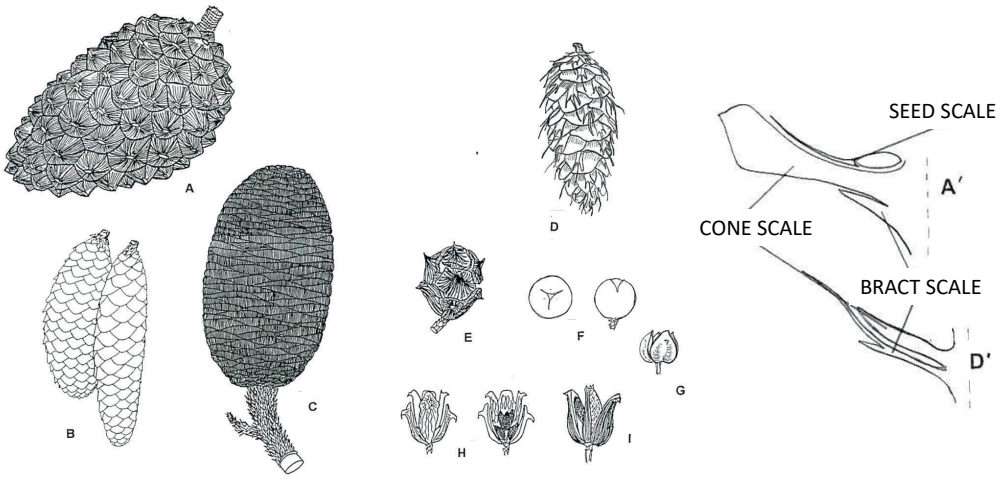


Figure 3.1.4: Gynostrobili in conifers: A) *Pinus pinea*; A') Detail of the cone in *Pinus*; B) *Spruce abies*; C) *Cedrus deodara*; D) *Pseudotsuga menziessii*; D) Detail of the cone in *Pseudotsuga*; E) *Cupressus arizonica*; F) *Juniperus oxycedrus* subsp. *macrocarp*; G) *Tetraclinis articulata*; H) *Platyclados orientalis*; I) *Calocedus decurrens*; According to F.J. Esteras.

- Seeds, generally with a woody external coat coat), more rarely fleshy (Cephalotaxus) or even protected by an "aril" (*Taxus*) or "epimacium" (Podocarpus), can have wings (*Abies, Pinus*) or not (*Cupressus*) and have a variable number of cotyledons. See figure 3.1.5

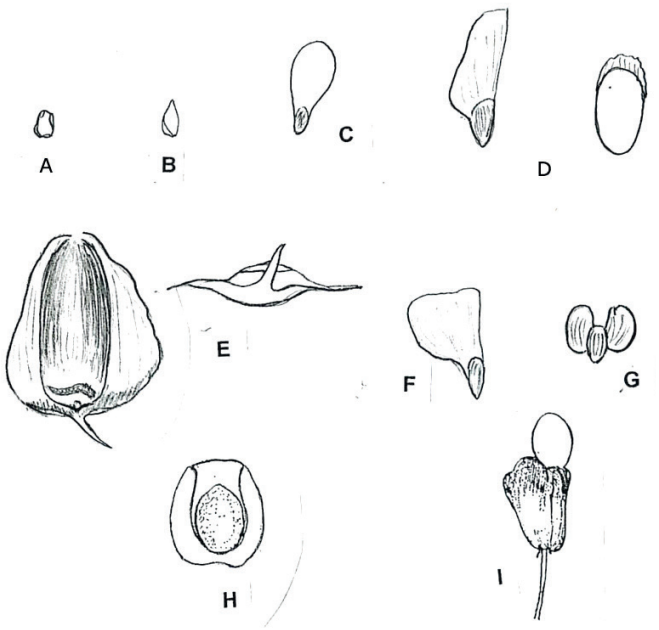


Figure 3.1.5: Coniferous seeds: A) *Cupressus*; B) *Platyclades*; C) *Spruce*; D) *Pinus*; E) *Araucaria*; F) *Cedrus*; G) *Tetraclinis*; H) *Taxus;* I) *Podocarpus*. According to F.J. Esteras.

Subchapter 3.2 Species

This chapter describes **35 species of conifers**, used in gardening and landscape architecture, selected according to their ornamental use, their botanical interest, or other characteristics which make them of special interest in this chapter.

Below is a guide table with the parameters that have been used to describe each species See Table 3.2.1.

PARAMETERS AND VALUES USED IN THE BOTANIC DATASHEET	
TAXONOMY	
TAXONOMIC RANKS	DIVISION, SUBDIVISION, TYPE, ORDER, FAMILY
VARIETIES	OTHER VARIETIES OF INTEREST
STRUCTURE	
SHAPE	GLOBE-SHAPED, ROUNDED, OVAL, COLUMNAR, CONE, EXTENDED, IRREGULAR, PARASOL, FAN-SHAPED, HORIZONTAL, PALMIFORM, PENDULAR, WEEPING
HEIGHT	IN METERS OR CENTIMETERS
DIAMETER	IN METERS OR CENTIMETERS
TEXTURE	LEAVES>10CM= COARSE. LEAVES OR LEAFLETS BETWEEN 2-10CM= MEDIUM. LEAVES OR LEAFLETS <2CM= FINE
SHADE	LIGHT, FULL, DENSE
ROOT	TAPROOT, FASCICULATE, OBLIQUE, HORIZONTAL, AERIAL, ADVENTITIOUS
MORPHOLOGY	
TRUNK	
BARK	SMOOTH, VERTICAL FISSURES, LONGITUDINAL FISSURES, DIAGONAL FISSURES; ROUGH, SCALY, CORKY WITH PLATES
COLOR OF BARK	GREY; GREEN/GREY OR BLUE/GREY. SILVER; LIGHT GREEN, YELLOW, LIGHT BROWN, DARK, GREEN, RED; RED. PURPLE; YELLOW; BLACK; MARBLED; TWO-TONED; THREE-TONED; LIGHT GREY, DARK GREY
LEAF	
TYPE	EVERGREEN, SEMI-EVERGREEN, DECIDUOUS, SEMI-DECIDUOUS
SIZE OF LEAF	LENGTH IN CM
SIZE OF LEAFLET	LENGTH IN CM
COLOR OF UPPER SIDE (US)	PALE GREEN, LIGHT GREEN, DARK GREEN, BLUE/GREEN, GREY, PURPLE; PALE; YELLOW; VARIEGATED
COLOR OF LOWER SIDE (LS)	GREEN, LIGHT GREEN, DARK GREEN, BLUE/GREEN, GREY PURPLE; PALE; YELLOW; VARIEGATED; RUST COLORED; SILVER
TEXTURE OF UPPER SIDE (US)	SHINY, ROUGH, GLABROUS, TOMENTOSE, HAIRY, ROUGH, SCALY, VISCOSE
TEXTURE OF LOWER SIDE (LS)	SHINY, ROUGH, GLABROUS, TOMENTOSE, HAIRY, ROUGH, SCALY, VISCOSE
COMPOUNDS	NO COMPOUND LEAVES YES. COMPOUNDS: IMPARIPINNATE, PARIPINNATE, TRIFOLIATE, PALMATE, PALMIFORM, PALM, PINNATE, BIPINNATE
HARDNESS	CORIACEOUS, SOFT, SUCCULENT, HARD
ARRANGEMENT	OPPOSITE, ALTERNATE, WHORLED, VERTICAL FASICULATE
VENATION	PINNATE, PALMATE, PARALLEL, RETICULATE, ARCUATE, A3 MAIN VEINS
SHAPE	ROUNDED, LINEAR, LANCEOLATE, FALCATE, OVAL, OBLONG, ELLIPTIC, DELTOID, RHOMBOID, SPATULATE, ACICULAR GROUPS 2, ACICULAR GROUPS 3, ACICULAR GROUPS 5, ACICULAR GROUPS, ACICULAR IN 1 PLANE, ACICULAR IN SPIRAL, SCALY, PALM 7 LOBES, PALM 5 LOBES- PALM 3 LOBES, POLYMORPHIC; PANDURIFORM; PINNATIFID, SAGITATE, RENIFORM, CORDATE, ORBICULAR, OBOVATE, OBLANCEOLATE, LIRATE, HASTATE, RUNCINATE
LEAF MARGIN	WHOLE, CILIATE, DENTATE, CRENATE, SERRATED, DOUBLE SERRATED, LOBED, DOUBLE LOBED
APEX	ACUTE, CUSPIDATE, OBTUSE, RETUSE, MUCRONATE
LEAF BASE	ATTENUATE, CORDATE, ROUNDED, ASYMMETRIC, CUNEATE, OBLIQUE, SAGITATE, HASTATE
PETIOLE	LONG, SHORT, SESSILE, WIDE
STROBILUS	
SIZE	MALE/FEMALE STROBILUS: (CM OR MM)
TYPE	UNISEX, HERMAPHRODITE, STERILE
DISTRIBUTION	MONOECIOUS, HERMAPHRODITE, POLYGAMOUS

FLOWERING	ESTROBILUS male or hermaphrodite: COLOR OF INFLORESCENCE, TYPE OF INFLORESCENCE ESTROBILUS female:), COLOR OF INFLORESCENCE, TYPE OF INFLORESCENCE
FRAGRANCE	YES, NO, UNPLEASANT
FRUIT	
SIZE	FEATURES OF THE CONE OR GALBULUS (IN CMS)
TYPE	CONE GALBULUS, EPIMACHIUM, DRUPE, WITH ARIL
EDIBLE	YES (Part), NO
COLOR	WHEN MATURE
FRUITING SEASON	INTERVAL OF MONTHS: JAN - DEC
DEVELOPMENT	
GROWTH	SLOW, VERY SLOW, MEDIUM, FAST, VERY FAST
LONGEVITY	<25 YEARS, 25 YEARS, 50 YEAR, 75 YEARS, 100 YEARS, 150 YEARS, 200 YEARS, 250 YEARS, 300 YEARS, >300 YEARS
ECOLOGY	
CLIMATE	
ALTITUDE	ADEQUATE ALTITUDE FOR THE PLANT: interval of sea level altimetry
IRRIGATION	++HIGH, MODERATE, LOW, ++LOW (very low/low < 350 mm; Very high/high > 750 mm)
MINIMUM TEMPERATURE AND INTERNATIONAL CLASSIFICATION	MINIMUM TEMPERATURES: DEGREES CELSIUS CLASSIFICATION ACCORDING TO EUROPEAN REGULATION: (SEE MAP) G2____ HOT GREENHOUSES IN SOUTHERN EUROPE G1____ COLD GREENHOUSES IN SOTHERN EUROPE H5____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM 0ºC TO -5ºC H4____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM -5ºC TO -10ºC H3____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM -10ºC TO -15ºC H2____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM -15ºC TO -20ºC H1____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM -20 CLASSIFICATION INTERNATIONAL REGULATIONS. ACCORDING TO MINIMUM TEMPERATURE RANGES Z1____SUPPORT MINIMUM TEMPERATURES OF -50ºC Z2____ SUPPORT MINIMUM TEMPERATURES OF -50ºC TO -40ºC Z3____ SUPPORT MINIMUM TEMPERATURES OF -40ºC TO -30ºC Z4____ SUPPORT MINIMUM TEMPERATURES OF -30ºC TO -20ºC Z5____ SUPPORT MINIMUM TEMPERATURES OF -20ºC TO -10ºC Z6____ SUPPORT MINIMUM TEMPERATURES OF -10ºC TO -0ºC Z7____ SUPPORT MINIMUM TEMPERATURES OF -0ºC TO 10ºC Z8____ SUPPORT MINIMUM TEMPERATURES OF 10ºC TO 20ºC Z9____ SUPPORT MINIMUM TEMPERATURES OF 20ºC TO 30ºC Z10___ SUPPORT MINIMUM TEMPERATURES OF 30ºC TO 40ºC Z11___ SUPPORT MINIMUM TEMPERATURES OF MORE THAN 40ºC
EXPOSURE TO SUNLIGHT	FULL SUN, FULL SHADE, SHADE, PART SHADE
DROUGHT RESISTANCE	YES, NO, MODERATE
FROST RESISTANCE	YES, NO, MODERATE
SOIL	
PH OPTIMUM	ALL TYPES- NEUTRAL, ACID, BASIC (OR INTERVAL OF PH)
LEVEL OF FERTILITY	FERTILE, AVERAGE, POOR
TEXTURE OF SOIL	SAND, SILT OR LOAM, CLAY, SANDY/ LOAMY, CLAYEY/ LOAMY, ALL TYPES
DRAINAGE	HIGH, MODERATE, LOW
RESISTANCE TO SEA	YES, NO, MODERATE
RESISTANCE TO LIME	YES, NO, MODERATE

USES	
RESISTANCES	
COASTAL	1ST LINE, 2ND LINE, NO.
POLLUTION	HIGH, MODERATE, LOW
WIND	HIGH, MODERATE, LOW
APPLICATIONS	
IN SLOPES **IN LINES** **ON RIVERBANKS** **AS WINDBREAKERS** **IN HEDGES** **IN FIELD BORDERS** **IN GROUPS** **ISOLATED**	YES, NO
SPACING	MINIMUM RECOMMENDED DISTANCE BETWEEN PLANTS: (IN M). Since the use is diverse and variable, these measurements are simply a guideline
PLANTING AND PLANT HEALTH	
PLANTING AND PLANT HEALTH	TRANSPLANT PLANT HEALTH: Problems (pathogens, deficiencies…) symptoms and treatments
CALENDARS	
CHROMATIC CALENDAR	FOLIAGE, FLOWERING, FRUITING SEASON: the color white represented with grey or black cell
CULTIVATION CALENDAR	SOWING, PLANTING, PRUNING
TREATMENTS CALENDAR	FUNGICIDES, PESTICIDES, FERTILIZERS
COMMERCIALIZATION	
PRESENTATION	BR (BARE ROOT); CT (CONTAINER or POT (size in LITERS), CE (ROOT BALL); CEY (ROOT BALL IN GYPSUM), ROOT BALL IN MESH
DIMENSION OF THE CONTAINER	LITERS
PLANT HEIGHT	METERS OR CENTIMETERS OR YEARS
TRUNK HEIGHT	METERS OR CENTIMETERS

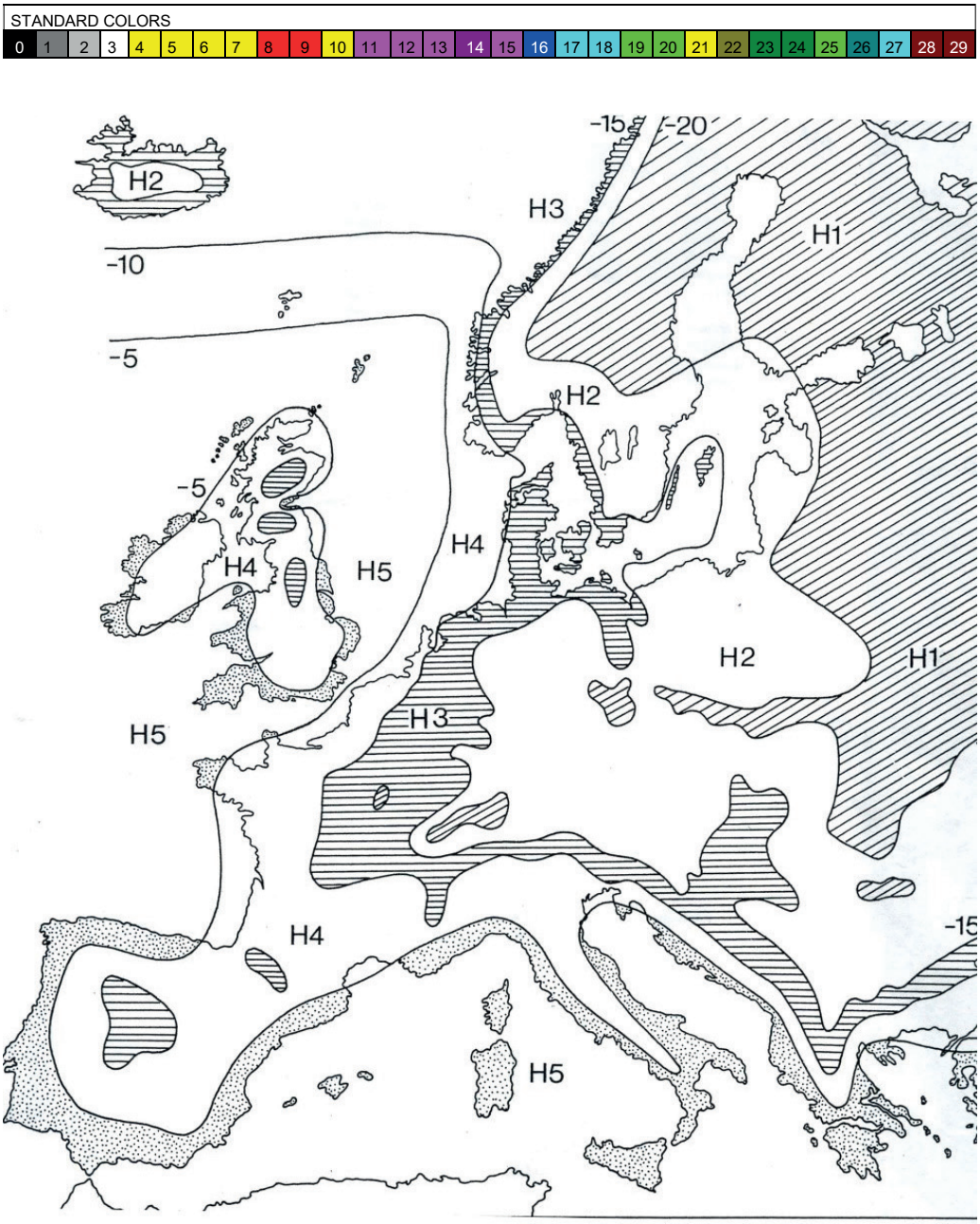


Figure 3.2.1: Thermal classification map according to European regulations

Taxonomy of the described conifers

The conifers, whose general characteristics have already been presented in Subchapter 3.1, are distributed in 7 families, some of which (*Taxaceae*) of controversial inclusion, whose composition, distribution and characteristics are included in Table 3.2.2. The described species include those genera and species that are most frequently marketed in Spain for ornamental purposes.

Family / Characteristics	Subfamily	Genus	Species	Sheet
ARAUCARIACEAE ● evergreen trees ● monoecious (gen.) ● whorled branching ● woody cone, erect, with deciduous scales				
		Agathis (13)		
		Araucaria (19) ● whorled branches ● seed fused to the scale	***Araucaria araucana*** ***Araucaria bidwillii*** ***Araucaria columnaris*** ***Araucaria heterophylla***	Yes Yes
PINACEAE ● evergreen trees. (gen.) ● monoecious ● woody cone, erect or pendulous, with deciduous or persistent scales ● winged seed				
	Abietoideae ● all leaves are alternate	*Abies* (50) ● leaf ± flat ● erect cone with deciduous scales	***Abies alba*** ***Abies concolor*** ***Abies koreana*** ***Abies x masjoani*** ***Abies nobilis*** ***Abies nordmanniana*** ***Abies pinsapo***	 Yes
		Spruce (40) ● leaf with rhomboid section ● pendulous cone with persistent scales	***Picea abies*** ***Picea engelmannii*** ***Picea glauca*** ***Picea omorika*** ***Picea orientalis*** ***Picea pungens***	Yes Yes
		Pseudosuga (6) ● almost flat leaf ● pendulous cone with persistent scales and trifid bracts	***Pseudosoga menziesii***	Yes
		Tsuga (10)		
	Laricoideae ● alternate and fasciculate leaves	*Cedrus* (3) ● evergreen, stiff ● erect cone with deciduous scales, duration 2-3 years	***Cedrus atlantica*** ***Cedrus deodara***	Yes Yes
		Larix (12) ●deciduous, soft ● erect cone with persistent scales, annual duration.	***Larix decidua*** ***Larix kaempferi***	 Yes
	Pinoideae ● Fasciculated leaves surrounded by a membranous sheath.	*Pinus* (100) ● leaves in groups of 2, 3 or 5. ● cone ± reflexes with persistent scales	***Pinus brutia*** ***Pinus canariensis*** ***Pinus densiflora*** ***Pinus halepensis*** ***Pinus leucodermis*** ***Pinus mugo*** ***Pinus nigra*** ***Pinus parviflora*** ***Pinus pinaster*** ***Pinus pinea*** ***Pinus radiata*** ***Pinus strobus*** ***Pinus sylvestris*** ***Pinus uncinata*** ***Pinus wallichiana***	Yes Yes Yes Yes Yes Yes Yes

TAXODIACEAE ● evergreen and resinous trees.(gen.), ● monoecious ● woody cone with persistent or deciduous scales, (resinous) ● winged seeds				
		Cryptomeria (1)	***Cryptomeria japonica***	Yes
		Sequoia (1)	***Sequoia sempervirens***	
		Sequoiadendron (1)	***Sequoiadendron giganteum***	Yes
		Taxodium (2)	***Taxodium distichum***	Yes
CUPRESACEAS ● trees and shrubs: evergreen, diverse sizes; resinous. ● monoecious (gen.) ● woody and dehiscent cone or fleshy and indehiscent ● seeds with or without wings				
		Calocedrus (3) ● *thuja* leave sheet ● woody cone that opens ● winged seed	***Calocedrus decurrens***	Yes
		Chamaecyparis (6) ● cupresoid sheet ● woody cone that opens with peltate scales ● seed with rudimentary wing	***Chamaecyparis lawsoniana*** ***Chamaecyparis nootkatensis*** ***Chamaecyparis obtusa*** ***Chamaecyparis pisifera*** ***Chamaecyparis thuyoides***	Yes
		X *Cupresocyparis* (1) ● *thuja* leave	***X Cupresocyparis leylandii***	Yes
		Cupressus (15) ● cupresoid sheet ● woody cone that opens with peltated scales ● seed with rudimentary wing	***Cupressus arizonica*** ***Cupressus glabra*** ***Cupressus macrocarpa*** ***Cupressus sempervirens***	Yes Yes Yes Yes
		Juniperus (60) ● often dioecious ● juniperoid (juniper) or cupresoid (sabina) leaf ● fleshy and indehiscent cone	***Juniperus chinensis*** ***Juniperus communis*** ***Juniperus conferta*** ***Juniperus horizontalis*** ***Juniperus x media*** ***Juniperus oxycedrus*** ***Juniperus phoenicea*** ***Juniperus procumbens*** ***Juniperus sabina*** ***Juniperus scopulorum*** ***Juniperus squamata*** ***Juniperus thurifera*** ***Juniperus virginiana***	Yes Yes Yes Yes
		Platyclados (1) ● *thuja* leaf ● dehiscent cone with non-peltate scales ● wingless seed	***Platycladus orientalis***	Yes

		Tetraclinis (1) ● *thuja* leaf ● dehiscent cone with non-peltate scales ● seed with two wings	***Tetraclinis articulata***	Yes
		Thuja (5) ● *thuja* leaf ● dehiscent cone with non-peltate scales ● seed with one wing	***Thuja occidentalis*** ***Thuja plicata***	
PODOCARPACEAE ●trees or shrubs (evergreen, somewhat resinous). ● dioecious (gen.) ● leaves with 1 nerve from scale-shaped to linear-oblong ● drupaceous seeds with fleshy receptacle.				
		Dacrydium (20)		
		Podocarpus (100)	***Podocarpus macrophyllus*** ***Podocarpus nerifolius*** ***Podocarpus salignus***	Yes
CEFALOTAXACEAE ● shrubs or trees (evergreen, little resinous) ● dioecious ● flattened linear leaves with 1-nerve ● drupaceous seeds				
		Cephalotaxus (7) ● dioecious usually ● "drupaceous" seed	***Cephalotaxus harringtonia*** **var.** ***drupacea***	Yes
TAXACEAE ● trees and shrubs (evergreen, aromatic, and not resinous). ● dioecious ● flat linear sheets with 1 central nerve ● seed surrounded by a fleshy aril.				
		Taxus (9) ● dioecious ● seed with aril	***Taxus baccata*** ***Taxus x media***	Yes

Table 3.2.1. List of families and genus included in conifers. (Due to space limitations, the abbreviation of the botanist has been omitted from the names of the species). The number of recognized species in each genus is indicated in parentheses

List of the species described in the datasheets

Each Botanic datasheet contains information about the name, botanical characteristics, ecological needs, uses, cultivation, phenological stages, commercialization, and other characteristics of each described species. This information is complemented with a selection of photographs, in which both the general appearance of the species and different details of interest for its recognition are displayed.

LIST OF THE CONIFER SPECIES DESCRIBED IN THE BOTANIC DATASHEET

1. *Abies pinsapo*
2. *Araucaria araucana*
3. *Araucaria heterophylla*
4. *Calocedrus decurrens*
5. *Cedrus atlantica*
6. *Cedrus deodara*
7. *Cephalotaxus harringtonia*
8. *Chamaecyparis lawsoniana*
9. *Cryptomeria japonica*
10. *Cupressus arizonica*
11. *Cupressus macrocarpa*
12. *Cupressus sempervirens*
13. *Juniperus communis*
14. *Juniperus horizontalis*
15. *Juniperus oxycedrus*
16. *Juniperus thurifera*
17. *Larix decidua*
18. *Picea abies*
19. *Picea pungens*
20. *Pinus brutia*
21. *Pinus canariensis*
22. *Pinus halepensis*
23. *Pinus nigra*
24. *Pinus pinaster*
25. *Pinus pínea*
26. *Pinus sylvestris*
27. *Pinus wallichiana*
28. *Platycladus orientalis*
29. *Podocarpus macrophylla*
30. *Pseudotsuga menziesii*
31. *Sequoiadendron giganteum*
32. *Taxus baccata*
33. *Taxodium distichum*
34. *Tetraclinis articulata*
35. *X Cupressocyparis leilandii*

ABIES

CONIFER

Abies pinsapo Boiss.

PINSAPO (SPANISH) | AVET DE RONDA (VALENCIAN) | SPANISH FIR (ENGLISH) | SAPIN D'ANDALOUSIA (FRENCH)

STRUCTURE		
Shape: CONICAL/OVAL	Height: 10-20 M	Diameter: 5-10 M
Texture: FINE	Shade: FULL	Root: TAPROOT

DIVISION:	SPERMATOPHYTES
SUBDIVISON:	CONIFEROPHYTAS
TYPE:	PINOPSIDAS
ORDER:	PINALES
FAMILY:	PINACEACE

VARIETIES

GLAUCA

MORPHOLOGY		
Trunk	Bark: FISSURED	Color: DARK GREY
Leaf	COMPOUND: NO	
	HARDNESS: CORIACEOUS	
EVERGREEN (10 YEARS)	ARRANGEMENT: ALTERNATE(SPIRAL) BOTTLEBRUSH	
SIZE: 10-15x2.5MM	VENATION: ACICULATE	
LEAFLETS: NO	SHAPE: ACICULAR	
COLOR: US:DARK GREEN	MARGIN: ENTIRE	
LS:STRIPED GREEN	APEX: ACUTE	
TEXTURE: US: GLOSSY	LEAF BASE: ELONGATE	
LS: GLOSSY	PETIOLE: SESSILE/SUB-SESSILE	
Strobilus	Sex: UNISEXUAL	Distribution: MONOCEIOUS
SIZE AND TYPE: ♂/M 15 MM	PURPLE-SPIKE	Fragrant: NO
♀/F 25 MM	DARK GREEN -SOLITARY	
Fruit	Type: CONE(1)	Color: DARK RED
SIZE: 10-14x3-4 CM	Edible: NO	Fruiting season: SEPT-OCT
Growth	Rate: SLOW	Longetivity: < 150 YEARS

ECOLOGY		
Climate	Temperature: H-2	Drought resistant: YES
ALTITUDE: 600-1800	Sun exposure: SUN/SHADE	Frost resistant: YES
IRRIGATION: MODERATE		
Soil	Texture: LOAMY/SANDY	Salt resistant: NO
pH: 6.5 - 8.5	Drainage: HIGH	Lime resistant: YES
FERTILITY: MODERATE		

USES				
Resistances		Applications		
COASTAL:	2ND LINE	SLOPES:	YES	LINE: NO
POLLUTION:	NO	RIVERBANKS:	NO	WINDBREAKER: YES
WIND:	YES	GROUP:	YES	ISOLATED: YES



POINTS OF INTEREST

Native to South of Spain (Mountain areas of Cadiz and Malaga). Main branches are whorled and almost horizontal. The basal ones detach with age, leaving the trunk clean. Twigs in groups of 2-3. Flat leaves, radially arranged (in "pipe cleaners" and older ones in " bottlebrush" due to deformation, sometimes frostlike white/pale green on both surfaces. Oblong-cylindrical cones, erect, deciduous scales and bracts not exserted. Winged seed. This is great ornamental species due to its regular size, colorful foliage and hardy. It has some cultivars of interest, variable in size and foliar color. Interesting for reforestation. Its wood is not very resinous although more than that of a fir tree. Care must be taken as pollen can cause allergies. Generally does not need pruning.

SPACING: 7-8 m.

PLANTING AND PLANT HEALTH

Propagation by seed in the spring. Properly preserved seeds maintain their germinative power for 1-2 years. Transplanting can be delicate and should be carried out in the winter. This species is prone to pests (insects) and cryptogamic diseases.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Planting Pruning X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Height (cm)	Topiary shape
1/2 years	15/25	
C 28	100/125/150	
C 40	150/175/200	
C100	200/250	

ARAUCARIA

CONIFER

Araucaria araucana (Molina) Kock.

PINO ARAUCANO (SPANISH) · ARAUCÀRIA DE XILE (VALENCIAN) · MONKEY PUZZLE TREE (ENGLISH) · ARAUCARIS DU CHILI (FRENCH)

STRUCTURE		
Shape: OVAL/SPREADING	Height: 20-25 M	Diameter: 8-10 M
Texture: MEDIUM	Shade: PARTIAL	Root: TAPROOT/HORIZONTAL

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	CONIFERPHYTAS
TYPE:	PINOSIDAS
ORDER:	PINALES(CONIFERS)
FAMILY:	ARAUCARIACEAE

VARIETIES

MORPHOLOGY

Trunk	Bark: FISSURED/HORIZONTAL	Color: BROWN-RED
Leaf	COMPOUND: NO	
	HARDNESS: CORIACEOUS	
EVERGREEN	ARRANGEMENT: ALTERNATE(SPIRAL)	
SIZE: 30-50x15 MM	VENATION: ACICULAR	
LEAFLETS: YES	SHAPE: OVAL/LACEOLATE	
COLOR: US:DARK GREEN	MARGIN: ENTIRE	
LS:DARK GREEN	APEX: CUSPIDATE	
TEXTURE: US: GLOSSY	LEAF BASE: ACUMINATE	
LS: GLOSSY	PETIOLE: SHORT	
Strobilus	Sex: UNISEXUAL	Distribution: DIOECIOUS
SIZE AND TYPE: ♂/M 6-10 CM YELLOW-SOLITARY		Fragrant: NO
♀/F 8-10 CM GREEN-SOLITARY		
Fruit	Type: CONE (2 YEARS)	Color: BROWN-GRAY
SIZE: 8-12 x 10 CM	Edible: YES (THE SEED)	Fruiting season: OCT-DEC
Growth	Rate: SLOW	Longevity: >400 YEARS









ECOLOGY

Climate	Temperature: 10 to 15º C	Drought resistant: NO
ALTITUDE: 500-1500	Sun exposure: SUN/PARTIAL SHADE	Frost resistant: YES
IRRIGATION: HIGH		
Soil	Texture: LOAMY	Frost resistant: NO
pH: 6 - 7.5	Drainage: MODERATE	Lime resistant: NO
FERTILITY: MODERATE		

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	NO	LINE:	NO
POLLUTION:	NO	RIVERBANKS:	NO	WINDBREAKER:	NO
WIND:	YES	GROUPS:	NO	ISOLATED:	YES

POINTS OF INTEREST

Native to Chile and Argentina. Characteristic crown, especially in old specimens, with whorled branches, deciduous at the base and arching upwards in its apical area. Regrowing root. Generally dioecious although occasionally monoecious individuals have been detected. Flat leaves hide the branch. Spherical cones, upright, deciduous scales. Oblong seeds fused to the scale, without wings, with a mucron apical, 2.5-4 cm. Its seeds are edible. The yellowish wood is of interest as it is easy to work (furniture, construction, paper pulp,...). Its resin is also of interest: "resin from Chile". Care must be taken with its leaves as they can pose risks. Usually pruning is not needed and in some cases not tolerated.

SPACING: ISOLATED. THIS WILL HIGHLIGHT THE SYMMETRY OF ITS CROWN

PLANT AND PLANT HEALTH

Propagation by seed in the spring or by apical cutting or graft. Seeds loose their germinative power after 2-3 months and therefore should be kept in suitable conditions (hermetically sealed containers; RH 60-70% and 3-6 ºC.). This will ensure its germinative capacity for 6-12 months. Germination lasts between 20-30 days. Seedlings are very sensitive to cold and must be protected during the first years. Transplanting can be delicate (spring and autumn). Not prone to pests, however the presence of fungi in the soil must be monitored.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Planting Pruning X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Height (cm)	Topiary shape
CT 2.5	15/30	
CT 3	30/40	
CT 7	50/60	
CT15	60/80	
CT25	80/100	
CT 40	100/125	
Rootball in mesh	125/150/175/200	

ARAUCARIA

Araucaria heterophylla (Salisbury) Franco

CONIFER

PINO DE NORFOLK (SPANISH) | ARBRE DE PISOS (VALENCIAN) | NORFOLK-ISLAND TREE (ENGLISH) | PINO DE NORFOLK (FRENCH)

STRUCTURE		
Shape: CONICAL	Height: 15-20 M	Diameter: 8 M
Texture: FINE	Shade: PARTIAL	Root: TAPROOT/HORIZONTAL

DIVISION:	SPERMATOPHYTES
SUBDIVISIOIN:	CONIFERPHYTAS
TYPE:	PINOSIDAS
ORDER:	PINALES (CONIFERS)
FAMILY:	ARAUCARIACEAES

VARIETIES

MORFPHOLOGY		
Trunk	Bark: SCALY/ROUGH	Color: DARK BROWN
Leaf: EVERGREEN; SIZE: LEAF: 1.2-1.6 CM, LEAFLETS: YES; COLOR: US: MEDIUM GREEN, LS: MEDIUM GREEN; TEXTURE: US: GLOSSY, LS: GLOSSY	COMPOUND: NO; HARDNESS: CORIACEOUS; ARRANGEMENT: ALTERNATE(SPIRAL); VENATION: ACICULAR; SHAPE: OVAL/LANCEOLATE; MARGIN: ENTIRE; APEX: ACUTE; LEAF BASE: WIDE; PETIOLE: SESSILE	
Strobilus	Sex: UNISEXUAL	Distribution: MONOECIOUS
SIZE AND TYPE: ♂/M 5-6 CM LIGHT RED/SOLITARY; ♀/F E2 GREEN/SOLITARY		Fragrant: NO
Fruit: SIZE: 10-14 x 9-12	Type: CONE(2 YEARS)	Color: LIGHT GRAY
	Edible: NO	Fruiting season: OCT-DEC
Growth	Rate: MEDIUM	Longevity: >150 YEARS

ECOLOGY		
Climate: ALTITUDE: 0-300; IRRIGATION: MODERATE	Temperature: 0 to -5ºC	Drought resistant: MODERATE
	Sun exposure: SUN/PARTIAL SHADE	Frost resistant: NO
Soil: pH: 6.5-7.5; FERTILITY: MOD/POOR	Texture: LOAMY	Salt resistant: NO
	Drainage: HIGH	Lime resistant: NO

USES					
Resistances		Applications			
COASTAL:	1ST LINE	SLOPES:	NO	LINE:	NO
POLLUTION:	NO	RIVERBANKS:	NO	WINDBREAKER:	NO
WIND:	YES	GROUPS:	NO	ISOLATED:	YES











POINTS OF INTEREST

Native to theNorfolk Islands. Commonly known as *Araucaria excelsa*. A characteristic species bearing clearly whorled and horizontal primary branches and secondary ones arranged in a "V" shape. Its flexible, worm-like twigs fall in a characteristic way. Adult leaves, somewhat arched, almost flat; young leaves are linear-falcate and rhomboid-shaped. Cones are subspherical or upright, deciduous scales. Winged seeds fused to the scale and with mucron apical. Its wood is heavy, hard and easy-to-work and used for making poles, furniture, sculpture, etc. Young specimens are cultivated as an indoor plant. Pruning is not necessary.

ISOLATED. THIS WILL HIGHLIGHT THE SYMMETRY OF ITS CROWN

PLANTING AND PLANT HEALTH

Propagation by seeds, cutting or grafting in the spring. See *A. araucana*. Transplanting can de delicate (spring and autumn). Not seriously affected by pests however is prone to sooty mold specifically the *Capnodium* genus.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Planting Pruning X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Height (cm)	Topiary shape

CALOCEDRUS

Calocedrus decurrens (Torr.) Florin

Conifer

CALOCEDRO	CALOCEDRE	INCENSE CEDAR	LIBOCEDRE
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Shape	Height	Diameter
COLUMNAR	15-20M	2-4M
Texture	Shade	Root
FINE	FULL/PARTIAL	TAPROOT

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	CONIFERPHYTAS
TYPE:	PINOSIDAS
ORDER:	PINALES
FAMILY:	CUPRESSACEAE

VARIETIES

AUREO VARIEGATA - BRANCHES WITH YELLOW SPOTS

COLUMNARIS - STRICTLY COLUMNAR CROWN

MORFOLOGY

Trunk	Bark: RETICULATE/FIBROUS	Color: SALMON-RED
Leaf	COMPOUND: NO	
	HARDNESS:	
PERSISTENT	ARRANGEMENT: OPPOSITE(TUYOIDE)	
SIZE: 3.5 *2MM	VENATION:	
LEAFLETS: YES	SHAPE: SCALE	
COLOR: US:DARK GREEN	MARGIN: DENTATE	
LS: DARK GREEN	APEX: ACUTE	
TEXTURE: US:GLOSSY	LEAF BASE: DECURRENT	
LS: GLOSSY	PETIOLE: SESSILE	
Strobilus	Sex: UNISEXUAL	Distribution: MONOECIOUS
SIZE AND TYPE: ♂/M 6-7 MM	YW/GREEN - SOLITARY	Fragrant: NO
♀/F	GREEN/SOLITARY	
Fruit	Type: CONE (1 YEAR)	Color: LIGHT BROWN
SIZE: 2-3 x 0.6	Edible: NO	Fruiting season: SEPT-OCT
Growth	Rate: MEDIUM	Longevity: > 150 YEARS



ECOLOGY

Climate	Temperature: -20ºC A9	Drought resistant: YES
ALTITUDE: 300-2500	Sun exposure: SUN/PARTIAL SHADE	Frost resistant: YES
IRRIGATION: MODERATE		
Soil	Texture: ALL TYPES	Frost resistant: NO
pH: 6.5-8.5	Drainage: MODERATE/HIGH	Lime resistant: YES
FERTILITY: MODERATE		

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	NO	LINE:	YES
POLLUTION:	YES (URBAN)	RIVERBANKS:	NO	WINDBREAKER:	YES
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Native to the West Coast of North America. Its bark exfoliates in elongated plates. Flattened branchlets , in vertical planes, very aromatic, rough and with an articulated appearance. Imbricated leaves in thuyoide arrangement, without dorsal gland with a smell of resin. Cones are oblong, pedunculate, woody, pendulous. Winged seed. This species is of ornamental interest and varies in height, species and foliage color. Pink wood, light, brittle and durable, fragrant and easy to work. It is used in cabinetmaking, carpentry and pencil making. This species tolerates pruning and trimming.

SPACING: 3-4 m

PLANTING AND PLANTING HEALTH

Propagation by seed (preferably in autumn, also in spring) or its varieties by cutting or grafting on *Calocedrus* , *Platyclados*, *Cupressus* and *Chamaecyparis* . The seed must always be fresh, since it quickly loses its germinative power, and must be previously stratified (in moist sand at 2-3º C for 1-2 months) to improve its germination. Transplanting can be delicate (winter). This tree is prone to pests.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Planting Pruning X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Height (cm)	Topiary Shape
CT1	1/1	
CT5	50/60	
CT10	60/80/100	
CT20	100/125	
CT28	100/125/150/200	

CEDRUS

Cedrus atlantica Manetti

Conifer

CEDRO DEL ATLAS (SPANISH) | CEDRE DE L'ATLAS (VALENCIAN) | ATLAS CEDER (ENGLISH) | CEDRE DE L'ATLAS (FRENCH)

STRUCTURE

Shape	Height	Diameter
EXTENDED CONE	10-25 M	6-10 M
Texture	**Shade**	**Root**
MEDIUM	PARTIAL	TAPROOT/HORIZONTAL

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	PINOPHYTAS
TYPE:	PINOSIDAS
ORDER:	PINALES
FAMILY:	PINACEAE

VARIETIES

GLAUCA - DEEP BLUE

PENDULA - PENDULOUS WITH BLUE LEAVES

MORPHOLOGY

Trunk		Bark: SCALY	Color: LIGHT GRAY
Leaf		COMPOUND: NO	
		HARDNESS: CORIACEOUS	
EVERGREEN (3 YEARS)		ARRANGEMENT: ALTERNATE/FASCICULATE	
SIZE: 15-25x1 MM		VENATION: ACICULAR	
LEAFLET: NO		SHAPE: ACICULAR	
COLOR: US: DARK GREEN		MARGIN: ENTIRE	
LS: DARK GREEN		APEX: ACUMINATE	
TEXTURE: US: GLOSSY		LEAF BASE: ACUMINATE	
LS: GLOSSY		PETIOLE: SESSILE	
Strobilus		Sex: UNISEXUAL	Distribution: MONOECIOUS
SIZE AND TYPE:	♂/M 35 MM	OCHER-SOLITARY	Fragrant: NO
	♀/F 25 MM	YELLOW/RED-SOLITARY	
Fruit		Type: CONE (2 YEARS)	Color: BROWN/PURPLE
SIZE: 6-9 x 4-5 CM		Edible: NO	Fruiting season: SEPT-OCT
Growth		Rate: MEDIUM	Longevity: > 300 YEARS

ECOLOGY

Climate		Temperature: -15ºC to -20ºC	Drought resistant: YES
ALTITUDE:	500-2500	Sun exposure: PARTIAL SUN	Frost resistant: YES
IRRIGATION:	MOD/LOW		
Soil		Texture: LOAMY/SANDY	Salt resistant: NO
pH:	6.5-8.5	Drainage: HIGH	Lime resistant: YES
FERTILITY:	MOD/LOW		

USES

Resistances		Applications			
COASTAL:	NO	SLOPES:	NO	LINE:	YES
POLLUTION:	YES(URBAN)	RIVERBANKS:	NO	WINDBREAKER:	YES
WIND:	MODERATE	GROUPS:	YES	ISLOATED:	YES



POINTS OF INTEREST

Native to Atlas Mountains. Whorled branches, somewhat raised and non-hanging branchlets. Leaves are tetragonous, alternate (macroblasts) or fasciculated and somewhat longer (brachyblasts). Pines are elliptical and flattened, erect, pedunculated, deciduous scales. Winged seed. This tree is of great ornamental value as it varies in sizes and color of its foliage. It hybridizes very easily, giving rise to types that are difficult to distinguish among them. Its wood is white, durable and easy to work. It is fragrant and of variable quality and used for luxury carpentry (marquetry, sculpture, pencils,...). If distilled, it gives a type of essence which is used in pharmacy and perfumery. Aromatic and medicinal resin. Care must be taken as its pollen can cause allergies. Does not tolerate pruning.

SPACING:8 m

PLANTING AND PLANT HEALTH

Propagation by seed (spring) or its varieties by cutting or grafting on ungrafted base. It does not need treatment but it germinates much better if the seeds are placed in water 3-4 hours before sowing. Germination time is 30 days. The seed can maintain its germinative power for 1-2 years by keeping it in an airtight container, at 2-4 ºC and with minimal humidity. Transplanting can be delicate (winter). It is sensitive to pests and cryptogamic diseases. For their best development, greater showiness and better protection against fungal attack, the specimens must be planted quite far apart from each other.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing | Planting | Pruning (X)

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizer

COMMERCIALIZATION

Presentation	Height (cm)	Topiary shape
Pot	1/1	
CT 5	40/60	
CT10	80/100	
CT 18	150/175	
CT 28	125/150-175/200	
CT 30	200/250	
Root ball in mesh	150/175/200/250	

CEDRUS

Cedrus deodara (Don) G. Don

CONIFER

CEDRO DEL HIMALAYA	CEDRE DE L'HIMALAIA	DEODAR	CEDRE DE L'HIMMALAYA
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Shape: EXTENDED/CONCIAL	Height: 15-25M	Diameter: 6-10M
Texture: MEDIUM	Shape: FULL	Root: TAPROOT

DIVISION:	SPERMATOPHYTES
SUBDIVISON:	CONIFERPHYTAS
TYPE:	PINOSIDAS
ORDER:	PINALES
FAMILY:	PINACEAE

VARIETIES

AUREA AND *GOLDEN HORIZON* - GOLD LEAVES
PENDULA - PENDULOUS
FEELING BLUE - PENDULOUS WITH BLUE LEAVES

MORPHOLOGY

Trunk	Bark: RETICULATE	Color: DARK GRAY
Leaf: EVERGREEN (2); SIZE: > 40x1 MM; LEAFLET:NO; COLOR: US: LIGHT GREEN; LS: LIGHT GREEN; TEXTURE: US: GLOSSY; LS: GLOSSY	COMPOUND: NO; HARDNESS: CORIACEOUS; ARRANGEMENT: ALTERNATE/FACICULATE; VENATION: ACICULAR; SHAPE: ACICULAR; MARGIN: ENTIRE; APEX: ACUMINATE; LEAF BASE: ACUMINATE; PETIOLE: SESSILE	
Strobilus: SIZE AND TYPE: ♂/M 40MM YELLOW -SOLITARY; ♀/F 10MM BLUE/GREEN SOLITARY	Sex: UNISEXUAL	Distribution: MONOCEIOUS
		Fragrant: NO
Fruit: SIZE: 7-11 x 5-6 CM	Type: CONE (2 YEARS)	Color: BROWN/RED
	Comestible: NO	Fruiting season: OCT-DEC
Growth	Rate: MEDIUM/FAST	Longevity: > 150 YEARS









ECOLOGY

Climate: ALTITUDE: 1000-3000M; IRRIGATION: HIGH	Temperature: H-3	Drought resistant: MODERATE/HIGH
	Sun exposure: SUN/PARTIAL	Frost resistant: MODERATE/HIGH
Soil: pH: 6 - 8.5; FERTILITY: MOD/POOR	Texture: ALL TYPES	Salt resistant: NO
	Drainage: HIGH	Lime resistant: YES

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	NO	LINE:	YES
POLLUTION:	YES (URBAN)	RIVERBANKS:	NO	WINDBREAKER:	YES
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Also known as *Cedrus libani Laws. var. Deodara Hook* . Native to Western Himalayan region. It differs from the other species of the genus for its longer needles (> 4 cm).The crown has a recurved top, somewhat inclined and pendulous branches (the basal ones can even touch the ground) giving the tree a certain weeping appearance of great effect. It has a large number of varieties of ornamental interest, variable in size (including dwarf and"prostata" (low growing spreading mound species) and color of its foliage. Its wood is light, strong, rot resistant, easy to work and of good quality. Ideal for construction, beams, sleepers and luxury carpentry. Its resins are exploited. Care must be taken as its pollen can cause allergies. These trees do not tolerate pruning.

PLANTING AND PLANT HEALTH

Propagation by seed (spring) or its varieties by cutting or grafting on ungrafted base (similar to *Cedrus atlantica*). In very cold winters it can lose part of its foliage. Transplanting can be delicate (winter). This tree is prone to pests and cryptogamic diseases.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Planting Pruning X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Height (cm)	Topiary shape
Year 0/1	10/15	
Year 1/1	15/30	
CT 3	20/40	
CT 5	20/40	
CT 10	50/60-80/100	
CT15	100/125/150	
CT 25	150/175	
CT 40	175/200	
CT 45	200/250	
CT80	250/300	
Rootball in mesh	150/175/200/250	

CEPHALOTAXUS

CONIFER

Cephalotaxus harringtonia K.Koch. var.***drupacea*** Koidz.

TEJO DE ORIENTE (SPANISH) | TEIX D'ORIENT (VALENCIAN) | JAPANESE PLUM YEW (ENGLISH) | CEPHALOTAXE DRUPACE (FRENCH)

STRUCTURE		
Shape: GLOBULAR/EXTENDED	Height: 3-5M	Diameter: 4-5M
Texture: MEDIUM	Shade: DENSE	Root: OBLIQUE/HORIZONTAL

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	CONIFERPHYTAS
TYPE:	PINOPSIDA
ORDER:	PINALES
FAMILY:	CEPHALOTAXUS

VARIETIES

MORPHOLOGY		
Trunk	Bark: SMOOTH/ ± SCALY	Color: DARK GRAY
Leaf: EVERGREEN; SIZE: 20-50 x 4MM; LEAFLET: NO; COLOR: US: DARK GREEN; LS: GRAY/GREEN; TEXTURE: US: GLOSSY; LS: OFF-WHITE	COMPOUND: NO; HARDNESS: SOFT; ARRANGEMENT: ALTERNATE-SUBDISTICHUOUS; VENTATION: 1 CENTRAL VEIN-NEARLY INVISIBLE; SHAPE: LINEAR-FALCATE; MARGIN: ENTIRE; APEX: ACUTE/ACUMINATE; LEAF BASE: EXTENDED/DECURRENT; PETIOLE: SHORT	
Strobilus	Sex: UNISEXUAL	Distribution: DIOECIOUS (GEN.)
SIZE AND TYPE: ♂/M 6-8 MM CREAM-SOLITARY; ♀/F CREAM-PAIRS (X2)		Fragrant: NO
Fruit: SIZE: 2-3x1.5CM	Type: DRUPE (2 YEARS); Edible: NO	Color: BROWN; Fruiting season: SEPT-NOV
Growth	Rate: SLOW	Longevity: > 150 YEARS

ECOLOGY		
Climate: ALTITUDE: 300-900M; IRRIGATION: HIGH	Temperature: -20ºC; Sun exposure: PARTIALSUN/SHADE	Drought resistant: NO; Frost resistant: MODERATE
Soil: pH: 6.5-8.5; FERTILITY: MODERATE	Texture: ALL TYPES; Drainage: MODERATE/HIGH	Salt resistant: NO; Lime resistant: YES

USES				
Resistances		Applications		
COASTAL: NO		SLOPES: NO	LINE: YES	
POLLUTION: YES		RIVERBANKS: NO	WINDBREAKER: YES	
WIND: MODERATE		GROUPS: YES	ISOLATED: YES	



POINTS OF INTEREST

Also known as *Cephalotaxus drupacea* . Native to China, Japan and Korea. Opposite (or whorled) branches somewhat pendulous. Leaves organized in 2 planes arranged in V; with 2 stomatal bands on its underside. Male strobili pedunculated and axillary; the female is scaled and terminal, in pairs. The seed is roughly pyriform (pear-shaped), pedunculated, pendulous, drupaceous in appearance with a woody inner shell and a fleshy outer shell, with an unpleasant odour. It has some cultivars of interest. This tree tolerates pruning and trimming (topiary).

SPACING: 5 m

PLANTING AND PLANT HEALTH

Propagation by seed (in autumn with seed of the year, or spring with stratified seed during winter for a minimum period of 6 months) or cultivars by apical cutting (March) or by grafting (on *Cephalotaxus* or *Taxus* rootstocks). The seeds must be soaked to remove the fleshy seedpods, and adequate storage is necessary to preserve their germinative power. Germination lasts 1-2 years. Cuttings take almost a year to root. Transplanting can be delicate (winter). This species is not prone to pests or diseases.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Planting Pruning (X)

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Height (cm)	Topiary shape
CT5	30/40/50	

CHAMAECYPARIS

CONIFER

Chamaecyparis lawsoniana (A. Murray) Parl.

CEDRO DE OREGON (SPANISH) · XIPRER DE LAWSON (VALENCIAN) · OREGON CEDAR (ENGLISH) · FAUX CYPRÈS (FRENCH)

STRUCTURE		
Shape: CONICAL/COLUMNAR	Height: 10-15 M	Diameter: 2-6 M
Texture: FINE	Shade: FULL	Root: TAPROOT

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	CONIFERPHYTAS
TYPE:	Pinopsida PINOPSIDA
ORDER:	PINALES
FAMILY:	CUPRESSACEAE

VARIETIES

ALUMIGOLD, COLUMNARIS, *ELWOODII* (GREEN-SILVER BLUE), *GLOBOSA*, *MINIMA AUREA, MINIMA GLAUCA*, *NIDIFORMIS*,...

MORPHOLOGY		
Trunk	Bark: FISSURED	Color: DARK RED
Leaf: PERSISTENT; SIZE: 1-2x1-2 MM; COLOR: US:DK BLUE/GREEN, LS:DK BLUE/GREEN; TEXTURE: US:GLOSSY, LS:GLOSSY	COMPOUND: NO; HARDNESS:; ARRANGEMENT: OPPOSITE (TUYOIDE); VENATION:; SHAPE: SCALE; MARGIN: ENTIRE; APEX: ACUTE; LEAF BASE: DECURRENT; PETIOLE: SESSILE	
Strobilus; SIZE AND TYPE: ♂/M 2-3 MM YELLOW/RED-SOLITARY; ♀/F 4-6 MM GREEN/BLUE-SOLITARY	Sex: UNISEXUAL	Distribution: MONOECIOUS; Fragrant: NO
Fruit; SIZE: 0.7-1x0.7-1CM	Type: CONE (1 YEAR); Edible: NO	Color: DARK RED; Fruiting season: SEPT-NOV
Growth	Rate: FAST	Longevity: > 300 YEARS

ECOLOGY		
Climate; ALTITUDE: 500-1500M; IRRIGATION: HIGH	Temperature: -5 to 10ºC; Sun exposure: SUN/SHADE	Drought resistant: MODERATE; Frost resistant: YES
Soil; pH: 6-8; FERTILITY: MODERATE	Texture: LOAMY; Drainage: HIGH	Salt resistant: NO; Lime resisitant: MODERATE

USES			
Resistances: COASTAL: NO; POLLUTION: YES(URBAN); WIND: YES	Applications: SLOPES: NO	LINE: YES	
	RIVERBANKS: NO	WINDBREAKER: YES	
	GROUPS: YES	ISOLATED: YES	



POINTS OF INTEREST

Native to Western U.S.A. Flattened branchlets, smelling of resin when crushed. Leaves in thuyoid arrangement, with dorsal gland. Cones are spherical, pedunculate with peltate woody scales, some of them with recurved mucron (similar to those of Cupressus but smaller). Winged seed, with glands. This tree is of great ornamental value as it has a large number of varieties of interest (>200) that vary in height, size and leaf color. In Spain it has been used for reforestation. Light brown wood, light, resistant to rot, fragrant and easy to work. It is used in shipbuilding, carpentry, furniture, matches,... Care must be taken as its pollen can cause allergies. This tree tolerates pruning and trimming (topiary).

SPACING:Variable according to use and cultivar.

PLANTING AND PLANT HEALTH

Propagation by seed (autumn) or its varieties by cutting (soft or hard) and grafting. Seeds lose their germination power quickly therefore they must be properly preserved (airtight containers, humidity > 5% and temperature 1-2%) until the moment of sowing (spring). No previous treatment is needed although they improve germination by stratifying them in moist sand at 2-4 ° C, for 1-2 months. Transplanting can be delicate (winter). They are prone to *Phytophthora* (root browning), *Armillaria* and *Phomopsis* (types of fungus); also pests (insects).

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Planting Pruning (X)

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Height (cm)	Topiary shape
CT1	1/1	
CT5	50/60	
CT10	60/80/100	
CT20	100/125	
CT28	100/125/150/200	

CRYPTOMERIA

CONIFER

Cryptomeria japonica (L.f.) D. Don.

CRIPTOMERIA DEL JAPON	CRIPTOMERIA DEL JAPO	JAPANESE CEDAR	CRYPTOMERIE DU JAPON
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Shape: CONICAL/COLUMNAR	Height: 8-12 M	Diameter: 3-4 M
Texture: FINE	Shape: PARTIAL/FULL	Root: TAPROOT

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	CONIFERPHYTAS
TYPE:	PINOPSIDA
ORDER:	PINALES
FAMILY:	TAXIDIOIDEAE

VARIETIES

CRISTATA
ELEGANS and *ELEGANS VIRIDIS*
VILMORIANA
GLOBOSA NANA

MORPHOLOGY

Trunk	Bark: FIBROUS	Color: BROWN/RED
Leaf	COMPOUND: NO	
	HARDNESS: SOFT(FLEXIBLE)	
EVERGREEN(4-5 YEARS)	ARRANGEMENT: ALTERNATE	
SIZE: 10-20x2 MM	VENATION: ACICULAR	
LEAFLET:NO	SHAPE: POINTED	
COLOR: US:LIGHT GREEN	MARGIN: ENTIRE	
LS:LIGHT GREEN	APEX: ACUTE	
TEXTURE: US: SMOOTH	LEAF BASE: DECURRENT	
LS: SMOOTH	PETIOLE: SESSILE	
Strobilus	Sex: UNISEXUAL	Distribution: MONOECIOUS
SIZE AND TYPE: ♂/M 7.5 MM	YELLOW/CLUSTERED	Fragrant: NO
♀/F	GREEN/RED-SOLITARY	
Fruit	Type: CONE	Color: BROWN/RED
SIZE: 1.5-2.5x2.5 CM	Comestible: NO	Fruiting season: OCT-NOV
Growth	Rate: MEDIUM/SLOW	Longevity: >150 YEARS







ECOLOGY

Climate	Temperature: H-2	Drought resistant: NO
ALTITUDE: 200-2000	Sun exposure: SUN/PARTIAL SHADE	Frost resistant: NO
IRRIGATION: HIGH		
Soil	Texture: LOAMY/CLAYEY	Salt resistant: NO
pH: 6-7.5	Drainage: MODERATE/HIGH	Lime resistant: NO
FERTILITY: HIGH		

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	YES	LINE:	YES
POLLUTION:	YES (URBAN)	RIVERBANKS:	NO	WINDBREAKER:	YES
WIND:	NO	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Native to China and Japan. Its bark can be peeled off in long strips. Somewhat pendulous whorled branches and deciduous branchlets. Tetragonal leaves, brown in winter and green in spring. Its cones are subglobular, somewhat pedunculated, slightly pendulous with scales not peltate with recurved dorsal appendage and 2-3 toothed apex, sometimes the axis of the strobilus gives rise to a bud. Its seed has a rudimentary wing. It has a large number of varieties that are variable in height, size and color. Reddish wood, resistant, durable, aromatic, of good quality and easy to work. Used in construction (shipbuilding), interior carpentry. Its resin is aromatic. Care must be taken as its pollen can cause allergies. Does not require pruning.

SPACING: 2m

PLANTING AND PLANT HEALTH

Propagation by seed (spring) or its varieties by cutting, layering or grafting. The seed loses its germinative power quickly and therefore if properly preserved it can be viable for 2 years or more. It does not need previous treatments for its germination. During the first year the seedlings should be protected from the sun. Transplanting is delicate (winter). It is sensitive to cryptogamic diseases (parasites and/or fungi).

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Planting Pruning X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Height (cm)	Topiary shape
CT3	30/40/50	
CT5	30/40	
CT7	50/60-80/100	
CT10	60/80	
CT15	60/80/100	
CT40	175/200/250	Ball
CT220	250/300	

CUPRESSUS

CONIFER

Cupressus arizonica Greene

CIPRES DE ARIZONA (SPANISH) · XIPRER D'ARIZONA (VALENCIAN) · ARIZONA CYPRESS (ENGLISH) · CYPRÈS DE L'ARIZONA (FRENCH)

STRUCTURE

Shape	Height	Diameter
CONICAL ± EXTENDED	10-15 M	4-6 M
Texture	**Shade**	**Root**
FINE	FULL	TAPROOT

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	CONIFERPHYTAS
TYPE:	POINOPSIDA
ORDER:	PINALES
FAMILY:	CUPRESSACEAE

SUBESPECIES

CUPRESSUS ARIZONICA VAR. *GLABRA* = *CUPRESSUS GLABRA*

THEY DIFFER BY HAVING A BARK THAT CAN BE PEELED OFF IN THIN GRAY STRIPS.

MORPHOLOGY

Trunk	Bark: RETICULATE	Color: DARK GRAY
Leaf	COMPOUND: NO	
	HARDNESS:	
EVERGREEN (4 YEARS)	ARRANGEMENT: OPPOSITE(CUPRESSOIDE)	
SIZE: 1.5 x1.5 MM	VENATION:	
	SHAPE: SCALE	
COLOR: US: GREEN/GRAY	MARGIN: SLIGHTLY DENTATED	
LS: GREEN/GRAY	APEX: ACUTE	
TEXTURE: US:SMOOTH	LEAF BASE: DECURRENT	
LS: SMOOTH	PETIOLE: SESSILE	
STROBILUS	Sex: UNISEXUAL	Distribution: MONOECIOUS
SIZE AND TYPE: ♂/M 2-3MM	YELLOW/SOLITARY	Fragrant: NO
♀/F 3MM	DARK GREEN/SOLITARY	
Fruit	Type: CONE (2 YEARS)	Color: DARK GRAY
SIZE: 2-2.5x2 cm	Edible: NO	Fruiting season: SEPT-DEC
Growth	Rate: MEDIUM/FAST	Longevity: < 150 YEARS



ECOLOGY

Climate	Temperature: -5 to -10ºC	Drought resistant: YES
ALTITUDE: 1000-2400M	Sun Exposure	Frost resistant
IRRIGATION: MODERATE	SUN/PARTIAL SHADE	YES
Soil	Texture: CLAYEY	Salt resistant: NO
pH: 6-8.5	Drainage	Lime resistant
FERTILITY: POOR	MODERATE/HIGH	YES

USES

Resistances		Applications			
COASTAL:	1ST LINE	SLOPES:	YES	LINE:	YES
POLLUTION:	YES(URBAN)	RIVERBANK:	NO	WINDBREAKER:	YES
WIND:	YES	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Native to Mexico/U.S.A. Crown widens with age. Cylindrical branchlets on non-flattened shoots. Imbricate leaves, cupressoids, with a very conspicuous dorsal gland, smelling of resin when squeezed. Cones are spherical, pedunculate, woody, dehiscent, very persistent, peltate scales with dorsal appendage. Seed with a rudimentary wing. Of great ornamental and forest interest. It has been used in Spain for reforestation. Straw-colored wood, hard, heavy and durable. It is used in construction, poles,... Care must be taken as its pollen can cause allergies. This tree tolerates pruning and trimming (topiary).

SPACING: variable according to use: 0.4 - 5 m

PLANTING AND PLANT HEALTH

Propagation by seed, mainly in spring (easy), cutting (September) or graft (on *Cupressus* and *Chamaecyparis)* Since this species tends to lose germination power quickly, the seeds should be properly stored (in airtight containers, dry and between 2-4 ºC).This will ensure germination power for 2-4 years and generally not needing prior treatment (at most 1-2 days soaking) to germinate. The germination percentage however is low due to the large number of sterile seeds. Germination time is between 14-20 days. Transplanting can be delicate (winter). Prone to fungi and insects. Minimal maintenance required.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Planting Pruning x

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Height (cm)	Topiary Shape
CT1	1/1	
CT10	80/100/125	
CT15	125/150	
CT15		Ball
CT20	150/175	
CT25	175/200	
CT40	200/250	
CT40		Ball
CT80	250/300/350	

CUPRESSUS

CONIFER

Cupressus macrocarpa Hartw.

CIPRES DE MONTERREY (SPANISH) · XIPRER DE LAMBERT (VALENCIAN) · MONTERREY CYPRESS (ENGLISH) · CYPRÈS DE MONTERREY (FRENCH)

STRUCTURE

Shape	Height	Diameter
CONICAL ± EXTENDED	12-15 M	4-7 M
Texture	**Shade**	**Root**
FINE	FULL	TAPROOT/HORIZONTAL

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	CONIFERPHYTAS
TYPE:	PINOPSIDA
ORDER:	PINALES
FAMILY:	CUPRESSACEAE

VARIETIES

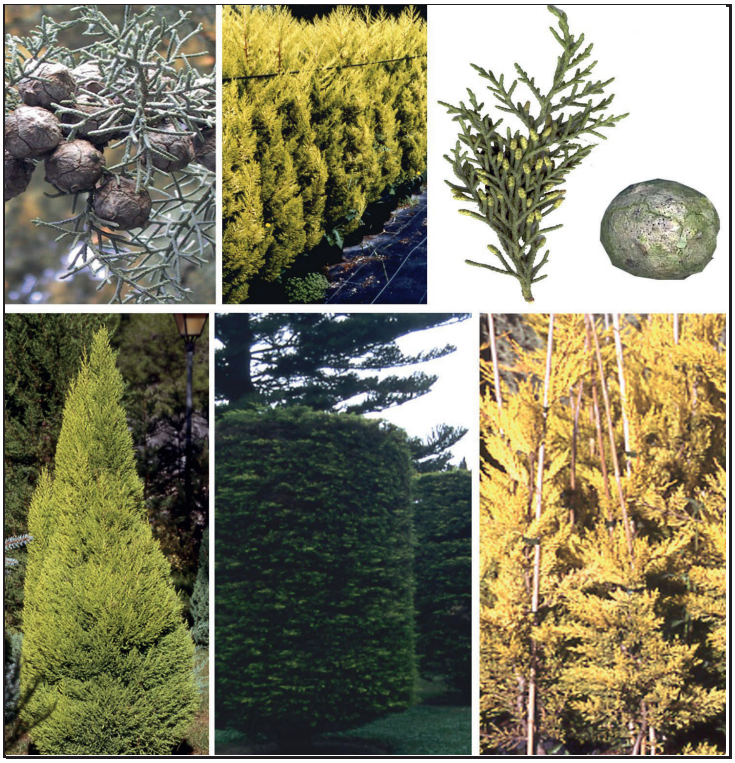
GOLDCREST , *GOLDEN CONE* , *GOLDEN PILLAR* - YELLOW FOLIAGE

LAMBERTINA AUREA , *LUTEA* - GOLDEN FOLIAGE

WILMA - YELLOW FOLIAGE

MORPHOLOGY

Trunk	Bark: FISSURED	Color: DARK RED
Leaf	COMPOUND: NO	
EVERGREEN (3-4 YEARS)	HARDNESS:	
SIZE: 1.5x1.5 MM	ARRANGEMENT: OPPOSITE(CUPRESSOIDE)	
	VENATION:	
	SHAPE: SCALE	
COLOR: US: DARK GREEN	MARGIN: SERRATE	
LS: DARK GREEN	APEX: ACUTE/OBTUSE	
TEXTURE: US: GLOSSY	LEAF BASE: DECURRENT	
LS: GLOSSY	PETIOLE: SESSILE	
Strobilus	Sex: UNISEXUAL	Distribution: MONOECIOUS
SIZE AND TYPE: ♂/M 3-6 MM YELLOW/SOLITARY		Fragrant: NO
♀/F 4-6 MM GRAY/SOLITARY		
Fruit	Type: CONE (2 YEARS)	Color: BROWN/RED
SIZE: 2-4x2-3 CM	Edible: NO	Fruiting season: OCT-NOV
Growth	Rate: FAST	Longevity: > 200 YEARS



ECOLOGY

Climate	Temperature: H-4	Drought resistant: MODERATE/LOW
ALTITUDE: 0-400 M	Sun exposure: SUN/PARTIAL SUN	Frost resistant: NO
IRRIGATION: MODERATE		
Soil	Texture: LOAMY	Salt resistant: NO
pH: 6.0-8.5	Drainage: MODERATE	Lime resistant: MODERATE/LOW
FERTILITY: MODERATE		

USES

Resistances		Applications			
COASTAL:	1ST LINE	SLOPES:	YES	LINE:	YES
POLLUTION:	YES (URBAN)	RIVERBANKS:	NO	WINDBREAKER:	YES
WIND:	YES	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Native to Monterey Bay (California). Characteristic crown with branches arranged at a 45º angle. Cylindrical branches in clusters not flattened, with a lemon scent when crushed. Adult leaves in cupressoid arrangement, with inconspicuous dorsal gland; young leaves are somewhat acuminate, very durable, on elongating and interior shoots. Globose cones, pedunculate, peltate scales with slightly protruding dorsal appendix. Seed with poorly developed wing. Of great ornamental interest, it has varieties that vary in appearance, size and color. White wood, heavy and hard, durable, very good although it has many knots. Interesting in repopulation in temperate and humid zones and to fix coastal dunes. Care must be taken as its pollen can cause allergies. This tree tolerates pruning and trimming.

SPACING: Variable according to use: 4 - 5 m.

PLANTING AND PLANT HEALTH

Propagation by seed, mainly in spring (easy), or cultivars by grafting, on *Cupressus* or *Chamaecyparis*, or layering. Properly stored seeds can maintain their germinative power for 2-4 years, generally not needing any prior treatment. The percentage of germination is low due to the abundance of sterile seeds. Transplanting can be delicate (winter). This tree is prone to cryptogomic problems (parasites and fungi) and pest attacks. Minimal maintenance is required.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Planting Pruning x

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Height(cm)	Topiary shape
CT1	1/1	
CT3	30/40	
CT7	50/60/80/100/125	
CT15		Ball
CT20	125/150/175	
CT28	200/250	
CT40	200/250/300	
CT80	250/300/350/400	
	450	
CT130	400/450	

CUPRESSUS

CONIFER

Cupressus sempervirens L.

CIPRÉS COMUN	XIPRER	ITALIAN CYPRESS	CYPRÈS COMMUM
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE

Shape	Height	Diameter
CONICAL/EXTENDED	15-25 M	2-4 M
Texture	**Shade**	**Root**
FINE	FULL	HORIZONTAL

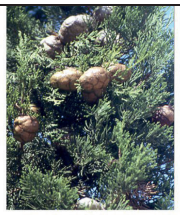
DIVISION:	SPERMATOPHYTES
SUBDIVISION:	CONIFERPHYTAS
TYPE:	PINOPSIDA
ORDER:	PINALES
FAMILY:	CUPRESSACEAE

VARIETIES

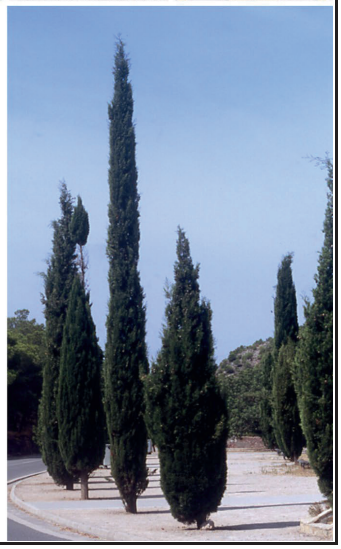
GARDA
GRACILIS
STRICTA, STRICTA AUREA
TOTEN, TOTEN AUREA

MORPHOLOGY

Trunk	Bark: FIBEROUS	Color: DARK GRAY
Leaf	COMPOUND: NO	
	HARDNESS:	
EVERGREEN (4 YEARS)	ARRANGEMENT: OPPOSITE (CUPRESSOIDE)	
SIZE: 1.2 x 1.2 MM	VENATION:	
LEAFLET: NO	SHAPE: SCALE	
COLOR: US: DARK GRAY	MARGIN: SERRATE	
LS: DARK GRAY	APEX: ACUTE/OBTUSE	
TEXTURE: US: SMOOTH	LEAF BASE: DECURRENT	
LS: SMOOTH	PETIOLE: SESSILE	
Strobilus	Sex: Unisexual	Distribution: MONOECIOUS
SIZE AND TYPE: ♂/M 4-6 MM YELLOW/SOLITARY		Fragrant: NO
♀/F 4-5 MM GRAY/SOLITARY		
Fruit	Type: CONE (2YEARS)	Color: DARK RED
SIZE: 2.5-4x2-3 CM	Edible: NO	Fruiting season: SEPT-NOV
Growth	Rate: MEDIUM	Longevity: > 300 YEARS





ECOLOGY

Climate	Temperature: -5 to -10ºC	Drought resistant: MODERATE/LOW
ALTITUDE: 0-1000 M	Sun exposure: SUN/PARTIAL SUN	Frost resistant: MODERATE
IRRIGATION: MOD/LOW		
Soil	Texture: NO SAND	Salt resistant: NO
pH: 6-8.5	Drainage: MODERATE/HIGH	Lime resistant: YES
FERTILITY: LOW		

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	YES	LINE:	YES
POLLUTION:	YES	RIVERBANK:	NO	WINDBREAKER:	YES
WIND:	YES	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Native to Eastern and Southern Mediterranean region. Variable crown: the 'stricta' variety has branches parallel to the trunk and in the 'horizontalis' variety the branches are separated from it. Cylindrical branches in groups not flattened and smelling of resin when rubbed. Adult leaves in cupressoid arrangement, imbricate, with dorsal gland. The cones are elliptic-oblong, pedunculate, peltate scales with short mucron. The seed has a rudimentary wing. Essential in the Mediterranean garden, it has a large number of varieties. The wood is somewhat pink, compact and light, fragrant, rot-proof, easy to work. Used in cabinetmaking, turnery, sculpture and soundboards. Its resin and oil were used in ancient times. Used in reforestation. Care must be taken as its pollen causes allergies. The tree tolerates pruning and trimming.

SPACING: variable according to use: 0.4-5 m.

PLANTING AND PLANT HEALTH

Propagation by seed, mainly in spring (easy) or its varieties by cutting (September), layering, or grafting (May), on *Cupressus* or *Chamaecyparis*. Properly stored seeds (see *Cupressus arizonica*) maintain germination power for 2-4 years, generally not needing prior treatment to germinate. The percentage of germination is low due to the large number of sterile seeds. Transplanting can be delicate (winter). The fungus *Coryneum cardinale* can kill it and some insects can harm it. Minimal maintenance is required.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Planting Pruning x

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Height (cm)	Topiary shape
CT1	1/1	
CT5	40/60/100	
CT10	80/100/125/150	
CT28	200/250	
CT40	200/250/300/350	
CT80	300/350	
CT extra sizes	350/400/450/500	
	550	

JUNIPERUS

Juniperus communis L.

CONIFER

ENEBRO COMÚN	GINEBRE	COMMON JUNIPER	GENÉBRIER COMMUN
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Shape: VARIABLE	Height: 0.3-4 M	Diameter: 2-3 M
Texture: FINE	Shade: FULL	Root: TAPROOT/HORIZONTAL

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	CONIFERPHYTAS
TYPE:	PINOPSIDA
ORDER:	PINALES
FAMILY:	CUPRESSACEAE

VARIETIES

GREEN CARPET ,*CARPET* and *REPANDA* -GROUND COVER

HIBERNICA , *SENTINEL*

DEPRESA AUREA, SPRING GOLD, SUECICA AUREA - VARIEGATED

MORPHOLOGY		
Trunk	Bark: FISSURED/RETICULATE	Color: BROWN/GRAY
Leaf	COMPOUND: NO	
EVERGREEN	HARDNESS: CORIACEOUS	
SIZE: 7-15x2.5MM	ARRANGEMENT: WHORLED (X3)	
LEAFLET: YES	VENATION:	
COLOR: US:LIGHT GREEN	SHAPE: ACICULAR	
LS: DARK GREEN	MARGIN: ENTIRE	
TEXTURE: US: GLOSSY	APEX: ACUTE	
LS: GLOSSY	LEAF BASE: EXTENDED	
	PETIOLE: SESSILE	
Strobilus	Sex: UNISEXUAL	Distribution: DIOECIOUS
SIZE AND TYPE: ♂/M 3-5 MM	YELLOW/SOLITARY	Fragrant: YES
♀/F 3-4 MM	GREEN/RED -SOLITARY	
Fruit	Type: GALBULOS (2 YEARS)	Color: BLACK/BLUE
SIZE: 6-8x 5-6 MM	Edible: NO	Fruiting season: SEPT-NOV
Growth	Rate: SLOW	Longevity: > 150 YEARS



ECOLOGY		
Climate	Temperature: -15 to -20 ºC	Drought resistant: YES
ALTITUDE: 0-2500M	Sun exposure: INDIFFERENT	Frost resistant: YES
IRRIGATION: MODERATE		
Soil	Texture: INDIFFERENT	Salt resistant: YES
pH: 6-8.5	Drainage: INDIFFERENT	Lime resistant: YES
FERTILITY: MOD/POOR		

USES				
Resistances		Applications		
COASTAL:	2ND LINE	SLOPES:	YES	LINE: NO
POLLUTION:	YES	RIVERBANKS:	NO	WINDBREAKER: YES
WIND:	YES	GROUPS:	YES	ISOLATED: YES

POINTS OF INTEREST

Native to Europe, N. Africa, Asia and N. America. Distributed in the Nothern part of Spain. Its morphology is variable. The bark can be peeled off in strips. Juniperoid leaves, almost flat, with a characteristic greyish band on the upper side, aromatic. Nut shaped, slightly pedunculated, fleshy, indehiscent, with bloom. Of ornamental interest, it has numerous varieties of variable interest in size, size and color. Reddish wood, soft, resistant, rot-proof and easy to work with.The berry-like fruit (three awns or bristles) used to aromatize gin and other alcoholic beverages (beer). This tree tolerates pruning and trimming.

SPACING: 3-4 m.

PLANTING AND PLANT HEALTH

Propagation by seed (spring or autumn) or its varieties by grafting, layering and grafting. Properly stored seeds (airtight containers, dry and at low temperatures) can maintain germination power for 3-4 years. Germination occurs naturally in the 2nd-3rd spring after dissemination due to its internal dormancy and the strong waterproofing of the seed. The seed must be stratified in moist sand for 3-4 months at 3-4 ºC, sometimes being necessary to accompany it with mechanical or chemical scarification. The germinative power of the species is low, 15-30%. Transplanting can be delicate (winter). Prone to attacks by insects. Minimal maintainence is required.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Planting Pruning x

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Height (cm)	Topiary Shape
POT 7	Sappling 1/1	
CT2.5	20/40	
CT3	20/40/60	
CT5	30/40	
CT10	50/60/80	
CT28	100/125/150/175	
CT extra sizes	60/80/100	
CT130	400/450	

JUNIPERUS

CONIFER

Juniperus horizontalis Moench.

SABINA RASTRERA AMERICANA (SPANISH) | SABINA HORIZONTAL (VALENCIAN) | CREEPING JUNIPER (ENGLISH) | GENÉVRIER RAMPANT (FRENCH)

STRUCTURE

Shape	Height	Diameter
"POSTRATE"	1 M	2-3 M
Texture	**Shade**	**Root**
FINE	FULL	TAPROOT/HORIZONTAL

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	CONIFERPHYTAS
TYPE:	PINOPSIDA
ORDER:	PINALES
FAMILY:	CUPRESSACEAE

VARIETIES

ANDORRA

ANDORRA VAREIGATA - WITH WHITE SPOTS

BLUE CHIP - BLUE THAT TURNS PURPLE IN WINTER

PRINCE OF WALES - LIGHT GREEN

MORPHOLOGY

Trunk	Bark: FISSURED	Color: BROWN/RED
Leaf	COMPOUND: NO	
	HARDNESS:	
EVERGREEN	ARRANGEMENT: FASCICULATE (X2)	
SIZE: 15-25x0.2 CM	VENATION:	
LEAFLETS: YES	SHAPE: SCALE/ACICULAR	
COLOR: US: VARIABLE	MARGIN: ENTIRE	
LS: VARIABLE	APEX: ACUTE	
TEXTURE: US: SMOOTH	LEAF BASE: DECURRENT	
LS: SMOOTH	PETIOLE: SESSILE	
Strobilus	Sex: UNISEXUAL	Distribution: MONOECIOUS
SIZE AND TYPE: ♂/M 4 MM	YELLOW/SOLITARY	Fragrant: NO
♀/F 4 MM	GREEN/RED - SOLITARY	
Fruit	Type: CONE (2YEARS)	Color: BROWN/RED
SIZE: 7-9 x7-9 MM	Edible: NO	Fruiting season: SEPT-NOV
Growth	Rate: SLOW	Longevity: > 100 YEARS

ECOLOGY

Climate	Temperature: H-2	Drought resistant: MODERATE
ALTITUDE: 0-1500M	Sun exposure: SUN/PARTIAL SHADE	Frost resistant: YES
IRRIGATION: MODERATE		
Soil	Texture: INDIFFERENT	Salt resistant: NO
pH: 5.5-7.5	Drainage: MODERATE	Lime resistant: YES
FERTILITY: MODERATE		

USES

Resistances		Applications			
COASTAL:	NO	SLOPES:	YES	LINE:	NO
POLLUTION:	YES (URBAN)	RIVERBANKS:	NO	WINDBREAKER:	NO
WIND:	YES	GROUP:	YES	ISOLATED:	YES



POINTS OF INTEREST

Also known as *Juniperus sabina* var. *procumbens; J. prostrata*. Native to Eastern and Northern America. Its seeds are winged. There is a great number of varieties that are very difficult to distingiush among them. Suitable as groundcover and to protect slopes. This tree tolerates pruning and trimming.

PLANTING AND PLANT HEALTH

Propagation by seed (autumn or spring) and its varieties by cutting, grafting or layering (sometimes natural). Transplanting is delicate (winter). They are prone to fungal and insect attacks.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Planting Pruning X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Height (cm)	Topiary shape
POT 7	Year 0/1 and 1/1	
CT 2.5	20/40	
CT 3	20/40	
CT 7	40/50	
CT 10	40/60	

JUNIPERUS

CONIFER

Juniperus oxycedrus L.

ENEBRO DE LA MIERA (SPANISH) | GINEBRÓ (VALENCIAN) | BROWN-BERRIED CEDAR (ENGLISH) | GENÉVRIER OXYCEDRE (FRENCH)

STRUCTURE		
Shape: CONICAL ± EXTENDED	Height: 1.5-4 M	Diameter: 1-2 M
Texture: FINE	Shade: FULL	Root: TAPROOT/HORIZONTAL

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	CONIFERPHYTAS
TYPE:	PINOPSIDA
ORDER:	PINALES
FAMILY:	CUPRESSACEAE

SUBSPECIES

SUBSP. *OXYCEDRUS*- SMALL FRUIT (0.8-1.2 mm)

SUBSP. *MACROCARPA* -LARGE FRUIT (1.3-1.5 mm)

MORPHOLOGY		
Trunk	Bark: FISSURED	Color: DARK GRAY
Leaf: EVERGREEN ( )	COMPOUND: NO	
	HARDNESS: CORIACEOUS	
	ARRANGEMENT: WHORLED (x3)	
SIZE: 10-15x2.5MM	VENATION:	
LEAFLET:YES	SHAPE: ACICULAR	
COLOR: US: LIGHT GREEN	MARGIN: ENTIRE	
LS: DARK GREEN	APEX: ACUTE	
TEXTURE: US: GLOSSY	LEAF BASE: EXTENDED	
LS: GLOSSY	PETIOLE: SESSILE	
Strobilus	Sex: UNISEXUAL	Distribution: DIOECIOUS
SIZE AND TYPE: ♂/M 3-5MM	YELLOW-SOLITARY	Fragrant: NO
♀/F 3-4MM	GREEN- SOLITARY	
Fruit: SIZE: 8-10x 8-10MM	Type: GALBULUS (2 YEARS)	Color: BROWN/RED
	Edible: NO	Fruiting season: SEPT-NOV
Growth	Rate: SLOW	Longevity: > 150 YEARS



ECOLOGY		
Climate	Temperature: -10 to-15ºC	Drought resistant: YES
ALTITUDE: 0-2500M	Sun exposure: SUN/PARTIAL SHADE	Frost resistant: YES
IRRIGATION: MOD/LOW		
Soil	Texture: LOAMY	Salt resistant: NO
pH: 6.5-8	Drainage: MODERATE/HIGH	Lime resistant: YES
FERTILITY: MOD/LOW		

USES				
Resistances		Applications		
COASTAL: 1ST LINE		SLOPES: YES	LINE: NO	
POLLUTION: YES (URBAN)		RIVERBANKS: NO	WINDBREAKER: YES	
WIND: YES		GROUPS: YES	ISOLATED: YES	

POINTS OF INTEREST

Native to the Mediterranean region.The bark can be peeled off in strips. Visible branches or somewhat hanging that give it a certain weeping appearance and the branchlets somewhat trigonous. "Juniperiod" adult leaves, visible, with articulate arrangement, with 2 white lines on the upper side, somewhat keeled on the underside. Round galbulus fruit, short stalks, fleshy, indehiscent. It has some varieties of ornamental interest that vary in size, leaves, position of the branches,... Reddish wood, compact, resistant, aromatic, easy to work. It is used to make pencils etc. By distillation, it produces "juniper cade oil", with a resinous odor and used as a medicine (skin conditions, vermifuge, etc.) or insecticide. It is a protected species. Tolerates pruning and trimming.

SPACING: Variable according to use: 0.5-2 m.

PLANTING AND PLANT HEALTH

Propagation by seed, mainly in autumn and spring, or its varieties by layering. The seeds require the same treatment as in *Juniperus communis*. Transplanting can be delicate (winter). Prone to attacks by insects. Minimum maintenance required.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing | Planting | Pruning (x)

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation	Height (cm)
CT130	400/450
POT7	Year 1/1
CT2.5	20/40
CT3	20/40/60
CT5	30/40
CT10	50/60/80
CT28	100/125/150/175
CT extra sizes	60/80/100

Topiary shape

JUNIPERUS

CONIFER

Juniperus thurifera L.

SABINA ALBAR	SAVINA TURIFERA	INCENSE JUNIPER	GENÉVRIER À ENCENS
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE

Shape	Height	Diameter
CONICAL ± EXTENDED	4-12 M	2-5 M
Texture	**Shade**	**Root**
FINE	FULL	TAPROOT/HORIZONTAL

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	PINOPHYTAS
TYPE:	PINOPSIDA
ORDER:	PINALES
FAMILY:	CUPRESSACEAE

VARIETIES

MORPHOLOGY

Trunk	Bark: FISSURED	Color: LIGHT GRAY
Leaf	COMPOUND: NO	
	HARDNESS:	
EVERGREEN	ARRANGEMENT: OPPOSITE(CUPRESSOIDE)	
SIZE: 1.4 x 1.4 mm	VENATION:	
LEAFLETS: YES	SHAPE: SCALE	
COLOR: US: LIGHT GREEN	MARGIN: ENTIRE/SERRATE	
LS: LIGHT GREEN	APEX: ACUTE/OBTUSE	
TEXTURE: US: GLOSSY	LEAF BASE: DECURRENT	
LS: GLOSSY	PETIOLE: SESSILE	
Strobilus	Sex: UNISEXUAL	Distribution: DIOECIOUS
SIZE AND TYPE: ♂/M 3-6 MM	YELLOW-SOLITARY	Fragrant: NO
♀/F	GREEN-SOLITARY	
2	Type: GALBULUS (2 YEARS)	Color: LIGHT BLUE
SIZE: 9 x 7-10 MM	Edible: NO	Fruiting season: OCT-DEC
Growth	Rate: SLOW	Longevity: > 200 YEARS








ECOLOGY

Climate	Temperature: -5 to -10 ºC	Drought resistant: YES
ALTITUDE: 500-1500M	Sun exposure: SUN	Frost resistant: YES
IRRIGATION: MODERATE		
Soil	Texture: INDIFFERENT	Salt resistant: YES
pH: 7- 8.5	Drainage: MODERATE/HIGH	Lime resistant: YES
FERTILITY: LOW		

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	YES	LINE:	YES
POLLUTION:	YES (URBAN)	RIVERBANKS:	NO	WINDBREAKER:	YES
WIND:	YES	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Native to Western Mediterranean region. Its bark can be peeled off in strips. Branchlets are rough, cylindrical and 1-2 mm in diameter. Imbricate adult leaves, generally opposite, somewhat keeled and with a dorsal gland. Galbulous ± oblong, fleshy, indehiscent. Of great decorative effect. Its use is restricted due to complicated reproduction and slow growth. Reddish, compact, resistant, rot-proof and aromatic wood; used in sculpture, fine cabinetry, pencils, interior carpentry, etc. Protected species of difficult regeneration. Great care must be taken as its foliage is toxic. Tolerates pruning and trimming (topiary).

SPACING: Variable according to it use: 1-4 m

PLANTING AND PLANT HEALTH

Propagation by seed (autumn and spring) or cultivars by cutting or grafting, on *Juniperus virginiana*. See *Juniperus communis*. Transplanting is delicate (winter). It does not sprout from the stock. Prone to attacks by insects. Minimal maintenance required.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Planting Pruning X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Height (cm)	Topiary form

LARIX

CONIFER

Larix decidua Mill.

ALERCE EUROPEO	LARIX	EUROPEAN LARCH	MÉLEZÈ D'EUROPE
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE

Shape	Height	Diameter
IRREGULAR CONICAL	15-25 M	4-7 M
Texture	**Shade**	**Root**
MEDIUM	PARTIAL	TAPROOT

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	CONIFERPHYTAS
TYPE:	PINOPSIDA
ORDER:	PINALES
FAMILY:	PINACEAE

VARIETIES

MORPHOLOGY

Trunk	Bark: FISSURED	Color: BROWN/GRAY
Leaf	COMPOUND: NO	
DECIDUOUS	HARDNESS: SOFT(FLEXIBLE)	
SIZE: 20-35x1 MM	ARRANGEMENT: ALTERNATE/FACICULATE	
LEAFLETS:NO	VENATION: 1 CENTRAL VEIN	
COLOR: US: LIGHT GREEN	SHAPE: ACICULAR	
LS: LIGHT GREEN	MARGIN: ENTIRE	
TEXTURE: US:SMOOTH	APEX: ACUTE	
LS: SMOOTH	LEAF BASE: EXTENDED	
	PETIOLE: SESSILE	
Strobilus	Sex: UNISEXUAL	Distribution: MONOCEIOUS
SIZE AND TYPE: ♂/M 10MM YELLOW/RED-SOLITARY		Fragrant: NO
♀/F 10MM REDDISH -SOLITARY		
Fruit	Type: CONE (1 YEAR)	Color: REDDISH BROWN
SIZE: 2-4x1.5-2.5CM	Edible: NO	Fruiting season: OCT-NOV
Growth	Rate: FAST	Longevity: > 300 YEARS



ECOLOGY

Climate	Temperature: H-2 / H-3	Drought resistant: MODERATE
ALTITUDE: 500-2000M	Sun exposure: SUN	Frost resistant: YES
IRRIGATION: HIGH		
Soil	Texture: LOAMY/ALL TYPES	Salt resistant: NO
pH: 6-8.5	Drainage: HIGH	Lime resistant: NO
FERTILITY: MOD/HIGH		

USES

Resistances		Applications			
COASTAL:	NO	SLOPE:		LINE :	NO
POLLUTION:	NO	RIVERBANK:		WINDBREAKER:	YES
WIND:	YES	GROUP:	YES	ISOLATED:	YES

POINTS OF INTEREST

Native to Central Europe. Leaves with a triangular section, alternate (macroblasts) or fasciculated (brachyblasts). Cones are ovoid, erect with persistent scales not reflexed, bracts exserted. Winged seeds. Its slender crown and the striking coloration of its foliage (light green in the vegetative period and golden before it falls) give it great ornamental value in gardens and mountain recreation areas. It has some varieties of interest (including pendulums and dwarfs). Light wood, heavy and hard, resistant to rot, aromatic and easy to work. Its wood is of excellent quality and used to make posts, beams, in construction and shipbuilding. "Balsam of Venise" (medicinal) and tannins are produced from its resin. This tree tolerates pruning and trimming.

SPACING: 7-8 m

PLANTING AND PLANT HEALTH

Propagation by seed (mainly in spring) and cultivars by grafting before budding. The seed does not need prior treatment to germinate, maintaining its germinative power for up to 4-5 years if stored properly (humidity < 10%; temperature 2ºC and hermetic closure). Germination time is 4-5 weeks. Transplanting is delicate (winter). This species is prone to canker.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Planting Pruning x

TREAMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Height (cm)	Topiary Shape
Year 0/1	10/20	
CT 5	75/100/150	
CT 40	200/250	

PICEA

CONIFER

Picea abies (L.) Karsten

ABETO ROJO, A. DE NAVIDAD (SPANISH) | AVET ROIG (VALENCIAN) | NORWAY SPRUCE (ENGLISH) | EPICÉA COMMUN (FRANCE)

STRUCTURE		
Shape: CONICAL/SUBCYLINDRICAL	Height: 15-25M	Diameter: 8-10M
Texture: FINE	Shade: PARTIAL	Root: HORIZONTAL

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	CONIFERPHYTAS
TYPE:	PINOPSIDAS
ORDER:	PINALES
FAMILY:	PINACEAE

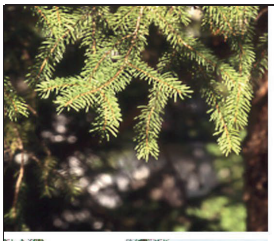
VARIETIES

ACROCONA, *CINDERELLA*, *COMPACTA*, *EXCELSA*
INVERSA, *REMONTI*
NIDIFORMII,*OHLENDOFII* and *PUMILA GLAUCA* (CLIMBERS)

MORPHOLOGY		
Trunk	Bark: RETICULATE/SCALE	Color: BROWNISH RED
Leaf: EVERGREEN; SIZE: 15-20x15 MM; LEAFLETS:NO; COLOR: US:DARK GREEN; LS: DARK GREEN; TEXTURE: US: GLOSSY; LS: GLOSSY	COMPOUND: NO; HARDNESS: CORIACEOUS; ARRANGEMENT: ALTERNATE; VENATION: 1 CENTRAL VEIN; SHAPE: ACICULAR; MARGIN: ENTIRE; APEX: ACUTE/ACUMINATE; LEAF BASE: EXPANDED (CUSHION-LIKE); PETIOLE: (ALMOST) SESSILE	
Strobilus: SIZE AND TYPE: ♂/M 20MM YELLOWIRED - SOLITARY; ♀/F 25MM ROSE - SOLITARY	Sex: UNISEXUAL	Distribution: MONOCEIOUS; Fragrant: NO
Fruit: SIZE: 9-15x3-4 CM	Type: CONE (1 YEAR); Edible: NO	Color: LIGHT BROWN; Fruiting season: OCT-NOV
Growth	Rate: MEDIUM/SLOW	Longevity: > 300 YEARS

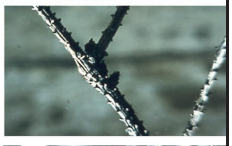
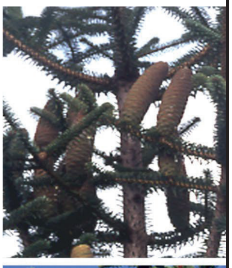
ECOLOGY		
Climate: ALTITUDE: 500-1500M; IRRIGATION: HIGH	Temperature: H-1; Sun exposure: SUN/PARTIAL SHADE	Drought resistant: NO; Frost resistant: YES
Soil: pH: 6.5-7.5; FERTILITY: MODERATE	Texture: LOAMY; Drainage: HIGH	Salt resistant: NO; Lime resistant: NO

USES				
Resistances		Applications		
COASTAL:	NO	SLOPES:	YES	LINE: YES
POLLUTION:	NO	RIVERBANKS:	NO	WINDBREAKER: YES
WIND:	NO	GROUPS:	YES	ISOLATED: YES








POINTS OF INTEREST

Picea excelsa. ORIGIN: Central and North of Europe. Its bark has deciduous plates. Whorled branches and somewhat pendulous branchlets. Colored leaves with teragonal sections and somewhat arched. Cylindrical cone just or almost over the branch, pendulous, persistent scales and included bracts. Winged seed. Due to its size and beauty it has great ornamental interest and has numerous varieties that vary in size and color (those of the dwarf variety are highly appreciated for rockeries, etc..). Widely used for "Christmas trees" and in reforestation (Pyrenees). White wood, light, resistant and easy to work with, of good quality; for construction, cabinetry, soundboards (Stradivarius violins), paper pulp. Provides resin and tannins. Care must be taken as it can cause allergies. Pruning is not necessary.

SPACING: 7-8 m

PLANTING AND PLANT HEALTH

Propagation by seed (spring), or its varieties by layering or grafting on *Picea Abies*. Properly preserved seed (humidity 6-8%, temperature 0-5º C, darkness and hermeticity) maintains its germinative power > 5 years; seeds do not have a dormant period and therefore germinate easily without treatment. It takes between 15-30 days to germinate, and the seedlings must be protected from the sun during the first summer. Transplanting is easy (winter). It is sensitive to pests and diseases. It must be treated against insects, mites and fungi (from the soil, rot, rust, etc.). Fertlize in spring or summer with Nitrogen and Potassium.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Planting Pruning x

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Height(cm)	Topiary Shape
Year 0/2	10/20	
Year 1/1	15/30	
POT9	15/25	
CT 3	20/30/40/50	
CT 5	30/40/50	
CT 10	60/80	
CT 15	75/100/125/150	
CT 28	60/80/100/125/150	
CT 40	100/125/150/175	
CT 80	150/175	
CT 100	175/200	
CT 100	200/250/300	

PICEA
CONIFER

Picea pungens Engelm.

PICEA AZUL	PICEA PUNGENT	BLUE SPRUCE	SAPIN DU COLORADO
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE

Shape	Height	Diameter
CONICAL OR COLUMNAR	10-15 M	3-5 M
Texture	**Shade**	**Root**
FINE/MEDIUM	FULL	HORIZONTAL

DIVISION:	SPERMATOPHTYES
SUBDIVISION:	CONIFERPHYTAS
TYPE:	PINOPSIDA
ORDER:	PINALES
FAMILY:	PINACEAE

VARIETIES

KOSTER - SILVER BLUE COLOR
GLOBOSA KOSTER
HOOPSII - DEEP BLUE COLOR

MORPHOLOGY

Trunk	Bark: SCALE	Color: BROWNISH GRAY
Leaf	COMPOUND: NO	
	HARDNESS: CORIACEOUS	
EVERGREEN	ARRANGEMENT: ALTERNATE(SPIRAL)	
SIZE: 20-30 x 2 MM	VENATION: 1 CENTRAL VEIN	
LEAFLETS: NO	SHAPE: ACICULAR	
COLOR: US: BLUE GREEN	MARGIN: ENTIRE	
LS: BLUE GREEN	APEX: ACUTE (SHARP POINT)	
TEXTURE: US:GLOSSY	LEAF BASE: EXPANDED (CUSHION-LIKE)	
LS: GLOSSY	PETIOLE: (ALMOST) SESSILE	
Strobilus	Sex: UNISEXUAL	Distribution: MONOCEIOUS
SIZE AND TYPE: ♂/M 20MM YELLOW/RED - SOLITARY		Fragrant: NO
♀/F 40MM REDDISH - SOLITARY		
Fruit	Type: CONE (1 YEAR)	Color: LIGHT BROWN
SIZE: 5-9 x 3 CM	Edible: NO	Fruiting season: OCT-NOV
Growth	Rate: SLOW	Longevity: < 100 YEARS







ECOLOGY

Climate	Temperature: -15 to -20 ºC	Drought resistant: MODERATE
ALTITUDE: 1000-2500M	Sun exposure: PARTIAL SUN	Frost resistant: YES
IRRIGATION: MOD/HIGH		
Soil	Texture: LOAMY/SANDY	Salt resistant: NO
pH: 6.5-8.5	Drainage: HIGH	Lime resistant: NO
FERTILITY: MODERATE		

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	NO	LINE:	YES
POLLUTION:	YES	RIVERBANKS:	NO	WINDBREAKER:	YES
WIND:	MODERATE	GROUP:	YES	ISOLATED:	YES

POINTS OF INTEREST

Native to South West of the Rocky Mountains (U.S.A). Its needles have a tetragonal section and are spiral-shaped and produce a pleasant odor when rubbed. Its cones are oblong-cylindrical, pendulous and their scales are persistent and have inclusive bracts. This is a highly appreciated ornamental tree for the intense color of its foliage. It has a large number of it varieties that vary in size and intensity of color. The wood is used for construction, soundboards, paper pulp, etc. Care must be taken as its pollen can cause allergy.Pruning is not necessary.

SPACING: 4 m

PLANTING AND PLANT HEALTH

Propagation by seed in winter (without scarification) or in spring (with scarification), and its varieties by grafting or cutting. The seed shows dormancy of variable intensity, being inconvenient to stratify it in moist sand for 1-2 months at 2-3ºC. Transplanting is easy (winter). It can be somewhat sensitive to cryptogamic diseases. Does not tolerate excessive heat.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Planting Pruning X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Height (cm)	Topiary shape
Year 1/1	15/20	
CT 5	20/30	
CT 7	30/40	
CT10	40/50-60/80/100	
CT 28	50/60-100/125/150	
CT 40	60/80-125/150/175	
CT 45	150/175/200	
CT 80	100/125/150/175	
CT 100	175/200	
CT 150	200/250/300	
CT 240	200/250	

PINUS

CONIFER

Pinus brutia Ten.

PINO DE CHIPRE	PI DE XIPRE	CYPRUS PINE	PIN DE CHIPRE
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Shape: CONICAL/LOBED	Height: 10-12 M	Diameter: 5-8 M
Texture: COARSE	Shape: PARTIAL	Root: TAPROOT/HORIZONTAL

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	CONIFERPHYTAS
TYPE:	PINOPSIDA
ORDER:	PINALES
FAMILY:	PINACEA

VARIETIES

MORPHOLOGY		
Trunk	Bark: FISSURED	Color: LIGHT RED
Leaf: EVERGREEN (2 years); SIZE: 10-15x0.15 CM; LEAFLETS: NO; COLOR: US: DARK GREEN, LS: DARK GREEN; TEXTURE: US: GLOSSY, LS: GLOSSY	COMPOUND: NO; HARDNESS: CORIACEOUS; ARRANGEMENT: FASCICUALTE (X2); VENATION: 1 CENTRAL VEIN; SHAPE: ACICULAR; MARGIN: ENTIRE; APEX: ACUTE; LEAF BASE: WITH BASAL SHEATH; PETIOLE: SESSILE	
Strobilus; SIZE AND TYPE: ♂/M 6-8MM YELLOW/SPIKE; ♀/F 10MM VIOLET/SOLITARY	Sex: UNISEXUAL	Distribution: MONOECIOUS; Fragrance: NO
Fruit; SIZE: 6-10 x 4-5 CM	Type: CONE (2 YEARS); Edible: NO	Color: RED BROWN; Fruiting season: SEPT-OCT
Growth	Rate: FAST	Longevity: >200 YEARS

ECOLOGY		
Climate; ALTITUDE: 0-1000M; IRRIGATION: MOD/LOW	Temperature: 0º to -5ºC; Sun exposure: SUN	Drought resistant: YES; Frost resistant: MODERATE
Soil; pH: 7-8.5; FERTILITY: MOD/LOW	Texture: CLAYEY; Drainage: HIGH	Salt resistant: NO; Lime resistant: YES

USES				
Resistances		Applications		
COASTAL:	1ST LINE	SLOPE:	NO	LINE: YES
POLLUTION:	YES	RIVERBANK:	NO	WINDBREAKER: YES
WIND:	MODERATE	GROUPS:	YES	ISOLATED: YES



POINTS OF INTEREST

Also known as *Pinus halepensis var brutia* ; *Pinus eldarica* . Natvie to Eastern Mediterranean. Leaves are longer and thicker than in *Pinus halepensis.* Cones are ovate, just or almost over the branches, erect and generally whorled. The scales of the cones consist of a flat crest and a slightly protruding umbo with bracts included. Its seed has an articulated wing. This species has the same ornamental interest as *P.halepensis,* which it replaces in gardens and in reforestation activities. Care must be taken as its pollen causes allergy. This tree tolerates pruning although it is not required.

SPACING: 7 m

PLANTING AND PLANT HEALTH

Propagation by seed (preferably in spring) and its varieties by grafting. If properly preserved the seed can maintain its germinative power for 3-4 years. It does not need prior treatment, although immersion in water for 2 days promotes quicker germination. Germination time is 21 days. Transplanting is easy (winter).This species is prone to the processionary moth. (*Limantria monacha*).

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Planting Pruning x

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Height (cm)	Topiary shape

PINUS

CONIFER

Pinus canariensis Chr. Sm. ex DC.

PINO CANARIO	PI DE CANARIES	CANARY ISLANDS PINE	PIN DES CANARIES
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Shape: IRREGULAR CONICAL	Height: 15-25M	Diameter: 6-8 M
Texture: COARSE	Shade: PARTIAL	Root: TAPROOT/HORIZONTAL

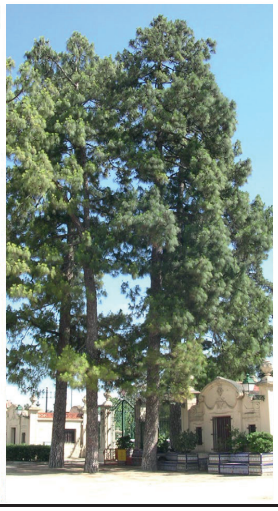
DIVISION:	SPERMATOPHYTES
SUBDIVISION:	CONIFERPHYTES
TYPE:	PINOPSIDA
ORDER:	PINALES
FAMILY:	PINACEAES

VARIETIES

MORPHOLOGY		
Trunk	Bark: RETICULATE/SCALE	Color: LIGHT GRAY
Leaf	COMPOUND: NO	
	HARDNESS: SOFT (FLEXIBLE)	
EVERGREEN (2-3YEARS)	ARRANGEMENT: FASCICULATE (X3)	
SIZE: 10-15x0.15CM	VENATION: 1 CENTRAL VEIN	
LEAFLET: NO	SHAPE: ACICULAR	
COLOR: US: LIGHT GREEN	MARGIN: ENTIRE	
LS: LIGHT GREEN	APEX: ACUTE	
TEXTURE: US: GLOSSY	LEAF BASE: WITH BASAL SHEATH	
LS: GLOSSY	PETIOLE: SESSILE	
Strobilus	Sex: UNISEXUAL	Distribution: MONOECIOUS
SIZE AND TYPE: ♂/M 10MM	YELLOW/SPIKE	Fragrant: NO
♀/F 15MM	GREED/RED - SOLITARY	
Fruit	Type: CONE (2 YEARS)	Color: LIGHT RED
	Edible: NO	Fruiting season: JUL-SEPT
SIZE: 12-15x 5-6CM		
Growth	Rate: MEDIUM/FAST	Longevity: > 200 YEARS








ECOLOGY		
Climate	Temperature: H-5	Drought resistant: MODERATE/HIGH
ALTITUDE: 0- 2000M	Sun exposure: SUN	Frost resistant: YES
IRRIGATION: MODERATE		
Soil	Texture: ALL TYPES	Salt resistant: NO
pH: 6-8	Drainage: HIGH	Lime resistant: YES
FERTILITY: MOD/LOW		

USES				
Resistances		Applications		
COASTAL: 2ND LINE		SLOPE: NO	LINE: YES	
POLLUTION: YES (URBAN)		RIVERBANKS: NO	WINDBREAKER: YES	
WIND: YES		GROUPS: YES	ISOLATED: YES	

POINTS OF INTEREST

Native to the Canary Islands. It has great ornamental interest due to the ability to sprout from its trunk. Its branches that begin horizontal then arch upwards to reach a hanging position of its long and flexible needles. Oblong fusiform cones, almost attached to the branches, generally solitary, persistent scale with pyramidal umbo and protruding apophysis. Seed with fixed wing. Good quality wood; soft, heavy, yellowish-white. Its pine needles are used in the Canary Islands as an organic amendment and as packaging material (bananas). Interesting for reforestation and recreational areas. Care must be taken as its pollen can cause allergies. This tree tolerates pruning although not necessary. Does not tolerate trimming.

SPACING: 6 m

PLANTING AND PLANT HEALTH

Propagation by seed (spring) or by graft. The seed does not require any previous treatment to germinate. Transplanting can be delicate (winter). Affected by the processionary moth of the pine tree. (*Limantria monacha*).

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Planting Pruning X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Height (cm)	Topiary Shape

PINUS

CONIFER

Pinus halepensis Mill.

PINO CARRASCO (SPANISH) | PI BORD (VALENCIAN) | ALEPO PINE (ENGLISH) | PIN D'ALEP (FRENCH)

STRUCTURE		
Shape: OBLONG-LOBED	Height: 12-15M	Diameter: 6-8 M
Texture: COARSE	Shade: PARTIAL	Root: TAPROOT/HORIZONTAL

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	CONIFERPHYTAS
TYPE:	PINOPSIDA
ORDER:	PINALES
FAMILY:	PINACEAS

CULTIVATED VARIETIES

MORPHOLOGY		
Trunk	Bark: FISSURED	Color: PALE RED
Leaf: EVERGREEN (2 YEARS); SIZE: 6-10x0.07 CM; LEAFLETS: NO; COLOR: US:LIGHT GREEN, LS:LIGHT GREEN; TEXTURE: US: GLOSSY, LS: GLOSSY	COMPOUND: NO; HARDNESS: SOFT (FLEXIBLE); ARRANGEMENT: FASCICULATE (X2); VENATION: 1 CENTRAL VEIN; SHAPE: ACICULAR; MARGIN: ENTIRE; APEX: ACUTE; LEAF BASE: WITH BASEL SHEATH; PETIOLE: SESSILE	
Strobilus: SIZE AND TYPE: ♂/M 6-8 MM YELLOW/SPIKE; ♀/F 10 MM GREEN/RED-SOLITARY	Sex: UNISEXUAL	Distribution: MONOECIOUS; Fragrant: NO
Fruit: SIZE: 6-12x 4-5CM	Type: CONE (2 YEARS); Edible: NO	Color: PALE RED; Fruiting season: SEPT-OCT
Growth	Rate: FAST	Longevity: 200 YEARS

ECOLOGY		
Climate: ALTITUDE: 0-1500M; IRRIGATION: MODERATE	Temperature: -5 to-10ºC; Sun exposure: SUN	Drought resistant: YES; Frost resistant: MODERATE
SOIL: pH: 6.5-8.5; FERTILITY: LOW	Texture: CLAYEY; Drainage: HIGH	Salt resistant: NO; Lime resistant: YES

USES			
Resistances		Applications	
COASTAL: 1st LINE		SLOPES: NO	LINE: YES
POLLUTION: YES (URBAN)		RIVERBANKS: NO	WINDBREAKER: YES
WIND: MODERATE		GROUPS: YES	ISOLATED: YES



POINTS OF INTEREST

Native to the Mediterranean region. Ovate-conical cone, with bundled peduncle, generally solitary, persistent scale with flat crest and slightly protruding umbo. Seed with articulated wing. Essential species in the Mediterranean garden. Its wood is clear, hard, semi-heavy, very resinous and of poor quality. Through a bleeding process (making a small cut in the trunk) a resin can be produced from which turpentine is extracted. The bark is rich in tannins. Very resistant to heat and drought (it even supports gypsum soils). Interesting as a protective species, due to its hardiness that allows it to be planted in adverse situations, and for reforestation even in arid and degraded soils. Care must be taken as its pollen causes allergy. This tree tolerates pruning but does not require it.

SPACING: 5-6 m

PLANTING AND PLANT HEALTH

Propagation by seed (preferably in spring) and its varieties by grafting. No pre-treatment of seeds is necessary. Transplanting is easy (winter). It can be sensitive mainly to the pine processionary moth (*Thaumatopoea pityocampa*).

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing | Planting | Pruning (x)

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation	Height (cm)	Topiary Shape
Year 0/1		
CT2	40/60/80	
CT 5	80/100/125/150	
CT 15	150/175/200	
CT 28	200/250/300	

PINUS

CONIFER

Pinus nigra Arnold

PINO SALGAREÑO (SPANISH) | PI DE AUSTRIA, PI DE L'ASEGA (VALENCIAN) | AUSTRIAN PINE (ENGLISH) | PIN NOIR D'AUSTRIA (FRENCH)

STRUCTURE		
Shape: CONICAL-IRREGULAR	Height: 15-25M	Diameter: 8-12M
Texture: COARSE	Shade: PARTIAL	Root: TAPROOT/HORIZONTAL

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	CONIFERPHYTAS
TYPE:	PINOPSIDA
ORDER:	PINALES
FAMILY:	PINACEAE

VARIETIES

PINUS NIGRA subsp. *NIGRA AUSTRIACA*

PINUS NIGRA subsp. *SALZMANNII*

MORPHOLOGY		
Trunk	Bark: FISSURED	Color: DARK GRAY
Leaf	COMPOUND: NO	
	HARDNESS: CORIACEOUS	
EVERGREEN(3-6 YEARS)	ARRANGEMENT: FASCICULATE (X2)	
SIZE: 8-12 x 0.15CM	VENATION: 1 CENTRAL VEIN	
LEAFLETS:NO	SHAPE: ACICULAR	
COLOR: US: DARK GREEN	MARGIN: ENTIRE	
LS: DARK GREEN	APEX: ACUTE	
TEXTURE: US: GLOSSY	LEAF BASE: WITH BASAL SHEATH	
LS: GLOSSY	PETIOLE: SESSILE	
Strobilus	Sex: UNISEXUAL	Distribution: MONOECIOUS
SIZE AND TYPE: ♂/M 15-20MM	YELLOW/SPIKE	Fragrant: NO
♀/F 10MM	GREEN/RED-SOLITARY	
Fruit	Type: CONE (2 YEARS)	Color: LIGHT CHESTNUT
SIZE: 4-8 x 3 CM	Edible: NO	Fruiting season: SEPT-NOV
Growth	Rate: MEDIUM-LOW	Longevity: > 200 YEARS

ECOLOGY		
Climate	Temperature: -15º to -20ºC	Drought resistant: YES
ALTITUDE: 500-1500	Sun exposure: SUN	Frost resistant: YES
IRRIGATION: MODERATE		
Soil	Texture: ALL TYPES	Salt resistant: NO
pH: 6.5-8	Drainage: MODERATE/HIGH	Lime resistant: YES
FERTILITY: LOW		

USES			
Resistances		Applications	
COASTAL: 1ST LINE	SLOPE: YES	LINE: YES	
POLLUTION: YES	RIVERBANKS: NO	WINDBREAKER: YES	
WIND: YES	GROUPS: YES	ISOLATED: YES	








POINTS OF INTEREST

Native to Central and South East Europe. Ovate-conical cone, symmetrical and attached to the branch in the variety *austriaca* ; Solitary in groups of 2-3. Persistent scale with almost flat umbo. Its seeds are winged. It has great ornamental value. Wood of variable quality depending on the place of origin. Sometimes the best of the Spanish pines, hard and resistant to rot and easy to work. It is used in construction, shipbuilding, paper pulp, etc. It produces good quality resin although it is not fully exploited (it has a lower yield than other species). Interesting in reforestation and as a protects the soil, due to its rusticity. Care must be taken as its pollen causes allergies. Although this tree can tolerate pruning, it does not require it.

SPACING: 7-8 m

PLANTING AND PLANT HEALTH

Propagation by seed (autumn or spring) and its varieties by grafting. The seed does not need previous treatments to germinate (in some countries pre-germinated seed in sand is used). Transplanting is delicate (winter). This tree is prone to the processionary moth of the pine (Limantria monacha).

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUIT SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing | Planting | Pruning X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation	Height (cm)	Topiary shape
Year 1/1		
Years 2/0	10/20	
CT 4	20/30	
CT 5	30/40	
CT 28	100/125/150	
CT 40	150/175	

PINUS

CONIFER

Pinus pinaster Ait.

PINO RESINERO	PI RODENO	CLUSTER PINE	PIN MARITIME
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE

Shape	Height	Diameter
ROUND/SPREADING	10-20 M	6-10 M
Texture	**Shade**	**Root**
COARSE	PARTIAL/FULL	TAPROOT/HORIZONTAL

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	PINOPHYTAS
TYPE:	PINOPSIDA
ORDER:	PINALES
FAMILY:	PINACEAE

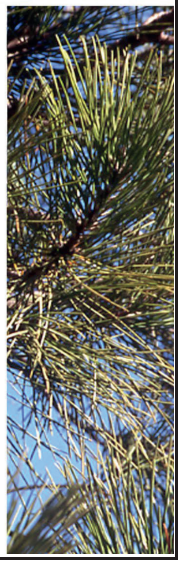
VARIETIES

MORPHOLOGY

Trunk	Bark: FISSURED	Color: REDDISH BROWN
Leaf	COMPOUND: NO	
	HARDNESS: CORIACEOUS	
EVERGREEN(2-3YEARS)	ARRANGEMENT: FASCICULATE (X2)	
SIZE: 15-25x0.25CM	VENATION: 1 CENTRAL VEIN	
LEAFLETS:NO	SHAPE: ACICULAR	
COLOR: US:DARK GREEN	MARGIN: ENTIRE	
LS:DARK GREEN	APEX: ACUTE	
TEXTURE: US: GLOSSY	LEAF BASE: WITH BASAL SHEATH	
LS: GLOSSY	PETIOLE: SESSILE	
Strobilus	Sex: UNISEXUAL	Distribution: MONOECIOUS
SIZE AND TYPE:	♂/M 10-20MM YELLOW-SPIKE	Fragrant: NO
	♀/F 20MM GREEN/RED-SOLITARY	
Fruit	Type: CONE (2 YEARS)	Color: REDDISH BROWN
	Edible: YES	Fruiting season: SEPT-NOV
SIZE: 12-20x6-8CM		
Growth	Rate: MEDIUM/FAST	Longevity: > 200 YEARS






ECOLOGY

Climate	Temperature: -5 to -10ºC	Drought resistant: MODERATE
ALTITUDE: 0-1500M	Sun exposure: SUN	Frost resistant: YES
IRRIGATION: MODERATE		
Soil	Texture: LOAMY/SANDY	Salt resistant: NO
pH: 6-7.5	Drainage: HIGH	Lime resistant: NO (GENERALLY)
FERTILITY: MOD/POOR		

USES

Resistances		Applications			
COASTAL:	1ST LINE	SLOPE:	NO	LINE:	YES
POLLUTION:	NO	RIVERBANK:	NO	WINDBREAKER:	YES
WIND:	YES	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Also known as *Pinus maritima*. Native to Western Mediterranean and North Africa. Horizontal almost whorled branches. Oval-conical cone, somewhat asymmetrical, twisted and attached to the branch. Persistent scales with a pyramidal and very sharp umbo. Its seed has articulated wing used locally in bird feeding. Very ornate. Its wood is heavy, hard, medium-low quality and used for construction, sleepers, paper pulp,... an excellent resinous species for obtaining turpentine. The bark is used in tanning and its tender shoots are fodder and interesting in reforestation. The subspieces *Atlantica* does not tolerate lime, while *Mesogeensis* does. Care must be taken as its pollen causes allergies. Although this tree tolerates pruning, it does not require it.

SPACING: 10m

Propagation by seed (preferably in spring) and its varieties by grafting. The seed must undergo previous treatment before germination. Tranplanting is delicate (winter). In Spain, it is prone to a large number of pests and diseases, some of which can be dangerous. Bleeding (making a small cut) from trunks shortens the life of the tree.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Planting Pruning X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Height (cm)	Topiary shape

PINUS

CONIFER

Pinus pinea L.

PINO PIÑONERO SPANISH | PÍ PINYONIER VALENCIAN | ITALIAN STONE PINE ENGLISH | PIN PARASOL, PIN PINIER FRENCH

STRUCTURE		
Shape	Height	Diameter
SPREADING	15-25 M	8-10 M
Texture	Shade	Root
COARSE	FULL	TAPROOT/HORIZONTAL

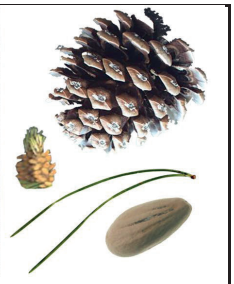
DIVISION:	SPERMATOPHYTES
SUBDIVISION:	PINOPHYTAS
TYPE:	PINOPSIDA
ORDER:	PINALES
FAMILY:	PINACEAE

VARIETIES

MORPHOLOGY		
Trunk	Bark: RETICULATE	Color: Reddish brown
Leaf	COMPOUND: NO	
EVERGREEN	HARDNESS: CORIACEOUS	
SIZE: 15-20x0.15CM	ARRANGEMENT: FASCICULATE (X2)	
LEAFLETS:NO	VENATION: 1 CENTRAL VEIN	
COLOR: US: MED. GREEN	SHAPE: ACICULAR	
LS: MED. GREEN	MARGIN: ENTIRE	
TEXTURE: US:GLOSSY	APEX: ACUTE	
LS: GLOSSY	LEAF BASE: WITH BASAL SHEATH	
	PETIOLE: SESSILE	
Strobilus	Sex: UNISEXUAL	Distribution: MONOECIOUS
SIZE AND TYPE: ♂/M 12 MM	YELLOW/SPIKE	Fragrant: NO
♀/F 20MM	GR.YELLOW-SOLITARY	
Fruit	Type: CONE (3 YEARS)	Color: Reddish brown
SIZE: 10-15x8-10CM	Edible: YES (THE SEED)	Fruiting season: SEPT-NOV
Growth	Rate: MEDIUM	Longevity: > 300 YEARS











ECOLOGY		
Climate	Temperature: 0 to -5ºC	Drought resistant: YES
ALTITUDE: 0-1000M	Sun exposure: SUN	Frost resistant: YES
IRRIGATION: MOD/LOW		
Soil	Texture: LOAMY/SANDY	Salt resistant: YES
pH: 6.5-7.5	Drainage: HIGH	Lime resistant: YES
FERTILITY: LOW		

USES			
Resistances		Applications	
COASTAL: 1ST LINE	SLOPE: NO	LINE: YES	
POLLUTION: YES(URBAN)	RIVERBANK: NO	WINDBREAKER: YES	
WIND: YES	GROUPS: YES	ISOLATED: YES	

POINTS OF INTEREST

Native to Southwest Europe. Scaly bark that detaches (in adult specimens it forms characteristic plates). Oval-globose cones, almost attached to the branch with persistent scales (the lower ones are deciduous) with an inflated and slightly prominent umbo. Thick seeds with blackish stony seedpods, rudimentary wing, and edible almond. Essential in the Mediterranean garden for its high aesthetic value. Its wood is somewhat reddish, heavy, resinous, resistant to humidity but difficult to work. Used for carpentry and ship building. It is occasionally exploited for its resin (perfume). Fruit tree for its "pine nuts" (dressings, pastries, toast, raw, etc). Protected species (fixing of dunes). Care must be taken as its pollen can cause allergies. It tolerates pruning but does not require it.

SPACING: 10 m

PLANTING AND PLANT HEALTH

Propagation by seed in spring or by grafting. It can maintain its germinative power for a long time. The seed does not need previous treatment however, if immersed in water, they will be damaged. Transplanting can be delicate (winter).This species is prone to pests (processionary moth).

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Planting Pruning X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Height (cm)	Topiary shape
CT 2	20/40/60/80	
CT 5	80/100	
CT 10	100/125	
CT 25	125/150/175	
CT 28	175/200/250/300	
Rootball in mesh	250/300/350/400	

PINUS

CONIFER

Pinus sylvestris L.

PINO ALBAR, PINO SILVESTRE (SPANISH) | PI ROIG (VALENCIAN) | SCOTS PINE (ENGLISH) | PIN SYLVESTRE (FRENCH)

STRUCTURE

Shape	Height	Diameter
OVOID/IRREGULAR	15-25 M	7-10 M
Texture	**Shade**	**Root**
MEDIUM	PARTIAL	TAPROOT/HORIZONTAL

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	PINOPHYTAS
TYPE:	PINOPSIDA
ORDER:	PINALES
FAMILY:	PINACEAE

VARIETIES

AUREA
FASTIGIATA
GLAUCA
NANA

MORPHOLOGY

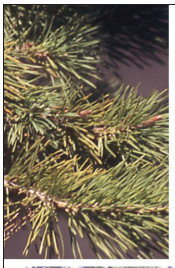
Trunk	Bark: RETICULATE/SCALE	Color: REDDISH BROWN
Leaf	COMPOUND: NO	
EVERGREEN(3-4 YEARS)	HARDNESS: CORIACEOUS	
SIZE: 3-8 x0.15 CM	ARRANGEMENT: FASCICULATE (X2)	
LEAFLETS: NO	VENATION: 1 CENTRAL VEIN	
COLOR: US: LIGHT GREEN	SHAPE: ACICULAR	
LS: LIGHT GREEN	MARGIN: ENTIRE	
TEXTURE: US: GLOSSY	APEX: ACUTE	
LS: GLOSSY	LEAF BASE: WITH BASAL SHEATH	
	PETIOLE: SESSILE	
Strobilus	Sex: UNISEXUAL	Distribution: MONOECIOUS
SIZE AND TYPE: ♂/M 6-8MM	YELLOW/RED-SOLITARY	Fragrant: NO
♀/F 6MM	REDDISH - SOLITARY	
Fruit	Type: CONE (2 YEARS)	Color: LIGHT YELLOW
SIZE: 3-6x2-3 CM	Edible: NO	Fruiting season: SEPT-NOV
Growth	Rate: FAST	Longevity: > 300 YEARS

ECOLOGY

Climate	Temperature: -20ºC	Drought resistant: MODERATE/LOW
ALTITUDE: 500-1500M	Sun exposure: SUN/PARTIAL SHADE	Frost resistant: YES
IRRIGATION: HIGH		
Soil	Texture: INDIFFERENT	Salt resistant: NO
pH: 6.5-8	Drainage: HIGH	Lime resistant: MODERATE
FERTILITY: LOW		

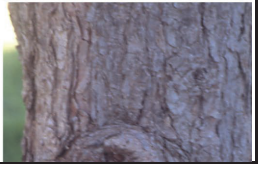
USES

Resistances		Applications			
COASTAL:	NO	SLOPE:	YES	LINE:	YES
POLLUTION:	YES(URBAN)	RIVERBANK:	NO	WINDBREAKER:	YES
WIND:	YES	GROUPS:	YES	ISOLATED:	YES









POINTS OF INTEREST

Native to Europe and Asia. (In Spain in the Pyrenees, Iberian and Cenrtal Mountain Ranges). Its bark can be peeled off in strips. The cones ovate-conical, reflex, persistent scales with +/- prominent and sometimes bent umbo. It has winged seeds. This tree is of great ornamental value due to its elegant size and it has some varieties of interest. Its wood is durable, easy-to-work, reddish-brown wood, the best of the Spanish pines; is used in construction (including shipbuilding), joinery, carpentry, plywood. It can be exploited for its resin. Pine needles have been used as fodder and used for stuffing and coarse weaving. Provides excellent fuel. Of interest in reforestation. Care must be taken as its pollen can cause allergies. This species of pine does not tolerate pruning.

PLANTING AND PLANT HEALTH

Propagation by seed in spring or its varieties by grafting. Transplanting is delicate (winter). Prone to diseases and insect pests.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing | Planting | Pruning (X)

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation	Height (cm)	Topiary shape
Years 2/0	10/20	
CT 4	20/30	
CT5	30/40/50	
CT 7	60/80	
CT 10	50/60	
CT 12	60/80	
CT 28	80/100/125/150	
	175/200	
CT40	150/175	
CT 100	175/200	

PINUS

Pinus wallichiana A.B. Jacks.

CONIFER

PINO LLORÓN DEL HIMALAYA	PI NEGRE	BLUE PINE	PIN PLEUREUR DE L'HIMALAYA
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE

Shape	Height	Diameter
CONICAL/EXTENDED	15-20 M	4-6 M
Texture	**Shade**	**Root**
COARSE	PARTIAL	TAPROOT

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	PINOPHYTAS
TYPE:	PINOPSIDA
ORDER:	PINALES
FAMILY:	PINACEAE

VARIETIES

MORPHOLOGY

Trunk	Bark: FISSURED/SCALE	Color: GRAYISH/BROWN
Leaf	COMPOUND: NO	
EVERGREEN	HARDNESS: SOFT (FLEXIBLE)	
SIZE: 10-20x0.1CM	ARRANGEMENT: FASCICULATE (X5)	
	VENATION: 1 CENTRAL VEIN	
	SHAPE: ACICULAR	
COLOR: US: BLUE/GREEN	MARGIN: ENTIRE	
LS: BLUE/GREEN	APEX: ACUTE	
TEXTURE: US: GLOSSY	LEAF BASE: WITH SHEATH (NOT PERSISTENT)	
LS: GLOSSY	PETIOLE: Sessile	
Strobilus	Sex: UNISEXUAL	Distribution: MONOECIOUS
SIZE AND TYPE: ♂/M	YELLOW/SPIKE	Fragrant: NO
♀/F 20 MM	ROSE/GREEN	
Fruit	Type: CONE (2 YEARS)	Color: LIGHT BROWN
Size: 13-20x2-4 CM	Edible: NO	Fruiting season: SEP-NOV
Growth	Rate: FAST	Longevity: < 100 YEARS



ECOLOGY

Climate	Temperature: H-3	Drought resistant: MODERATE
ALTITUDE: < 3000M	Sun exposure: SUN/PARTIAL SHADE	Frost resistant: YES
IRRIGATION: HIGH		
Soil	Texture: SANDY	Salt resistant: NO
pH: 6-7.5 7	Drainage: HIGH	Lime resistant: NO
FERTILITY: MOD/HIGH		

USES

Resistances		Applications			
COASTAL:	NO	SLOPES:	NO	LINE:	NO
POLLUTION:	YES(URBAN	RIVERBANKS:	NO	WINDBREAKER:	NO
WIND:	MODERATE	SLOPE:	YES	ISOLATED:	YES

POINTS OF INTEREST

Also known as *Pinus griffithii*. Native to Western Himalayas. Slightly curved cylindrical cones,attached to branches, hanging, generally bundled, persistent scales with convex and slightly protruding umbo. Its seeds are winged. Of great ornamental interest due to its long drooping bluish-green needles and its long drooping cones. Good quality wood, used for furniture, carpentry, etc. Bleeding the trunk can produce quality resin. In Spain, this tree has been used for reforestation. Care must be taken as its pollen can cause allergies. This species does not tolerate pruning.

SPACING: 6 m

PLANTING AND PLANT HEALTH

Propagation by seed (spring) or by graft. Transplanting can be delicate (winter). This species is prone to insect plagues.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Planting Pruning X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Height (cm)	Topiary shape
CT 2.5	20/30	
CT 12	60/80	

PLATICLADUS

Platycladus orientalis (L.) Franco

CONIFER

TUYA DE ORIENTE (SPANISH) · ARBRE DE LA VIDA (VALENCIAN) · ORIENTAL THUJA (ENGLISH) · ARBRE DE VIE (FRENCH)

STRUCTURE		
Shape: CONICAL/SPREADING	Height: 8-12 M	Diameter: 3-5 M
Texture: FINE	Shade: FULL/PARTIAL	Root: TAPROOT

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	PINOPHYTAS
TYPE:	PINOPSIDA
ORDER:	PINALES
FAMILY:	CUPRESSACEAE

VARIETIES

AUREA, NANA - YELLOW

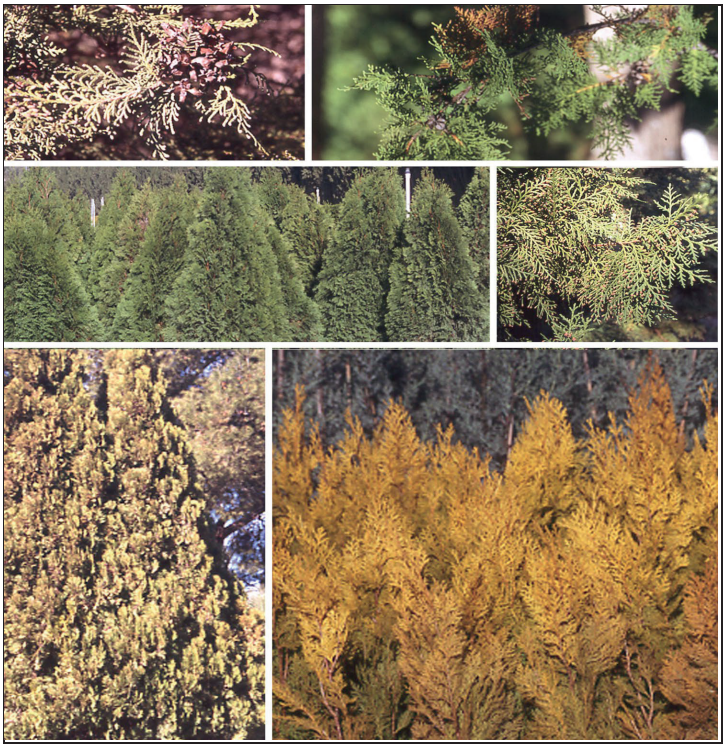
PYRAMIDALIS AUREA - YELLOW

WANGS GREEN - GREEN AND VERY COMPACT

MORPHOLOGY		
Trunk	Bark: FISSURED	Color: LIGHT RED
Leaf	COMPOUND: NO	
	HARDNESS:	
EVERGREEN	ARRANGEMENT: OPPOSITE (TUYOIDE)	
SIZE: 1.5x1.5MM	VENATION:	
LEAFLET: NO	SHAPE: SCALE	
COLOR: US: LIGHT GREEN	MARGIN: ENTIRE	
LS: LIGHT GREEN	APEX: ACUTE	
TEXTURE: US: GLOSSY	LEAF BASE: DECURRENT	
LS: GLOSSY	PETIOLE: SESSILE	
Strobilus	Sex: UNISEXUAL	Distribution: MONOECIOUS
SIZE AND TYPE: ♂/M 4-5 MM	YELLOW- SOLITARY	Fragrant: NO
♀/F 2.5-3MM	BLUE/GREEN-SOLITARY	
Fruit	Type: CONE (1 YEAR)	Color: BROWN/RED
SIZE: 1.5-2x1 CM	Edible: NO	Fruiting season: SEPT-NOV
Growth	Rate: SLOW	Longevity: > 300 YEARS

ECOLOGY		
Climate	Temperature: -10 to-15ºC	Drought resistant: YES
ALTITUDE: 0-500 M	Sun exposure: SUN/PARTIAL SHADE	Frost resistant: MODERATE
IRRIGATION: MOD/HIGH		
Soil	Texture: INDIFFERENT	Salt resistant: NO
pH: 7 - 8.5	Drainage: HIGH	Lime resistant: YES
FERTILITY: MODERATE		

USES			
Resistances		Applications	
COASTAL: 2ND LINE		SLOPES: YES	LINE: YES
POLLUTION: YES		RIVERBANKS: NO	WINDBREAKER: YES
WIND: YES		GROUPS: YES	ISOLATE: YES



POINTS OF INTEREST

Also known as *Thuja orientalis* ; *Biota orientalis.* Native to China and Korea. Its bark can be peeled off in narrow strips. Flattened branchlets arranged in vertical planes, odorless when crushed. Leaves are imbricate, thuyoid, with dorsal gland. Its cones are ovoid, pedunculated, dehiscent; persistent scales, somewhat fleshy, not peltate, with bent umbo. Its seeds do not have wings. Of great ornamental interest as it has numerous varieties that vary in appearance, size and color. In the East it is considered a sacred tree. White wood, light, brittle, aromatic and easy to work. It can be used for furniture and coffins. Occasionally used in reforestation. Care must be taken with its toxic leaves as they can cause skin problems. This tree tolerates pruning and trimming (topiary).

SPACING: Variable according to use: 0.4 m - 5 m.

PLANTING AND PLANT HEALTH

Propagation by seed (spring) or its varieties by cutting, layering or grafting, on *Platyclados* , *Thuja* or *Chamaecyparis* . The seeds lose their germinative power quickly but if properly preserved (airtight containers, dry and at 2-4º C) they are viable for 3 -4 years. They do not require prior treatment to germinate, since they are not dormant, although it is convenient to stratify them in moist sand to advance germination. The germination period is 3-4 weeks and the percentage is 50-60%. Seedlings should be protected from the sun (summer) and cold (winter). Transplanting is delicate (winter). This tree can occasionally present fungal and insect attacks. Minimal maintainance is required.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Planting Pruning x

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Height (cm)	Topiary shape
POT 9	Year 1/1	
CT3	20/30/40	
CT5	30/40	
CT7	40/50/60/80	
CT10	50/60	
CT15	50/60-80/100	
CT22	100/125	
CT28	60/80/100/125/ /50/175	
CT40	80/100-175/200	

PODOCARPUS *Podocarpus macrophyllus* (Thub.) D.Don

CONIFER

PODOCARPO (SPANISH) | VALENCIAN | BROAD LEAVED PODOCARPUS (ENGLISH) | PIN DES BOUDDHISTES (FRENCH)

STRUCTURE		
Shape: OBLONG/OVAL	Height: 15-20 M	Diameter: 8-10 M
Texture: COARSE/FINE	Shape: FULL	Root: OBLIQUE

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	PINOPHYTAS
TYPE:	PINOPSIDA
ORDER:	PINALES
FAMILY:	PODOCARPACEAE

VARIETIES

MORPHOLOGY		
Trunk	Bark: FISSURED	Color: LIGHT GRAY
Leaf: EVERGREEN; SIZE: 8-10x0.6 CM; LEAFLET:NO; COLOR: US: DARK GREEN, LS: MED. GREEN; TEXTURE: US: GLOSSY, LS: SMOOTH	COMPOUND: NO; HARDNESS: CORIACEOUS; ARRANGEMENT: ALTERNATE; VENATION: 1 CENTRAL VEIN; SHAPE: LANCEOLATE/FALCATE; MARGIN: ENTIRE; APEX: ACUTE/ACCUMINATE; LEAF BASE: EXTENDED; PETIOLE: SHORT	
STROBILUS; SIZE AND TYPE: ♂/M 2-3CM YELLOW/GREEN-GROUP; ♀/F 1CM LIGHT GREEN -SOLITARY	Sex: UNISEXUAL	Distribution: DIOECIOUS; Fragrant: NO
Fruit; SIZE: 3.5-4 x 1.5 CM	Type: EPIMATIUM (1 YEAR); Comestible: NO	Color: RED/VIOLET; Fruiting season: SEP-OCT
Growth	Rate: MEDIUM/SLOW	Longevity: < 150 YEARS

ECOLOGY		
Climate; ALTITUDE: 0-600M; IRRIGATION: MODERATE	Temperature: H-4; Sun exposure: SUN	Drought resistant: MODERATE/LOW; Frost resistant: MODERATE
Soil; pH: 6.5-8.5; FERTILITY: MOD/POOR	Texture: INDIFFERENT; Drainage: HIGH	Salt resistant: NO; Lime resistant: YES

USES				
Resistances		Applications		
COASTAL: 2ND LINE	SLOPES: NO	LINE: NO		
POLLUTION: YES(URBAN)	RIVERBANKS: NO	WINDBREAKER: YES		
WIND: MODERATE	GROUPS: YES	ISOLATED: YES		



POINTS OF INTEREST

Native to China and Japan. Trunk somewhat sinuous. Branches with pendulous tips. Leaves are sometimes falcate. Male strobilus is short stalked. The female strobilus is made up of many sterile basal scales fused to the axis and a fertile apical scale that bears a single ovule. Ovoid seed with a somewhat fleshy outer shell and a woody inner shell (drupaceous appearance) surrounded by a colored fleshy receptacle. Some of its varieties are of ornamental interest. Yellowish wood, durable, easy to work. The wood is of good quality and has a wide range of uses. This tree tolerates pruning.

SPACING: L2

PLANTING AND PLANT HEALTH

Propagation by seed and its varieties by cutting (autumn). Grafting (on species that root easily). Transplanting is delicate (spring, autumn and winter). In Europe, it does not have any natural enemies.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Planting Pruning X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Height (cm)	Topiary shape
CT3	20/30	

PSEUDOTSUGA

CONIFER

Pseudotsuga menziesii (Mirb.) Franco

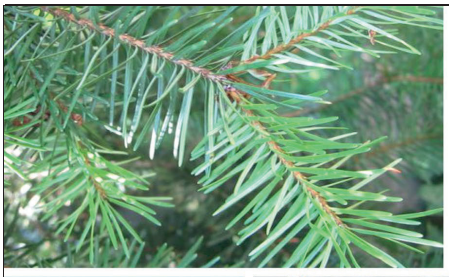
ABETO DE DOUGLAS (SPANISH) | AVET DE DOUGLAS (VALENCIAN) | DOUGLAS FIR (ENGLISH) | SAPIN DE DOUGLAS (FRENCH)

STRUCTURE		
Shape: CONICAL/IRREGULAR	Height: 20-25 M	Diameter: 6-10 M
Texture: MEDIUM	Shade: FULL	Root: HORIZONTAL

DIVISION:	SPERMATOPHYTES
SUBDIVISON:	PINOPHYTAS
TYPE:	PINOPSIDA
ORDER:	PINALES
FAMILY:	PINACEAE

VARIETIES

MORPHOLOGY		
Trunk	Bark: RETICULATE	Color: REDDISH GRAY
Leaf: EVERGREEN; SIZE: 20-35x2 MM; LEAFLETS: NO; COLOR: US: DARK GREEN; LS:GREENISH GRAY; TEXTURE: US: GLOSSY; LS: GLOSSY	COMPOUND: NO; HARDNESS: SOFT(FLEXIBLE); ARRANGEMENT: ALTERNATE(SUBDISTICHUOUS); VENATION: 1 CENTRAL VEIN; SHAPE: ACICULAR; MARGIN: ENTIRE; APEX: ROUND; LEAF BASE: EXTENDED; PETIOLE: SESSILE	
Strobilus: SIZE AND TYPE: ♂/M 15-20 MM YELLOWIRED- SOLITARY; ♀/F 15 MM GREEN/YELLOW- SOLITARY	Sex: UNISEXUAL	Distribution: MONOECIOUS
		Fragrant: NO
Fruit: SIZE: 6-9 x 3-4 CM	Type: CONE (1 YEAR)	Color: REDDISH BROWN
	Edible: NO	Fruiting season: SEPT-DEC
Growth	Rate: HIGH	Longevity: > 300 YEARS









ECOLOGY		
Climate: ALTITUDE: 200-2000; IRRIGATION: MOD/HIGH	Temperature: -15° to -20ºC	Drought resistant: NO
	Sun exposure: SUN /PARTIAL SHADE	Frost resistant: YES
Soil: pH: 5.5 -7.5; FERTILITY: MODERATE	Texture: LOAMY/SANDY	Salt resistant: NO
	Drainage: HIGH	Lime resistant: NO

USES				
Resistances		Applications		
COASTAL:	2ND LINE	SLOPES:	NO	LINE: YES
POLLUTION:	YES(URBAN)	RIVERBANKS:	NO	WINDBREAKER: YES
WIND:	NO	GROUPS:	YES	ISOLATED: YES

POINTS OF INTEREST

Also known as *P. douglasii.* Native to Northwest America (Canada-Mexico). Up to 90 m and a trunk diameter of 3 m. (origin area). Branchlets are somewhat pendulous. Flat leaves with bands on their undersides, with a lemon or tangerine fragrance when rubbed. Its cones which are attached to the branches are conical, pendulous have persistent scales and exserted trifid bracts. Winged seed. This tree is highly appreciated for its ornamental value. It has some varieties of interest that vary in size and appearance that make them suitable for different uses (rockeries, etc.). This species can be used in regions with a humid climate since it gives more yield than European conifers. Yellowish wood, of good quality, hard, easy to work. Used for construction, carpentry, joinery and paper pulp. This tree tolerates pruning, trimming and topiary.

SPACING : 10 m

PLANTING AND PLANT HEALTH

Propagation by seed (in spring if it is stratified or in autumn if not), and its varieties by cutting or grafting. The seed has variable dormancy periods and should be treated with sand and moist peat at 2-3 ºC for 4-5 weeks or by immersion in water at 15 ºC for 40-48 hours. Seedlings are delicate to develop. Germination period about 20 days. Transplanting is easy (winter). This tree is prone to attack by aphids and cryptogamic diseases.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing | Planting | Pruning X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation	Height(cm)	Topiary shape
Years 2/0	15/30	
Year 1/1	20/40	
Year 2/1	60/100	

SEQUOIADENDRON *Sequoiadendron giganteum* (Lindl.) Bucholz.

CONIFER

SEQUOIA GIGANTE (SPANISH) | SEQUOIA GEGANT (VALENCIAN) | BIG TREE/GIANT SEQUOIA (ENGLISH) | SEQUOIA GEANT (FRENCH)

STRUCTURE		
Shape: CONICAL/COLUMNAR	Height: 20-30 M	Diameter: 4-7 M
Texture: FINE	Shade: FULL	Root: TAPROOT

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	PINOPHYTAS
TYPE:	PINOPSIDA
ORDER:	PINALES
FAMILY:	TAXODIACEAS

VARIETIES

PENDULA

MORPHOLOGY

Trunk	Bark: FIBEROUS	Color: REDDISH BROWN
Leaf: PERSISTENT; SIZE: LEAF:4-10x1MM; LEAFLET: NO; COLOR: US: LIGHT GREEN; LS: LIGHT GREEN; TEXTURE: US: SMOOTH; LS: SMOOTH	COMPOUND: NO; HARDNESS: CORIACEOUS; ARRANGEMENT: ALTERNATE (SPIRAL); VENATION: 1 CENTRAL VIEN; SHAPE: LANCEOLATE/SCALE; MARGIN: ENTIRE; APEX: ACUTE; LEAF BASE: EXTENDED/DECURRENT; PETIOLE: SESSILE	
Strobilus: SIZE AND TYPE: ♂/M 5-6 MM LIGHT YELLOW -SOLITARY; ♀/F 10 MM GREEN/VIOLET -SOLITARY	Sex: UNISEXUAL	Distribution: MONOECIOUS; Fragrance: NO
Fruit: Size: 5-8x3-4 CM	Type: CONE (2-3 YEARS); Edible: NO	Color: LIGHT GREEN; Fruiting season: SEPT-NOV
Growth	Rate: MEDIUM/FAST	Longevity: > 1000 YEARS









ECOLOGY

Climate: ALTITUDE: 1500-2500; IRRIGATION: HIGH	Temperature: -15º to -20ºC; Sun exposure: SUN /PARTIAL SHADE	Drought resistant: NO; Frost resistant: YES
Soil: pH: 6-8; FERTILITY: MOD/HIGH	Texture: LOAMY/CLAYEY; Drainage: HIGH	Salt resistant: NO; Lime resistant: MODERATE

USES

Resistances		Applications			
COASTAL:	NO	SLOPES:	NO	LINE:	YES
POLLUTION:	YES (URBAN	RIVERBANKS:	NO	WINDBREAKER:	YES
WIND:	YES	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Also known as *Sequoia gigantea* . Native to Eastern U.S.A. Its bark can be peeled off in strips. Base generally wide. Branchlets are thin and pendulous, rough to the touch. Leaves of two types (+- trigone.) Its cones are oblong, pedunculated. Its scales are pendulous, long and persistent with a rough umbo. It has a depressed back and deciduous mucron; they rarely occur before the plant reaches 100 years. Seed with 2 wings. Of great ornamental value due to its majestic size. It has some varieties of variable interest in size and foliar color. Its wood is fragile, of little resistant and poor quality. Used in the construction of roofs and fences,... This species of pine tolerates pruning but does not require it.

SPACING: 4-6 m

PLANTING AND PLANT HEALTH

Propagation by seed (spring), or its varieties by cutting, layering or grafting. Transplanting is delicate (winter). The seed does not need previous treatments for its germination, although if it is stratified with moist sand, they will germinate faster. The seedlings should be protected from the sun in early stages. This species is resistant to pests and diseases.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Planting Pruning x

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Height(cm)	Topiary shape
POT 9	Year1/1	
CT5	50/60	
CT7	60/80	
CT100	200/250	

TAXODIUM

CONIFER

Taxodium distichum (L.) Rich.

CIPRÉS DE LOS PANTANOS	TAXODÍ	SWAMP CYPRESS	CYPRÈS CHAUVE
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Shape	Height	Diameter
CONICAL/EXPANDED	15-25 M	6-12 M
Texture	Shade	Root
FINE	PARTIAL	PNEUMATOPHORES

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	PINOPHYTAS
TYPE:	PINOPSIDA
ORDER:	PINALES
FAMILY:	TAXODIACEAS

VARIETIES

MORPHOLOGY

Trunk	Bark: FIBEROUS	Color: REDDISH BROWN
Leaf	COMPOUND: NO	
	HARDNESS: SOFT(FLEXIBLE)	
DECIDUOUS	ARRANGEMENT: ALTERNATE (DISTICHUOUS)	
SIZE: 1.3-2 x 0.1 CM	VENATION: 1 CENTRAL VEIN	
	SHAPE: LINEAR/SCALE	
COLOR: US: LIGHT GREEN	MARGIN: ENTIRE	
LS: LIGHT GREEN	APEX: ACUTE	
TEXTURE: US: GLOSSY	LEAF BASE: ATTENUATE	
LS: GLOSSY	PETIOLE: SESSILE	
Strobilus	Sex: UNISEXUAL	Distribution: MONOECIOUS
SIZE AND TYPE: ♂/M 2-3MM	REDDISH - SPIKES	Fragrant: NO
♀/F 2-3 MM	GREEN-SOLITARY	
Fruit	Type: CONE (1 YEAR)	Color: REDDISH BROWN
SIZE: 2-3x1.5-2.5CM	Edible: NO	Fruiting season: OCT-DEC
Growth	Rate: MEDIUM/SLOW	Longevity: > 300 YEARS



ECOLOGY

Climate	Temperature: -20ºC	Drought resistant: MOD/LOW
ALTITUDE: 0-400 M	Sun exposure: SUN/PARTIAL SHADE	Frost resistant: MOD/LOW
IRRIGATION: MOD/HIGH		
Soil	Texture: LOAMY	Salt resistant: NO
pH: 6-7.5	Drainage: LOW	Lime resistant: LOW
FERTILITY: MODERATE		

USES

Resistances		Application			
COASTAL:	NO	SLOPES:	NO	LINE:	NO
POLLUTION:	YES(URBAN)	RIVERBANKS:	YES	WINDBREAKER:	NO
WIND:	NO	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Native to Florida (U.S.A). Its bark can be peeled off in strips. Branching with the appearance of a candelabrum (in older specimens). Persistent branches with scale-shaped spiral leaves, the deciduous species have flat leaves. Its cones are subglobular, erect and attached to the branches. Its scales are deciduous, peltate and with a bent umbo. Slightly winged seed. Very ornamental due to its appearance with thickened base, presence of buttress roots and pneumatophores and the autumn color of its leaves (brown-reddish).They can be used to decorate lakes and water areas and wet ground. Yellow-reddish wood, light and elastic, easy to work and of excellent quality (carpentry, shipbuilding, warehouses). It has formed important deposits of brown coal (lignite). Its resin has medicinal interest.This tree does not tolerate pruning.

SPACING:7-8 m

PLANTING AND PLANT HEALTH

Propagation by seed (mainly in autumn) or its varieties by cutting (relatively easy) or grafting. The seed is dormant in winter and must be stratified in moist sand for 1-2 months at 4-5º C. It sprouts from a stock. Transplanting is difficult (winter). This tree is prone to cryptogamic diseases.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Planting Pruning X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Height (cm)	Topiary shape
Year 1/0	30/50	
CT 5	75/100/150	

TAXUS *Taxus baccata* L.

CONIFER

TEJO	TEIX	COMMON YEW	IF
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE

Shape	Height	Diameter
CONICAL ± EXTENDED	6-10 M	4-6 M
Texture	**Shade**	**Root**
MEDIUM/FINE	FULL	TAPROOT/HORIZONTAL

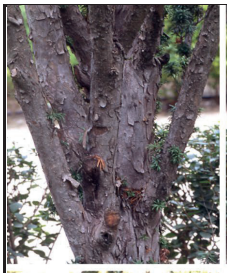
DIVISION:	SPERMATOPHYTES
SUBDIVISION:	PINOPHYTAS
TYPE:	PINOPSIDA
ORDER:	CUPRESSALES
FAMILY:	TAXACEAS

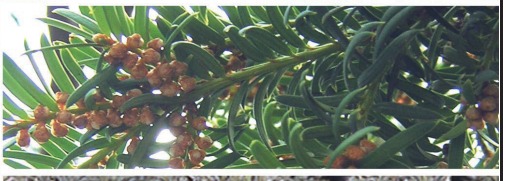
VARIETIES

FASTIGIATA ROBUSTA
PIRAMIDAL

MORPHOLOGY

Trunk	Bark: FISSURED	Color: LIGHT RED
Leaf	COMPOUND: NO	
	HARDNESS: CORIACEOUS	
EVERGREEN (8 YEARS)	ARRANGEMENT: ALTERNATE(SUBDISTICHUOUS)	
SIZE: 15-25x 3 MM	VENATION: 1 CENTRAL VEIN	
LEAFLETS: YES	SHAPE: LINEAR-LANCEOLATE	
COLOR: US: DARK GREEN	MARGIN: ENTIRE	
LS: MED.GREEN	APEX: ACUTE/MUCRONATE	
TEXTURE: US: GLOSSY	LEAF BASE: ATTENUATE/DECURRENT	
LS: OFF-WHITE	PETIOLE: SHORT SESSILE	
Strobilus	Sex: UNISEXUAL	Distribution: DIOECIOUS
SIZE AND TYPE: ♂M 6 MM	YELLOW -SOLITARY	Fragrant: NO
♀/F 6 MM	GREEN- SOLITARY	
Fruit	Type: DRUPE (1 YEAR)	Color: RED
SIZE: 9-11x 8-10 MM	Edible: NO	Fruiting season: OCT-DEC
Growth	Rate: SLOW	Longevity: > 500 YEARS




ECOLOGY

Climate	Temperature: -15º to -20ºC	Drought resistant: MODERATE
ALTITUDE: 0-1800M	Sun exposure: PARTIAL SUN	Frost resistant: YES
IRRIGATION: MODERATE		
Soil	Texture: LOAMY	Salt resistant: NO
pH: 6.5-8.5	Drainage: HIGH	Lime resistant: YES
FERTILITY: MOD/HIGH		

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	YES	LINE:	YES
POLLUTION:	YES	RIVERBANKS:	NO	WINDBREAKER:	YES
WIND:	YES	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Native to Europe, Eastern Asia and Northern Africa. Its bark can be peeled off in strips. Stems with frequent budding (dormant buds). Isolated seed, covered by a fleshy aril that gives it the appearance of a drupe. Of great ornamental interest, it has numerous varieties of variable interest in size, leaf length, foliage color. Reddish wood, hard and very resistant, compact, elastic and rot-proof; of interest in cabinetmaking, sculpture, imitation ebony, manufacture of bows. Taxol can be obtained from its leaves and has medicinal interest in treatment of tumors. Care must be taken as its branches, leaves and seeds are toxic (presence of taxin), but not the aril. This tree tolerates pruning and trimming and is ideal for topiary. It sprouts well from the stump.

SPACING: variable according to use: 0.5 - 3 m.

PLANTING AND PLANT HEALTH

Propagation by seed (in autumn germinating in the 2nd/3rd spring or in spring with treated seed, germinating in that or the following spring) or its varieties by cutting (collected in autumn and stratified during the winter in moist sand and cold chamber and planted in spring), grafting or layering. The seed once dry, should be devoid of the aril should be stored in airtight containers at 3-4 ºC. or be sown, and must be treated, with hot or sulfuric water, since it presents a delicate dormancy period. Transplanting can be done in the winter. This tree is prone to attacked by insects.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Planting Pruning X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Height (cm)	Topiary shape
POT 9	Year/s 1/1 - 15/20	
CT2.5	20/30/40	
CT 3	10/20/30/40/50	
CT 5	40/50/60/80	
CT 7	50/60/80	
CT 10	60/80	
Extra sizes	60/80	
CT15	80/100	
CT 28	125/150/175	
CT100	175/200	

TETRACLINIS

CONIFER

Tetraclinis articulata (Vahl.) Masters

CIPRÉS DE CARTAGENA (SPANISH) | XIPRER DE CARTAGENA (VALENCIAN) | SANDARAC (ENGLISH) | THUYA ARTICULÉ (FRENCH)

STRUCTURE		
Shape: CONICAL ± EXTENDED	Height: 6-10 M	Diameter: 4-5 M
Texture: FINE	Shade: PARTIAL	Root: TAPROOT

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	PINOPHYTAS
TYPE:	PINOPSIDA
ORDER:	PINALES
FAMILY:	CUPRESSCEAE

VARIETIES

MORPHOLOGY		
Trunk	Bark: FISSURED	Color: LIGHT GRAY
Leaf: EVERGREEN; SIZE: 0.8-1 x 1.5 m; LEAFLETS: YES; COLOR: US: MED. GREEN, LS: MED.GREEN; TEXTURE: US: GLOSSY, LS: GLOSSY	COMPOUND: NO; HARDNESS:; ARRANGEMENT: SUBWHORLED (THUYOIDE); VENATION:; SHAPE: SCALE; MARGIN: SERRATE; APEX: ACUTE/OBTUSE; LEAF BASE: DECURRENT; PETIOLE: SESSILE	
Strobilus: SIZE AND TYPE: ♂/M 5-6 MM YELLOW-SOLITARY; ♀/F 5-6 MM LIGHT GREEN-SOLITARY	Sex: UNISEXUAL	Distribution: MONOECIOUS; Fragrance: NO
Fruit: SIZE: 10-12x8-10MM	Type: CONE (2 YEARS); Edible: NO	Color: GRAY OCHER; Fruiting season: OCT-NOV
Growth	Rate: SLOW	Longevity: > 300 YEARS

ECOLOGY		
Climate: ALTITUDE: 0-1800 M; IRRIGATION: LOW	Temperature	Drought resistant: YES
	Sun exposure: SUN	Frost resistant: NO
Soil: pH: 6.5-8; FERTILITY: MOD/POOR	Texture: LOAMY	Salt resistant: NO
	Drainage: HIGH	Lime resistant: YES

USES			
Resistances		Applications	
COASTAL: 2ND LINE		SLOPES: YES	LINE: YES
POLLUTION: YES(URBAN)		RIVERBANKS: NO	WINDBREAKER: YES
WIND: YES		GROUPS: YES	ISOLATED: YES



POINTS OF INTEREST

Native to Northern Africa and Cartagena. Erect-like branches; flexible branchlets in flattened groups, appearing to be jointed. Opposite adult leaves with a whorled appearance (x4), thuyoid, with dorsal gland. Its cones are subglobose, solitary, woody and stalked, with 4 cordate scales, 2 of them with longitudinal depression on their back. Seed with two lateral wings. Interesting in Mediterranean gardens. Hard, resistant and very durable wood, rich in resin; It is used in joinery and marquetry. By bleeding, the sandarac can be extracted and is used to make varnishes. It can also be used in pharmacuetical industry and in ancient times it was used as an imbalming agent. Vine sprouts from the stump. This species can be used for reforestation in temperate and arid zones. This tree tolerates pruning and trimming (topiary).

SPACING: 3-4 m

PLANTING AND PLANT HEALTH

Propagation by seed (mainly in autumn and spring) or its varieties by cutting, grafting or layering. The seed loses its germination power quickly and if properly preserved it can be viable for 2-3 years. It does not need any previous treatment for its germination, although it is usually soaked between 8-24 hours before sowing. The germination time is 15-30 days, and the seedlings do not need to be protected. Transplanting is delicate (autumn and spring). This species is very resistant to destruction agents (fires, mutilations, etc.), as well as pests and diseases. Minimal maintenance is required.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing | Planting | Pruning (x)

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation	Height (cm)	Topiary shape

X CUPPRESOCYPARIS

CONIFER

X Cupressocyparis leylandii Dallin

CIPRES DE LEYLAND (SPANISH) · XIPRER DE LEYLAND (VALENCIAN) · LEYLAND CYPRESS (ENGLISH) · CYPRÈS DE LEYLAND (FRENCH)

STRUCTURE		
Shape: CONICAL-COLUMNAR	Height: 9-12 M	Diameter: 4-6 M
Texture: FINE	Shade: FULL	Root: TAPROOT

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	PINOPHYTAS
TYPE:	PINOPSIDAS
ORDER:	PINALES
FAMILY:	CUPRESSACEAE

VARIETIES

CASTLEWELLEN GOLD - GOLDEN YELLOW *GOLD RIDER* - YELLOW
NAYLOR'S BLUE and *PIRAMIDALIS* - BOTH GREENISH GRAY
SILVER DUST DARK GREEN WITH WHITE SPOTS
HERCULEA - DARK GREEN

MORPHOLOGY

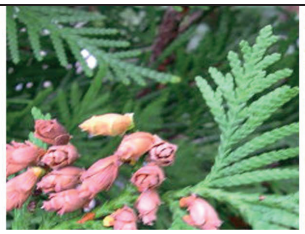
Trunk	Bark	Color: LIGHT RED
Leaf: EVERGREEN	COMPOUND: NO	
SIZE: 4*2MM	HARDNESS:	
LEAFLETS: YES	ARRANGEMENT: OPPOSITE (THUYOIDE)	
COLOR: US: DARK GREEN	VENATION:	
LS: DARK GREEN	SHAPE: SCALE	
TEXTURE: US: GLOSSY	MARGIN: DENTATE	
LS : GLOSSY	APEX: ACUTE	
	LEAF BASE: DECURRENT	
	PETIOLE: SESSILE	
Strobilus	Sex: UNISEXUAL	Distribution: MONOECIOUS
SIZE AND TYPE: ♂/M 3-4 MM YELLOW-SOLITARY; ♀/F 4-5MM GREEN-SOLITARY		Fragrant: NO
Fruit	Type: CONE (1YEAR)	Color: BROWN
SIZE: 1.5-2 x2-1.5CM	Edible: NO	Fruiting season: OCT-NOV
Growth	Rate: FAST	Longevity: > 100 YEARS

ECOLOGY

Climate	Temperature: -10º to 15ºC	Drought resistant: MODERATE
ALTITUDE:	Sun Exposure: SUN	Frost resistant: YES
IRRIGATION: MODERATE		
Soil	Texture: INDIFFERENT	Frost resistant: NO
pH: 6.5-8	Drainage: HIGH	Lime resistant: YES
FERTILITY: MOD/POOR		

USES

Resistances		Applications			
COASTAL:	1ST LINE	SLOPES:	NO	LINE:	YES
POLLUTION:	YES (URBAN)	RIVERBANKS:	NO	WINDBREAKER:	YES
WIND:	YES	SLOPES:	YES	ISOLATED:	YES




POINTS OF INTEREST

Specific to Horticultural (hybrid between *Cupressus macrocarpa* and *Chamaecyparis nootkatensis*). Flat branches arranged in bundles. Its leaves are rough and release a fragrance when rubbed. The cones are spherical or oblong, pedunculate, woody, with peltate and persistent scales. This species is widely cultivated as an ornamental and it has a large number of varieties of interest. It is used to build hedge rows but should be restricted to a minimum height (2.5 m minimum) since it is too vigorous. This tree tolerates pruning and trimming (topiary).

SPACING: 4-5 m /0.4 m (on hedge rows)

PLANTING AND PLANT HEALTH

Propagated by soft cutting in spring (easy) or by graft. As it is a species of hybrid origin, it cannot be propagated by seed.Transplanting is delicate (winter). This species is resistant to pests and diseases.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Planting Pruning (X)

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Height (cm)	Topiary shape
POT 9	30/40	
CT1.5	40/60/80/100	
CT3	80/100/125	
CT10	125/150/175/200	
CT28	175/200/250	
CT40	200/250	
CT50	250/300	
CT70	300/350	
CT240	300/400	

Subchapter 3.3 Commercialization

TYPOLOGY OF CONIFERS

Conifers can be classified according to its final size and shape in:

- **TYPE A:** Conifers of great development and conical shape. Ex: *Cedrus deodara*
- **TYPE B:** Highly developed conifers with a well-differentiated crown. Ex: *Pinus canariensis*
- **TYPE C:** Conifers of great development and columnar shape. Ex: *Cupressus sempervirens*
- **TYPE D:** Medium-sized conifers with globose growth. Ex: *Juniperus x media*
- **TYPE E:** Medium-sized conifers with columnar growth. Ex: *Taxus bacata ´Fastigiata´*
- **TYPE F:** Small conifers. Ex: *Juniperus communis ´*Green Carpet´

CULTIVATION CONDITIONS IN THE GREENHOUSE

Conifers can be grown in the field or in a container.

Field grown conifers

As displayed in Table 3.3.1, the spacing between plants will be proportional to the needs of the individuals, according to species and variety.

TYPE	Height (cm)	Spacing Minimal Surface (m^2)	Recommended spacing (Distance between plants by rows in cm)
A	200/300 300/400 >400	2.25 4.50 9.00	150 x 150 150 x 300 300 x 300
B	200/300 300/400 >400	2.25 4.50 9.00	150 x 150 150 x 300 300 x 300
C	200/300 300/400 >400	2.25 2.25 4.50	150 x 150 150 x 150 150 x 300
	Width (cm)		
D	50/100 100/150	0.55 2.25	75 x 75 150 x 150
	Height (cm)		
E	100/150 150/200	0.35 1.25	50 x 75 100 x 125
F	< 40 > 40	0.25 0.80	40 x 60 80 x 100

Table 3.3.1: Spacing for conifers grown in the field (this may vary depending on the machinery used). NT07C of the Technical Standards for Gardening and Landscaping, COITAPAC.

The minimum dimensions of the root ball, depending on the height of the plant, for adequate stability when being lifted can be consulted in Table 3.3.2 (NTJ-07C).

TYPE	HEIGHT (cm)	RECOMMENDED ROOT BALL DIMENSIONS (*) (Depth x Diameter, in centimeters)
A	200/250 250/300 300/400 400/600	45 x 40 50 x 45 65 x 45 75 x 55
B	200/250 250/300 300/400 400/600	45 x 40 50 x 45 65 x 45 75 x 55
C	200/300 300/400 400/500 500/600	40 x 35 50 x 40 60 x 45 70 x 55
	Width	
D	50/100 100/150	25 x 25 30 x 30
	Height	
E	100/150 150/200	25 x 25 30 x 30
F	< 40 > 40	22 x 22 25 x 25

Table 3.3.2: Recommended root ball dimensions for field-grown conifers. NT07C of the Technical Standards for Gardening and Landscaping, COITAPAC. (*) Not applicable to conifers for hedges

Conifers cultivated in containers

Container-grown conifers should have been transplanted into and grown in a container big enough for their new roots to develop so that the root system retains its shape and remains compact when the plant is removed.

The size of the container will be proportional to the size of the plant and will be at least 2 liters according to Table 3.3.3. In either case the plants will need to be moved to a larger container before root spiraling occurs.

MINIMUM VOLUME OF CONTAINER	
GROUP *	**MINIMUM VOLUME (liters)**
1 (> 80 cm)	4.0
2 (between 60-80 cm) and 3 (between 40-80 cm)	3.0
4 (between 25-60 cm)	2.5
5 (between 25-30 cm)	2.0

Table 3.3.3: Minimum volume of container. NT07C of the Technical Standards for Gardening and Landscaping, COITAPAC. In Annex II of the NTJ-07C, the species included in each group are listed, as well as their maximum size.

Rootstocks

Rootstocks for conifers such as *Abies alba, Picea abies, Cedrus deodara, Pinus spp, Cupressus sempervirens, Platycladus orientalis, Thuja occidentalis, Chamaecyparis lawsoniana, Juniperus virginiana, Taxus baccata* and similar, will depend on the species, straight plants, transplanted from two, three or four years and with a minimum length of 5 cm above the neck of the plant.

Root pruning and transplants

Conifers will be transplanted or root pruned according to their needs, species or variety, age, and location.

Conifers not grown in a nursery cannot be commercialized until they have taken new root. The plant from nursery cultivation will be root pruned a month and a half before its sale, at least, ensuring the creation of new roots.

The conifers grown in containers will be transplanted or planted at intervals of time, which will not exceed those listed in Table 4 (NTJ 07C), variables depending on the group, the cultivar, and their dimensional features.

HEIGHT (cm.)				DURATION (years)
*GROUP 1 and 2	GROUP 3	GROUP 4	GROUP 5	
< 100	<100	< 80	< 30	2
100-200	100-200	80-150	35-80	3
200-300	200-300	150-250	80-150	4
>350	>300	>250	>150	5

Table 3.3.4: Maximum duration of container crops without transplanting. NT07C of the Technical Standards forGardening and Landscaping, COITAPAC

Dimensions and proportions

Conifers will be measured according to the total height measured from the ground level to the top as shown in Figure 3.3.1. The base to its height is classified according to its height as shown in Table 3.3.5. (NTJ07C).

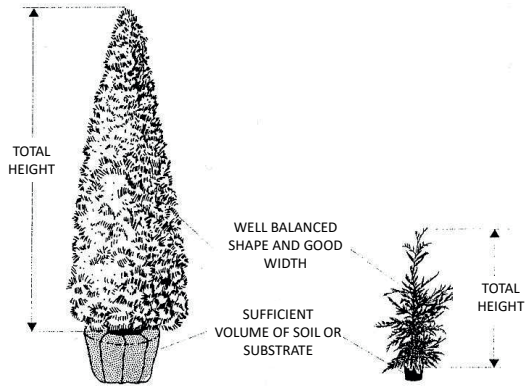


Figure 3.3.1: Measurements to classify conifers in height NT07C of the Technical Standards for Gardening and Landscaping, COITAPAC

STANDARD HEIGHTS (cm)					
12/15	30/40	60/80	100/125	200/250	* 600/700
15/20	40/50	80/100	125/150	250/300	
20/25	50/60		150/175	300/350	
25/30	60/70		175/200	350/400	
				400/450	
				450/500	
				500/550	
				550/600	

Table 3.3.5: Measurements to classify conifers in height above 600 cm. They will be measured every 100 cm). NT07C of the Technical Standards for Gardening and Landscaping, COITAPAC

Conifers whose main dimensional characteristic is its width will be measured as shown in Figure 3.3.2 and will be classified according to the sections shown in Table 3.3.6. NTJ 07C.

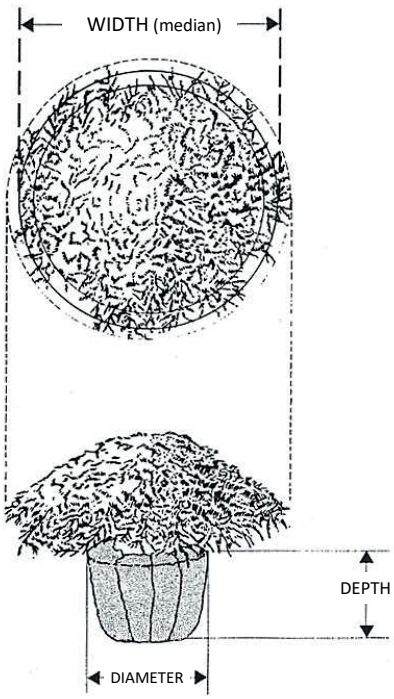


Figure 3.3.2: Dimensions to classify conifers in width. NT07C of the Technical Standards for Gardening and Landscaping, COITAPAC

WIDTH (cm)
40/50
50/60
60/80
80/100
100/125
125/150
150/175
175/200
200/250
250/300

Table 3.3.6: Measurements to classify conifers in width. NT07C of the Technical Standards for Gardening and Landscaping, COITAPAC

For conifers with a regular shape, it's width will correspond to the largest measurement and for irregularly shaped ones to the median of the widths at the level of the largest section.

SUPPLY

Specific and varietal authenticity

Conifers intended for sale must have the appropriate identification and purity in relation to the species or cultivar to which they belong (if they are marketed with reference to the latter). This means that they must respond to both the features that determine the species and those that determine the cultivar. In general, conifers will be fully branched from the base according to the growth habit of the species or variety. The leaves will also have the typical color of the species or variety depending on the time of year.

Presentation

Conifers may be commercialized with a root ball, in a container or in other types of containers, as long as they are capable of developing new roots within the root ball.

- *Conifers supplied in root ball:*

The root ball should be solid and have a well-developed root system.

The root ball must be protected with non-galvanized wire mesh, with a basket of the same material, with degradable organic fabric, or with reinforced plaster and must be tied with suitable degradable material. In the case of specimen trees, the root ball must be protected with non-galvanized wire mesh, a basket of the same material, reinforced plaster, or in a wooden bucket and must be tied with suitable degradable material. The protective materials must not be damaged during delivery.

- *Conifers supplied in containers:*

A containerized conifer should have been transplanted and grown long enough for new roots to develop in such a way that the root ball will hold its shape inside the container and remain compact when removed. Roots should not show symptoms of spiraling and should not protrude significantly through drainage holes.

Container-grown conifers should be sold based on plant size and container volume. The container should be rigid enough to support the shape of the root ball, protecting the root mass during transport. The tree should be centered in the container and have enough substrate in the container relative to the volume of the container.

Particular specifications

Conifers for hedges will be fully branched from the base, with full foliage and, if necessary, must be cut back during the growing season. Conifers taller than 3 m will be trimmed annually to compensate for their growth.

Strong-growing conifers will be fully branched to the last annual branch. Both the length of the last annual branch and the set of leaves will be harmoniously proportioned to the growth habit of the species-variety.

The species that present forms of vertical growth will be delivered with the central branch intact, except for *Taxus* spp., *Thuja* spp., *Tsuga* spp.

Supply period

The appropriate planting time depends on the type of supply (root ball or container), the species of conifer, the climate in both the planting site and the nursery, the weather and the type of maintenance that is planned to be carried out.

Planting should be carried out preferably when the roots of the tree are dormant, avoiding the critical period of sprouting, which depends on the species and the climatic conditions of the place. It is also not recommended to plant in unfavorable weather conditions, such as frost, heavy rain, snowfall, or on days with strong winds or excessively high temperatures.

Supplying conifers in containers or plastered root balls facilitates handling and the possibility of planting throughout the year.

Plant health

The conifer trees must be healthy, mature, and sufficiently hardened so that their roots and future development are not compromised.

Trees cannot show defects caused by diseases, pests, physiopathology, nutritional deficiencies, or phytotoxicity due to phytosanitary treatments that reduce the value or qualification for use.

The trees should not have any burns or injuries in the bark, apart from the normal ones produced during formative pruning. There should be no broken branches or twigs and the foliage should not be damaged or dry. The twigs as well as the roots must present a good turgidity.

The substrates of the plants, both those supplied in containers and in root balls, must be free of weeds, especially for perennial plants.

Labelling

Once the vegetative material has left the nursery, each lot must have a durable label that is correctly and solidly attached to the tree, with clearly visible characters, recording:

- Name of variety and/or cultivar. If the variety has been registered, the certificate of origin must be supplied and ® after it's registered name
- Group or type conifer
- Size: height or width
- Volume of container
- Total weight
- NTJ 07C: 1995

Reviewing the last treatment, the plant was subjected to is recommended, indicating the active material, the date of the treatment, as well as the production system.

When the plant material is marketed between countries of the European Union, it will be accompanied by a document, issued by the supplier, where the following data should be recorded:

- Indication: "CEE quality"
- Member State Code
- Name or identification code of the responsible official body
- Name and registration or authorization number
- Name of supplier
  - · Individual serial or batch number
  - · Date of issued document.
  - · Where applicable, Phytosanitary Passport number
- Where applicable, Ornamental Label
- Quantity
- In the case of imports from third countries, the name of the country of production

Verifications

- *Compliances:* Those who produce and import conifer trees will appear registered in an Official Register of Producers, Traders and Importers and will comply with the obligations to which they are subject.

- *Control:*

  - The application of softwood quality standards is checked individually and visually for compliance with the proposed standards. It is possible to require the test of 2% of the plants of the different batches.
  - Five percent (5%) of the conifers may have dimensions that are 10% smaller than the specifications indicated for each type, group, and category in the previous sections.

PLANTING CONIFERS (trees and shrubs)

The planting project, soil preparation and opening of planting pits was already studied in Chapter 1 so only the specificities related to conifers will be outlined below.

For the planting of trees supplied with a ball or in a container, the diameter of the pit should be as large as possible, see Table 3.3.7 (NTJ08C).

TYPE OF SUPPLY	MINIMUM DIAMETER	RECOMMENDED DIAMETER	MINIMUM DEPTH
ROOT BALL	2 x DIAMETER OF ROOT BALL	3 x DIAMETER OF ROOT BALL	= ROOT BALL DEPTH
CONTAINER	2 x DIAMETER OF CONTAINER	3 x DIAMETER OF CONTAINER	= CONTAINER DEPTH

Table 3.3.7: Size of planting pits. NT07C of the Technical Standards for Gardening and Landscaping, COITAPAC

As already outlined in Chapter 1, the shape of the pit can be cylindrical, truncated conical, cubic, parallelepiped or a truncated pyramid. In compact soils, it is convenient that the volume excavated in the upper part is considerably greater than that of the lower part.

The opening of planting pits will be carried out by excavating the ground in a volume proportional to the requirements of the planting. This excavation reveals the different horizons of the soil and subsoil. The different properties of the materials that form these horizons in relation to the future planting should be considered individually and be given a separate treatment.

In the case of non-sandy soils, the walls and bottom of pits must be scarified to favor the action of atmospheric agents as well as root penetration.

Drainage

- *Check:* Once the pits have been excavated, verify that there is sufficient drainage. To carry this out, a representative number will be filled halfway with water and then check if it seeps through. If the soil has adequate drainage, the water will seep through without difficulties. If within 2 hours this has not occurred, corrective measures must be taken to avoid radical suffocation problems.

- *Installation:* The same procedure outlined in Chapter 1 will be followed.
When under a layer of poorly drained soil there is another layer with good drainage, vertical perforations or vertical drains must be made, which allows water to drain towards deeper layers. These drains will be filled with washed gravel or porous material and will connect with the deep draining layer.

Planting period

The most appropriate time to plant will depend on the type of supply (root ball or container), the species, the climate (both in the place of planting and in the nursery of origin), the weather, and the maintenance needs. See Table 3.3.8. (NTJ 08 C).

Planting should be carried out preferably in the dormant stage avoiding the critical sprouting period, which naturally depends on the species and the climatic conditions of the place. Unfavorable weather situations, such as frost, heavy rain, snowfall, or strong winds, or on days with excessively high temperatures should be avoided.

FACTORS TO CONSIDER			PLANTING											
Origin	**Climatic conditions**	**Supply**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Trees from Mediterranean or warm climates.	Mediterranean	Root ball												
		Container												
From subtropical climates	Mediterranean	Root ball												
		Container												
From Mediterranean or subtropical climates	Subtropical	Root ball												
		Container												

Preferred period:

Complementary period:

Table 3.3.8: Approximate time for planting conifers depending on the climate where it will be grown, the climate of its origin and within the new location. NT08C of the Technical Standards for Gardening and Landscaping, COITAPAC

Planting procedure

The same indications outlined in Chapter 1 will be followed:

- *Conifers with root ball:*

  - fill in the planting pit with topsoil and tap it down until the root collar of the tree is level with the ground
  - Accessory elements will be removed: metal mesh (the upper part must be removed, and enough cuts made in the wire collar) or plaster protection (this must be broken and the plaster will be removed only from the lower part, making sure that the sides are perforated).
  - The plant will be positioned in the pit ensuring: that it is centered, in a vertical position and that the root collar s not buried.
  - If necessary, tutors or underground anchors will be placed.
  - The pit will be filled with filler soil, plugging it every 30 cm deep. Settle the soil with a stick to eliminate air pockets thus facilitating the contact of the roots with the soil.
  - It will be leveled, and an irrigation hole will be created to retain water or rainwater.
  - A settlement irrigation will be carried out.

- Soil will be added, if necessary, up to the root collar to the neck of the plant and a second settlement irrigation can be carried out. The collar must be flush with the ground level, neither buried nor bare.

- *Conifers in containers:* The process is similar, except that here the accessory element is the container (not mesh or plaster).

In all cases, the work must be carried out with caution to avoid disintegrating the root ball or damaging the roots, trunk, branches, and foliage.

Filling the planting pits

The process is similar to what has been outlined in Chapter 1.

Preferably, the extracted soil should be used if it has a sandy/loamy or sandy texture, both to optimize resources and to avoid stress to the plant when its root system develops outside the planting hole.

In any case, soils of good agronomic quality should be used, suitable for a correct development of the root system.

Creating a tree pit

It consists of making a watering basin around the tree that will hold the irrigation or rainwater, and possibly the contribution of fertilizer. The height of the basin should be about 20 cm and the width of the pit equivalent to that of the projection of the crown at the time of planting. See figure 3.3.3 (NTJ 08 C).

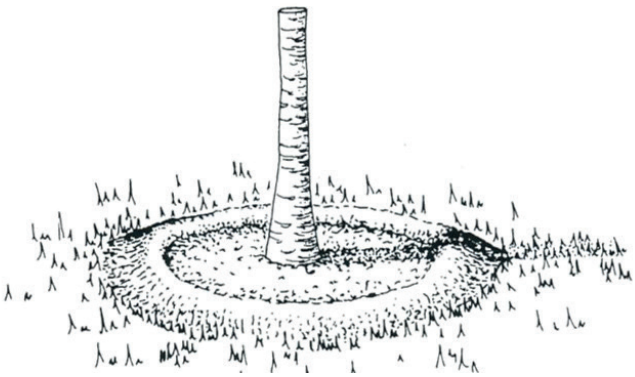


Figure 3.3.3: Making a planting pit. NT08C of the Technical Standards for Gardening and Landscaping, COITAPAC

If planting on a slope, the pit must be made so that it is completely below the original slope. The bottom of the pit will also be flat or slightly inclined in the opposite direction to that of the slope. See Illustration 3.3.4 NT08C.

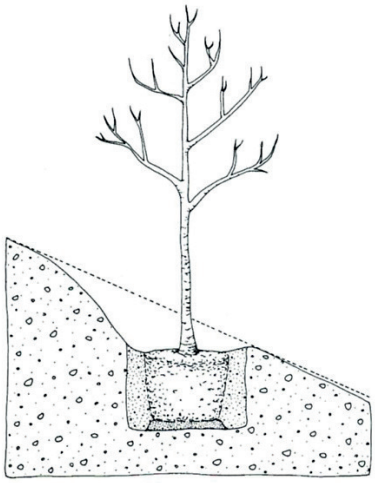


Figure 3.3.4: Making a tree pit on a slope. NT08C of the Technical Standards for Gardening and Landscaping, COITAPAC

Irrigation after planting

Once the planting has been carried out, the pit should be filled with a large amount of water so that the root system is completely wet. The soil must be at field capacity. Watering must be done at low pressure to ensure no loss of soil.

Mulching

Follow the recommendations outlined in Chapter 1

Complementary works

- Artificial support

Trees that do not have their stability assured must be properly supported until they are rooted. The use of stakes, guying systems, and other supports can anchor the tree and keep newly planted trees upright, preventing them from being uprooted or blown over by the wind, or from losing root contact with the ground.

The aim of artificial support in a new plant is:

- to avoid movements that can break roots
- to keep the tree upright until they are able to support themselves

The trees, with a root ball or in a container, can be supported by 1-4 stakes, with underground anchoring or with guy lines or cables.

The underground anchoring gives greater guarantees of security for pedestrians in public areas since aerial guy lines can be dangerous. It can also protect the tree itself from the scratches.

The stakes and other fastening elements must be maintained for a minimum of 2 years, and both the position of the newly planted trees and the condition of the guying elements must be periodically verified, especially after strong winds or very heavy rains.

- *Staking*

  - Prevents movements that can break the root
  - Stabilizes plants that need time to take root
  - It must resist strong winds
  - Elastic and non-abrasive straps must be used if attaching to the trunk and branches
  - The material, the height and the thickness of staking will be determined by the average size of the tree and the conditions of the place
  - The aerial part of the plant nor the roots must not be damaged (especially the root ball)
  - It must not put people or urban furniture at risk
  - It must be resistant to vandalism, hits and pulling that may occur in the planting area
  - Stakes must be placed prior to filling the planting pit
  - It will be fastened at least 50 cm below the bottom of the planting pit. If only one stake is used, it will be placed on the side where dominant winds prevail
  - In adverse situations up to 4 stakes can be used
  - Stakes will be placed in vertical and at a distance of 20 cm from the trunk
  - Stakes will support the plant in such as a way that it does not move at ground level but allows the crown to sway freely in the wind
  - Only one guy line should be used and will be placed at maximum one-third of the total height of the tree
  - Trunk or branch guying system must be of elastic and non-abrasive materials and must not cause damage to the trees
  - Stakes should not remain longer than 2 years (enough for the tree to take root and support itself)

An example of staking can be found in Chapter 1

- *Underground anchoring*

The following steps should be taken into consideration: See Figure 3.3.5 (NT08C):

  - The root ball will be supported by a cable or an underground structure that is secured to 3 to 4 anchor points to the subsoil
  - The upper part of the root ball will be protected by the wooden framework
  - The guying system should be very tight

- *Wires*

In special cases when conifers branch from the base, the placement of stakes is not adequate and although it is always better to use underground anchoring, especially in pedestrian traffic areas, wiring or support by means of cables or guy lines can be used.

The following should be taken into consideration:

  - The wiring will consist of 3 galvanized cables equidistant according to an angle of 120º.
  - Before tensioning, it must be verified that the guy lines have the expected resistance and will be done in such a way that the tree does not move at ground level but allows the crown to sway freely with the wind.

- The cables will have galvanized turnbuckles, anchors to the ground and have protections in the area where the tree is fixed so that they do not cause injuries to passers-by.
- The cables will carry signaling plates, with a clearly visible color to warn of their presence, placed between 1 and 2 m above the ground. See Figure 3.3.6
- The aerial part of the anchors must be marked with a highly visible colored tube.
- The installation of cables and turnbuckles will allow pedestrians to pass under them, so they must be anchored to supports, struts or other elements at a minimum height of 2 m from the ground.
- The anchoring or supporting system must be removed 2 years after planting.

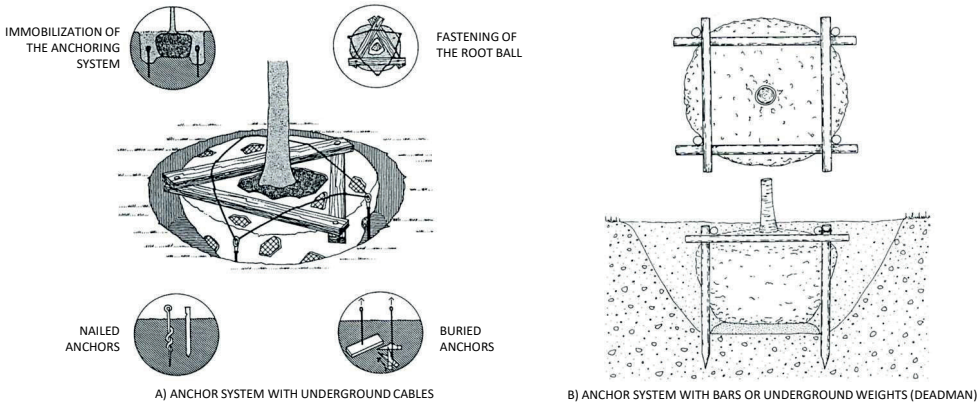


Figure 3.3.5: Examples of underground anchoring. NT08C of the Technical Standards for Gardening and Landscaping, COITAPAC

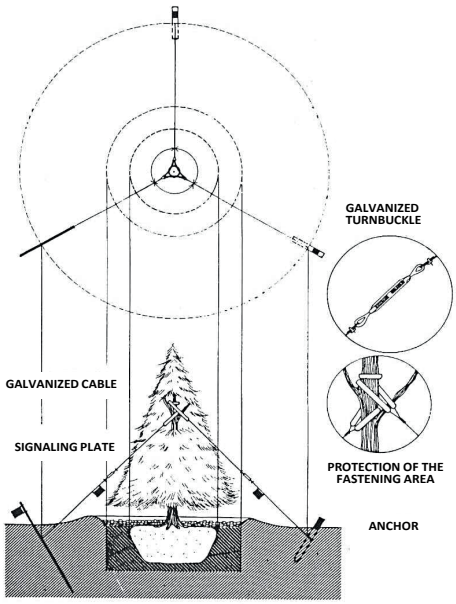


Figure 3.3.6: Example of cable anchoring system NT08C of the Technical Standards for Gardening and Landscaping, COITAPAC

- *Plant protection*

Tree protectors will aim to minimize the risks of blows or friction produced by vehicles, machines, work that can be carried out in the crown, trunk or that can be produced by rodents in the bark or neck of the tree.

These protectors will be placed so that they do not damage the trunk, root collar system, and must be replaced before their presence damages the plant (due to its growth) or be removed when they are no longer required.

Protective sleeves will serve to protect against low intensity blows, in areas with strong insolation, or to protect against frost in young plants.

- *Anti root barriers*

They will be used to deter or limit root penetration, minimizing damage to pavements, foundations, subterranean utility networks, etc.

To be effective, a barrier must block root growth and suppress any root activity on the other side, avoiding the possibility that any roots could pass over, under, around or through it and proliferate on the other side of it. Otherwise, it will provide a false sense of security.

To install these barriers, the project specifications and the manufacturer's instructions must be followed. In any case, they should not hinder the stability of the tree.

The use of chemical root barriers, with inhibitors of root growth, must be made based on their technical knowledge, obtained from the study of their performance, their durability, their possible phytotoxicity and their possible toxicity for people and the environment.

- *Aeration tubes*

The placement of tubes will help to aerate the soil in the root zone. Emission points from irrigation systems may not be installed in them.

They will be placed in a vertical position, going from the surface to the bottom of the planting pit and will be filled with washed gravel or porous and consistent material, its surface covered with a perforated lid. Often, they can serve as a drain.

Subchapter 3.4 Maintenance

INTRODUCTION

The general objectives of the maintenance of any plant species, and in this case, conifers, are as follows:

- Achieve and maintain a proper structure and development of the plants, arboreal or shrub.

- Achieve a satisfactory state of the plants

- Provide greater beauty to plants and their environment

Prior to taking any steps, the objectives must be clearly determined and previously defined by the technical manager within a maintenance program or plan that considers the specific requirements of the included plants (coniferous in this case). The various operations as well as its management and costs will be taken into consideration.

MAINTENANCE OPERATIONS

For the correct maintenance of coniferous trees, the following operations must be completed:

a) Technical inspection, whose objectives will be:

- Outline the necessary maintenance operations
- Detect possible unforeseen maintenance needs, such as: pathologies, failures in the irrigation and drainage system, etc.
- Determine singular actions
- Update the technical inventory

b) Pruning. In most conifers, the pruning of a branch without leaving foliage, generally causes its death as they lack dormant buds on old wood located below the foliage area.

The following forms of pruning are possible:

- **b.1) FORMATIVE PRUNING** and must be carried out on young specimens, already planted in their final place. This will prevent larger cuts and promote better healing. Conifers generally need little or no formative pruning, as most have a dominant central leader.

  Formative pruning can be:
  · **For trunk formation**, and will consist of maintaining a single dominant stem, reducing, or eliminating those secondary branches that compete with the guide or that are damaged.
  · **For structure formation**, which will establish a strong trunk provided with sufficiently robust structural branches and suitably oriented and spaced along the trunk. It must help to achieve the natural form of the species or direct it towards artificial forms more appropriate to the situation or intended use (architecturalized pruning).
  · **Thinning out/lifting the crown**, which will consist of the progressive elimination of the lower branches of the arrowed trees (with central leader and lateral branches). Only small diameter branches should be removed, also considering that the part removed does not exceed one third of the total crown height. This is the case of coniferous trees used for alignments or in pedestrian areas. The free height of the trunk will ultimately depend on its location: on public roads it will be 4.5 m and in pedestrian areas 2.5-3 m

· **For security of overhead networks and other utilities**



Figure 3.4.1: Thinning out/lifting the crown

- **b.2) ADULT TREES.** Pruning can be carried out for different purposes:

· **Cleaning or sanitation.** which will consist in eliminating dead, weak, poorly oriented, codominant, crossing, cracked or broken branches, non-recoverable branches due to disease and suckers Likewise, cleaning will be carried out of whatever remains on the tree without reason or justified cause.
· **Security**. This will eliminate everything that could pose a potential risk (detachment of branches, damage to facilities or buildings) or that could hinder certain activities (pedestrian and vehicle traffic).
· **Thinning**. This step consists of selectively removing branches or parts of them in order to: reduce the density and weight of the crown, allow light to penetrate in the inner part of the tree crown, reduce the resistance of the tree to the wind and enhance more balanced internal sprouting. Thinning must be balanced and not excessive, so as not to reduce the photosynthesis capacity and avoid the formation of branches with excessive apical weight.
· **Crown reduction**. The aim will be to reduce its volume (height and width), create security spaces around buildings and service networks, increase the stability of the tree or branch and reduce shading to homes and solar panels. The English method consists of eliminating terminal branches, leaving a lateral branch in each cut, thick enough and facing outwards, so that it assumes the role of central leader.
· **Restoration and reform pruning**. This process will improve the structure, shape, and appearance. It should only be applied to large specimens with great heritage value. Only some species admit it.

- **b.3) HRUBS.** Cleaning, thinning, and reduction pruning is mainly carried out.

· **Architectural pruning**. This will be based on a previous formative pruning and will try to obtain geometric designs, regular maintenance being very important. Due to its high cost, it only makes sense in parks and historical gardens of certain styles. Examples of architectural pruning are trimmed hedges, arches, topiary art, etc. Associated with this type of architectural pruning is the interweaving which consists in creating crisscross patterns sometimes accompanied by grafting, of branches from different trees. Examples are arches, gazebos, tunnels, etc. Not all conifers admit this type of pruning.



Figure 3.4.2: Topiary pruning in *Taxus baccata*

c) Soil operations. Regardless of other special or improvement works that the technicians could determine, the most common operations are:

- **c.1) CARIFICATION.** This consists of breaking the soil crust, favoring both aeration and the penetration of water and fertilizers into the soil. The scarification depth should be 3-7 cm, depending on the needs of the soil.

- **c.2) DE-COMPACTING OF THE SOIL.** The aim here is to improve the aeration conditions of a soil.

- **c.3) VERTICAL AERATION** of the soil through holes (depth: 30-50 cm; diameter: 5-10 cm., distance between holes: 0.5-2 m) that will later be filled with gravel or porous material. Solid bars of porous material or corrugated plastic tubes filled with gravel can also be placed.

- **c.4) PARTIAL SUBSTITUTION OF THE SOIL.** In the case of compacted, salinized, and contaminated soils, it will be replaced with ones that are in good agronomic condition. It can be more or less deep and must be done in such a way that it affects the roots as little as possible. See NTJ 14C (3rd part).

- **c.5) FERTILIZATION.** This must be carried out based on a diagnosis and according to real needs, determined by corresponding analyzes (soil, foliar, water) or by the deficiency symptoms presented.

  · **Requirements.** Systematic fertilization should be done only in impoverished or highly washed soils. In the case of cultivation in containers or in gardens on protected spaces, a periodic contribution of fertilizers will be advisable since they are frequently made to grow in soils with not too many available nutrients or even with limited volume of soil.
  · **Type of fertilization**. preferably with slow-release organic or chemical fertilizers; generally, with N-P-K compounds and sometimes with fertilizers rich in micronutrients. Fertilization will be more effective when applied with organic mulches.
  · **Dose**. This will be calculated according to the needs of each plant, the deficiencies shown in the analyzes. The dose will vary according to species, age and the physiological state of the plant, the characteristics of the soil (pH, organic matter, etc.) and the weather. Generally, it is enough to make 1-2 annual contributions (slow-release fertilizers), small amounts and more frequent contributions (soluble fertilizers) or as a background fertilizer in the planting phase (organic fertilizers).
  · **The fertilized area**. This should be slightly larger than the irrigated zone and somewhat away from the trunk so as not to damage emerging young roots (mineral or chemical fertilizers) or in small holes (slow-release organic and mineral fertilizers).
  · **Application**. Superficial, in holes (depth 20-50 cm; diameter 5-10 cm, distance 30-90 cm), in

irrigation (fertigation) or by foliar application.
· **Period**. Preferably when the plant is beginning its active growth (soluble fertilizers), or at any other time (slow-release fertilizers). The soil should humid, or the rainy season should be in process.

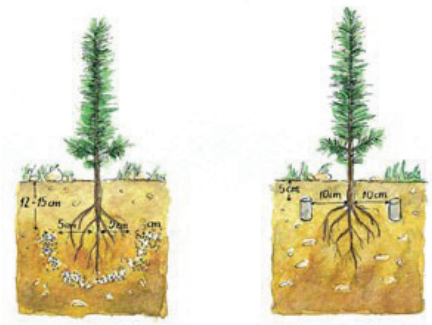


Figure 3.4.3: Granulated or pellet fertilizers

d) Mulching. mulch should surround the trunk of the plant, expanding it, if necessary, as the plant grows. The layer of mulch should be 5-10 cm thick, watering afterwards to pack it down slightly and thus avoid losses due to wind or rain. In humid areas, and to avoid possible rotting due to excess humidity, the mulch will be separated from root collar NTJ 05 A. The purpose of mulching is:

- to protect the roots from the cold
- to preserve moisture in the soil
- to increase water infiltration and aeration
- to increase the % of organic material on the ground
- to promote mycorrhization
- to reduce the presence of weeds
- to reuse residues from pruning and cleaning



Figure 3.4.4: Mulching

e) Weeding. Can be manual, mechanical, or chemical.

f) Irrigation. The following must be taken into consideration:

- Although urban trees are not usually irrigated, except for newly established ones, they sometimes require emergency irrigation.
- Regular irrigation will cause a reduced or very superficial root system, mainly in those plants located in tree pits.
- The water used must meet the appropriate physical, chemical and biological requirements as irrigation water; In the case of using reused wastewater, its chemical composition will be considered.
- Irrigation may be manual, based on hoses connected to hydrants, with a tanker truck or similar used exclusively for this purpose and provided with an irrigation perch, automatic (by flooding dripping nozzles, sprinkler).
- Manual irrigation will be carried out promptly and with little pressure to avoid dragging and formation of gullies
- Sprinkler irrigation is not recommended as it causes damage to the neck and bark of the plants and causes the appearance of fungi.

g) Phytosanitary treatments.

- Preventive or curative. Carried out by a qualified technician who must always comply with the current legislation on phytosanitary treatments and the instructions that appear on the labels. These professionals must pay special attention to the phytosanitary treatments that are carried out on public roads, using formulations and active materials of low toxicity both for humans and for terrestrial and aquatic fauna.
- Sometimes the use of growth inhibitors may also be used.

h) Treatment of wounds will be carried out with products that are innocuous for the cambium and with a bactericidal-fungicidal nature. In general, the use of healing paints or mastics will not be recommended, as they promote the appearance of rot. Nor is it recommended to fill the cavities in the trunk.

i) Maintenance of artificial support for which periodic reviews will be carried out, especially after situations that may alter it (storms, gales, works, etc.) and make necessary the implementation of appropriate measures (remove friction, readjust the tensioners, etc.).

j) Elimination of dead plants and stumps, which will be decided by the technical staff. These operations might be recommended when dealing with:

- Dead individuals or those with a serious infectious disease
- Plants that represent an irreparable danger
- Plants that affect buildings, roads and other urban furniture.
- Excessive plant densities that lead to over competition and mutual damage between plants

In the case of stumps, they may be cut at ground level, buried or removed (if they were arranged in planting pits) by various methods.



Figure 3.4.5: Stump chopper

k) Replacement of dead plants. This should be done using others of the same species or cultivar, provided that their death has not been due to adaptive problems, diseases, or serious pests, or when the technician proposes to replace it with another more suitable species.

l) Cleaning the planting pits

RECOMMENDED MAINTENANCE PROGRAMS

The maintenance operations will depend on the species, its situation, the function it performs, its age, etc. Standard maintenance guidelines are given in the following sections, which should be followed whenever possible. Sometimes it will be necessary to establish the requirements of a single specimen or group to specify the operations as well as the periodicity of the same.

The frequency of maintenance is a variable that will depend on the species, the determinants corresponding to the location of the plants (climate, microclimate, soil, etc.) and the planting conditions. Specific maintenance programs must be developed that adapt to different species, establishing the appropriate period to carry out each operation.

RECOMMENDED MAINTENANCE PROGRAM		
Maintenance Procedure		**Frequency guidelines**
1.	Technical inspection	Annual or immediately after one incident, biannual in case of shrubs
2.	Pruning	According to NTJ.
3.	Soil intervention Scarification Fertilizing Replacing organic mulch Weeding Other interventions in the soil	 When determined by technical inspection When determined by technical inspection Annual Biannual or according to needs When determined by technical inspection
4.	Watering	According to needs and location, especially during the first years and after planting
5.	Preventive phytosanitary treatments	According to location and treatment
6.	Corrective and curative phytosanitary treatments	When determined by technical inspection and depending on the treatment
7.	Treating injuries	When determined by technical inspection
8.	Maintaining artificial foundations	Annual and after incidents
9.	Removing dead or dangerous trees	When determined by technical inspection
10.	Removing stumps	When it is necessary

Table 3.4.1: Recommended maintenance, according to NTJ

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4

PALM TREES, ZAMIACEAE AND CYCADACEAE

Chapter 4 PALM TREES, ZAMIACEAE AND CYCADACEAE

Subchapter 4.1 Introduction
Subchapter 4.2 Species
Subchapter 4.3 Commercialization, use and planting
Subchapter 4.4 Maintenance
Subchapter 4.5 Bibliography

Subchapter 4.1 Introduction

Palm trees belong to the Arecaceae or Palmae family. They are woody monocotyledon plants that date back to the Upper Cretaceous. They are evergreen and long-lived plants.

The root system of palm trees, unlike that of trees (main root and secondary, tertiary roots...), is made up of a set of roots, called adventitious roots, which arise at the base of the trunk or stipe (false trunk). As it grows in length as the plant ages. These are fasciculate roots; they all have the same functional importance.

The trunk is protected by developing leaves. Another of its peculiarities is that the trunk does not have secondary thickening (a growth in thickness). Most species reach maximum thickening before the trunk begins to grow in height. The leaves of palm trees have a characteristic and striking shape while their flowers are small and inconspicuous when compared to other plants. The fruits can be small and abundant (dates) or large and few (coconut).

In the following Figure 4.1.1, you can see the different parts of the plant that make up its morphological structure.

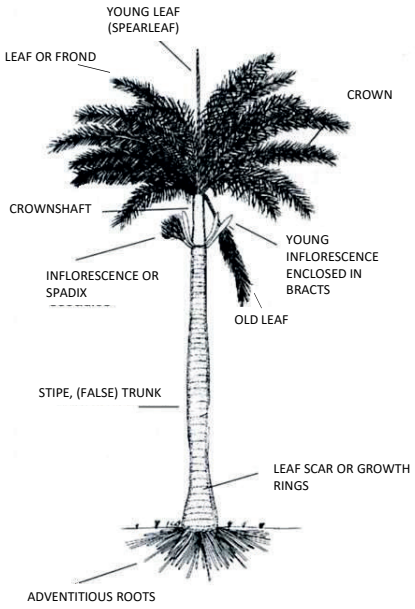


Figure 4.1.1: Morphology of the palm

Global distribution

While palm trees can be found all over the world, in Europe the number of autochthonous species is scarce. Some of the common species are: the Palmetto (*Chamaerops humilis*) of Mediterranean origin, the Canary Palm (*Phoenix canariensis*), as its name indicates, originally from the Canary Islands, and the *Phoenix theophrasti* from Crete (Greece) and some areas of Turkey.



Chamaerops humilis



Phoenix canariensis



Phoenix theophrasti

Tropical Asia is where the largest number of species can be found (around 1,400) followed by the American continent (800 species). Palm trees are also present in Africa and Australia.

The economic importance of palm trees

The palm tree is of great economic significance, especially in less developed countries. As an example, we will cite the Cocos nucifera (coconut tree) and the Phoenix dactylifera (date palm), which are basic elements in the economy of some Asian and African countries.

Palm leaves are used to roof homes and to produce cooking oil, fibers for mats, brushes, rugs, raffia, the sap to produce palm sugar, etc.

In the west, palm trees are seen as the quintessential ornamental plants of tropical gardens. They are also used as houseplants.

As in previous chapters, the selection criteria to choose a particular species are determined by many factors, including:

- For its structure and external morphology
    - Size or height
    - Type and color of the leaves
    - Bloom season
    - Production of ornamental or undesirable fruit

- For its necessities or physiological limitations

    - Resistance to frost and severe cold
    - Resistance to drought
    - Requirement of sunlight
    - Resistance to winds
    - Resistance in coastal areas
    - Resistance to urban contamination
    - Requirements of soil, pH, texture, humidity…
    - Rate of growths
    - Longevity
    - Resistance to infestations and diseases

In urban areas, the palm tree is part of part of street and avenue alignments (promenades) and can also be found isolated or in groups in green spaces (gardens, urban parks).

Subchapter 4.2 Species

This subchapter describes **18 species of palm trees, 1 cycadaceae** and **1 zamiaceae** used in gardening and landscape design. They have been selected primarily for their ornamental use, botanical interest, or other characteristics. As a result, an in-depth analysis is carried out in this subchapter.

But first of all, it is essential to consider the morphology of the palm tree. This will make it easy to identify and differentiate between species and allow for an adequate understanding of the technical datasheets that describe each species.

To begin, palm trees are classified into three groups according to the number of stipes:

1. Single trunk palm tree (with one stipe): Only the terminal bud has the ability to develop itself

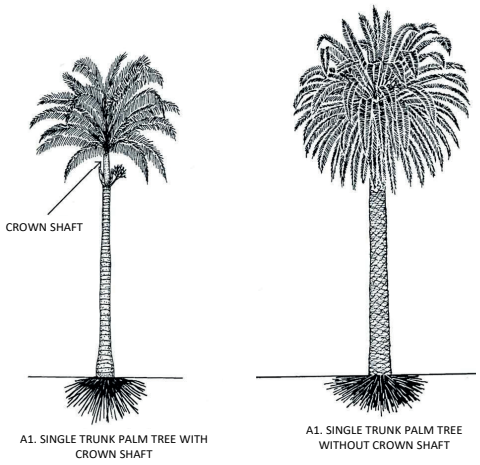


Figure 4.2.1: Single trunk palm trees. (NTJ 07P COITAPAC)

2. Palms with multiple trunk (clumping): Multiple trunks where basal offsets or suckers are produced

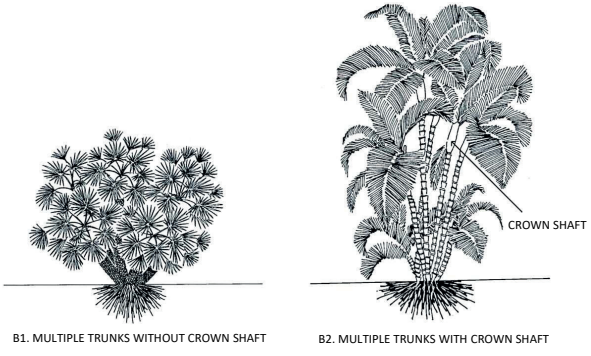


Figure 4.2.2: Palm tree with multiple trunks. (NTJ 07P COITAPAC)

3. Other types of Palm tree

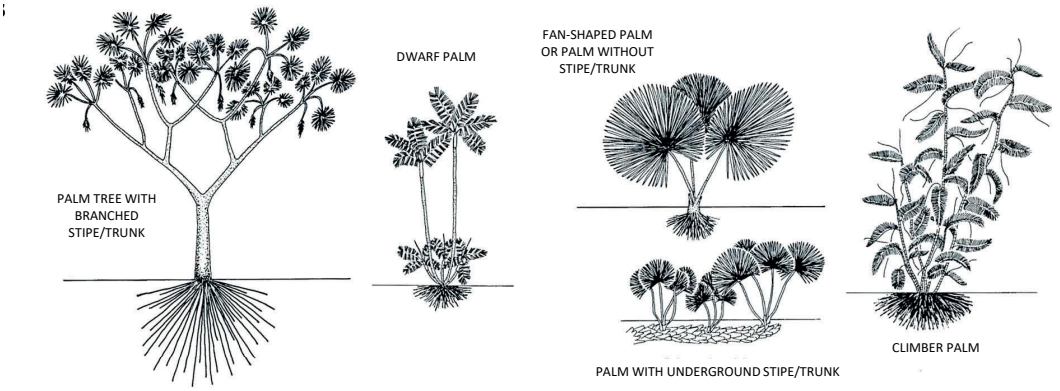


Figure 4.2.3: Other types of palm trees. (NTJ 07P COITAPAC)

The following diagram shows the different types of trunks or stipes (Figure 4.2.4.)

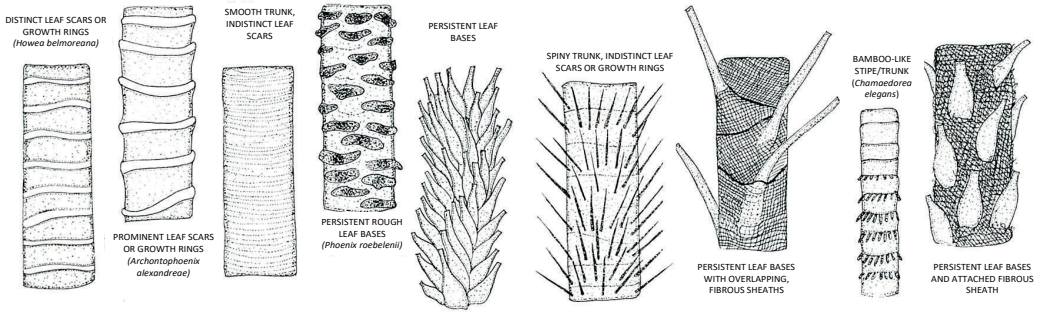


Figure 4.2.4. Types of Palm trees (Palms throughout the world. D. Jones)

The trunks of palm trees stand out for their strength and flexibility and each species has its own characteristic trunk. They can be smooth, fibrous, with spines or covered with the sheath of the leaves.

The leaves are found in the trunk through a point that we call a node. The space between leaves is called the internode space. Thanks to the observation of the internode spaces, we can understand the type of growth as short or very close internodes indicate slow growth and longer internodes indicate rapid and vigorous growth.

The leaves or fronds are normally found in the crown, but in some species, they are distributed throughout the upper part of the stipe. The leaf has a lignified base (wooden appearance) that joins it to the trunk and is called the petiole. When joining the petiole with the trunk, it forms the sheath or foliar base. In Figure 4.2.5 we can see diverse types of sheaths.

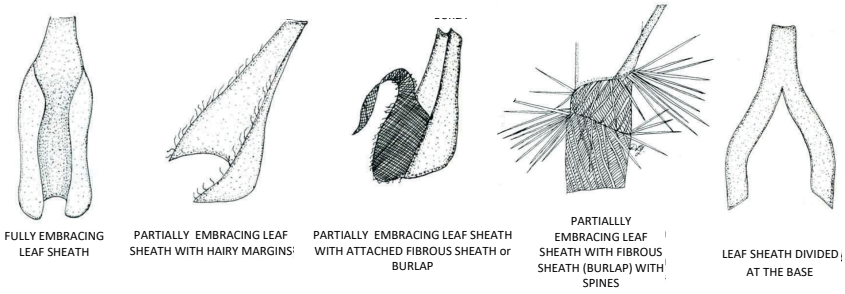


Figure 4.2.5.: Types of sheaths (source: Palms throughout the world. D. Jones)

Palm trees can de classified according to leave type:

A. Pinnate: The leaves are divided into leaflets or pinnas
B. Palmate or fans-shaped: Circular o semi-circular leaves (that can be divided in leaflets)
C. Entire: The blade of the leave is not divided
D. Bipinnate: The leaves are divided twice. Firstly, they have a primary rachis (as is the case with pinnate leaves), and then, with a secondary rachis, where the leaflets appear.

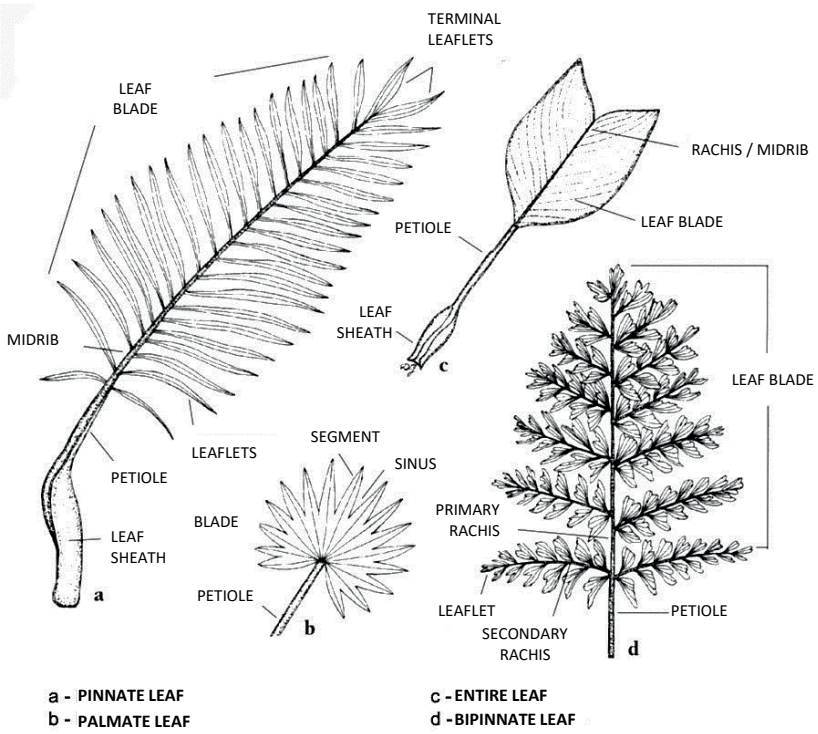


Figure 4.2.6: Types of Palm leaves (source: Palms throughout the world. D. Jones)

Most palm trees have an axillary inflorescence. The entire inflorescence is called a spadix and in its immature state it is protected by bracts.

Flowers can be bisexual (hermaphrodite) or unisexual.

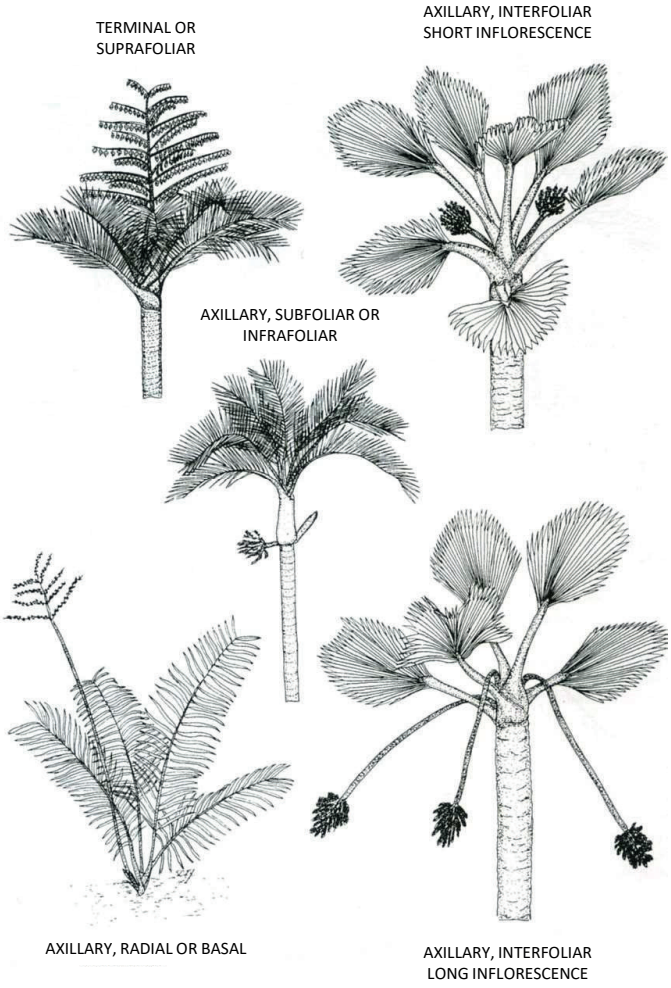


Figure 4.2.7: Types of inflorescences. (Source: Palms throughout the world. D. Jones)

The following pages include a table of parameters and values that have been used to complete a botanic datasheet for each studied species. Each botanic datasheet gathers the information of a certain palm tree species: botanical and ecological aspects, uses, cultivation, and other characteristics of interest, including its commercialization. This information is complemented by photographs displaying the general appearance of the tree species and different morphological details.

PARAMETERS AND VALUES USED FOR THE BOTANIC DATASHEET	
TAXONOMY	
TAXONOMY RANKS	DIVISION, SUBDIVISION, TYPE, ORDER, FAMILY
VARIETIES	VARIETIES OF INTEREST
STRUCTURE	
GROWTH HABIT	SINGLE TRUNK, MULTIPLE TRUCK, DICHOTOMIC BRANCHES, LATERAL BRANCHES, ABNORMAL BRANCHES, MULTIPLE TRUNK CLIMBERS
HEIGHT	M or CM
DIAMETER	M or CM
HABITAT	EMERGENT, UNDERSTOREY, MANGROVES, COASTAL, RHEOPHYTE, AQUATIC, DESERT, CALCIPHILES, TROPICAL
FROND	CROWN OR SCATTERED
ROOT	ADVENTITIOUS, EPIGEAL IN STILTS, EPIGEAL IN COLUMNS
MORPHOLOGY	
TRUNK	
SURFACE (FIBERS)	NAKED, COVERED (FIBER: OCHREA ATTACHED OCHREA OVERLAPPED, NO OCHREA, IN HESSIAN FABRIC
SIZE	STRAIGHT THIN, STRAIGHT STOUT, CURVE THIN, CURVE STOUT
TEXTURE (NAKED SURFACE) **SHEATH (COVERED SURFACE)**	ROUGH; SMOOTH COMPLETELY ENCIRCLING TRUNK, PARTIALLY ENCIRCLING TRUNK,
LEAF SCARS	++ (EXTREMELY VISIBLE); + (VISIBLE); INVISIBLE
SPINES	YES, NO
LEAF	
TYPE	PINNATE, BIPINNATE, PALMATE, COSTAPALMATE, ENTIRE
SIZE	in CENTIMETERS
SIZE OF LEAFLET	in CENTIMETERS
COLOR UPPER SIDE (US)	PALE GREEN, LIGHT GREEN, DARK GREEN, BLUE/GREEN, GREY, PURPLE, PALE YELLOW, VARIEGATED, RUST, SILVER
COLOR LOWER SIDE (LS)	PALE GREEN, LIGHT GREEN, DARK GREEN, BLUE/GREEN, GREY, PURPLE PALE YELLOW, VARIEGATED, RUST, SILVER
ARRANGEMENT OF LEAF (IF PINNATE OR BIPINNATE) **ARRANGEMENT OF LEAF (PALMATE OR COSTAPALMATE)**	IN ONE PLANE, IN TWO PLANES, REGULAR, IRREGULAR, ERECT, PLUMOSE, DROOPING ENTIRE, THREAD, BILOBED, NOTCHED, FRAYED

LEAF SHAPE AND + APEX (IF PINNATE OR BIPINNATE) **LEAF BASE (IF PALMATE OR COSTAPALMATE)**	IN ONE PLANE, IN TWO PLANES, REGULAR, IRREGULAR, ERECT, PLUMOSE, DROOPING APEX: ACUTE, BLUNT, UNEQUALLY EMARGINATE, OBLIQUELY PREAMORSE, 4-PRONGED, CONCAVELY PREAMORSE, 3-PRONGED PREAMORSELY 3-PRONGED DIVIDED ¼ PART, DIVIDED UNTIL THE BASE, ALMOST ENTIRE
THREADS	YES, NO
INFLORESCENCE	
TYPE **POSITION OF INFLORESCENCE**	- PALMACEA: IN CORYMB, IN TOP, CROWN/HEAD, IN CLUSTERS, IN SPIKE, IN UMBEL, IN CATKIN, IN SPADIX, IN CROWN SHAFT, IN PANICLE. - CYCADACEAE: CONE AXILLARY, INTERFOLIAR, AXILLARY INFRAFOLIAR SHORT, AXILLARY INFRAFOLIAR LONG, AXILLARY RADICAL, TERMINAL.
TYPE OF FLOWER	UNISEXUAL, HERMAPHRODITE
SIZE OF INFLORESCENCE	in CENTIMETERS
FRAGRANCE	SI; NO; UNPLEASANT
FRUIT	
SIZE	CM or MM
TYPE	FOLLICLE, PLURIFOLLICLE, LEGUME, LOMENT, SAMARA, DOUBLE SAMARA, PLURISAMARA, CAPSULE, ACHENE, TETRACHENE, POLYACHENE, NUT, ACORN, SYCONIUM, HESPERIDIUM, SOROSIS, BERRY, RACEME, POME, BALAUSTA, DRUPE, STROBILUS, PSEUDO STROBILUS, CONE
EDIBLE	YES, NO
COLOR	RED, GREEN, YELLOW, BROWN, PALE, WHITE, PURPLE
FRUITING SEASON	JAN, FEB, MAR, APR, MAY, JUN, JUL, AUG, SEP, OCT, NOV, DEC
GROWTH	
RATE	VERY SLOW, SLOW, MEDIUM, FAST, VERY FAST
LONGEVITY	<25 YEARS 25 YEARS 50 YEARS, 75 YEARS, >100 YEARS
ECOLOGY	
CLIMATE	
ALTITUDE	INTERVAL OF ALTITUDE / ELEVATION ABOVE SEA LEVEL
IRRIGATION	++HIGH; MODERATE; LOW; ++LOW (very low/low < 350 mm; Very high/high > 750 mm)

MINIMUM TEMPERATURE AND INTERNATIONAL CLASSIFICATION	MINIMUM TEMPERATURES: DEGREES CELSIUS **CLASSIFICATION ACCORDING TO EUROPEAN REGULATION**: (SEE ATTACHED MAP) G2____ HOT GREENHOUSES IN SOUTHERN EUROPE G1____ COLD GREENHOUSES IN SOTHERN EUROPE H5____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM 0ºC TO -5ºC H4____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM -5ºC TO -10ºC H3____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM -10ºC TO -15ºC H2____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM -15ºC TO -20ºC H1____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM -20 ºC **CLASSIFICATION INTERNATIONAL REGULATIONS.** ACCORDING TO MINIMUM TEMPERATURE RANGES Z1____SUPPORT MINIMUM TEMPERATURES OF -50ºC Z2____ SUPPORT MINIMUM TEMPERATURES OF -50ºC TO -40ºC Z3____ SUPPORT MINIMUM TEMPERATURES OF -40ºC TO -30ºC Z4____ SUPPORT MINIMUM TEMPERATURES OF -30ºC TO -20ºC Z5____ SUPPORT MINIMUM TEMPERATURES OF -20ºC TO -10ºC Z6____ SUPPORT MINIMUM TEMPERATURES OF -10ºC TO -0ºC Z7____ SUPPORT MINIMUM TEMPERATURES OF -0ºC TO 10ºC Z8____ SUPPORT MINIMUM TEMPERATURES OF 10ºC TO 20ºC Z9____ SUPPORT MINIMUM TEMPERATURES OF 20ºC TO 30ºC Z10___ SUPPORT MINIMUM TEMPERATURES OF 30ºC TO 40ºC Z11___ SUPPORT MINIMUM TEMPERATURES OF MORE THAN 40ºC
EXPOSURE TO SUN	FULL SUN, FULL-SHADE, PART SHADE, SHADE
DROUGHT RESISTANT	SI; NO; MODERATE
FROST RESISTANT	YES, NO, MODERATE
PH	ALL TYPES, NEUTRAL, ACIDIC, BASIC OR ALKALINE (OR INTERVAL OF PH)
FERTILITY	FERTILE, MODERATE, POOR
TEXTURE SOIL	SANDY, SILT OR LOAM; CLAY, SANDY LOAM, CLAY LOAM, ALL TYPES
DRAINAGE	HIGH, MODERATE, LOW
SALT RESISTANT	SI, NO, MODERATE
LIME RESISTANT	SI, NO, MODERATE
USES	
RESISTANCES	
COASTAL	1st LINE, 2nd LINE, NO, MODERATE
POLLUTION	HIGH, MODERATE, LOW
WIND	HIGH, MODERATE, LOW

APPLICATIONS	
INTERIOR **IN LINES** **ON RIVERBANKS** **AS WINDBREAKERS IN** **SCREENS** **IN GROUPS** **ISOLATED**	YES, NO
SPACING	MINIMUM RECOMMENDED DISTANCE BETWEEN PLANTS: METERS; CENTIMETERS
PLANTING AND PLANT HEALTH	
PLANTING AND PLANT HEALTH	
CALENDARS	
CHROMATIC DATASHEET	FOLIAGE, FLOWERING, FRUITING SEASON: the color white represented with grey or black cell
CULTIVATION	SOWING, PLANTING, PRUNING
TREATMENT	FUNGICIDES, PESTICIDES, FERTILIZERS, HERBICIDES
COMMERCIALIZATION	
PRESENTATION	RD (BARE ROOT); CT (CONTAINER or POT (in liters); CE (ROOT BALL); CEY (ROOT BALL IN GYPSUM), YEARS, ROOT BALL IN MESH
DIMENSION OF CONTAINER	LITERS
TOTAL HEIGHT **TRUNK HEIGHT**	CM or M CM or M

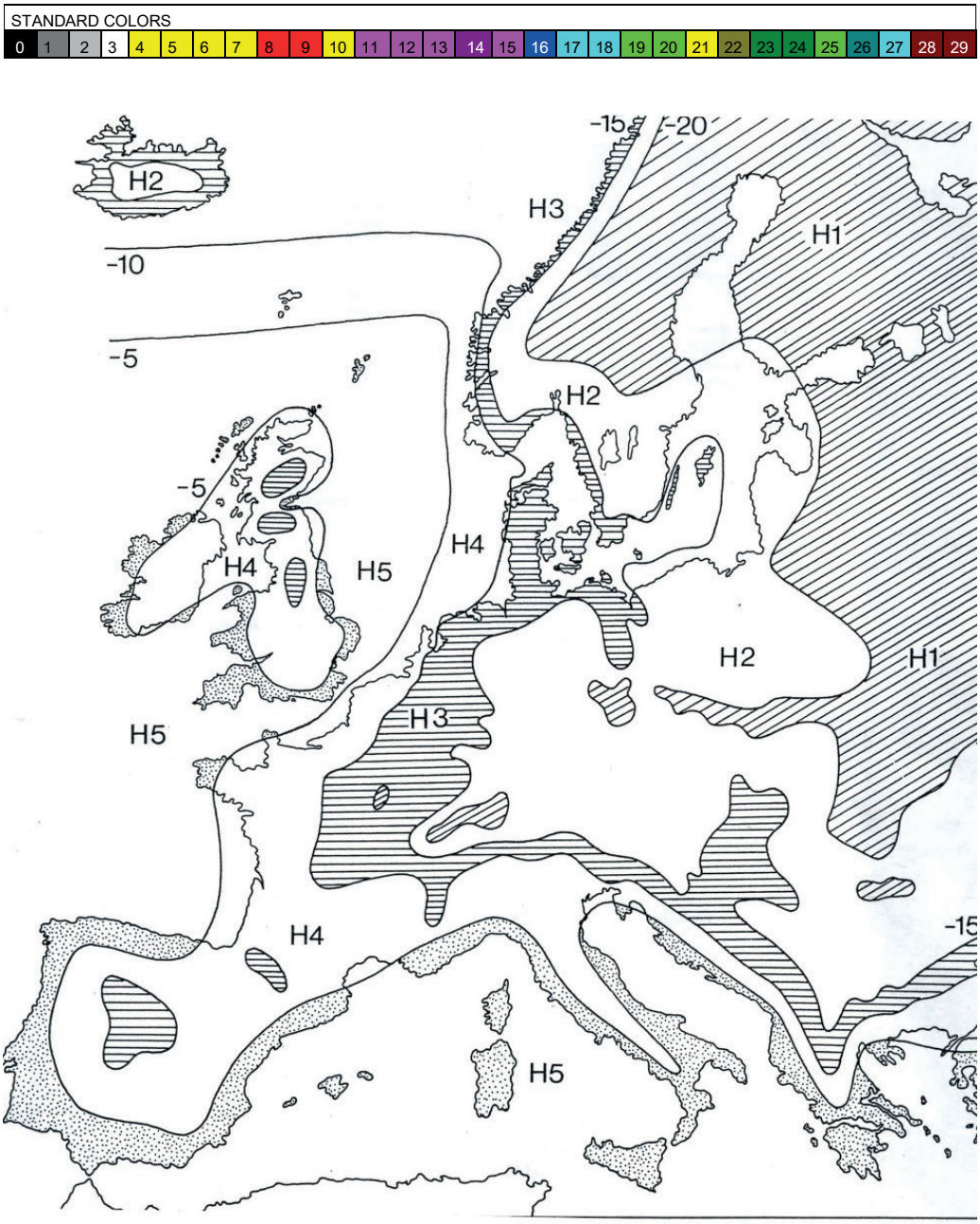


Figure 4.2.1: Thermal classification map according to European regulations

LIST OF PALMACEA, CYCADCEA AND ZAMIACEA PLANTS DESCRIBED IN THE BOTANIC DATASHEET

1. *Brahea armata*
2. *Butia capitata*
3. *Chamaerops humilis*
4. *Copernicea alba*
5. *Cyca revoluta (cycadácea)*
6. *Diion spinulosum (zamiácea)*
7. *Howea fosteriana*
8. *Jubaea chilensis*
9. *Livistona australis*
10. *Livistona chinensis*
11. *Livistona decipiens*
12. *Phoenix canariensis*
13. *Phoenix dactylifera*
14. *Phoenix reclinata*
15. *Phoenix roebelinii*
16. *Sabal palmeto*
17. *Sygarus ramanzoffianum*
18. *Trachycarpus fortunei*
19. *Washingtonia filifera*
20. *Washingtonia robusta*

BRAHEA

PALM

Brahea armata S. Watson

PALMA AZUL (SPANISH) | VALENCIAN | BLUE HESPER PALM (ENGLISH) | PALMIERE BLEU DU MEXIQUE (FRENCH)

STRUCTURE		
Growth habit: SINGLE TRUNK	Height: 9-12 M	Diameter: 6-8 M
Habitat: DESERT	Crown: YES	Root: NORMAL

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	MONOCOT
ORDER:	ARECALES
FAMILY:	ARECACEAE

VARIETIES

MORPHOLOGY		
Trunk	Size: STRAIGHT, THIN	Diameter: 40-50 CM
Surface + Fibers: NAKED (--)	Texture: ROUGH	Leaf scars++ SPINES: NO
Leaf	Petiole: DENTATE	Leaflet arrangement: FRAYED
TYPE: PALMATE	Leaflet shape: ALMOST ENTIRE	Threads: YES
SIZE: Leaf: 3-4M	Upper side: BLUE GREEN	Lower side: BLUE GREEN
TEXTURE: SMOOTH		
Inflorescence	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
TYPE: SPATHE	Leaflet: 4-6 M	Fragrant: NO
POSITION: INTERFOLIAR/LONG		
Fruit	Type: BERRY	Color: LIGHT BROWN
SIZE: 18-24 MM	Edible: NO	Fruiting season: DEC-FEB
Growth	Rate: SLOW	Longevity: +100 YEARS



ECOLOGY		
Climate	Temperature: -8 A -10ºC; H5, Z6	Drought resistant: LOW
ALTITUDE: 400-1200 M	Sun exposure: FULL SUN	Frost resistant: YES
IRRIGATION: MODERATE		
Soil	Texture: SANDY	Salt resistant: NO
pH: -	Drainage: HIGH	Lime resistant: YES
FERTILITY: MODERATE		

USES			
Resistances		Applications	
COASTAL: 1ST LINE		INTERIOR: YES	LINE: YES
POLLUTION: MODERATE		RIVERANKS: -	WINDBREAKER: -
WIND: MODERATE		GROUPS: -	ISOLATED: YES

POINTS OF INTEREST

Native to the Island of Guadalupe (Mexico), off the coast of Baja California and in deep and thermophilic ravines. This species is characteristic for its blue green color and its discontinuous flowering, that is, after blooming for a year it does not do so again for another five years or so.

SPACING: 4-6M

PLANTING AND PLANT HEATH

Propagation by seed. It is a species that is difficult to transplant, which must be done in spring/summer. This species is resistant to pests and diseases.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing | Transplanting | Pruning [X]

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation	Liters	TOTAL HEIGHT(CM)
CT	3	
CT	7	
CT	10	
CT	30	60/80
CT	65	100/120
CT	90	120/140
CT	100	140/160
CT	100	160/180
CT	120	180/200

BUTIA
PALM

Butia capitata (Martius) Beccari

BUTIA SPANISH | BUTIA VALENCIAN | JELLY PALM ENGLISH | PETIT COCOTIER CAPITE FRENCH

STRUCTURE		
Growth habit: SINGLE TRUNK	Height: 5 M	Diameter: 5-8 M
Habitat: COASTAL	Crown: YES	Root: NORMAL

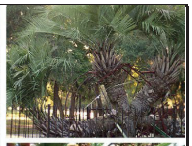
DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	MONOCOT
ORDER:	ARECALES
FAMILY:	ARECACEAE

VARIETIES

BUTIA CAPITATA var. *STRICTOR* (Naked stipe)

MORPHOLOGY		
Trunk	Size: STRAIGHT	Diameter: 40-50 CM
Surface+ Fibers: COVERED + HESSIAN FABRICS	Sheath: ENTIRE,PARTIAL	Leaf scars Spines: NO
Leaf	Petiole: DENTATE	Leaflet arrangemen: IRREGULAR
PINNATE	Leaflet shape: LANCEOLATE	Threads: NO
SIZE: Leaf: 3-4M, Leaflet:1-1.5M	Upper side: BLUE GREEN	Lower side: BLUE GREEN
TEXTURE: HARD		
Inflorescence	Type: UNISEXUAL	Reproduction: MONOECIOUS
TYPE: SHEATH	Size: 50-70 CM	Fragrant: NO
POSITION: INTERFOLIAR		
Fruit	Type: DRUPE	Color: PURPLE
SIZE: 2-3 CM	Edible: YES	Fruiting season: SEPT.-OCT.
Growth	Rate: MODERATE	Longevity: > 200 YEARS







ECOLOGY		
Climate	Temperature: -8ºC,H4,Z6	Drought resistant: MODERATE
ALTITUDE: 300-800 M	Sun exposure: FULL SUN	Frost resistant: MODERATE
IRRIGATION: MODERATE		
Soil	Texture: SANDY	Salt resistant: NO
pH: 6.5 - 8.5	Drainage: MODERATE	Lime resistant: YES
FERTILITY: NORMAL		

USES				
Resistances		Applications		
COASTAL: YES		INTERIOR: NO	LINE: YES	
POLLUTION: NO		RIVERANKS: -	WINDBREAKER: NO	
WIND: YES		GROUPS: YES	ISOLATED: YES	

POINTS OF INTEREST

Two characteristics make this palm especially striking; its airy, arched pinnate palms with a bluish hue and the persistent sheaths that surround the stipe confining a very orderly spiral. Jelly is made from the edible fruits, hence the English name "Jelly Palm".

SPACING: 5-7M

PLANTING AND PLANT HEALTH

Propagation by seeds taking approximately six months to germinate. This species is difficult to transplant even under optimum conditions.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing | Transplanting | Pruning [x]

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation	Liters	Total Height (cm)
CT	3	
CT	10	
CT	15	
CT	30	
CT	50	100/120
CT	90	120/140
CT	110	140/160
CT	130	160/180
CT	130	180/200
CT	160	200/235
CT	160	235/270

CHAMAEROPS

PALM

Chamaerops humilis L.

PALMITO (SPANISH) | NARGALLÓ (VALENCIAN) | EUROPEAN FAN PALM (ENGLISH) | PALMIER NAIN (FRENCH)

STRUCTURE		
Growth habit	Height	Diameter
MULTIPLE TRUNK	6 M	2-3 M
Habitat	Crown	Root
UNDERSTOREY	YES	NORMAL

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	MONOCOT
ORDER:	ARECALES
FAMILY:	ARECACEAE

VARIETIES

CHAMPAEROPS HUMILIS var. *ELAITOR* (single trunk)
CHAMPAEROPS HUMILIS var. *ABORESCENS* multiple trunk - 3)
CHAMPAEROPS HUMILIS var. *GRACILIS* (base with hanging pts)
CHAMPAEROPS HUMILIS var. *GLAUCSCENS* (blue leaves)

MORPHOLOGY		
Trunk	Size	Diameter
Surface + Fibers	STRAIGHT, THIN	5 to 18 CM
COVERED AND INTERLACED	Sheath	Leaf Scars + +
	ENTIRE, PARTIAL	Spines: NO
Leaf	Petilole	Leaflet arrangement
PALMATE	DENTATE	BILOBED
SIZE: Leaf: 70-100 CM	Leaflet shape	Threads
Leaflet: 10-15 CM	DIVIDED 1/4	NO
TEXTURE: CORIACIOUS	Upper side	Lower side
	LIGHT GREEN	LIGHT GREEN
Inflorescence	Type	Reproduction
COVERED/INTERLACED	UNISEXUAL	DIOECIOUS
POSITION: INTERFOLIAR	Leaflet	Fragrant
	15-20 CM	NO
Fruit	Type	Color
	BERRY	GRAY
	Edible	Fruiting season
SIZE: 2 CM	YES	JUL-SEPT
Growth	Rate	Longevity
	VERY SLOW	>200 YEARS



ECOLOGY		
Climate	Temperature	Drought resistant
	-13ºC, H3, Z5	YES
ALTITUDE: 0-100 M	Sun exposure	Frost resistant
IRRIGATION: MODERATE	FULL SUN	MODERATE
Soil	Texture	Salt resistant
	LOAMY/SANDY	YES
pH: 6.5-8.5	Drainage	Lime resistant
FERTILITY: POOR	HIGH	YES

USES			
Resistances	Applications		
COASTAL: 1ST LINE	INTERIOR: YES	LINE: -	
POLLUTION: MODERATE	RIVERBANKS: -	WINDBREAKER: -	
WIND: HIGH	GROUP: YES	ISOLATED: YES	

POINTS OF INTEREST

It is the only spontaneously growing palm tree in Europe. As an ornamental plant it can be used in groups or isolated in rockeries, terrace pots or corners of the garden. The palm leaves are used to make brooms, baskets and mats. The spearleaf is edible, with a pleasant flavor, used in salads and referred to as the shepherd's date.

SPACING: 3-5M

PLANTING AND PLANT HEALTH

It propagates by seed or sucker. Transplanting is easy.This species is prone to diseases and pests caused by insects or fungi.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing | Transplanting | Pruning X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation	Liters	Total Height(cm)
CT	2	
CT	3	40/60
CT	7	60/80
CT	30	80/100
CT	50	80/100
CT	50	100/125
CT	65	80/100
CT	85	100/125
CT	85	125/150
CT	100	150/175
CT	120	175/200

COPERNICEA

PALM

Copernicea alba

PALMA COLORADA (SPANISH) | VALENCIAN | CARNAUBA WAX PALM (ENGLISH) | LE CARANDAY (FRENCH)

STRUCTURE		
Growth habit: SINGLE TRUNK	Height: 10-18 M	Diameter: 4-7 M
Habitat: TROPICAL, COASTAL	Crown: YES	Root: ADVENTITIOUS

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	MONOCOT
ORDER:	ARECALES
FAMILY:	ARECACEAE

VARIETIES

MORPHOLOGY		
Trunk: Surface + Fibers: COVERED(-)	Size: STRAIGHT	Diameter: 10-30 CM
	Sheath: ENTIRE,PARTIAL	Leaf scars: THIN; SPINES: NO
Leaf: PALMATE; SIZE: Leaf: 6-7 M, Leaflet: 30-60cm; TEXTURE: SMOOTH	Petiole: SPINES	Leaflet arrangement: BILOBED
	Leaflet shape: DIVIDED 1/2	THREADS: NO
	Upper side: GREEN /GRAY	Lower side: GREEN/GRAY
Inflorescence: TYPE: PANICLE; POSITION: INTERFOLIAR	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
	Size: 2 M	Fragrant: —
Fruit: SIZE: —	Type: DRUPE	Color: BLACK
	Edible: —	Fruiting season: —
Growth	Rate: MODERATE	Longevity: —







ECOLOGY		
Climate: ALTITUDE: —; IRRIGATION: MODERATE	Temperature: -2ºC, H5, Z6	Drought resistant: NO
	Sun exposure: SUN/PARTIAL SHADE	Frost resistant: MODERATE
Soil: pH: 6-8; FERTILITY: HARDY	Texture: SANDY/OTHERS	Salt resistant: YES
	Drainage: HIGH	Lime resistant: MODERATE

USES				
Resistances: COASTAL: 2ND LINE; POLLUTION: —; WIND: —	Applications: INTERIOR: NO	LINE: YES		
	RIVERBANK: YES	WINDBREAKER: NO		
	GROUPS: YES	ISOLATED: YES		

POINTS OF INTEREST

Spectacular palm tree with a very large population in Central and South America. It has great possibilities in gardening. Its spreading is slowed down by its reduced initial growth. Among all Copernicea spiecies, it has the highest level of resistance to cold. Younger plants have leaves with a bluish tint. Its leaves are sharp and have thorns, so it must be handled with care. Palm tree of great beauty both isolated and in groups. Careful pruning allows the base of the leaf to be maintained, lending additional interest to the slender stipe.

SPACING: 3- 4 M

PLANTING AND PLANT HEALTH

Fresh seeds germinate easily 3-6 months after sowing if kept in water for 7 days. They can also germinate in artificial media such as agar (gelatinous substance). When collecting the seeds, it is advisable to remove the fleshy cover before storing them.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
					X	X	X				

Sowing | Transplanting | Pruning X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation	Liters	Total Height(cm)

CYCA

CYCADACEAS

Cyca revoluta

CICA, Palma de Iglesia	CICA	SAGO PALM	CYCA DU JAPON
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Growth Habit: SINGLE TRUNK	Height: 1-3 M	Diameter: 1-1.5 M
Habitat: —	Crown: YES	Root: FASCICULATE

DIVISION:	SPERMTOPHYTES
SUBDIVISION:	GYMNOSPERMS
TYPE:	CYCADOPSIDA
ORDER:	CYCADALES
FAMILY:	CYCADACEAS

VARIETIES

MORPHOLOGY		
Trunk: STRAIGHT	Size: STRAIGHT	Diameter: 20-30 CM
Surface: COVERED	Sheath: —	Leaf scars+ / Spines: NO
Leaf: TYPE: PINNATE; SIZE: Leaf: 2 M, Leaflet: 75CM; TEXTURE: SMOOTH	Petiole: NO SPINES	Leaf arrangement: REGULAR 1 PLANE
	Leaflet shape: LINEAR/LANCEOLATE	Thread: NO
	Upper side: DARK GREEN	Lower side: LIGHT GREEN
Inflorescence	Type: UNISEXUAL	Reproduction: DIOCEIOUS
CONE ♂/M: CYLINDER 50 -70CM/STRAIGHT / CONE ♀/F: ROUND 30CM/SMOOTH(VELVET)		Fragrant: —
Fruit: SIZE: 3 CM	Type: PSUEDODRUPE	Color: ORANGE
	Edible: POISONOUS	Fruiting season: —
Growth	Rate: SLOW	Longevity: 100 YEARS



ECOLOGY		
Climate: ALTITUDE: 0-400 m; IRRIGATION: HIGH	Temperature: -5ºC; H5; Z6	Drough resistant: MODERATE
	Sun exposure: SUN /PARTIAL SHADE	Frost resistant: MODERATE
Soil: pH: 6-8; FERTILITY: FERTILE	Texture: LIGHT	Salt resistant: NO
	Drainage: HIGH	Lime resistant: MODERATE

USES			
Resistences		Applications	
COASTAL: 2ND LINE		INTERIOR: NO	LINE: NO
POLLUTION: MODERATE		RIVERBANKS: —	WINDBREAKER: NO
WIND: MODERATE		GROUPS: YES	ISOLATED: YES

POINTS OF INTEREST

Native to China, Japan and Indonesia. It grows in monospecific groups in the mountainous areas of Papua. It is the most rustic species of the Cyca genus. Despite requiring good soil moisture,warerlogging will turn it yellow. It can be planted isolated or in groups. This species cannot tolerate pruning. Its leaves are used in flower arrangements. The leaves have 1 central vein. It contains a mealy pith (sago) with which a kind of bread is made in Japan. The seeds are poisonous.

SPACING: 1-2 M

PLANTING AND PLANT HEALTH

Easy propagation by stem cuttings in spring. Easy transplant in summer.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Transplanting Pruning X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation (L)	Total Height (cm)	Trunk Height(cm)
CT (14)	40/60	
CT (20)	50/60	
CT (22)	50/60	
CT (30)	70/80	10
CT (40)	80/90	25
CT (50)		40/45
CT (50)		65/70
CT (85)		70/75
CT (85)		80/85
CT (110)		90/95
CT (110)		95/100

DIOON

ZAMIACEAS

Dioon spinulosum

PALMA DE VIRGINIA (SPANISH) | VALENCIAN | GIANT DIOON, GUM PALM (ENGLISH) | FRENCH

STRUCTURE		
Growth Habit: SINGLE TRUNK	Height: 1.5-15 M	Diameter: 1-3 M
Habitat: __	Crown: YES	Root: FASCICULATE

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	GYMNOSPERMS
TYPE:	CYCADS
ORDER:	CYCADALES
FAMILY:	ZAMIACEAS

VARIETIES

MOROHOLOGY		
Trunk	Size: STRAIGHT	Diameter: 20-25 CM
Surface: COVERED	Sheath: __	Leaf scars:++ / Spines: NO
Leaf	Petiole: NO SPINES	Leaflet arrangement: REGULAR 1 PLANE
TYPE: PINNATE; SIZE: Leaf: 2 M, Leaflet: 7 CM; TEXTURE: SMOOTH (HAIRY WHEN YOUNG)	Leaflet shape: LINEAR/LANCEOLATE	Threads: NO
	Upper side: DARK BLUE/GREEN	Lower side: DARK BLUE/ GREEN
Inflorescence	Type: UNISEXUAL	Reproduction: DIOCECIOUS
CONE ♂/M: SUBSPHERICAL,GRAY (WOOLLY) / CONE ♀/F: OVOID - VERY WOOLLY		Fragrant: __
Fruit	Type: PSEUDODRUPE	Color: __
SIZE: __	Edible: YES	Fruiting season: __
Growth	Rate: VERY SLOW	Longevity: __







ECOLOGY		
Climate	Temperature: 5 ° C; G1/H5; Z7	Drought resistant: YES
ALTITUDE: 0-100	Sun exposure: SUN	Frost resistant: NO
IRRIGATION: MODERATE		
Soil	Texture: LIGHT	Salt resistant: NO
pH: 5-7	Drainage: HIGH	Lime resistant: __
FERTILITY: FERTILE		

USES			
Resistances		Applications	
COASTAL: 2ND LINE	INTERIOR: __	LINE: NO	
POLLUTION: __	RIVERBANKS: __	WINDBREAKER: NO	
WIND: __	GROUPS: __	ISOLATED: YES	

POINTS OF INTEREST

Native to Mexico (from Yucatan to Tuxla). Like other species of the cycadales order, it has a morphological resemblance to palm trees and ferns. Among the cycads, only the *Cyca media* (Australian species) exceeds it in height. Its pinnate leaves have numerous longitudinal veins and include more than 100 leaflets per leaf, each with 5 to 8 spines on the blade. This species is closest to the fossil forms. The seeds and the trunk produce an edible starch, which is why it is also known as the gum palm. Pruning is done only to remove dead leaves.

SPACING: 1-2 M

PLANTING AND PLANT HEALTH

Propagation by seeds.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing | Transplanting | Pruning x

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation(L)	Total height (cm)	Trunk height(cm)
CT (30)	35/40	
CT (50)	40/45	
CT (50)	45/50	
CT (50)	50/55	

HOWEA

Palm

Howea forsteriana

QUENTIA SPANISH	QUENTIA VALENCIAN	HOWE´S ISLAND PALM ENGLISH	KENTIA FRENCH

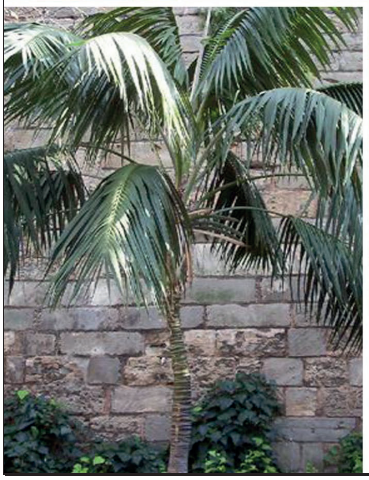
STRUCTURE		
Growth Habit: SINGLE TRUNK	Height: 10-15 M	Diameter: 4-6 M
Habitat: TROPICAL, COASTAL	Crown: YES	Root: ADVENTITIOUS

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	MONOCOT
ORDER:	ARECALES
FAMILY:	ARECASEAE

VARIETIES

MORPHOLOGY		
Trunk: Surface + Fibers: COVERED (-)	Size: STRAIGHT	Diameter: 8-15 CM
	Sheath: ENTIRE,PARTIAL	Leaf scars: THIN; Spines: NO
Leaf: TYPE: PINNATE; SIZE: Leaf: 2 M, Leaflet: 75CM; TEXTURE: SMOOTH	Petiole: NO SPINES	Leaflet arrangement: REGULAR 1 PLANE
	Leaflet shape: LINEAR/LANCEOLATE	Threads: NO
	Upper side: DARK GREEN	Lower side: DARK GREEN
Inflorescence: TYPE: SPIKES; POSITION: INTRAFOLIAR	Type: UNISEXUAL	Reproduction: MONOCEIOUS
	Size: 90 CM	Fragrant: —
Fruit: SIZE: 1.5 M	Type: CLUSTER BERRY	Color: GREEN/RED
	Edible: —	Fruiting season: —
Growth	Rate: FAST	Longevity: 100 YEARS




ECOLOGY		
Climate: ALTITUDE: 0-200; IRRIGATION: HIGH	Temperature: -2ºC; H5; Z7	Drought resistant: NO
	Sun exposure: PARTIAL SUN/ SHADE	Frost resistant: MODERATE
Soil: pH: 5-7.5; FERTILITY: FERTILE	Texture: LIGHT	Salt resistant: YES
	Drainage: HIGH	Lime resistant: NO

USES			
Resistances		Applications	
COASTAL: 2ND LINE		INTERIOR: YES	LINE: NO
POLLUTION: —		RIVERBANKS: —	WINDBREAKER: YES
WIND: MODERATE		GROUPS: YES	ISOLATED: YES

POINTS OF INTEREST

Species belonging to a genus native to Lord Howe Island where it grows in extensive colonies.This species does well indoors; requiring little shade and care. It can support full sun from 5 years. It grows well in coastal areas due to its good resistance to saline winds. It can be planted both isolated and in groups. Pruning is done only to remove old leaves. Flowering occurs in specimens over 6 years old.

SPACING: 1-2 M

PLANTING AND PLANT HEALTH

Propagation by seed. This species is difficult to transplant and should be done in spring or summer preferably with grown specimens and with abundant irrigation after transplanting.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTVIATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
					X	X	X				

Sowing Transplanting Pruning X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation (L)	TOTAL HEIGHT(cm)	TRUNK HEIGHT(cm)
CT (3)	0	
CT (10)	100-120	
CT (30)	120-160	
CT (35)	160-220	
CT (40)	160-250	
CT (80)	350-400	100-120
CT (80)	400-450	200-220
CT (230)	500-700	230-250

JUBAEA

PALM

Jubaea chilensis

COQUITO	PALMERA DE XILE	CHILEAN WINE PALM	JEBEE REMARQUABLE
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Growth habit: SINGLE TRUNK	Height: 10-33 M	Diameter: 4-6 M
Habitat: COASTAL	Crown: YES	Root: NORMAL

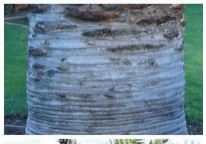
DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	MONOCOT
ORDER:	ARECALES
FAMILY:	ARECACEAE

VARIETIES

MORPHOLOGY		
Trunk	Size: STRAIGHT/STOUT	Diameter: 1-2 M
Surface + Fibers: NAKED	Texture: SMOOTH	Leaf scars: + Spines: NO
Leaf	Petiole: SHORT BARE STEM	Leaflet arrangement: REGULAR 1 PLANE
TYPE: PINNATE SIZE: Leaf: 4-5 M, Leaflet: 60 CM TEXTURE: SMOOTH	Leaflet shape: PINNATE	Threads: NO
	Upper side: DARK GREEN	Lower side: LIGHT GREEN
Inflorescence	Type: UNISEXUAL	Reproduction: MONOECIOUS
TYPE: SPATHE POSITION: INTERFOLIAR	Size: 1-1.5 M	Fragrant: NO
Fruit	Type: BERRY	Color: ORANGE
SIZE: 3.5 CM	Edible: YES	Fruiting season: OCT-NOV
Growth	Rate: VERY SLOW	Longevity: >600 YEARS









ECOLOGY		
Climate	Temperature: -10ºC; H4; Z6	Drought resistant: YES
ALTITUDE: 0-1500 M IRRIGATION: MODERATE	Sun exposure: SUN/PARTIAL SHADE	Frost resistant: MODERATE
Soil	Texture: SANDY	Salt resistant: NO
pH: 6.5-8.5 FERTILITY: MODERATE	Drainage: HIGH	Lime resistant: YES

USES				
Resistances		Applications		
COASTAL:	2ND LINE	INTERIOR:	NO	LINE: YES
POLLUTION:	MODERATE	RIVERBANKS:	-	WINDBREAKER: NO
WIND:	MODERATE	GROUPS:	YES	ISOLATED: YES

POINTS OF INTEREST

This Palm species is native to Chile and highly appreciated for its sugary sap from which a characteristic wine is made. Its seed is an edible fruit called *coquito*. Its pulp is attached to the shell. It is easily confused with *Coco nuccifera* due to its texture and flavor.

SPACING: 4-6M

PLANTING AND PLANT HEALTH

Propagation by seed. Transplanting is difficult and carried out in spring-summer. In general, this palm is resistant to pests and diseases.However, if grown in the Mediterranean area it can be delicate as in its first three years of life, it can be prone to fungi and bacteria.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Transplanting Pruning X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation (L)	Total Height (cm)	Trunk height(cm)
CT (60)	210	60

LIVISTONA

PALM

Livistona australis (Brown) Mart.

PALMERA DE ABANICO DE AUSTRALIA (SPANISH) | LIVISTONA DÁUSTRALIA (VALENCIAN) | AUSTRALIAN FAN PALM (ENGLISH) | PALMIER ÉVENTAIL (FRENCH)

STRUCTURE		
Growth habit: SINGLE TRUNK	Height: 23-26 M	Diameter: 4 M
Habitat: EMERGENT	Crown: YES	Root: NORMAL

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	MONOCOT
ORDER:	ARECALES
FAMILY:	ARECACEAE

VARIETIES

LIVISTONA AUSTRALIS **var.** *LATANIA A.*

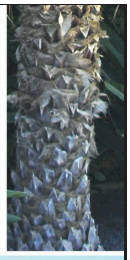
LIVISTONA AUSTRALIS **var.** *CORYPHA A*

MORPHOLOGY		
Trunk	Size: STRAIGHT, THIN	Diameter: 35-60 CM.
Surface + Fibers: NAKED/SMOOTH (VELVET)	Texture: SMOOTH	Leaf scars: ++ / Spines: NO
Leaf	Petiole: DENTATE	Leaflet arrangement: ENTIRE
Costapalmate	Leaf shape: DIVIDED1/2	Threads: YES
SIZE: Leaf: 2-3 M.	Upper side: DARK GREEN	Lower side: DARK GREEN
TEXTURE: ROUGH		
Inflorescence	Type: UNISEXUAL	Reproduction: MONOECIOUS
TYPE: SPATHE	Size: 1-1, 25 M.	Fragrant: NO
POSITION: INTERFOLIAR		
Fruit	Type: BERRY	Color: RED
SIZE: 1.5-2 CM.	Edible: NO	Fruiting season: SEPT-NOV
Growth	Rate: SLOW	Longevity: + 100 YEARS

ECOLOGY		
Climate	Temperature: -8ºC; H5; Z6	Drought resistant: NO
ALTITUDE: 0-200 M	Sun exposure: FULL SUN	Frost resistant: MODERATE
IRRIGATION: MODERATE		
Soil	Texture: SANDY	Salt resistant: NO
pH: 5.5-8.5	Drainage: MODERATE	Lime resistant: YES
FERTILITY: HARDY		

USES					
Resistances		Applications			
COASTAL:	2ND LINE	INTERIOR:	YES	LINE:	YES
POLLUTION:	MODERATE	POTS :	YES	WINDBREAKER:	NO
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	YES





POINTS OF INTEREST

This is an excellent palm species to use as street trees and in groups.

SPACING: 5-7 M

PLANTING AND PLANT HEALTH

Propagation by seed.
Transplanting is easy and should be done in spring-summer.
This species is resistant to pests and diseases.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing | Transplanting | Pruning: X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation	Liters	Total height (cm)
CT	2	25
CT	3	35
CT	7	45
CT	15	60
CT	30	75
CT	50	90
CT	140	125
CT	230	255

LIVISTONA

Livistona chinensis (Jacquin) Martius

PALM

PALMA DE ABANICO DE CHINA (SPANISH) | LIVISTONA DE LA XINA (VALENCIAN) | CHINESE FAN PALM (ENGLISH) | PALMIER ÉVENTAIL CHINOIS (FRENCH)

STRUCTURE		
Growth habit: SINGLE TRUNK	Height: 8-10 M	Diameter: 3 M
Habitat: DESERT	Crown: YES	Root: NORMAL

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	MONOCOT
ORDER:	ARECALES
FAMILY:	ARECACEAE

VARIETIES

L. CHINENSIS **var.** *BONINENSIS* (Pear-shaped fruit)

MORPHOLOGY		
Trunk	Size: STRAIGHT/STOUT	Diameter: 20-30 CM
Surface: NAKED/SMOOTH/VELVET +	Texture: SMOOTH	Leaf scars: ++
		Spines: NO
Leaf	Petiole: DENTATE	Leaflet arrangement: BILOBED
COSTAPALMATE	Leaflet shape: DIVIDED1/4	Threads: YES
SIZE: Leaf: 3 M.	Upper side: LIGHT GREEN	Lower side: LIGHT GREEN
TEXTURE: GLOSSY		
Inflorescence	Type: UNISEXUAL	Reproduction: MONOECIOUS
TYPE: CLUSTER	Size: 1.8 M	Fragrant: UNPLEASANT
POSITION: INTERFOLIAR		
Fruit	Type: DRUPE	Color: OLIVE GREEN
	Edible: NO	Fruiting season: SEPT-NOV
SIZE: 2 cm.		
Growth	Rate: SLOW	Longevity: +100 YEARS



ECOLOGY		
Climate	Temperature: -7ºC; H5; Z6	Drought resistant: NO
ALTITUDE: 0-600 M.	Sun exposure: PARTIAL SHADE	Frost resistant: MODERATE
IRRIGATION: MODERATE		
Soil	Texture: SANDY	Salt resistant: NO
pH: 5.5-8.5	Drainage: MODERATE	Lime resistant: YES
FERTILITY: MODERATE		

USES				
Resistances		Applications		
COASTAL:	2ND LINE	INTERIOR: -	LINE:	YES
POLLUTION:	MODERATE	POTS: YES	WINDBREAKER:	NO
WIND:	HIGH	GROUPS: YES	ISOLATED:	YES

POINTS OF INTEREST

This species can be used both in and outdoors. If outdoors, its leaves are smaller and more curved. It is a very interesting palm for shaded areas or low light. The tips of the leaflets are straight, although not as straight as *L. decipiens*. It is an excellent plant for pots and as an indoor plant.

PLANTING AND PLANT HEALTH

Propagation by seeds although not long lasting. After harvest, they must be dried and the outer shell removed. It should be sown in substrates with a lot of organic matter, with an average soil temperature of 28ºC. Repotting is easy from a pot or container during the warm months, more difficult if done from the ground. This species is resistant to pests and diseases.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing | Transplanting | Pruning [x]

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation	Total height(cm)	Trunk height(cm)
CT (25L)	40-50	
CT (50L)	100-120	10-20
CT (50)	175-200	30-40
CT (80)	275-300	180-200

LIVISTONA

Livistona decipiens Becc.

PALM

PALMA LLORONA (SPANISH) | VALENCIAN | RIBBON FAN PALM (ENGLISH) | LATANIER PLEUREUR (FRENCH)

STRUCTURE		
Growth habit: SINGLE TRUNK	Height: 10-15 M	Diameter: 3-5 M
Habitat: MANGROVE	Crown: YES	Root: NORMAL

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	MONOCOT
ORDER:	ARECLAES
FAMILY:	ARECACEAE

VARIETIES

MORPHOLOGY		
Trunk	Size: STRAIGHT, THIN	Diameter: 20-25 CM
Surface + Fibers: NAKED (--)	Texture: SMOOTH	Leaf scars: ++ / Spines: NO
Leaf	Petiole: SPINES	Leaflet arrangement: ENTIRE
PALMATE; SIZE: Leaf: 3-4M, Leaflet:1-1.5M; TEXTURE: SMOOTH	Leaflet shape: DIVIDED 3/4 LEAF	Threads: YES
	Upper side: YELLOW/GREEN	Lower side: YELLOW/GREEN
Inflorescence	Type: UNISEXUAL	Reproduction: MONOECIOUS
TYPE: SPATHE; POSITION: INTERFOLIAR	Size: 1 M	Fragrant: -
Fruit	Type: DRUPE	Color: -
SIZE: 1.2-1.8 CM	Edible: -	Fruiting season: -
Growth	Rate: FAST	Longevity: -

ECOLOGY		
Climate	Temperature: -8ºC; H5; Z6	Drought resistant: NO
ALTITUDE: -	Sun exposure: FULL SUN	Frost resistant: MODERATE
IRRIGATION: HIGH		
Soil	Texture: VARIOUS	Salt resistant: NO
pH: 5 to 8	Drainage: HIGH	Lime resistant: YES
FERTILITY: MODERATE		

USES				
Resistances		Applications		
COASTAL: MODERATE		INTERIOR: NO	LINE: YES	
POLLUTION: YES		RIVERBANKS: YES	WINDBREAKER: YES	
WIND: YES		GROUPS: YES	ISOLATED: YES	









POINTS OF INTEREST

This species of palm is of ornamental interest as it is easy to plant and for its characteristic weeping leaves where its leaflets fall from middle part of the leaf. The trunk is of rough texture.

SPACING: 4-6M

PLANTING AND PLANT HEALTH

Propagation by seeds which germinate quite easily.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing | Transplanting | Pruning (X)

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation	Liters	Height (cm)
CT	50	150

PHOENIX

PALM

Phoenix canariensis Hort. ex Chabaud

PALMERA CANARIA	PALMERA DE CANARIES	CANARY IS. DATE PALM	DATTIER DES CANARIES
SPANISH	VALENCIAN	ENGLISH	FRENCH

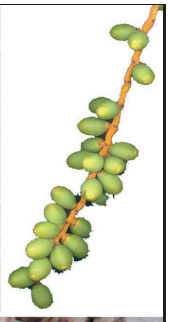
STRUCTURE		
Growth habit: SINGLE TRUNK	Height: 15-20 M	Diameter: 4-6 M
Habitat: COASTAL	Crown: YES	Root: NORMAL/AERIAL

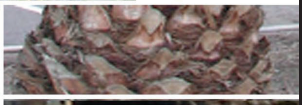
DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	MONCOT
ORDER:	ARECALES
FAMILY:	ARECACEAE

VARIETIES

MORPHOLOGY		
Trunk	Size: STRAIGHT	Diameter: 50-70 CM.
Surface + Fibers: COVERED/PERSISTANT FIBERS	Sheath: ENTIRE/PARTIAL	Leaf scars: ++ / Spines: NO
Leaf	Petiole: SPINE	Leaflet arrangement: REGULAR
PINNATE	Leaflet shape: LANCEOLATE	Threads: NO
SIZE: Leaf: 3-7M / Leaflet:15-20CM	Upper side: LIGHT GREEN	Lower side: LIGHT GREEN
TEXTURE: SMOOTH		
Inflorescence	Type: UNISEXUAL	Reproduction: DIOECIOUS
TYPE: SPATHE	Size: 1-1.5 M	Fragrant: NO
POSITION: INTERFOLIAR		
Fruit	Type: DRUPE	Color: ORANGE
	Edible: NO	Fruiting season: SEPT-NOV
SIZE: 1.5-2 CM		
Growth	Rate: MEDIUM/SLOW	Longevity: + 100 YEARS









ECOLOGY		
Climate	Temperature: -8ºC; H4; Z6	Drought resistant: YES
ALTITUDE: 300-700 m.	Sun exposure: FULL SUN	Frost resistant: MODERATE
IRRIGATION: MODERATE		
Soil	Texture: SANDY/OTHERS	Salt resistant: YES
pH: 5.5-9	Drainage: MODERATE	Lime resistant: YES
FERTILITY: HARDY		

USES			
Resistances		Application	
COASTAL: 1ST LINE	INTERIOR: YES	LINE: YES	
POLLUTION: HIGH	RIVERBANKS: -	WINDBREAKER: YES	
WIND: HIGH	GROUPS: YES	ISOLATED: YES	

POINTS OF INTEREST

Native to the Canary Islands. It has great ornamental appeal due to its leafy crown and thick, straight trunk. Adult specimens will embellish any garden. It is one of the most hardy palms (in some cases withstanding temperatures of up to -15ºC and lose their leaves but without dying). The first fruits appear in specimens that are 15 years old or more and their taste is less pleasant than *Phoenix dactylifera* and used for livestock. Using the leaves, a palm honey called *gomera* from the island of La Gomera is made. The palms most tender leaves are used for salad.

SPACING: 8-12 M

PLANTING AND PLANT HEALTH

Propagation by seed. It transplants easily (during the summer season) although it is a very delicate process and therefore a good root pruning must be ensured. Extremely sensitive to the attack of the red palm weevil (*Rhynchophorus ferrugineus*). Special care must also be taken with the vascular disease Lethal Yellowing produced by phytoplasmas (decimates up to 90% of the population), still found in the Iberian Peninsula, and with *Graphiola phoenicis*, which produces "scabs" on the leaves when these are collected to obtain palms for Holy Week.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Transplanting Pruning x

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Liters	Height(cm)
CT	3	
CT	5	100/120
CT	15	125/150
CT	45	160/190
CT	85	200/250
CT	100	250/300
CT	160	T40/50
CT	230/350	T50/60
CT	285/350	T60/80
CT	500/700	T80/100

PHOENIX

PALM

Phoenix dactylifera

PALMERA DATILERA (SPANISH) | PALMERA DE DATILS (VALENCIAN) | DATE PALM (ENGLISH) | DATTIER (FRENCH)

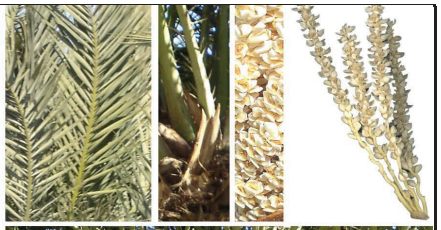
STRUCTURE		
Growth Habit: MULTIPLE TRUNK	Height: 20-50 M	Diameter: 7 M
Habitat: DESERT	CROWN: YES	Root: NORMAL/AERIAL

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	MONOCOT
ORDER:	ARECALES
FAMILY:	ARECACEAE

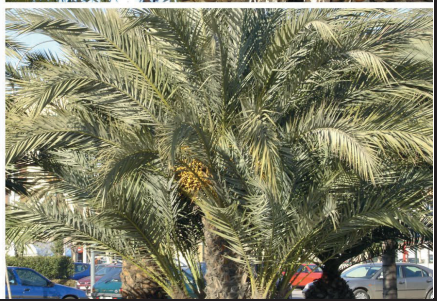
VARIETIES

MORPHOLOGY		
Stipe	Size: STRAIGHT/THIN	Diameter: 40-60 CM.
Surface + Fibers: COVERED/OCHREA ATTACHED	Sheathe: ENTIRE/PARTIAL	Annular rings/scars: + / Spine: NO
Leaf	Petiole: SPINES	Leaflet arrangement: REGULAR
TYPE: PINNATE	Leaflet shape: LANCEOLATE	Threads: NO
SIZE: Leaf: 6-7 M, Leaflet: 30-60CM	Upper side: MEDIUM GREEN	Lower side: MED/LIGHT GREEN
TEXTURE: SMOOTH		
Inflorescence	Type: UNISEXUAL	Reproduction: DIOECIOUS
TYPE: SPATHE	Size: 1-2 M	Fragrant: NO
POSITION: INTERFOLIAR		
Fruit	Type: DRUPE	Color: DARK BROWN
SIZE: 2.5-7 CM.	Edible: YES	Fruiting season: SEPT-NOV
Growth	Rate: SLOW	Longevity: +100 YEARS









ECOLOGY		
Climate	Temperature: -8C; H4; Z6	Drought resistant: YES
ALTITUDE: 0-200 M.	Sun exposure: FULL SUN	Frost resistant: MODERATE
IRRIGATION: MODERATE		
Soil	Texture: SANDY/OTHERS	Salt resistant: YES
Ph: 5.5,-8.5	Drainage: HIGH	Lime resistant: YES
FERTILITY: MODERATE		

USES				
Resistances		Applications		
COASTAL:	1ST LINE	INTERIOR:	NO	LINE: YES
POLLUTION:	HIGH	RIVERBANKS:	YES	WINDBREAKER: NO
WIND:	HIGH	GROUPS:	YES	ISOLATED: YES

POINTS OF INTEREST

It is the best known palm tree and is also widespread in warm areas for its cultivation of dates. It can reach up to 600 years of age although it dies earlier due to wind breakage. A special feature that distinguishes it from the *Phoenix canariensis* is the emission of suckers from its base. The fruiting of this palm tree can be appreciated in specimens of 15 years with the fruit developing from 4 years.

MINIMUM EQUIDISTANCE: 3 or 4 M

PLANTING AND PLANT HEALTH

Propagation by seeds and suckers. Transplanting is easy during the summer time. It has low resistant to diseases caused by insects and fungi. This species is prone to the red palm weevil (*Rhynchophorus ferrugineus*) .

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing | Transplanting | Pruning (X)

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation	Liters	Height (cm)
CT (3l)	60	
CT (7L)	80	
CT (10L)	100	
CT (15L)	120	
CT (30L)	140	
CT (50L)	150/175	
CT (50L)	175/200	
CT (70L)		20/30
CT (90L)		T30/40
CT (160/230L)		T60/80
CT (350L)		T100/125
CT (700L)		T175/200
CT (1000/1500L)		T450/500

PHOENIX

Palm

Phoenix reclinata

PALMERA DE SENEGAL (SPANISH) | PALMERA DE SENEGAL (VALENCIAN) | SENEGAL DATE PALM (ENGLISH) | DATTIER DU SÉNÉGAL (FRENCH)

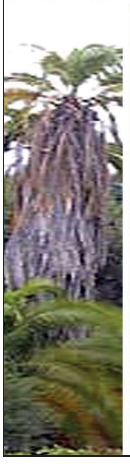
STRUCTURE		
Growth habit: MULTIPLE TRUNK	Height: 6-10 M	Diameter: 6-10 M
Habitat: TROPICAL, COASTAL	Crown: YES	Root: ADVENTITIOUS

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	MONOCOT
ORDER:	ARECALES
FAMILY:	ARECACEAE

VARIETIES

MORPHOLOGY		
Trunk	Size: CURVED, THIN	Diameter: 10-18 CM
Surface + Fibers: Covered (-)	Sheathe: ENTIRE/PARTIAL	Leaf scars: ++ / Spines: NO
Leaf	Petiole: SPINES	Leaflet arrangement: REGULAR
TYPE: PINNATE / SIZE: Leaf: 6-7 M, Leaflet: 30-60 C	Leaflet shape: LANCEOLATE	Threads: NO
TEXTURE: SMOOTH	Upper side: INTENSE GREEN	Lower side: LIGHT GREEN
Inflorescence	Type: UNISEXUAL	Reproduction: DIOECIOUS
TYPE: SPATHE / POSITION: INTERFOLIAR	Size: 90 CM	Fragrant: NO
Fruit	Type: DRUPE	Color: BROWN/RED
SIZE: 2.5-7 CM	Edible: YES	Fruiting season: SEPT-NOV
Growth	Rate: MODERATE	Longevity: +100 YEARS





ECOLOGY		
Climate	Temperature: 1ºC; G1/H5; Z7	Drought resistant: YES
ALTITUDE: 0-200 M. / IRRIGATION: MODERATE	Sun exposure: SUN/PARTIAL SHADE	Frost resistant: NO
Soil	Texture: SANDY/OTHERS	Salt resistant: YES
pH: 5.5,-8.5 / FERTILITY: MODERATE	Drainage: HIGH	Lime resistant: YES

USES			
Resistances		Applications	
COASTAL: 2ND LINE		INTERIOR: NO	LINE: NO
POLLUTION: MODERATE		RIVERBANK: YES	WINDBREAKER: NO
WIND: HIGH		GROUP: YES	ISOLATED: YES

POINTS OF INTEREST

This species of palm has multiple curved trunks which are separated from each other. Its base has numerous basal shoots that form a rosette around the trunks. Native to Tropical Africa and usually found on riverbanks and near coasts. Suckers can be removed so that the rest of the tree can grow faster. It is important to remove old leaves. Pruning can be done throughout most of the year, although at the beginning of summer it is especially advisable. Its fruits are edible but bitter.

SPACING: 7-8 M

PLANTING AND PLANT HEALTH

Propagation by seed and suckers.
Transplanting is easy and carried out in the summer months.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
					X	X	X				

Sowing | Transplanting | Pruning X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation (L)	Total Height (cm)	Trunk Height (cm
CT (3)		
CT (15)		
CT (30)		
CT (50)	150/200	
CT (85)	200/250	

PHOENIX

PALM

Phoenix roebelenii O'Brien

PALMERA DATILERA ENANA (SPANISH) | PALMERA NANA (VALENCIAN) | DWARF DATE PALM (ENGLISH) | DATTIER NAIN (FRENCH)

STRUCTURE		
Growth habit: SINGLE/MULTIPLE TRUNK	Height: 2-3 M	Diameter: 2-2.5 M
Habitat: INFERIOR STRATUM	Crown: YES	Root: NORMAL

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	MONOCOT
ORDER:	ARECALES
FAMILY:	ARECACEAE

VARIETIES

MORPHOLOGY		
Trunk	Size: CURVED/THIN	Diameter: 15-CM
Surface+ Fibers: COVERED (--)	Sheathe: ENTIRE/PARTIAL	Leaf scars: + DISTINCT
Leaf	Petiole: SPINES	Leaflet arrangement: ALMOST REGULAR
PINNATE	Leaflet Shape: ACCUMINATE	Threads: YES
SIZE: Leaf: 1-1.5M; Leaflet: 12-20CM	Upper side: INTENSE GREEN	Lower side: GREEN
TEXTURE: SOFT		
Inflorescence	Type: UNISEXUAL	Reproduction: DIOECIOUS
TYPE: SPATHE	Size: 0.5 M	Fragrant: NO
POSITION: INTERFOLIAR		
Fruit	Type: DRUPE	Color: GRAY
	Edible: YES	Fruiting season: SPET-NOV
SIZE: 1.5 CM		
Growth	Rate: SLOW	Longevity: >200 YEARS

ECOLOGY		
Climate	Temperature: 5ºC,G1,H7	Drought resistant: YES
ALTITUDE: 0-200 M	Sun exposure: SUN/SHADE	Frost resistant: NO
IRRIGATION: MODERATE		
Soil	Texture: SANDY/OTHERS	Salt resistant: NO
pH: 5.5-8.5	Drainage: HIGH	Lime resistant: YES
FERTILITY: MODERATE		

USES				
Resistances		Applications		
COASTAL: 2ND LINE		INTERIOR: YES	LINE: YES	
POLLUTION: MODERATE		RIVERBANKS: NO	WINDBREAKER: NO	
WIND: LOW		GROUPS: YES	ISOLATED: YES	



POINTS OF INTEREST

This is an excellent potted palm when young. In its adult stage, it can be grouped in different heights giving a unique set to the garden. Pruning can be done to remove old or dead leaves.

SPACING: 2M

PLANTING AND PLANT HEALTH

Propagation by seed. Transplanting is carried out during the summer season. Sensitive to diseases caused by insects and fungi.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
X	X	X	X	X	X	X	X	X	X	X	X

Sowing | Transplanting | Pruning (X)

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation	Liters	Height (cm)
CT	3	
CT	7	25
CT	10	40
CT	12	50
CT	12	60/80
CT	15	80/100
CT	35	90/110
CT	60	150/175

SABAL

PALM

Sabal palmetto

SABAL, PALMETO		PALMETTO	PALMIER DE FLORIDE
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Growth habit: SINGLE TRUNK	Height: 6-20 M	Diameter: 5-8 M
Habitat: SUBTROPICAL, COASTAL	Crown: YES	Root: ADVENTITIOUS

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	MONOCOT
ORDER:	ARECALES
FAMILY:	ARECACEAE

VARIETIES

MORPHOLOGY		
Trunk	Size: STRAIGHT	Diameter: 30-50 CM
Surface+ Fibers: COVERED (--)	Sheathe: ENTIRE/PARTIAL	Leaf scars: THIN; Spines: NO
Leaf	Petiole: NO SPINES	Leaflet arrangement: NOTCHED
COASTAPALMATE	Leaflet Shape: DIVIDED 2/3	THREAD: YES
SIZE: Leaf: 2.5 -3 M; Leaflet: 50-60CM	Upper side: DARK GREEN	Lower side: GREEN /GRAY
TEXTURE: SMOOTH		
Inflorescence	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
TYPE: PANICLE; POSITION: INTERFOLIAR	Size: 2,5 M	Fragrant: YES
Fruit	Type: DRUPE	Color: BLACK
SIZE: 8-14 MM	Edible: —	Fruiting season: SEPT-NOV
Growth	Rate: MEDIUM/SLOW	Longevity: 100 YEARS



ECOLOGY		
Climate	Temperature: -8ºC; H5; Z6	Drought resistant: YES
ALTITUDE: 0-400; IRRIGATION: MODERATE	Sun exposure: FULL SUN	Frost resistant: MODERATE
Soil	Texture: ALL TYPES	Salt resistant: YES
pH: 6-7; FERTILITY: HARDY	Drainage: INDIFFERENT	Lime resistant: YES

USES					
Resistances		Applications			
COASTAL:	1ST LINE	INTERIOR:	NO	LINE:	YES
POLLUTION:	—	RIVERBANK:	YES	WINDBREAKER:	NO
WIND:	YES	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

This is a variable and widely distributed palm tree in tropical and subtropical zones. It grows in different habitats: coastal dunes, flood plains, riverbanks, etc. It is one of the few palm trees that resists flooding. It can develop tall new roots looking for fertile and moist soil and as a consequence, raise pavements. This palm accepts pruning. It can be used in coastal dune areas. It is the official tree of the state of Florida (USA).

SPACING: 5-6 M

PLANTING AND PLANT HEALTH

Propagation by suckers and reproduction by sowing mature seeds that germinate in 2-3 months. Difficult to transplant and should be carried out in the summer months. This species is resistant to pests and diseases.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
					X X X X						

Sowing | Transplanting | Pruning X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation (L)	Total height (cm)	Trunk height (cm)
CT (45)	250-275	
CT (70)	250-275	40
CT (80)	300-350	160-170
CT (80)	400-450	200-220
CT (80)	400-450	240

SYAGRUS

Syagrus romanzoffianum

PALM

PALMERA DE LA REINA SPANISH	PALMERA DE LA REINA VALENCIAN	QUEEN PALM ENGLISH	COCOTIER DE ROMANZOFF FRENCH

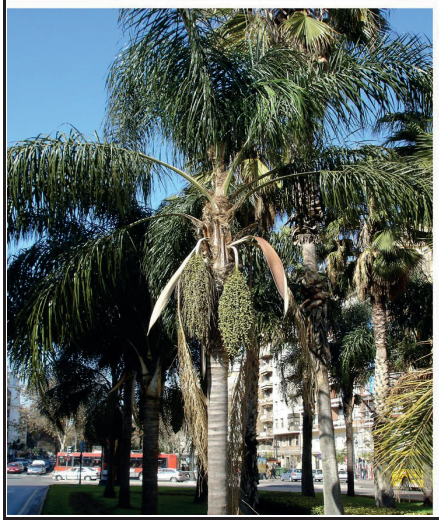
STRUCTURE		
Growth habit: SINGLE TRUNK	Height: 15-18 M	Diameter: 4-6 M
Habitat: COASTAL	Crown: YES	Root: NORMAL

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	MONOCOT
ORDER:	ARECALES
FAMILY:	ARECACEAE

VARIETIES

MORPHOLOGY		
Trunk	Size: STRAIGHT, THIN	Diameter: 30-60 CM
Surface + Fibers: NAKED/OVERLAPPED ORCHEA	Texture: SMOOTH /FISSURED	Leaf scars / Spines: NO
Leaf	Petiole: SHORT BARE STEM	Leaflet arrangement: REGULAR, DROOPING
PINNATE	Leaflet Shape: LANCEOLATE	Threads: YES
SIZE: Leaf: 2-6 M / Leaflet: 1-1.5 M	Upper side: LIGHT GREEN	Lower side: DARK GREEN
TEXTURE: SMOOTH		
Inflorescence	Type: UNISEXUAL	Reproduction: MONOECIOUS
TYPE: SPATHE	Size: 1.5-2 M	Fragrant: NO
POSITION: INTRAFOLIAR		
Fruit	Type: DRUPE	Color: ORANGE
	Edible: WHEN TREE IS MATURE	Fruiting season: AUG-NOV
SIZE: 2-2.5 CM		
Growth	Rate: FAST	Longevity: + 100 YEARS




ECOLOGY		
Climate	Temperature: -8ºC; H4; Z6	Drought resistant: MODERATE
ALTITUDE: 0-500 M	Sun exposure: FULL SUN	Frost resistant: YES
IRRIGATION: MODERATE		
Soil	Texture: LOAMY/SANDY	Salt resistant: NO
pH: 5.5-8.5	Drainage: MODERATE	Lime resistant: YES
FERTILITY: MODERATE		

USES			
Resistance	Applications		
COASTAL: 1ST LINE	INTERIOR: -	LINE: YES	
POLLUTION: MODERATE	RIVERBANKS: -	WINDBREAKER: No	
WIND: HIGH	GROUPS: YES	ISOLATED: No	

POINTS OF INTEREST

Its feathery or frayed appearance is the result of numerous leaflets found on each leaf and therefore similar to the coconut palm (*Cocos nuccifera*). It is an excellent palm in alignments. It adapts to interiors with half light.

SPACING: 4-6 M

PLANTING AND PLANT HEALTH

Propagation by seeds. Transplanting is easy at any size during the spring and summer months. Although in the Mediterranean area it is a disease-resistant palm, in other areas such as New Guinea and Australia, it is seriously affected by the caterpillar of the Palm Dart Butterfly (*Cephrenes spp*) causing serious damage to the leaves. This can be solved with carbaryl treatment at the dose recommended by the manufacturer. Two fungi affect the vigor and color of this species; *Phytophtora cinnamomii* and *Pestoliopsis spp*. (to prevent fungi, avoid waterlogging and treat with copper products when conditions are favorable for the disease).

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Planting Pruning X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Liters	Trunk Height (cm)
CT	10	
CT	30	
CT	50	
CT	70	
CT	160	180/200
CT	160	200/225
CT	230	225/250
CT	285	250/280

TRACHYCARPUS

PALM

Trachycarpus fortunei (Hooker) Wendland

PALMITO ELEVADO (SPANISH) | PALMERA EXCELSA (VALENCIAN) | HEMP PALM (ENGLISH) | PALMIER A CHANVRE (FRENCH)

STRUCTURE		
Growth habit: SINGLE TRUNK	Height: 10-13 M	Diameter: 2-3 M
Habitat: INFERIOR STRATUM	Crown: YES	Root: NORMAL

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	MONOCOT
ORDER:	ARECALES
FAMILY:	ARECACEAE

VARIETIES

MORPHOLOGY		
Trunk Surface + Fiber: COVERED/SMOOTH/VELVET	Size: STRAIGHT/THIN	Diameter: 30-20 CM
	Sheathe: ENTIRE/PARTIAL	Leaf scars:+ Spines: NO
Leaf PALMATE SIZE: Leaf: 60CM TEXTURE: SMOOTH	Petiole: A LITTLE DENTATE	Leaflet arrangement: BILOBED
	Leaflet shape: DIVIDED 1/2	Threads: YES
	Upper side: DARK GREEN	Lower side: LIGHT GREEN
Inflorescence TYPE: SPATHE POSITION: INTERFOLIAR	Type: UNISEXUAL	Reproduction: MONOECIOUS
	Size: 20/30 CM	Fragrant: NO
Fruit SIZE: 2-2.5CM	Type: BERRY	Color: BLUE/GRAY
	Edible: NO	Fruiting season: OCT-NOV
Growth	Rate: SLOW	Longevity: >150 YEARS



ECOLOGY		
Climate ALTITUDE: 2400 IRRIGATION: MODERATE	Temperature: -17º C; H3, Z5	Drought resistant: YES
	Sun exposure: FULL SUN	Frost resistant: YES
Soil PH: 5.5-8.5 FERTILITY: MODERATE	Texture: SANDY/OTHERS	Salt resistant: NO
	Drainage: MODERATE	Lime resistant: YES

USES			
Resistances		Applications	
COASTAL: 2ND LINE	INTERIOR: NO	LINE: YES	
POLLUTION: HIGH	RIVERBANKS: NO	WINDBREAKER: NO	
WIND: LOW	GROUPS: YES	ISOLATED: YES	

POINTS OF INTEREST

Hessian fabric from its stipe or trunk is used in China as a lining material for hanging flower baskets.

SPACING: 150-200CM

PLANTING AND PLANT HEALTH

Propagation by seeds. Transplanting is carried out in spring or autumn. This species is resistant to pests and diseases.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing | Transplanting | Pruning [X]

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation (L)	Trunk height (cm)	Total height(cm)
CT (2)		
CT (3)		
CT (7)		
CT (15)	60/80	60/80
CT (18)		T20/30
CT (24)		T30/40
CT (30)		T60/80
CT (75)		T80/100
CT (130)		T100/120
CT (160)		T120/140
CT (230)		T180/200

WASHINGTONIA

Washingtonia filifera (Linden) H. Wendland

PALM

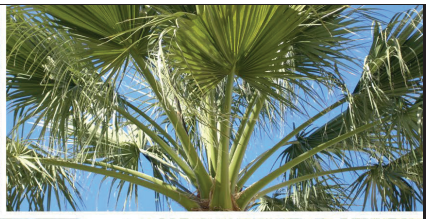
PALMERA DE ABANICO DEL DESIERTO (SPANISH) | PALMERA DE VENTALL (VALENCIAN) | CALIFORNIA FAN PALM (ENGLISH) | WASHINGTONIA FILAMENTEUSE (FRENCH)

STRUCTURE		
Growth habit: SINGLE TRUNK	Height: 15-20 M	Diameter: 3-4 M
Habitat: COASTAL	Crown: YES	Root: NORMAL

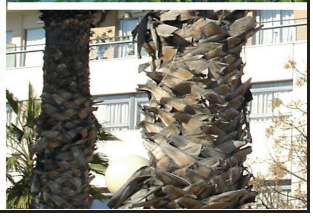
DIVISION:	SPERMAOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	MONOCOT
ORDER:	ARECALES
FAMILY:	ARECACEAE

VARIETIES

MORPHOLOGY		
Trunk	Size: STRAIGHT/STOUT	Diameter: 60-80 CM
Surface: COVERED	Sheathe: ENTIRE/PARTIAL	Leaf scars: THIN; Spines: NO
Leaf	Petiole: DENTATE	Leaflet arrangement: FRAYED
PALMATE; SIZE: Leaf: 1.5 M	Leaflet shape: DIVIDED 1/2	Threads: YES
TEXTURE: SMOOTH	Upper side: LIGHT GREEN	Lower side: LIGHT GREEN
Inflorescence	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
TYPE: SPATHE; POSITION: INTERFOLIAR/LONG	Size: 3.5 M	Fragrant: YES
Fruit	Type: DRUPE	Color: BLACKISH
SIZE: 6 MM	Edible: NO	Fruiting season: DEC
Growth	Rate: MEDIUM	Longevity: +100 YEARS





ECOLOGY		
Climate	Temperature: -3ºC; H5; Z6	Drought resistant: YES
ALTITUDE: 0-400 M; IRRIGATION: MODERATE	Sun exposure: FULL SUN	Frost resistant: LOW
Soil	Texture: LOAMY/SANDY	Salt resistant: YES
pH: 5.5-9; FERTILITY: MODERATE	Drainage: MODERATE	Lime resistant: YES

USES			
Resistances		Applications	
COASTAL: 1ST LINE	INTERIOR: NO	LINE: YES	
POLLUTION: MODERATE	RIVERBANKS: -	WINDBREAKER: YES	
WIND: YES	GROUPS: YES	ISOLATED: YES	

POINTS OF INTEREST

This is a straight and stout palm species and thickened at its base (120 cm). It is usually found isolated and as a windbreaker where the plant is unpruned and in different sizes. Some species can be as old as 500 years.

SPACING: 3-6M

PLANTING AND PLANT HEALTH

Propagation by seeds.
Transplanting is difficult even in the spring-summer season. This species is prone to fungal diseases and pests.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing | Transplanting | Pruning (X)

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation(L)	Total height (cm)	Trunk height(cm)
CT (3)	60/80	
CT (7)	80/100	
CT (30)		T100/120
CT (30)		T120/140

WASHINGTONIA

Washingtonia robusta H. Wenland

PALM

WASHINGTONIA MEXICANA	WASHINGTONIA ROBUSTA	MEXICAN FAN PALM	PALMIER DU MEXIQUE
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Growth habit: SINGLE TRUNK	Height: 25-30 M	Diameter: 2-4 M
Habitat: EMERGENT	Crown: YES	Root: NORMAL

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	MONOCOT
ORDER:	ARECALES
FAMILY:	ARECACEAE

VARIETIES

MORPHOLOGY		
Trunk	Size: STRAIGHT/THIN	Diameter: 25-30 CM
Surface + Fibers: COVERED	Sheathe: ENTIRE/PARTIAL	Leaf scars: THIN; Spines: NO
Leaf	Petiole: DENATE	Leaflet arrangement: BILOBED
PALMATE; SIZE: Leaf: 1-2M, Leaflet:; TEXTURE: SMOOTH	Leaflet shape: DIVIDED 1/2	Threads: YES
	Upper side: GREEN	Lower side: GREEN
Inflorescence	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
TYPE: SPATHE; POSITION: INTERFOLIAR	Size: 2-3 M	Fragrance: YES
Fruit	Fruit: DRUPE	Color: BLACKISH
SIZE: 0.8 MM	Edible: NO	Fruiting season: SEPT-NOV
Growth	Rate: MEDIUM/FAST	Longevity: + 100 YEARS



ECOLOGY		
Climate	Temperature: -3ºC; H5; Z6	Drought resistant: YES
ALTITUDE: 0-300 M; IRRIGATION: MODERATE	Sun exposure: SUN/SHADE	Frost resistant: MODERATE
Soil	Texture: ALL TYPES	Salt resistant: YES
pH: 5.5-9; FERTILITY: MODERATE	Drainage: INDIFFERENT	Lime resistant: YES

USES			
Resistances		Applications	
COASTAL: 1ST LINE	INTERIOR: NO	LINE: YES	
POLLUTION: MODERATE	RIVERBANKS: -	WINDBREAKER: YES	
WIND: HIGH	GROUPS: YES	ISOLATED: YES	

POINTS OF INTEREST

Native to Northeastern Mexico and California. This species of palm is characteristic for its erect, thin trunk which becomes thicker at its base (reaching 110 cm in this particular species). It is used as a street tree and windbreakers where it can be found in groups of different heights and without pruning. It can reach more than 500 years in age. A differentiating element with other *Washingtonias* is the white tomentum at the beginning of the base of the petiole.

PLANTING AND PLANT HEALTH

Seeds take 20 to 30 days to germinate. Transplanting is difficult even in spring-summer. This species is prone to fungal diseases.

CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

CULTIVATION CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Transplanting Pruning X

TREATMENT CALENDAR

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation(L)	Liters	Height (cm)
CT (3)	60/80	
CT (7)	60/100	
CT (8)		T20/25
CT (15)		T25/30
CT (40)		T35/40
CT (45L		T50/60
CT (70)		T60/80
CT (90)		T80/100
CT (100)		T100/125
CT (210)		T125/150
CT (240)		T150/170
CT (285)		T175/200
CT (350)		T200/500

Subchapter 4.3 Commercialization, use and planting

COMMERCIALIZATION

Palm trees can be commercialized in root ball or container.

Presentation of root system

Palm trees can be classified according to their ability to develop new roots. This classification is essential as it will determine the ease or complexity with which we can transplant palm trees (See Table 4.3.1). This classification must be considered as it will determine the most suitable marketing conditions for each species (in root ball or in container).

GROUP	SPECIES
VERY COMPLICATED TRANSPLANT	*Howea fosteriana*
COMPLICATED TRANSPLANT	*Brahea armata* *Butia capitata* *Juabaea chilensis* *Livistona australis* *Livistona chinensis* *Phoenix canariensis* *Sabal palmeto*
EASY TRANSPLANT	*Chamaerops humilis* *Phoenix dactylifera* *Phoenix reclinata* *Phoenix roebelenii* *Syagrus romanzoffianum* *Trachycarpus fortunei* *Washingtonia filifera* *Washingtonia robusta*

Table 4.3.1: Palm tree species according to transplant complexity (NTJ 07P COITAPAC)

Field cultivation

Depending on the type of palm tree, the root pruning operation will be essential, convenient, or not required according to the following Table 4.3.2:

Brahea armata	Essential
Butia capitata	Convenient
Chamaerops humilis	Not necessary
Howea fosteriana	Essential
Livistona chinensis	Convenient
Phoenix canariensis	Convenient
Phoenix dactylifera	Not required
Syagrus romanzzofianum	Not required
Trachycarpus fortunei	Not required
Washingtonia filifera	Not required
Washingtonia robusta	Not required

Table 4.3.2: Root pruning for palm trees. (NTJ 07P COITAPAC)

Container

When palm trees are cultivated in containers, it is also essential to carry out a root pruning that will reduce the root ball.

The root pruning or change of container will be done every two years, except for very slow-growing palm trees.

When root pruning, instead of putting the plant in a container, it can also be placed in a ditch with sandy soil. This will keep the plant moist and encourage the development of new roots. With this system, the maximum storage time for a palm tree is two years.

Dimensions to consider in the supply and commercialization

Aerial part

In palm trees with a single trunk, the height of the trunk must be measured, indicating whether or not it has a crown shaft.

In multiple trunk palms (clumped) or for groups of palms, the number of trunks or stipes thicker than 30 cm and the sum of the heights of all of them or the number of stipes and the total height of the group should be provided.

The thickness of the stipe will be measured at 1.30 m above the root neck.

Underground part

The size of the root ball must be proportional to the type of growth and structure of the species or variety, the development of the plant and the soil conditions.

Palm trees must be supplied with a root ball of minimum dimensions. The width of the root ball is measured using the distance between the outer face of the stipe (trunk) and the edge of the root ball, this minimum distance will be 20 cm. This is valid for specimens of single trunk palm trees with a stem height of less than 5 m.

For palm trees with a thick stem such as Phoenix canariensis, palm trees with a stem of more than 5 m and multiple trunk palms or groups, this minimum width distance of the root ball will be 30 cm. For small palm trees, the distance to be considered will be 15 cm.

The depth of the root ball will be equal to the diameter of the root ball.

Depth of root ball (in cm) = Diameter of root ball (in cm)

If the supply of palm trees is in a container, the minimum space between the stipe and the inner side of the container will be 25 cm. As in the previous case, if the palms have a thick stem, or have a stem height of more than 5 m, or are multiple trunk palms, or are a group, the distance between the stem and the interior of the container will be 35 cm.

The variations allowed in the height of the stipe in the supply of the palm trees will be +/- 5% of the height indicated on the delivery note.

General supply specifications

- Palm trees may only be marketed by authorized suppliers and must meet the conditions specified in this subchapter.

- A stout trunk is a sign of high quality (the thicker the trunk, the better). A palm tree that has very long leaves and a very thin trunk (etiolation) reveals that it has been grown in a very narrow plantation frame and it has grown lengthways seeking the light. This is a sign of inferior quality.

- The trunk must be straight and vertical, without the presence of wounds, cracks, or notches.

- If a batch is supplied, all specimens must be homogeneous in size and quality.

- The stipes may only be cleaned (shaved or skinned) once the final planting has been carried out.

- The conditions for the supply of plant material in NTJ 07A: CALIDAD GENERAL are applicable.

When a palm tree is supplied in a root ball, it must be covered with a biodegradable (within a year) material such as hessian fabric or similar; or with a material that can be removed at the time of planting, for example: metal mesh or plastic film.

The leaves are collected and tied up to facilitate the transport of the palm tree and protect the apical meristem (terminal bud). In some species all the leaves are surrounded by a wattle (*Phoenix dactylifera*). This bundle of leaves will be maintained until the palm tree has taken root and new leaves are seen sprouting.

Together with the tying of leaves, they are also shortened to reduce evapotranspiration and facilitate rooting.

GROUP	PERIOD BETWEEN ROOT PRUNING AND SUPPLY
VERY COMPLICATED TRANSPLANT	6 to 12 months
COMPLICATED TRANSPLANT	4 to 6 months
EASY TRANSPLANT	2 to 3 months

Table 4.3.3: period of safety between root pruning and planting (NTJ 07P COITAPAC)

The roots will be perfectly cut, without tears or rot.

Palms supplied in containers should be in a container large enough for the new roots to develop in such a way that the root ball maintains its shape on delivery and is compact when removed. The roots should not protrude through the drainage holes.

Container grown palms should be sold by plant size and container volume.

The container should be rigid enough to support the shape of the root ball, protecting the roots during transport.

Stipes	During loading and unloading, avoid strong pulling with the crane. Use nonmetallic straps or slings, which do not slip. Protect the attachments avoiding wounds, burns, and marks.
Multiple or branched stipes	Fasten them
Long and thin stipes	Once the root ball has been formed, try to place it on ground carefully, avoiding jerks and swaying. When loading and unloading, hold them with two straps or slings keeping the stipe horizontal. Fasten them with brackets to prevent breakage and tearing.
Inflorescence and infructescence	It is advisable to remove them
Leaves	Cut dry and damaged ones maintaining a balance between the crown and the root system. During transport, tie the leaves down with wet carp as protection against blows and drying out, without producing excessive pressure that could damage them.
Spear leaf and crown shaft	Avoid bumps and sudden movements. Protect the central bud or spear against excessive heat and drying out.
Root ball	Protect it against excessive heat and drying out.

Table 4.3.4: Conditions in supply and transport of palm trees. (NTJ 07P COITAPAC)

Planting periods

The appropriate planting time, especially for palm trees supplied in root ball, will be the time of greatest biological activity of the plant, which in temperate climates coincides with the end of spring and summer. Although it is necessary to avoid planting in the hottest season.

FACTORS TO CONSIDER			PLANTING PERIOD											
Type of supply	**Planting areas**	**Species**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
In container	Spain (including Canary Islands)	Any	■	■	■	■	■	■	■	■	■	■	■	■
With root ball and root pruned	Spain (including Canary Islands)	Any	■	■	■	■	■	■	■	■	■	■	■	■
With root ball not root pruned	Spain	*Chamaerops humilis* *Phoenix canariensis*					■	■	■		■			
		Phoenix dactylifera *Washingtonia sp.*					■	■	■		■			
		Butia capitata *Trachycarpus fortunei*				■	■	■			■	■		
With root ball not root pruned	Canary Islands	In container	■	■	■	■	■	■	■	■	■	■	■	■

■ Preferred time

■ Complementary

Table 4.3.5. Planting period. (NTJ 07P COITAPAC)

Planting project

Follow the guidelines set out in chapter 1:

- Digging the planting pit
- Soil conditioning
- Placement
- Staking (if necessary)
- First irrigation
- Mulching (if necessary)

To guarantee successful planting these steps should be carried out as carefully as possible.

Staking is very important. If the palm tree is not stable, when the new roots develop, they will break and therefore rotting will not take place. The way to fix the plant is by placing three stakes arranged around the trunk in a reasonable way. One end will rest on the trunk and the other on the ground. To avoid slipping, plaster is used to fix them into place.

Irrigation after planting. Once the planting has been carried out, the planting pit should be filled with a large amount of water so that the root system is completely wet. The soil must be at field capacity. The supply of water must be done at low pressure so ensure no loss of soil. To ensure that the water reaches the base of the palm tree, a tube of corrugated plastic material can be placed while it is being planted, connecting the base of the root ball with the outside, thus ensuring water flow to the bottom of the pit.

Untying of leaves. As previously mentioned, once the new leaves appear, the crown of leaves can be untied, since the palm tree will have rooted correctly.

Subchapter 4.4 Maintenance

Maintenance operations are similar to those described in previous chapters of this book. Below is a detailed description of the pruning process since it is one of the most important maintenance operations for palm trees.

PRUNING

Pruning is intended to eliminate dry or semi-dry leaves as well as shoots, inflorescences, and fruit (date) clusters.

The old leaves will be cut flush with the stipe. If the sheath and petiole do not come away easily, they should be preserved.

The distance from the pruning cut to the trunk should be uniform.



CUTS USED FOR PRUNING LEAVES



CUTS USED FOR PROFILING THE CROWN SHAFT

Figure 4.4.1 Different types of cuts. (NTJ 07P COITAPAC)

The cuts will be clean and will not cause tears. The cuts will be aimed directly at the palm tree, never from the side, to prevent injury to the pruner. In the case of leaf pruning, the cut will be made from the back to the front. In the case of profiling the crown shaft, the pruning will be carried out from the bottom to the top.

Leaf removal

In adult palm trees, it is recommended to cut only the dry leaves, respecting the spherical shape of the crown as much as possible. The removal of too many leaves weakens the plant and makes it more prone to pests and diseases.

In palm trees located by the sea, it is advisable not to cut the semi-dry leaves as they protect the plant from saline winds.

When pruning green leaves for maintenance reasons, it is advisable to remove a ring of green leaves, but always from the area with mature ones, never from the area with adult or young leaves. See figure 4.4.2:

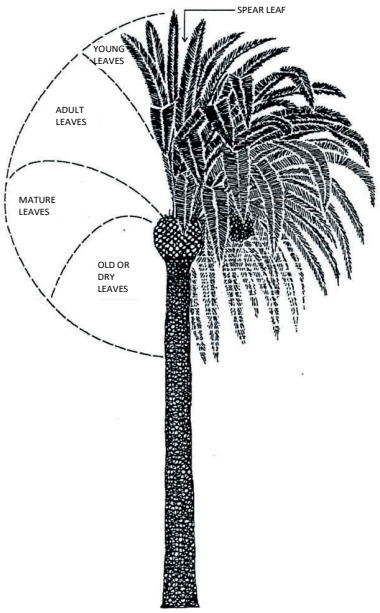


Figure 4.4.2: Area to eliminate leaves. (NTJ 07P COITAPAC)

When pruning in pedestrian or road areas:

- Hold the leaf with one hand and cut the petiole but not completely, so the leaf remains hanging and when making the definitive cut of the petiole, the leaf will fall without posing a safety risk.

When pruning young palm trees, the following operations will be considered:

- Adjustment of axillary buds so that they are kept at the same distance from the stipe.
- Removal of dead leaves.
- Reduction of the length of the unwanted green leaves to 1/3, instead of cutting them completely.
- Loosely tie the leaves but not too tight.

In addition, it must be considered that palm trees with a trunk height of less than 2 m should not be planted on public roads. They can be bothersome to passers-by. To avoid this, lower leaves might be removed but this might harm the growth of the pruned palm tree.

Pruning tools

The pruning must be done by specialized professionals, especially large specimens due to the risks that this entails (height pruning).

In these cases, climbing equipment (see figure 4.4.3) clamp arches, or approved machinery (hydraulic platform, hydraulic ladder, crane with basket, lifting basket) will be used to reach the crown. Climbing spikes or cleats should never be used as they cause wounds in the stipe and therefore can spread diseases and damage the trunk.



Figure 4.4.3: Clamp arches

Chainsaws and handsaws are the main tools for pruning. In addition, specific tools can be used for some pruning operations (see figure 4.4.4).

- To cut pinnate leaves: cutters, hook, chainsaw.
- To cut palmate leaves: gardener's handsaw, chainsaw.
- To eliminate inflorescence-infructescence of species with pinnate leaves: palm hook, pruning hook.
- To eliminate inflorescences-infructescence of species with palmate leaves: gardener's saw.
- To shape the crown shaft: cutters, chainsaw.
- To eliminate suckers: cutters, gardener's saw, chainsaw.
- To clean the stipe: cutters, chainsaw.

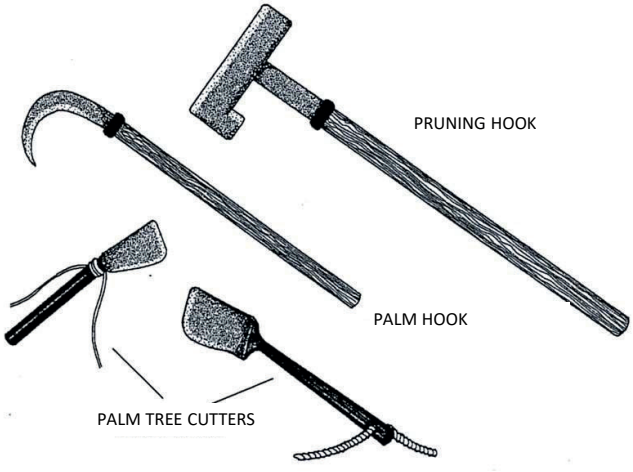


Figure 4.4.4: tool used for pruning palm trees (NTJ 07P COITAPAC)

Shaping the crown shaft

In those species of palm trees that keep their leaves for 3 or 4 years, it is recommended to define the crown shaft in the pruning operation, even if its purpose is only ornamental.

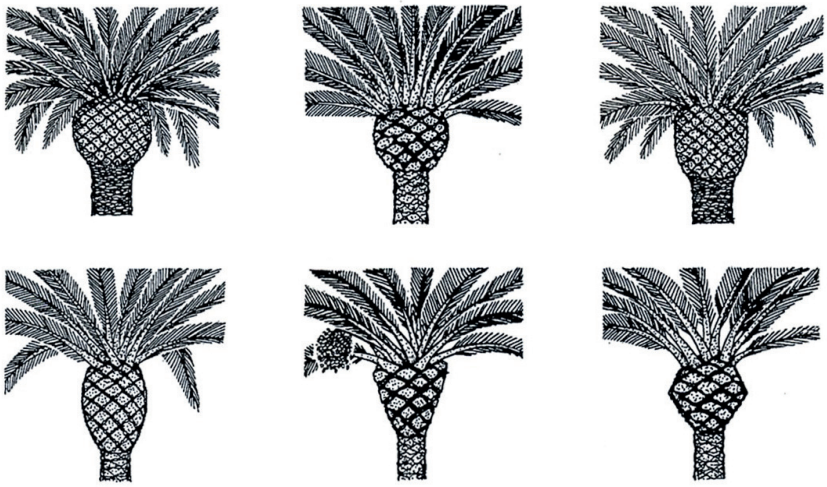
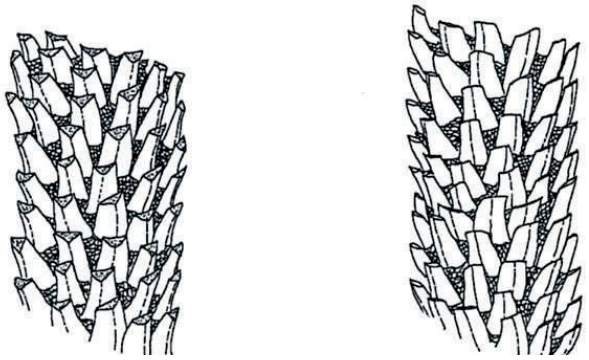


Figure 4.4.5: Different types of crown shafts (NTJ 07P COITAPAC)

Cuts used on crown shafts also depend on the geographic areas. See figure 4.4.6.



MEDITERRANEAN PRUNNING STYLE

EGYPTIAN PRUNING STYLE

Figure 4.4.6: Types of cuts used for the crown shaft (NTJ 07P COITAPAC)

Cleaning

The stipe is cleaned in species with persistent leaves for aesthetic and safety reasons or when the leaves have died, and the surface of the stipe is no longer uniform. In this case, peel the stipe from the base to the area where the leaves have fallen.

It is only recommended to clean the stipe when the dry petioles come off easily.

In *Phoenix dactylifera* this operation is not necessary since the dead leaves acts as a protective shield against environmental erosion and harsh weather.

In *Washingtonia robusta* the trunk is self-cleaning.

In *Trachycarpus fortunei* the hessian cloth should not be removed.

Pruning frequency

For safety reasons (prevent leaves or fruits to fall over people), cleaning and pruning of palm trees in streets must be carried out more frequently than in gardens. On streets, pruning is recommended from 1 to 3 years and in green areas from 3 to 6 years. In general, pruning takes place when dry leaves may pose a safety risk or when aesthetics require it.

According to species, the frequency is as follows (see Table 4.4.1):

SPECIES	RECOMMENDED FREQUENCY	RECOMMENDED MINIMUM FREQUENCY
Brahea armata	2 – 3 years	5 – 6 years
Butia capitata	2 – 3 years	5 – 6 years
Chamaerops humilis	1 – 2 years	
Jubaea chilensis	1 – 2 years	
Livistona australis	2 – 3 years	5 – 6 years
Phoenix canariensis	2 – 3 years	4 – 5 years
Phoenix dactylifera	2 – 3 years	3 – 4 years
Syagrus romanzoffianum	2 – 3 years	4 years
Trachycarpus fortunei	2 years	3 years
Washingtonia filifera	2 years	3 years
Washingtonia robusta	2 years	3 years

Table 4.4.1: Pruning frequency. (NTJ 07P COITAPAC)

OTHER MAINTENANCE OPERATIONS

- Improvement, fertilization, mulching replacement

- Weeding

- Irrigation

- Pest Control:

Due to its importance and severity as a pest, the characteristics and existing treatments for the red palm weevil or ferruginous curculionid (*Rhynchophorus ferrugineus Olivier*) are presented below. This species of beetle native to tropical Asia and Polynesia has spread rapidly throughout subtropical and temperate areas of the planet. In Spain it has been especially devastating with the Canary Islands palm (*Phoenix canariensis*) and, secondly, with the date palms (*Phoenix dactylifera*), although other palms such as *Butia capitata, Caryota maxima, Cocos nucifera, Livistona decipiens, Roystonea regia, Phoenix theophrasti, Phoenix sylvestris, Sabal umbraculifera, Trachycarpus fortunei, Washingtonia robusta* and *W. filifera* are equally susceptible.

The species have a characteristic reddish color, a size of 2 to 5 cm and a beak-shaped extension of the head, where the club-shaped antennae are located. Adults can fly long distances (up to 4-5 km) and access the trees by climbing the crowns, where the female deposits eggs (1 to 2 mm) in feeding galleries and move towards the center (the heart) of the palm of tree, making its detection difficult. The larvae can reach 5 cm in length, have a stocky shape, are ivory white to ocher in color with a brown head. Red weevil insects are legless and can excavate holes up to one meter long (3.3ft) thereby weakening and eventually killing the host plant. After living inside the trunk and at the bases of the palms, the larvae produce a brownish cocoon made of the fibers of the palm tree and transform into pupae. After a cycle lasting 3 to 4 months, they turn into adult beetles. This complete life cycle takes place in the same palm tree. It has been reported that the weevil is able to complete several generations in a year. Frequently, several generations can be passed in the same host tree before the tree collapses when they will fly to another tree and begin the process all over again.





Figures 4.4.7 and 4.4.8. *Phoenix canariensis* affected by the red palm weevil or ferruginous curculionid (left) and adult red palm weevil or ferruginous curculionid (right). (source: Regional Ministry of Agriculture, Fisheries and Food of the Valencian Region)

In all cases, and even though the infested palm tree initially does not show symptoms, the attack of the red weevil will kill the tree unless treatments or controls are carried out. If the attack occurs at the apex, it loses the arrow of young leaves, which are easily detached when pulled, and the palm tree dies quickly. These symptoms are very frequent in the Canary Islands palm tree.

Common symptoms include:

- Serrated (eaten) leaflets on the young and central leaves
- The presence of tilted leaves and/or with a drooping appearance
- As the attack progresses, the plume breaks and falls due to the wind

As a diagnostic test, it is observed that, when the affected leaves are pulled, they come away easily and the excavated holes made by the larvae are exposed. Frequently, the cocoons of the pupae give off a characteristic acidic odor.

Detection is key in controlling this pest. Once present, different methods can be used, although none of them have been proven completely effective to date.

Chemical treatment

Authorized chemical products are available as a preventive and curative treatment. Combined with biological treatments with entomopathogenic nematodes, they offer interesting results in pest control and prevention. Currently the following active materials are authorized (see possible updates on the website of the Ministry of the Environment and Rural and Marine Environment):

ACTIVE MATTER	CULTIVATION OF ORNAMENTAL PALM TREES	PARKS AND GARDENS	OUTDOOR PRIVATE GARDENS
Clorpirifos (48%)	YES	YES	YES
Fosmet (50%)	YES	NO	NO
Imidacloprid (50%)	YES	YES	YES
Tiametoxan	YES	YES	YES

Table 4.4.2. Active materials used to fight the infestation the red weevil (Source: Ministry of Environment and Rural and Marine Environment, Government of Spain, 2010)

The season to carry out the treatments depends on the activity of the insect. In the coldest months (December to February) they lay dormant and become active again in March and reach a peak in population in spring and autumn. The application of the product must be carried out on the bud and the upper part of the trunk, with plenty of spray solution so that it penetrates deeply into the galleries. These products cannot, however, be applied to palm trees whose dates are intended for human consumption.

Biological treatment

The Steinernema carpocapsae nematode is a microscopic organism that parasitizes living forms of Rhynchophorus ferrugineus, offering a valuable alternative or complementary tool to chemical insecticides, both in preventive and curative fights. Nematodes are sold in powder form and must be mixed in water for subsequent foliar application using a backpack with an agitator and a process that has guaranteed the cold chain of the product until the moment of application.

Treatment Calendar

As a guide and in accordance with the indications of the Department of Agriculture, Fisheries and Food of the Valencian Community, the following calendar is suggested.

TREATMENT	TIME
Imidacloprid 20%	First week of March
Clorpirifos 48%	First week of April
Clorpirifos 48%	First week of May
Steinernema carpocapsae	Mid-June
Steinernema carpocapsae	End of July
Imidacloprid 20%	Mid-September
Clorpirifos 48%	Mid-October

Table 4.4.3 Schedule for treatments against the red palm weevil or ferruginous curculionid (source: Regional Ministry of Agriculture, Fisheries and Food of the Valencian Region)

Recommendations on pruning palm trees

Since the weevil attack often occurs due to existing wounds on the palm tree, it is not recommended to carry out pruning work on affected areas but if absolutely essential, only dry palms should be pruned.

The pruning of green palms should be avoided. Pruning will be carried out from January to February, avoiding severe pruning and applying an insecticide treatment after the cut or covering the cut areas with mastic or healing paste. These treatments will be significant in the case of pruning during the period of greatest insect activity (between May and December).

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5
SHRUBS

Chapter 5 SHRUBS

Subchapter 5.1 Introduction
Subchapter 5.2 Species
Subchapter 5.3 Commercialization, use and planting
Subchapter 5.4 Maintenance
Subchapter 5.5 Bibliography

Subchapter 5.1 Introduction

Shrubs in gardening terms, refers to all woody plants with multiple or very short trunks and that measure between one and three meters. Smaller plants of this type are referred to as bushes.

Shrubs play an intermediate role between trees (volumes) and herbaceous plants (ground cover). They act on a more human scale and with their masses and groupings they can also add volume to areas and scenes in the garden. They are useful for establishing successive planes, layers, or levels in the green component of a park or a garden; they serve to conceal areas, limit others, or impede access to certain places without obstructing vision. Shrubs can also cover slopes and are frequently used to draw attention to a certain point or to break the monotony of a landscape.

Shrubs can provide privacy to an area or corner of the garden, or block unwanted views such as service areas, garbage containers, etc. Tall bushes can provide a background for planting beds and other plants of medium and small sizes.

By planting two tall shrubs or adequately arranging several of them, it is possible to frame and add perspective to an area and give it visual importance.

When choosing the right kind of shrub, the landscape architect needs to ask these four questions: Where? Why? When? Which one? The location, function, and season in which one species could be more spectacular than another is essential to improve the effects, arguments and purpose of the design.

The list of shrub species is very extensive, and their ornamental characteristics are varied: there are deciduous, evergreen, ornamental for their foliage, their flowers or their fruits, acidophilic and resistant to lime, and there are those adapted to very different ecological situations.

Shrubs provide the garden with its general shape and constitute the framework where the rest of the plants are located. Their functions in the garden are multiple, providing elements of separation and offering the advantages of evergreen plants, seasonal metamorphosis with a variety of colors in the case of deciduous shrubs, and a wide range of shapes and fragrances.

The arrangement of shrubs in the garden requires the application of compositional criteria that combine the different forms, masses, foliage, colors, of distinct shrub species.

By searching for the right harmony with shapes and colors or by contrasting them, an intelligent compositional use of shrubs will give rise to splendid results, provided that the set is not overloaded with an excess of species and/or the planting becomes too dense.

Care must be taken with the original habitat of each species and the ecological and cultural needs that derive from it. For example, rose bushes do not have the same requirements in terms of soil or lighting as azaleas do.

The choice of species is also related to the times of the year in which the garden is going to be used. For instance, if, in public parks, a green zone is to be in continuous use during the winter, evergreen species should be used more abundantly.

There are big shrubs such as *Prunus laurocerasus* that, due to their size, should be isolated. In other species such as *Nerium oleander*, *Pyracantha coccinea* or *Cotoneaster spp*., their flowers and fruits and other special characteristics make them worthy of being planted individually or in monovarietal groups.

On other occasions, certain species of shrubs with lesser individual importance can play a positive role as part of a mixed groups as long as they meet the aforementioned criteria.

In a private and small garden, a single specimen of *Jasminum mesnyi* can offer a sufficiently expressive mass and color effect. However, in a large public park the sense of scale makes it necessary to group five, ten or more specimens so that they can be properly perceived by the observer at a medium or long distance. This group of plants will seem like one single large specimen with the typical characters of the species.

Another aspect to consider in the use of shrubs for landscape purposes is the formation of the undergrowth. When a grove is established, an intermediate plant layer must be created that gives support to the tree layer by offering a transition between the herbaceous plants and ground covers, and the crowns of the trees.

Some shrubs thrive well when grown in flower boxes or decorative containers and placed on patios, terraces, pool areas, etc… Some species belonging to *Viburnum, Escallonia, Mahonia, Euonymus* are commonly used for these purposes.

Shrubs can also serve as windbreakers by acting as a type of shield against cold winds. This is achieved by forming masses of medium to high shrubs that use their foliage as protection (*Myoporum, Pittosporum, Cornus*). They can also offer an interesting and decorative flowering (*Hibiscus, Nerium, Ficus*).

A practical detail when planting to achieve an appearance of a certain maturity in a newly planted garden is to include among the shrub specimens a certain number that have reached already half their development.

Subchapter 5.2 Species

This subchapter outlines **51 species of shrubs** used in landscape design. They have been selected primarily for their ornamental use, botanical interest, or other characteristics. As a result, an in-depth analysis is carried out in this subchapter.

Firstly, a table shows the different parameters and values that have been used to describe each species in its specific botanic datasheet.

Each sheet gathers the information of a certain shrub species and describes its botanical and ecological aspects, uses, cultivation, and other characteristics of interest, including its commercialization. This information is complemented by photographic information, which shows the general appearance of the shrub species and different morphological details.

PARAMETERS AND VALUES USED FOR THE BOTANIC DATASHEET	
TAXONOMY	
TAXONOMIC RANKS	DIVISION, SUBDIVISION, TYPE, ORDER, FAMILY
VARIETIES	VARIETIES OF INTEREST
STRUCTURE	
SHAPE	GLOBE-SHAPED/ROUND, OVAL, COLUMNAR, CONE, EXTENDED, IRREGULAR, PARASOL, FAN-SHAPED, HORIZONTAL, PALMIFORM, PENDULAR
HEIGHT	AS APPROPRIATE- IN METERS (M) OR CENTIMETERS (CM)
DIAMETER	AS APPROPRIATE -IN M OR CM
TEXTURE	TEXTURE: LEAVES>10CM= COARSE. LEAVES OR LEAFLETS BETWEEN 2-10CM= MEDIUM. LEAVES OR LEAFLETS <2CM= FINE
SHADE	FULL, PARTIAL
ROOT	TAPROOT, FASCICULATE, OBLIQUE, HORIZONTAL, AERIAL, ADVENTITIOUS
MORPHOLOGY	
TRUNK	
BARK	SMOOTH, VERTICAL FISSURES, LONGITUDINAL FISSURES, DIAGONAL FISSURES; ROUGH, SCALY, CORKY WITH PLATES
COLOR OF BARK	GREYS, GREENISH GREY OR BLUISH GREY. SILVER; LIGHT GREEN, YELLOWISH, LIGHT BROWN, DARK, GREENISH, RED, REDDISH, PURPLE, YELLO,; BLACKISH, MARBLED, TWO-TONED, THREE-TONED, LIGHT GREY, DARK GREY
FOLIAGE	
LEAF TYPE	EVERGREEN, DECIDUOUS, SEMI-DECIDUOUS OR SEMI-EVERGREEN
LEAF SIZE	LENGTH (cm)
SIZE OF LEAFLET	LENGTH (cm)
COLOR OF UPPER SIDE (US)	PALE GREEN, LIGHT GREEN, DARK GREEN, BLUE/GREEN, GREY, PURPLE; PALE; YELLOW; VARIEGATED
COLOR OF LOWER SIDE (LS)	PALE GREEN, LIGHT GREEN, DARK GREEN, BLUE/GREEN, GREY PURPLE; PALE; YELLOW; VARIEGATED; RUST COLORED; SILVER
TEXTURE OF UPPER SIDE (US)	GLOSSY, ROUGH, GLABROUS, TOMENTOSE, HAIRY, ROUGH, SCALY, VISCOSE
TEXTURE OF LOWER SIDE (LS)	GLOSSY, ROUGH, GLABROUS, TOMENTOSE, HAIRY, ROUGH, SCALY, VISCOSE
COMPOUND LEAF	NO COMPOUND LEAVES YES. IMPARIPINNATE, PARIPINNATE, TRIFOLIATE, PALMATE, PALMIFORM, PALM, PINNATE, BIPINNATE
HARDNESS	CORIACEOUS, SOFT, SUCCULENT, HARD
ARRANGEMENT	OPPOSITE, ALTERNATE, WHORLED, ROSETTE
VENATION	PINNATE, PALMATE, PARALLEL, RETICULATE, ARCUATE, A3 MAIN VEINS
LEAF SHAPE	ROUNDED, LINEAR, LANCEOLATE, FALCATE, OVAL, OBLONG, ELLIPTIC, DELTOID, RHOMBOID, SPATULATE, ACICULAR GROUPS OF 2, ACICULAR GROUPS OF 3, ACICULAR GROUPS OF 5, ACICULAR GROUPS, ACICULAR IN 1 PLANE, ACICULAR IN SPIRAL, SCALE, PALMATE 7 LOBES, PALMATE 5 LOBES- PALMATE 3 LOBES, POLYMORPHIC, PANDURIFORM, PINNATIFIDA, SAGITATE, RENIFORM, CORDATE, ORBICULAR, OBOVATE, OBLANCEOLATE, LIRATE, HASTATE, RUNCINATE
LEAF MARGIN	ENTIRE, CILIATE, DENTATE, CRENATE, SERRATE, DOUBLY SERRATE, LOBED DOUBLE LOBED
APEX	ACUTE, CUSPIDATE, OBTUSE, RETUSE, MUCRONATE

LEAF BASE	ATTENUATE, CORDATE, ROUNDED, CUNEATE, OBLIQUE, SAGITATE, AURICULATE, HASTATE, ASYMMETRIC
PETIOLE	LONG, SHORT, SESSILE, WIDE
FLOWER	
SIZE	HERMAPHRODITE (OR MALE/FEMALE FLOWERS): CM OR MM
TYPE	UNISEXUAL, HERMAPHRODITE
REPRODUCTION	MONOECIOUS, DIOECIOUS, HERMAPHRODITE, POLYGAMY, SYNOICOUS, STERILE
FLOWERING	SOLITARY, INFLORESCENCE IN CORYMB, IN CYMOSE, IN RACEME, IN SPIKE, IN UMBEL, IN CATKIN, IN SPADIX, IN FLORET OR CAPITULUM, IN PANICLE (+ INFLORESCENCE SIZE (IN CM OR MM))
FRAGRANCE	YES, NO, UNPLEASANT
FRUIT	
SIZE	IN CM OR MM
TYPE	FOLLICLE, PLURIFOLLICLE, LEGUME, LOMENT, SAMARA, DOUBLE SAMARA, PLURISAMARA, CAPSULE; ACHENE, TETRACHENE, POLYACHENE, NUT, ACORN, SYCONIUM, HESPERIDIUM, SOROSIS, BERRY; RACEME, POME, BALAUSTA, DRUPE, STROBILUS, PSEUDO STROBILUS, CONE, UTRICLE
EDIBLE FRUIT	YES, NO
COLOR	RED, GREEN, YELLOW, BROWN, BLACK, PALE, WHITE, PURPLE
FRUITING SEASON	INTERVAL OF MONTHS: JAN, FEB, MAR, APR, MAY, JUN, JUL, AGO, SEP, OCT, NOV, DEC
DEVELOPMENT	
GROWTH	VERY SLOW, SLOW, MEDIUM, FAST, VERY FAST
LONGEVITY	<25 YEARS, 25 YEARS, 50 YEARS, 75 YEARS, 100 YEARS, 150 YEARS, 200 YEARS, 250 YEARS, 300 YEARS; >300 YEARS
ECOLOGY	
CLIMATE	
ALTITUDE	INTERVAL OF ALTITUDE / ELEVATION ABOVE SEA LEVEL
IRRIGATION	++HIGH, MODERATE, LOW, ++LOW (very low/low < 350 mm; Very high/high > 750 mm)
MINIMUM TEMPERATURE AND INTERNATIONAL CLASSIFICATION	MINIMUM TEMPERATURES: DEGREES CELSIUS **CLASSIFICATION ACCORDING TO EUROPEAN REGULATION**: (SEE MAP) G2____ HOT GREENHOUSES IN SOUTHERN EUROPE G1____ COLD GREENHOUSES IN SOTHERN EUROPE H5____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM 0ºC TO -5ºC H4____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM -5ºC TO -10ºC H3____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM -10ºC TO -15ºC H2____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM -15ºC TO -20ºC H1____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM -20 ºC **CLASSIFICATION INTERNATIONAL REGULATIONS.** ACCORDING TO MINIMUM TEMPERATURE RANGES Z1____SUPPORT MINIMUM TEMPERATURES OF -50ºC Z2____ SUPPORT MINIMUM TEMPERATURES OF -50ºC TO -40ºC Z3____ SUPPORT MINIMUM TEMPERATURES OF -40ºC TO -30ºC Z4____ SUPPORT MINIMUM TEMPERATURES OF -30ºC TO -20ºC Z5____ SUPPORT MINIMUM TEMPERATURES OF -20ºC TO -10ºC Z6____ SUPPORT MINIMUM TEMPERATURES OF -10ºC TO -0ºC Z7____ SUPPORT MINIMUM TEMPERATURES OF -0ºC TO 10ºC Z8____ SUPPORT MINIMUM TEMPERATURES OF 10ºC TO 20ºC Z9____ SUPPORT MINIMUM TEMPERATURES OF 20ºC TO 30ºC Z10___ SUPPORT MINIMUM TEMPERATURES OF 30ºC TO 40ºC Z11___ SUPPORT MINIMUM TEMPERATURES OF MORE THAN 40ºC

EXPOSURE TO SUNLIGHT	FULL SUN, FULL-SHADE; PART SHADE, SHADE
DROUGHT RESISTANCE	YES, NO, MODERATE
RESISTANCE TO FROST	YES, NO, MODERATE
SOIL	
OPTIMUM PH	ALL TYPES. NEUTRAL, ACIDIC, BASIC OR ALKALINE (OR INTERVAL OF PH)
FERTILITY LEVEL	FERTILE, MODERATE, POOR
TEXTURE OF SOIL	SANDY, SILT OR LOAMY, CLAYEY, SANDY/LOAMY, CLAY LOAM, ALL TYPES
DRAINAGE	HIGH, MODERATE, LOW
RESISTANCE TO SALT	YES, NO, MODERATE
RESISTANCE TO LIME	YES, NO, MODERATE
USES	
RESISTANCES	
COASTAL	1st LINE; 2ND LINE, NO, MODERATE
RESISTANCE TO POLLUTION	HIGH, MODERATE, LOW
RESISTANCE TO WIND	HIGH, MODERATE LOW
USE	
IN SLOPES **IN LINES** **ON RIVERBANKS** **AS WIND BREAKERS** **IN HEDGES** **IN FIELD BORDERS** **IN GROUPS** **ISOLATED**	YES, NO
SPACING	MINIMUM RECOMMENDED DISTANCE BETWEEN PLANTS: M; CM
PLANTING AND PLANT HEALTH	
PLANTING AND PLANT HEALTH	
CALENDAR	
CHROMATIC CALENDAR	FOLIAGE, FLOWERING, FRUITING SEASON: the color white represented with grey or black cell
CULTIVATION CALENDAR	SOWING, PLANTING, PRUNING
TREATMENTS CALENDAR	FUNGICIDES, PESTICIDES, FERTILIZERS, HERBICIDES
COMMERCIALIZATION	
PRESENTATION	RD (BARE ROOT), CT (CONTAINER or POT (in liters), CE (ROOT BALL), CEY (ROOT BALL IN GYPSUM), ROOT BALL IN MESH
STEM GIRTH (TREES)	CM (usually measured at 1 meter above ground) or years
HEIGHT (SHRUBS, CONIFERS AND PALMS)	CM, M

LIST OF SHRUB SPECIES DESCRIBED

1. *Abelia floribunda*
2. *Arbutus unedo*
3. *Atriplex halimus*
4. *Buddleia davidii*
5. *Buxus sempervirens*
6. *Callistemon citrinus*
7. *Callistemon speciosus*
8. *Capparis spinosa*
9. *Carissa macrocarpa*
10. *Cassia corymbosa*
11. *Cassia didymobotrya*
12. *Cestrum nocturnum*
13. *Chrysantemum frutescens*
14. *Cistus albidus*
15. *Coronilla valentina*
16. *Cotoneaster horizontalis*
17. *Cotoneaster pannosus*
18. *Cotoneaster salicifolius*
19. *Cytisus scoparius*
20. *Datura arborea*
21. *Datura sanguinea*
22. *Deutzia scabra*
23. *Echium fastuosum*
24. *Eleagnus pungens*
25. *Escallonia rubra*
26. *Euonymus japonicus*
27. *Genista monosperma*
28. *Hibiscus rosa-sinensis*
29. *Hibiscus syriacus*
30. *Jasminum officinale*
31. *Lantana camara*
32. *Laurus nobilis*
33. *Myoporum tenuifolium*
34. *Myrtus communis*
35. *Nerium oleander*
36. *Philadelphus coronarius*
37. *Photiniax fraseri*
38. *Pistacia lentiscus*
39. *Pittosporum tobira*
40. *Polygala Myrtifolia*
41. *Pyracantha coccinea*
42. *Rhamnus alaternus*
43. *Senecio petasitis*
44. *Senecio maritima*
45. *Solanum rantonnetti*
46. *Spartium junceum*
47. *Spirea x arguta*
48. *Syringa vulgaris*
49. *Teucrium fruticans*
50. *Viburnum tinus*
51. *Vitex agnus-castus*

Abelia

Abelia floribunda

ORNAMENTAL SHRUB

ABELIA SPANISH	VALENCIAN	ABELIA ENGLISH	ABELIA FLORIBUNDA FRENCH

Structure		
Shape: ROUND	Height: 1-3 M	Diameter: 2-3 M
Texture: MEDIUM	Shade: PARTIAL	Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	DIPSACALES
FAMILY:	CAPRIFOLIACEAE

VARIETIES

MORPHOLOGY

Trunk

Leaf
EVERGREEN
SIZE: LEAF: 1.5-4 CM
COLOR: US: DK. GREEN
LS:SMOOTH
TEXTURE: US: SMOOTH
LS: SMOOTH

COMPOUND:	NO
HARDNESS:	SOFT
ARRANGEMENT:	OPPOSITE
VENATION:	PINNATE
SHAPE:	OBLONG
MARGIN:	ENTIRE
APEX:	SHARP
LEAF BASE:	ACUTE
PETIOLE:	SHORT

Flower
SIZE: 1-3 CM

Type	Reproduction
HERMAPHRODITE	HERMAPHRODITE
Flowering: SINGLE/CLUSTERS	Fragrant: YES

Fruit
SIZE:

Type	Color
ACHENE	
Edible	Fruiting season

Growth

Rate	Longevity
MEDIUM	25 YEARS








ECOLOGY

Climate
ALTITUDE: 200-800
IRRIGATION: MODERATE

Temperature	Drought resistant
-5ºC,H4,Z6	MODERATE
Sun exposure: SUN/PARTIAL SHADE	Frost resistant: YES

Soil
pH: 6-7.5
FERTILITY: MODERATE

Texture	Salt resistant
LOAMY/CLAYEY	MODERATE/LOW
Drainage: MODERATE	Lime resistant: MODERATE/LOW

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	YES	HEDGE ROWS:	NO
POLLUTION:	MODERATE	RIVERBANKS:	NO	BORDERS:	NO
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Introduced in Europe in the middle of the 19th centry by the British diplomat Clark Abel -from whom it receives its name-, abelias are a clear example that excessive care is not always necessary to enjoy a truly beautiful plant. It is an evergreen shrub -semi-evergreen in cold areas- with small oval leaves with a shiny upperside. It has arched branches that divide into smaller and more numerous ones. From June or July and until the arrival of the cold, the ends of these branches develop small white and pink funnel-like flowers that are sweetly scented.

SPACING: 1 M

PLANTING AND PLANT HEALTH

It tolerates areas of partial or light shade, but it grows better in sunny exposures, which is where it flowers profusely. It needs well-drained soil but with enough humidity in summer. Although it is not very demanding in terms of nutrients, it prefers lime soils where the proportions of organic matter are low. To obtain a compact or closed appearance, the main branches should be pruned to half their length in winter or early spring. It is also advisable to eliminate damaged or diseased branches and those that are visibly aged.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
X	X	X	X	X	X	X	X	X	X	X	X									X	X	X	X

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shapes
CT(5)	60-80	
CT(10)	80-100	
CT(30)	125-150	

Arbutus

Arbutus unedo

ORNAMENTAL SHRUB

MADROÑO SPANISH | ARBORCER VALENCIAN | STRAWBERRY TREE ENGLISH | ARBUSIER FRENCH

Structure		
Shape	Height	Diameter
OVOID	2.5-4 M	1.5-2.5 M
Texture	Shade	Root
MEDIUM	DENSE	FIBROUS

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	ERICALES
FAMILY:	ERICACEAE

VARIETIES

COLOR:

Trunk		
Leaf	COMPOUND:	NO
	HARDNESS:	CORIACEOUS
EVERGREEN	ARRANGEMENT:	ALTERNATE
SIZE: LEAF: 4-11 CM	VENATION:	PINNATE
	SHAPE:	OBLONG
COLOR: US: GREEN	MARGIN:	SERRATE
LS:DK/SMOOTH	APEX:	SHARP
TEXTURE: US:SMOOTH	LEAF BASE:	ACUTE
LS:SMOOTH	PETIOLE:	SHORT
Flower	Type	Reproduction
	HERMAPHRODITE	HERMAPHRODITE
SIZE: FLOWER 0.6CM	Flowering	Fragrant
INFLOR: 5 CM	PANCILE	YES
Fruit	Type	Color
	BERRY	RED/ORANGE
	Edible	Fruiting season
SIZE: 1.5-2.5 CM	YES	OCT
Growth	Rate	Longevity
	MEDIUM	50 YEARS



ECOLOGY

Climate	Temperature	Drought resistant
	-6ºC,H4,Z6	MODERATE
ALTITUDE: 100-1200	Sun exposure	Frost resistant
IRRIGATION: MODERATE	SUN/PARTIAL SHADE	YES
Soil	Texture	Salt resistant
	LOAMY/CLAYEY	MODERATE
pH: 6-7.5	Drainage	Lime resistant
FERTILITY: MODERATE	MODERATE	MODERATE/LOW

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	NO	HEDGE ROWS:	NO
POLLUTION:	MODERATE	RIVERBANKS:	NO	BORDERS:	NO
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Native to Southwest Ireland, Southwest Europe, and North Africa, in the Sclerophile forests. This is an outstanding specimen in the garden due to its ornamental value of its flowers and fruits. It is a hardy shurb and generally has a twisted trunk, branched at low height. The bark of the young species is reddish in color. Its fruit can be used to make jam and be fermented to obtain aguardiente. Its leaves can be used for tanning.

SPACING: 1.5 M

PLANTING AND PLANT HEALTH

This species requires well drained soil and warm sites not exposed to dry winds. It can be propagated by seed and semi-ripe cuttings in late spring and summer. Its fruit is collected in November/December. It can be cultivated into shrub or small tree form. It is recommended to let them grow to its natural size. It tends to branch from the base. This shrub tolerates pruning.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Planting Pruning x

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation (L)	Height	Topiary Shapes
CT(5)	60-80	
CT(10)	80-100	
CT(30)	125-150	

Atriplex

ORNAMENTAL SHRUB

Atriplex halimus

SALADOS	SALAT BLANC	SALTBUSH	POURPRIER DE MER
SPANISH	VALENCIAN	ENGLISH	FRENCH

Structure		
Shape: ROUND	Height: 1-3 M	Diameter: 2-3 M
Texture: MEDIUM	Shade: PARTIAL	Root: SCATTERING

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	CARYOPHYLLALES
FAMILY:	CHENOPODIACEAE

VARIETIES

MORPHOLOGY

Trunk		
Leaf EVERGREEN; SIZE: LEAF: 1-6 CM; COLOR: US: GRAY, LS:SMOOTH; TEXTURE: US: ROUGH, LS : ROUGH	COMPOUND: NO; HARDNESS: SOFT; ARRANGEMENT: ALTERNATE; VENATION: PINNATE; SHAPE: OBLONG; MARGIN: ENTIRE; APEX: ACUTE; LEAF BASE: ACUTE; PETIOLE: SHORT	
Flower SIZE: 0.2cm	Type: UNISEXUAL	Reproduction: MONOECIOUS
	Type: TERMINAL RACEMES	Fragrant: NO
Fruit SIZE:	Type: UTRICLE	Color: YELLOW
	Edible	Fruiting season
Growth	Rate: FAST	Longevity: 25 YEARS



ECOLOGY

Climate ALTITUDE: 0-800; IRRIGATION: MODERATE	Temperature: -3ºC,H5,Z6	Drought resistant: MODERATE
	Sun Exposure: SUN	Frost resistant: YES
Soil pH: 6.5-8; FERTILITY: MOD/LOW	Texture: LOAMY	Salt resistant: HIGH
	Drainage: MODERATE	Lime resistant: MODERATE/HIGH

USES

Resistances		Applications			
COASTAL:	1ST LINE	SLOPES:	NO	HEDGE ROWS:	NO
POLLUTION:	MODERATE	RIVERBANKS:	NO	BORDERS:	NO
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Shrub 1 to 3 m tall and 3 m wide; leafy, with an extended and disorderly round shape, with a weak stem and numerous upright and silver-gray branches. It has an oblique and scattering root system. Its leaves are evergreen, alternate, entire or somewhat serrated, rhomboid-oval to oblong, with a short petiole and up to 6 cm long, with silver-gray scales. Its flowers are unisexual, greenish purple and very small. They are arranged in large glomerulous terminal, round and paniculate clusters. Its fruits are bracteate utricle. Seeds are somewhat compressed.

SPACING: 0.80 M

PLANTING AND PLANT HEALTH

It is a temperate climate plant that tolerates light frosts and proximity to the sea. It is resistant to salty soils but needs to be well drained. It adapts to poor, sandy and dry soils. It is also drought resistant. Requires moderate moisture, sunny lighting, and rejuvenation-only pruning, counting shoots in late spring and leaving only three buds from the ground to produce a glossy foliage.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
				X	X	X	X				

Sowing Planting Pruning X

Treatments Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation (L)	Height	Topiary shapes
CT(5)	60-80	
CT(10)	80-100	
CT(30)	125-150	

Buddleia

ORNAMENTAL SHRUB

Buddleia davidii

BUDLEIA SPANISH	BUDLEIA VALENCIAN	BUTTERFLY BUSH ENGLISH	ARBUSTE AUX PAPAILLOMS FRENCH

STRUCTURE

Shape	Height	Diameter
IRREGULAR	1-3 M	1-2 M
Texture	**Shade**	**Root**
LIGHT	PARTIAL	SCATTERING

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDON
ORDER:	LAMINALES
FAMILY:	SCROPHULARIACEAE

VARIETIES

ALBA
MAGNIFICA
HARLEQUIN
VEITCHIANA

MORPHOLOGY

Trunk

Leaf
SEMI-DECIDIOUS
SIZE: LEAF:10-25CM
COLOR: US: DK. GREEN
LS: GRAY
TEXTURE: LS: ROUGH
US: ROUGH

COMPOUND:	NO
HARDNESS:	SOFT
ARRANGEMENT:	OPPOSITE
VENATION:	PINNATE
SHAPE:	LANCEOLATE
MARGIN:	ENTIRE
APEX:	ACUTE
LEAF BASE:	ACUTE
PETIOLE:	SHORT

Flower
SIZE: 0.6 CM
INFLORESECENCE IN PANICLE (10-20)

Type	Reproduction
HERMAPHRODITE	HERMAPHRODITE
Flowering	Fragrant
	NO

Fruit
SIZE: 6 MM

Type	Color
OVOID CAPSULES	
Edible	Fruiting season
NO	

Growth

Rate	Longevity
FAST	0-25 YEARS





ECOLOGY

Climate
ALTITUDE: 0-1000
IRRIGATION: MODERATE

Temperature	Drought resistant
-5ºC,H4,Z6	MODERATE
Sun exposure	Frost resistant
SUN	YES

Soil
pH: 6-7.5
FERTILITY: MODERATE

Texture	Salt resistant
LOAMY	MODERATE
Drainage	Lime resistant
MODERATE	MODERATE

USES

Resistances		Applications			
COASTAL:	1ST LINE	SLOPES:	NO	HEDGE ROWS:	NO
POLLUTION:	LOW	RIVERBANKS:	NO	BORDERS:	NO
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Buddleja species native to China. It was discovered in the mid-19th century by the French missionary Armand David, from whom they get their specific name. When the English began to plant them in their gardens, they were called the butterfly bush since it attracted these insects to its sweet fragrance of their flowers. They are open shrubs with brittle, arching branches and a maximum height of 3.5 m. The leaves are very long (up to 25 cm) ending in a sharp spike and have a dull bluish-green color. Groups of small elongated conical flowers with a variety of colors sprout from the ends of these branches in summer.

SPACING: 2 M

PLANTING AND PLANT HEALTH

In bright and sunny exposures it blooms profusely. A good fertilized soil in the garden guarantees optimal development; however, buddleja can survive even in poor soils. These shrubs admit any type of pruning, even the most severe, sprouting vigorously the following year. This does not endanger its flowers since they sprout from the same year's wood. (Prune last year's stems at the beginning of spring until leaving 1 bud 5 cm away from old wood). Pruning in late fall prevents wind damage. A good formative pruning aims at leaving a single trunk with some branches that open up to the height of a person's head. They must have enough lateral space to allow for excellent development.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
		X	X	X	X	X					

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation(L)	Height (cm)	Topiary Shape
CT(5)	60-80	
CT(10)	80-100	
CT(30)	125-150	

Buxus *Buxus sempervirens*

ORNAMENTAL SHRUB

BOJ	BOIX	BOX TREE	BUIX
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Shape: OVOID	Height: 3-5 M	Diameter: 2-3 M
Texture: COARSE	Shade: PARTIAL	Root: SCATTERING

		VARIETIES
DIVISION:	PHANEROGAMS	
SUBDIVISION:	ANGIOSPERMS	*ARBORESCENS*
TYPE:	DICOTYLEDONS	*NANA*
ORDER:	BUXALES	*ARGENTA*
FAMILY:	BUXACEAE	*GLAUCA*

MORFOLOGY

Trunk

Leaf
EVERGREEN
SIZE: LEAF: 1-3 CM
COLOR: US: DK. GREEN; LS: YELLOW/GREEN
TEXTURE: US: SMOOTH; LS : SMOOTH

COMPOUND:	NO
HARDNESS:	CORIACEOUS
ARRANGEMENT:	OPPOSITE
VENATION:	PINNATE
SHAPE:	OBLONG
BORDER:	ENTIRE
APEX:	ROUND
LEAF BASE:	ACUTE
PETIOLE:	SHORT

Flower
SIZE AND TYPE: ♂/M 1-2mm; ♀/F 1-2mm

Type	Reproduction
UNISEXUAL	MONOECIOUS
Type: GLOMERULUS	Fragrant: NO

Fruit
SIZE: 0.8 CM

Type	Color
3 LOBED CAPSULE	GREEN/BLUE
Edible: NO	Fruiting season: JUL-AUG

Growth

Rate	Longevity
SLOW	>200 YEARS



ECOLOGY

Climate
ALTITUDE: 200-1200
IRRIGATION: MODERATE

Temperature	Drought resistant
-15ºC,H2,Z5	MODERATE
Sun Exposure	Frost resistant
SUN/PARTIAL SHADE	YES

Soil
pH: 6-7.5
FERTILITY: MODERATE

Texture	Salt resistant
LOAMY/CLAYEY	MODERATE
Drainage	Lime resistant
MODERATE	MODERATE/LOW

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	NO	HEDGE ROWS:	YES
POLLUTION:	MODERATE	RIVERBANKS:	NO	BORDERS:	NO
WIND:	MODERATE	GROUP:	YES	ISOLATED:	YES

POINTS OF INTEREST

This shrub is native to Europe, North Africa and Western Asia. It has slow growth and great longevity. It works well for hedges, wind breakers and topiary lasting many years. It is also excellent as a wooden plant, which can be cut into a cone or pyramid shape. Its wood is highly valued for turning and inlay work and ideal for wood engraving, buttons and chess pieces. It is also an excellent fuel. Sometimes it is used instead of hops to make beer. It is a toxic plant.

SPACING:1.5 M

PLANT AND PLANT HEALTH

It adapts to very hardy climates and resists the wind. Tolerates up to -15ºC. It also survives in all types of soil, but thrive in dry and chalky places preferring well-drained soils. It requires normal irrigation but avoid saturation and waterlogging. Somewhat resistant to drought. The ideal is a medium humidity level and sunny or partial shade although it can also live in the shade. Pruning is not essential, at the end of summer. Unwanted branches can be removed or trimmed to give it the right shape. It tolerates severe pruning.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting season



Cultivation Calendar



Treatment Calendar



COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shapes
CT(5)	60-80	Yes
CT(10)	80-120	Yes
CT(30)	125-150	Yes

Callistemon

Callistemon citrinus

ORNAMENTAL SHRUB

LIMPIA TUBOS SPANISH | VALENCIAN | LEMON BOTTLEBRUSH ENGLISH | RINCE-BOUTEILLES FRENCH

STRUCTURE		
Shape: ROUND	Height: 2-5 M	Diameter: 2 M
Texture: LIGHT	Shade: PARTIAL	Root: SCATTERED

DIVISION:	PHANEROGAMS	VARIETIES
SUBDIVISION:	ANGIOSPERMS	*VIMINALLIS*
TYPE:	DICOYILEDONS	
ORDER:	MYRTALES	
FAMILY	MYRTACEAE	

MORPHOLOGY		
Trunk		
Leaf	COMPOUND: NO	
EVERGREEN	HARDNESS: CORIACEOUS	
SIZE: LEAF: 4-9 CM	ARRANGEMENT: ALTERNATE	
	VENATION: PARALLEL	
	SHAPE: LINEAR/LANCEOLATE	
COLOR: US: GREEN	MARGIN: ENTIRE	
LS:GREEN	APEX: ACUMINATE	
TEXTURE:	LEAF BASE: ACUTE	
LS :SMOOTH	PETIOLE: SHORT	
Flower	Type: HERMAPHRODITE	Reproduction: MONOECIOUS
SIZE AND TYPE: 5-10CM	Flowering: SPIKED INFLORESCENCE	Fragrant: NO
Fruit	Type: CAPSULE	Color: BROWN
SIZE:	Edible: NO	Fruiting season: NOV-DEC
Growth	Rate: MEDIUM	Longevity: 25 YEARS





ECOLOGY		
Climate	Temperature: -3ºC,H5,Z6	Drought resistant: MODERATE
ALTITUDE: 0-800	Sun Exposure: SUN	Frost resistant: YES
IRRIGATION: MODERATE		
Soil	Texture: LOAMY	Salt resistant: LOW
pH: 6-7.5	Drainage: MODERATE	Lime resistant: MODERATE
FERTILITY: MODERATE		

USES			
Resistances		Applications	
COASTAL: 2ND LINE	SLOPES: NO	HEDGE ROWS: NO	
POLLUTION: LOW	RIVERBANKS: NO	BORDERS: NO	
WIND: MODERATE	GROUPS: YES	ISOLATED: YES	

POINTS OF INTEREST

Native to South Australia. Commonly known as Bottlebrush. As slow-growing shrub up to 5 m tall, it is suitable for coastal gardens both isolated and in groups or flowerbeds. Adapted to Mediterranean climates, it can tolerate light frosts but it should be placed in a sheltered area.

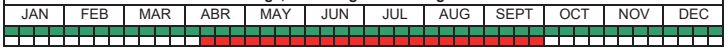
SPACING: 1.5 M

PLANTING AND PLANT HEALTH

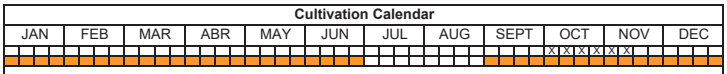
It requires a normal irrigation programme and overwatering should be avoided. It supports drought and preferably medium humidity. It is advisable to prune the tips when young to stimulate growth. Completely remove the old withered branches, since the plant does not renew itself from mature ones. Immediately after flowering, in autumn, a light pruning can be carried out, removing only the stems that have flowered, to promote robust growth. Severe pruning is not necessary as it has a slow almost non-existent growth from the shoots in a dormant state. Propagation is by seed, softwood cuttings in summer or layering in autumn. This species roots very easily.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting season



Cultivation Calendar



Sowing | Planting | Pruning X

Treatment Calendar



Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shapes
CT(5)	60-80	
CT(10)	80-100	
CT(30)	125-150	

Callistemon

ORNAMENTAL SHRUB

Callistemon speciosus

LIMPIA TUBOS (SPANISH) | VALENCIAN | GREY(Albany) BOTTLEBRUSH (ENGLISH) | RINCE-BOUTEILLES (FRENCH)

STRUCTURE		
Shape: ROUND	Height: 1-3 M	Diameter: 2-3 M
Texture: LIGHT	Shade: PARTIAL	Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	MYRTALES
FAMILY:	MYRTACEAE

VARIETIES

MORFOLOGY

Trunk

Leaf
EVERGREEN
SIZE: LEAF: 5-13 CM
COLOR: US: GREEN/GRAY; LS: GREEN/GRAY
TEXTURE: US: SMOOTH; LS :SMOOTH

COMPOUND:	NO
HARDNESS:	CORIACEOUS
ARRANGEMENT:	ALTERNATE
VENATION:	PARALLEL
SHAPE:	LINEAR/LANCEOLATE
MARGIN:	ENTIRE
APEX:	ACUMINATE
LEAF BASE:	ACUTE
PETIOLE:	SHORT

Flower

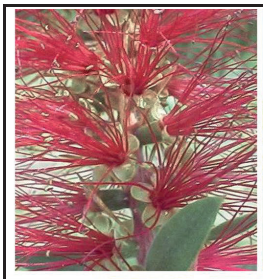
SIZE AND TYPE: 5-15 CM, SPIKED INFLORESCENCE	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
	Flowering	Fragrant: NO

Fruit
SIZE:

Type: CAPSULE	Color: BROWN
Edible: NO	Fruiting season

Growth

Rate: MEDIUM	Longevity: 25 YEARS







ECOLOGY

Climate
ALTITUDE: 0-800
IRRIGATION: MODERATE

Temperature: -3ºC,H5,Z6	Drought resistant: MODERATE
Sun exposure: SUN	Frost resistant: YES

Soil
pH: 6-7,5
FERTILITY: MODERATE

Texture: LOAMY	Salt resistant: LOW
Drainage: MODERATE	Lime resistant: MODERATE/LOW

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	YES	HEDGE ROWS:	NO
POLLUTION:	LOW	RIVERBANKS:	NO	BORDERS:	NO
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

This species can be planted isolated, mixed or in shrubby clusters. Its leaves, with a prominent central nerve, give off a fragrant smell when crushed. It is typical of places with hardy climates or even extreme temperatures where it prefers medium humidity and full sun.

SPACING 1.5 M

PLANTING AND PLANT HEALTH

It tolerates hardy soils but prefers neutral, fertile and well-drained ones. It is drought resistant. This shrub requires light formative pruning, trimming to stimulate growth and rejuvenating pruning where appropriate. Its propagation is by seed, cutting of its tender wood in summer or layering in autumn.This species roots very easily.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
		X	X	X	X						

Sowing | Planting | Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shapes
CT(5)	60-80	
CT(10)	80-100	
CT(30)	125-150	

Capparis

Capparis spinosa

ORNAMENTAL SHRUB

ALCAPARRA	TAPERA	CAPER	CÂPRIER
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Shape: ROUND	Height: 0.5-1.5 M	Diameter: 0.5-1 M
Texture: LIGHT	Shape: PARTIAL	Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDON
ORDER:	BRASSICALES
FAMILY:	CAPPARACEAE

VARIETIES

MORPHOLOGY

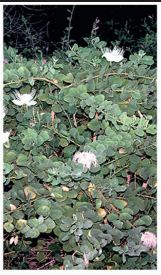
Trunk

Leaf
- SEMI- EVERGREEN
- SIZE: LEAF:1.5-6 CM
- COLOR: US: GREEN; LS:PALE GREEN
- TEXTURE: US:SMOOTH; LS: SMOOTH
- COMPOUND: NO
- HARDNESS: HARD
- ARRANGEMENT: ALTERNATE
- VENATION: PINNATE
- SHAPE: ROUNDED
- MARGIN: ENTIRE
- APEX: ACUMINATE
- LEAF BASE: ROUND
- PETIOLE: SHORT

Flower
- SIZE AND TYPE: 3-10 CM
- Type: HERMAPHRODITE
- Reproduction: HERMAPHRODITE
- Flowering: ISOLATED
- Fragant: YES

Fruit
- SIZE: 1 CM
- Type: BERRY
- Color: OLIVE GREEN
- Edible: NO
- Fruiting season

Growth
- Rate: MEDIUM
- Longevity: 25 YEARS






ECOLOGY

Climate
- ALTITUDE: 0-800
- IRRIGATION: MODERATE
- Temperature: -5ºC,H4,Z6
- Drought resistant: MODERATE
- Sun exposure: SUN
- Frost resistant: YES

Soil
- pH: 6.5-8
- FERTILITY: MODERATE
- Texture: LOAMY/CLAYEY
- Salt resistant: MODERATE
- Drainage: MODERATE
- Lime resistant: MODERATE

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	YES	HEDGE ROWS:	NO
POLLUTION:	LOW	RIVERBANKS:	NO	BORDERS:	NO
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Native to the Mediterranean region.It can be found in rocky places and walls and often by the sea. Showy and large flowers, white or pink, with very long stamens with violet filaments, spiny rounded leaves, although the spines are not persistent.
The root, buds and fruits are used to combat arthritis, loss of appetite and inflammation of the spleen. It blooms on wood from the previous year, so pruning after flowering significantly enhances this process for the following spring. The Romans exploited the buds (capers) and the fruits (large capers), by pickling with salt.
Today, they are used as a condiment (tartar sauce) to accompany "steak tartare", smoked salmon or as a simple appetizer.

SPACING: 0.75 M

PLANTING AND PLANT HEALTH

The reproduction by seed as well as by cutting presents certain difficulty. Seed germination is slow with rather low average percentages. Also the reproduction by cutting is not easy and should be carried out in the summer months using robust one year old herbaceous or semi-ligneous cuttings.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
								X	X	X	X

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation(L)	Height (cm)	Topiary shapes
CT(5)	60-80	
CT(10)	80-100	
CT(30)	125-150	

Carissa

Carissa macrocarpa

ORNAMENTAL SHRUB

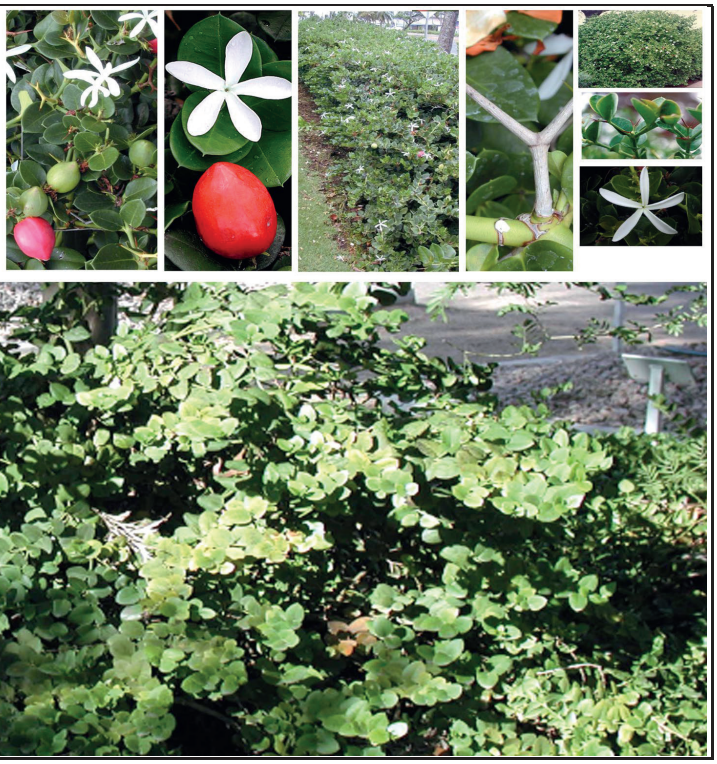
CIRUELO DE NATAL (SPANISH) | VALENCIAN | NATAL PLUM (ENGLISH) | PRUNIER DU NATAL (FRENCH)

STRUCTURE		
Shape: ROUND	Height: 2-3 M	Diameter: 2 M
Texture: COARSE	Shade: FULL	Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	GENTIANALES
FAMILY:	APOCYNACEAE

VARIETIES

MORPHOLOGY		
Trunk		
Leaf	COMPOUND: NO	
	HARDNESS: HARD	
EVERGREEN	ARRANGEMENT: OPPOSITE	
SIZE: LEAF: 3-6 CM	VENATION: PINNATE	
	SHAPE: OVAL	
COLOR: US: GREEN	MARGIN: ENTIRE	
LS:PALE GREEN	APEX: ACUTE	
TEXTURE: US: SMOOTH	LEAF BASE: ROUNDED	
LS :SMOOTH	PETIOLE: SHORT	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE AND TYPE: 3.5 CM	Flowering: SINGLE	Fragrant: YES
Fruit	Type: FLESHY	Color: RED
SIZE: 2.5 -5 CM	Edible: YES	Fruiting season: SEPT-NOV
Growth	Rate: MEDIUM	Longevity: 25 YEARS



ECOLOGY		
Climate	Temperature: -5ºC,H4,Z6	Drought resistant: MODERATE
ALTITUDE: 0-800	Sun exposure: SUN	Frost resistant: YES
IRRIGATION: MODERATE		
Soil	Texture: LOAMY/CLAYEY	Salt resistant: MODERATE
Ph: 6.5-8	Drainage: MODERATE	Lime resistant: MODERATE
FERTILITY: MODERATE		

USES			
Resistances		Applications	
COASTAL: 2ND LINE		SLOPES: YES	HEDGE ROWS: NO
POLLUTION: LOW		RIVERBANKS: NO	BORDERS: NO
WIND: MODERATE		GROUPS: YES	ISOLATED: YES

POINTS OF INTEREST

This shrub can measure up to 9m high. Known commonly as the Natal Plum, it is native to the tropical and subtropical parts of South Africa. It is used as a shrub in tropical and subtropical gardens and its flesh is used in fruit salads. Its large fruits and persistent leaves make it a spectacular shrub. Its spines are bifrucate and can measure up to 4 cm.

SPACING: 0.75 M

PLANTING AND PLANT HEALTH

This species of shrub is not resistant to frost and therefore will do better in warm climates. It is very resistant to and suitable for poor or sandy soils. It must have a low irrigation programme during its growth and then progressivley less. It is drought resistant. It prefers partial shade, although it grows well in the sun. No more than a light maintenance pruning is required. Flowering stalks are cut back halfway after flowering. Its propagation by seed is not difficult. It can also be propagated by semi-woody cutting in summer or by layering.

CHROMATIC CALENDAR

Foliation, Flowering and Fruiting season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
									X	X	X

Sowing | Planting | Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shapes
CT(5)	60-80	
CT(10)	80-100	
CT(30)	125-150	

Cassia

Cassia corymbosa

ORNAMENTAL SHRUB

CASIA DE BUENOS AIRES (SPANISH) | VALENCIAN | FLOWERY SENNA (ENGLISH) | SENNA CORYMBOSA (FRENCH)

STRUCTURE

Shape	Height	Diameter
OVOID	1.2-3 M	1,5 M
Texture	**Shade**	**Root**
LIGHT	PARTIAL	SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	FABALES
FAMILY:	FABACEAE

VARIETIES

MORPHOLOGY

Trunk

Leaf

PERSISTENT

SIZE: LEAF: 10 CM, LEAFLET:4-6

COLOR: US: GREEN, LS:GREEN

TEXTURE: US: SMOOTH, LS: SMOOTH

COMPOUND:	YES
HARDNESS:	SOFT
ARRANGEMENT:	ALTERNATE
VENATION:	PINNATE
SHAPE:	LANCEOLATE
MARGIN:	ENTIRE
APEX:	ACUTE
LEAF BASE:	ATTENUATE
PETIOLE:	SHORT

Flower

Type	Reproduction
HERMAPHRODITE	HERMAPHRODITE

SIZE AND TYPE: 2-3 CM, INFLORESCENCE IN CORYMB (3-8 CM)

Flowering	Fragrant
	IN NOV

Fruit

SIZE: 5 CM

Type	Color
LEGUME	
Edible	**Fruiting season**
	NOV

Growth

Rate	Longevity
FAST	0-25 YEARS





ECOLOGY

Climate

ALTITUDE: 100-500

IRRIGATION: MODERATE

Temperature	Drought resistant
-2ºC,H5,Z6	MODERATE
Sun exposure	**Frost resistant**
SUN	LOW

Soil

pH: 6.5-8

FERTILITY: MODERATE

Texture	Salt resistant
LOAMY	LOW
Drainage	**Lime resistant**
MODERATE	MODERATE

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	NO	HEDGE ROWS:	NO
POLLUTION:	HIGH	RIVERBANKS:	NO	BORDERS:	NO
WIND:	LOW	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Native to Argentina, Uruguay and Brazil. Commonly known as *Casia de Buenos Aires* . It can be used as an isolated shrub or in flowerbeds as a flowering bush. This is a fast growing species and does not live more than 25 years.

SPACING: 1.5 M

PLANTING AND PLANT HEALTH

It requires warm temperatures and is able to resist light frosts. It can reach heights of 100-500 m and is not resistant to wind but tolerates the second line of coastal areas and can cope with urban pollution. It does well in all types of soils, but prefers those that are salt-free with normal to humus-rich content and very permeable. It requires low humidity in watering and medium-high humidity in the environment, and sunny or partially shaded areas. Parts damaged during the winter must be pruned, the crowded parts thinned and topped. Flowering branches must be cut at the end of spring, to give the plant compactness.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
		X	X		X	X	X				

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation(L)	Height (cm)	Topiary shapes
CT(5)	60-80	
CT(10)	80-100	
CT(30)	125-150	

Cassia

Cassia didymobotrya

ORNAMENTAL SHRUB

CASSIA ALADA (SPANISH) · VALENCIAN · POPCORN CASSIA (ENGLISH) · CASSIA DIDYMOBOTRYA (FRENCH)

STRUCTURE		
Shape: OVOID	Height: 1-2 M	Diameter: 1.5 M
Texture: LIGHT	Shade: PARTIAL	Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOYILEDONS
ORDER:	FABALES
FAMILY:	FABACEAE

VARIETIES
SHRUB
COMPOUND FOLIAGE

MORPHOLOGY

Trunk		
Leaf	COMPOUND: YES	
PERSISTENT	HARDNESS: SOFT	
SIZE: LEAF: 2.5 CM	ARRANGEMENT: ALTERNATE	
LEAFLET: 10-20CM	VENATION: PINNATE	
COLOR: US: GREEN	SHAPE: LANCEOLATE	
LS: GREEN	MARGIN: ENTIRE	
TEXTURE: US: SMOOTH	APEX: ACUTE	
LS: SMOOTH	LEAF BASE: ATTENUATE	
	PETIOLE: SHORT	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE: 2-3 CM	Flowering: INFLORESCENCE IN RACEME (5-10 units)	Fragrant: NO
Fruit	Type: LEGUME	Color: GRAY/BLACK
SIZE:	Edible	Fruiting season
Growth	Rate: FAST	Longevity: 0-25 YEARS





ECOLOGY

Climate	Temperature: -2ºC,H5,Z6	Drought resistant: MEDERATE
ALTITUDE: 100-500	Sun exposure: SUN	Frost resistant: LOW
IRRIGATION: MODERATE		
Soil	Texture: LOAMY	Salt resistant: LOW
pH: 6.5-8	Drainage: MODERATE	Lime resistant: MODERATE
FERTILITY: MODERATE		

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	NO	HEDGE ROWS:	NO
POLLUTION:	HIGH	RIVERBANKS:	NO	BORDERS:	NO
WIND:	LOW	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Native to Ethiopia. This species is comprised of many branches. It has a round shape and is used in mixed flowerbeds or shrubby compositions.

SPACING: 1.5 M

PLANTING AND PLANT HEALTH

It must be protected from frost. Although it tolerates most garden soil conditions, it should be planted in cool, rich and loamy soils. It requires a normal irrigation programme, however waterlogging must be avoided. It requires medium humidity and full sun. Propagation is by seed.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
										X	X	X	

Sowing · Planting · Pruning (X)

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides · Pesticides · Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shapes
CT(5)	60-80	
CT(10)	80-100	
CT(30)	125-150	

Cestrum

Cestrum nocturnum

ORNAMENTAL SHRUB

GALAN DE NOCHE (SPANISH) | VALENCIAN | QUEEN OF THE NIGHT (ENGLISH) | GALANT DE NUIT (FRENCH)

Shape	Height	Diameter
ROUND	2-4 M	2-4 M
Texture	**Shade**	**Root**
MEDIUM	PARTIAL	SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	SOLANALES
FAMILY:	SOLANACEAEA

VARIETIES

MORPHOLOGY

Trunk

Leaf
EVERGREEN
SIZE: LEAF: 12-15CM
COLOR: US: GREEN
LS:GREEN
TEXTURE: US: SMOOTH
LS :SMOOTH

COMPOUND:	NO
HARDNESS:	SOFT
ARRANGEMENT:	OPPOSITE
VENATION:	PINNATE
SHAPE:	LANCEOLATE
MARGIN:	ENTIRE
APEX:	ACUTE
LEAF BASE :	ATTENUATE
PETIOLE:	SHORT

Flower
SIZE AND TYPE: 2.5 CM CYMOSE INFLORESCENCE

Type	Reproduction
HERMAPHRODITE	HERMAPHRODITE
Flowering	Fragrant
	YES

Fruit
SIZE:

Type	Color
BERRY	WHITE
Edible	Fruiting season
NO	

Growth

Rate	Longevity
MEDIUM	25 YEARS





ECOLOGY

Climate
ALTITUDE: 0-500
IRRIGATION: MODERATE

Temperature	Drought resistant
-3ºC,H5,Z6	MODERATE
Sun exposure	Frost resistant
SUN	LOW

Soil
pH: 6.5-8
FERTILITY: MODERATE

Texture	Salt resistant
LOMAY/CLAYEY	MODERATE
Drainage	Lime resistant
MODERATE	MODERATE

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	NO	HEDGE ROWS:	NO
POLLUTION:	MODERATE	RIVERBANKS:	NO	BORDER:	NO
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Native to Antilles and surrounding regions. Commonly known as queen of the night. It is used in Mediterranean gardens and near houses. Since it blooms nocturnally, a deep and pleasant scent can be enjoyed on summer nights. It can also be seen used on patios. It is widely distributed in cities and gardens in Southern Spain.

SPACING: 2 M

PLANTING AND PLANT HEALTH

It resists light frosts and hardy soils, but prefers those that are fertile and well-drained. This shrub is quite sensitive to drought and adapted to medium humidity and full sun or partial shade. Damaged and overgrown branches must be pruned at the end of winter or spring, even the young lateral ones. Propagation is by cuttings in winter.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
		X	X	X	X	X					

Sowing | Planting | Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shapes
CT(5)	60-80	
CT(10)	80-100	
CT(30)	125-150	

Chrysanthemum

ORNAMENTAL SHRUB

Chrysanthemum frutescens

MARGARITA DE BOLA (SPANISH) | (VALENCIAN) | MARGUERITE DAISY (ENGLISH) | MARGUERITE DE PARIS (FRENCH)

STRUCTURE		
Shape: ROUND	Height: 0.7-1 M	Diameter: 0.7-1
Texture: MEDIUM	Shade: PARTIAL	Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	ASTERALES
FAMILY:	ASTERACEAE

VARIETIES

MORPHOLOGY

Trunk		
Leaf: EVERGREEN; SIZE: LEAF: 8-10 CM; COLOR: US: GREEN, LS: GREEN; TEXTURE: US: SMOOTH, LS :SMOOTH	COMPOUND: NO; HARDNESS: SOFT; ARRANGEMENT: ALTERNATE; VENATION: PINNATE; SHAPE: OVAL/LANCEOLATE; MARGIN: DIVIDED; APEX: ACUTE; LEAF BASE: ATTENUATE; PETIOLE: SHORT	
Flower	Type: UNISEXUAL	Reproduction: MONOCEIOUS
SIZE AND TYPE: 2 CM, INFLOR. IN FLORET	Flowering	Fragrant: NO
Fruit; SIZE:	Type: ACHENE	Color
	Edible	Fruiting season
Growth	Rate: MODERATE	Longevity: 0-25 YEARS



ECOLOGY

Climate	Temperature: -3ºC.,H5,Z6	Drought resistant: MODERATE
ALTITUDE: 0-500	Sun exposure: SUN	Frost resistant: LOW
IRRIGATION: MODERATE		
Soil	Texture: LOAMY/CLAYEY	Salt resistant: MODERATE
pH: 6.5-7.5	Drainage: MODERATE	Lime resistant: MODERATE
FERTILITY: MODERATE		

USES

Resistances		Applications			
COASTAL:	1ST LINE	SLOPES:	NO	HEDGE ROWS:	NO
POLLUTION:	MODERATE	RIVERBANKS:	NO	BORDERS:	NO
WIND:	MODERATE	GROUP:	YES	ISOLATED:	YES

POINTS OF INTEREST

Excellent for quick color, coastal gardens and impatient gardeners.This is an easy shrub to grow specially for beginners.

SPACING: 0.50 M

PLANTING AND PLANT HEALTH

In Mediterranean climates the daisy is an evergreen and enjoys sunny, well-drained gardens. Generous mulching conserves water. Keep quite dry to promote compact growth and reduce health problems. Propagation by tender cuttings in spring. Cuttings reach flowering in a few months. Deadhead or moderately prune to thin out and gather the branches. This will to make the shrub more compact.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
								X	X	X	

Sowing | Planting | Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shapes
CT(5)	60-80	

Cistus *Cistus albidus*

ORNAMENTAL SHRUB

JARA BLANCA	ESTEPA D´ESCURAR	GRAY-LEAVED CISTUS	CISTE BLANC
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE

Shape	Height	Diameter
ROUND	0.4-2 M	0.6-2 M
Texture	**Shade**	**Root**
MEDIUM	PARTIAL	SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	MALVALES
FAMILY:	CISTACEAE

VARIETIES

MORPHOLOGY

Trunk

Leaf

EVERGREEN

SIZE: LEAF: 3-10 CM

COLOR: US: GRN./GRAY

LS: GRN./GRAY

TEXTURE: US: TOMENTOSE

LS :TOMENTOSE

COMPOUND:	NO
HARDNESS:	SOFT
ARRANGEMENT:	OPPOSITE
VENATION:	PINNATE
SHAPE:	BROADLY OVAL
MARGIN:	SMOOTH
APEX:	ROUNDED
LEAF BASE:	ATTENUATE
PETIOLE:	SHORT

Flower

SIZE AND TYPE: 4-6 CM, CYMOSE INFLORESCENCE

Type	Reproduction
HERMAPHRODITE	HERMAPHRODITE
FLOWERING	Fragrant
	NO

Fruit

SIZE:

Type	Color
CAPSULE	
Edible	Fruiting season

Growth

Rate	Longevity
MEDIUM	0-25 YEAR








ECOLOGY

Climate

ALTITUDE: 0-800

IRRIGATION: LOW

Temperature	Drought resistant
-8ºC,H4,Z6	HIGH
Sun exposure	Frost resistant
SUN	MODERATE/HIGH

Soil

pH: 6.5-8

FERTILITY: MOD/LOW

Texture	Salt resistant
ALL TYPES	MODERATE
Drainage	Lime resistant
MODERATE	HIGH

USES

Resistances		Applications			
COASTAL:	1ST LINE	SLOPES:	NO	HEDGE ROWS:	NO
POLLUTION:	MODERATE	RIVERBANKS:	NO	BORDERS:	NO
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Commonly known as gray-leaved cistus. It is a wild species that grows in almost all the dry hills of the southern part of the European continent, where they are widely spread in fields and shrubland with their unmistakable color and from which many hybrids and some cultivated varieties have been obtained. This shrub species is highly valued in gardening both for its beautiful flowers and ease to cultivate. They are recommended for hardy or wild garden scenes. Isolated specimens can be included in mixed bush formations. Due to the unpleasant odor it gives off on hot days, it should be avoided in transit or living places.

SPACING: 0.50 M

PLANTING AND PLANT HEALTH

The gray-leaved cistus should be placed in full sun. It is highly recommended for inland and coastal areas. They thrive in sandy and rocky terrain, regardless of soil quality. In any case, an excellent drainage capacity is essential. Prune to clean at the end of winter or early spring and when appropriate. It is resistant to droughts, frosty winters and proximity to the sea. Propagation by seed in autumn or tender cuttings in summer.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
		X	X	X							

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shapes
CT(5)	60-80	

Coronilla — *Coronilla valentina subs.*

ORNAMENTAL SHRUB

CAROLINA (SPANISH) · CORONETA (VALENCIAN) · SCORPION VETCH (ENGLISH) · CORONILLA (FRENCH)

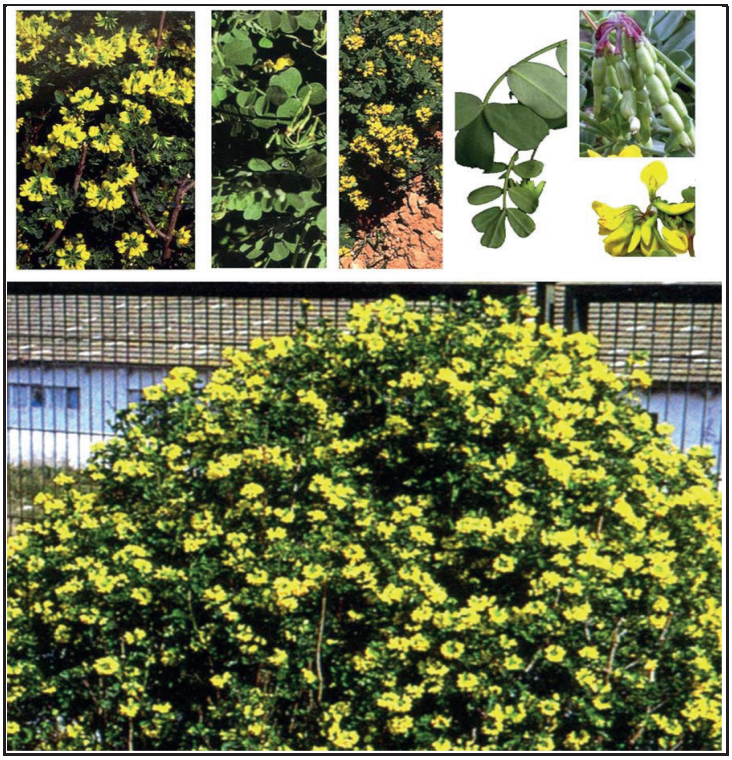
STRUCTURE		
Shape: ROUND	Height: 1.5-3 M	Diameter: 1.5-3 M
Texture: COARSE	Shade: FULL	Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	FABALES
FAMILY:	FABAECEAE

VARIETIES
DENSE
GREEN BLUEISH LEAVES

MORPHOLOGY

Trunk		
Leaf: PERSISTENT; SIZE. LEAF: 3 CM, LEAFLET: 5-7; COLOR: US: GREEN, LS: LIGHT GREEN; TEXTURE: US: SMOOTH, LS: SMOOTH	COMPOUND: YES. IMPARIPINNATE; HARDNESS: SOFT; ARRANGEMENT: OPPOSITE; VENATION: PINNATE; SHAPE: OVAL; MARGIN: ENITE; APEX: ROUNDED; LEAF BASE: ATTENUATE; PETIOLE: SHORT	
Flower; SIZE AND TYPE: 0.7-1.2 CM, UMBEL INFLORESCENCE (2-5 FLOWERS)	Type: HERMAPHRODITE; Flowering	Reproduction: HERMAPHRODITE; Fragrant: NO
Fruit; SIZE:	Type: LEGUME; Edible	Color; Fruiting season
Growth	Rate: MEDIUM	Longevity: 0-25 YEARS



ECOLOGY

Climate; ALTITUDE: 100-500; IRRIGATION: MODERATE	Temperature: -3ºC,H5,Z6	Drought resistant: MODERATE
	Sun exposure: SUN	Frost resistant: LOW
Soil; pH: 6.5-8; FERTILITY: MODERATE	Texture: LOAMY	Salt resistant: MODERATE
	Drainage: MODERATE	Lime resistant: MODERATE

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	NO	HEDGE ROW:	NO
POLLUTION:	HIGH	RIVERBANKS:	NO	BORDERS:	NO
WIND:	LOW	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Commonly known as scorpion vetch. Found mainly in the Mediterranean region. It is a dense rounded shrub that can be used isolated or in groups. Its golden flowers perfume the air from winter to spring. It is important to be aware that if irrigated directly above the plant, it will cause premature death. Remove diseased or old branches.To achieve a more compact shrub, cut the rest of the shoots in half in the springtime.

SPACING: 1 M

PLANTING AND PLANT HEALTH

It prefers warm places, but tolerates some cold. Soil should be light and with good drainage. It is somewhat drought resistant and is better adapted to hardy humidity and full sun. It should only be pruned for rejuvenatation or reinvigoration purposes. They are easily propagated by seed or tender cuttings in summer.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
X	X	X	X	X	X	X	X	X	X	X	X

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation (L)	Height(cm)	Topiary shapes
CT(5)	60-80	
CT(10)	80-100	
CT(30)	125-150	

Cotoneaster

Cotoneaster horizontalis

ORNAMENTAL SHRUB

COTONEASTER HORIZONTAL. SPANISH	VALENCIAN	PROSTRATE ROCK COTONEASTER ENGLISH	COTONEASTER RAMPANT FRENCH

STRUCTURE		
Shape: SPREADING	Height: 0.3-0.8 M	Diameter: 1.5 M
Texture: LIGHT	Shade: PARTIAL	Root: SCATTERED

		VARIETY
DIVISION:	PHANEROGAMS	
SUBDIVISION:	ANGIOSPERM	
TYPE:	DICOTYLEDONS	
ORDER:	ROSALES	
FAMILY:	ROSACEAE	

MORPHOLOGY

Trunk

Leaf
PERSISTENT
SIZE: LEAF: 1-4 CM
COLOR: US: GREEN
LS: GREEN
TEXTURE: US: SMOOTH
LS: TOMENTOSE

COMPOUND: NO
HARDNESS: CORIACEOUS
ARRANGEMENT: ALTERNATE
VENATION: PINNATE
SHAPE: OVAL
MARGIN: ENTIRE
APEX: ROUNDED
LEAF BASE: ATENUATE
PETIOLE: SHORT

Flower
SIZE AND TYPE: 0.5-0.7 CM, SOLITARY INFLOR. OR IN RACEME (3-7 FLOWERS)

Type	Reproduction
HERMAPHRODITE	HERMAPHRODITE

Flowering
Fragrant: NO

Fruit
SIZE: 5mm

Type	Color
POME	RED

Edible: NO
Fruiting season: OCT-NOV

Growth

Rate	Longevity
MEDIUM	0-25 YEARS



ECOLOGY

Climate
ALTITUDE: 0-1000
IRRIGATION: MODERATE

Temperature	Drought resistant
-5ºC,H4,Z6	MODERATE
Sun exposure	Frost resistant
SUN/PARTIAL SHADE	MODERATE

Soil
pH: 6.5-7.5
FERTILITY: MODERATE

Texture	Salt resistant
LOAMY	MODERATE
Drainage	Lime resistant
MODERATE	MODERATE

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	YES	HEDGE ROWS:	NO
POLLUTION:	HIGH	RIVERBANKS:	NO	BORDERS:	NO
WIND:	LOW	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Due to their variety of heights and types of growth, cotoneasters have a wide range of uses in gardens, terraces or balconies. Any location or corner can be decorated in a graceful and proportionate way. They provide good groundcovers due to the creeping growth of their multi-branched stems. The hanging feature of its branches allows dressing window boxes on balconies and buildings very effectively. This is a very elegant species when planted in pots on terraces, porches and entrance ways to gardens or buildings.

SPACING: 0.80 M

PLANTING AND PLANT HEALTH

They grow best in full sun, although they tolerate partial shade. They are very undemanding in terms of soil: any normal type of soil that is not too dry or excessively heavy will do. Pruning tasks are not essential since each cotoneaster develops a characteristic shape and size that should not be altered. Some of these shrubs, however, are modeled according to a formal pattern by trimming their branches in early spring. This operation is done with a secateur, cutting each branch just above a leaf. Pruning after flowering makes it possible to remove weak or dry branches.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Planting Pruning X

Treatments Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shapes
CT(5)	60-80	
CT(10)	80-100	
CT(30)	125-150	

COTONEASTER

ORNAMENTAL SHRUB

Cotoneaster pannosus

COTONEASTER SPANISH | VALENCIAN | SILVERLEAF COTONEASTER ENGLISH | COTONEASTER FRENCH

STRUCTURE		
Shape: SPREADING	Height: 1.5-3 M	Diameter: 1.5-3 M
Texture: LIGHT	Shade: PARTIAL	Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	ROSALES
FAMILY:	ROSACEAE

VARIETIES

MORPHOLOGY

Trunk

Leaf
SEMI-PERSISTENT
SIZE: LEAF: 2-5 CM
COLOR: US: GREEN
LS: GRAY
TEXTURE: US: SMOOTH
LS:TOMENTOSE

COMPOUND:	NO
HARDNESS:	SOFT
ARRANGEMENT:	ALTERNATE
VENATION:	PINNATE
SHAPE:	OBLONG
MARGIN:	ENTIRE
APEX:	ROUNDED
LEAF BASE:	ATENUATE
PETIOLE:	SHORT

Flower
SIZE AND TYPE: 0.5-0.8 CM, INFLORESCENCE IN CORYMB (1.5-4 CM)

Type	Reproduction
HERMAPHRODITE	HERMAPHRODITE
Flowering	Fragrant
	NO

Fruit
SIZE: 6mm

Type	Color
POMES	RED
Edible	Fruiting season
NO	OCT-MAR

Growth

Rate	Longevity
MEDIUM	0-25 YEARS







ECOLOGY

Climate
ALTITUDE: 0-1000
IRRIGATION: MODERATE

Temperature	Drought resistant
-5ºC,H4,Z6	MODERATE
Sun exposure	Frost resistant
SUN/PARTIAL SHADE	MODERATE

Soil
pH: 6.5-7.5
FERTILITY: MODERATE

Texture	Salt resistant
LOAMY	MODERATE
Drainage	Lime resistant
MODERATE	MODERATE

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	YES	HEDGE ROWS:	NO
POLLUTION:	HIGH	RIVERBANKS:	NO	BORDERS:	YES
WIND:	LOW	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Native to Southeastern China in the Yunnan province. It is cultivated for its abundant fruits and has beautiful autumn colors. If planted isolated on a meadow, it will exhibit and highlight its natural appearance or exhibit geometric or more compact shapes. They do very well in mixed borders and can be used as small border plants. Used as a background element or in intermediate locations can provide foliar textures and vivid winter tones.

SPACING: 0.80 M

PLANTING AND PLANT HEALTH

It prefers temperate climate but has good resistant to cold. It does not support excessve moisture in the soil, but can withstand medium humidity in the environment and sun or partial shade. Pruning is not necessary (at most every 4-5 years). It propagates by seed, of slow germination, after stratification. Also by grafting, cutting or layering.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing | Planting | Pruning x

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation (L)	Height(cm)	Topiary shapes
CT(5)	60-80	
CT(10)	80-100	
CT(30)	125-150	

Cotoneaster

Cotoneaster salicifolius

ORNAMENTAL SHRUB

COTONEASTER (SPANISH) | VALENCIAN | WILLOW LEAVED COTONEASTER (ENGLISH) | C. À FEUILLE DE SAULE (FRENCH)

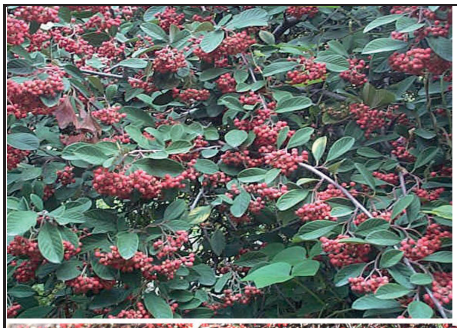
STRUCTURE		
Shape: IRREGULAR	Height: 4.5-5 M	Diameter: 4.5-5 M
Texture: FINE	Shade: PARTIAL	Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	ROSALES
FAMILY:	ROSACEAE

VARIETIES

MORPHOLOGY

Trunk		
Leaf: PERSISTENT; SIZE: LEAF: 3-9 CM; COLOR: US: DK.GREEN, LS: GRAY; TEXTURE: US: ROUGH, LS:TOMENTOSE	COMPOUND: NO; HARDNESS: SOFT; ARRANGEMENT: ALTERNATE; VENATION: PINNATE; SHAPE: LANCEOLATE; MARGIN: ENTIRE; APEX: ACUMINATE; LEAF BASE: ATENUATE; PETIOLE: SHORT	
Flower; SIZE AND TYPE: 0.5-0.8 CM, INFLORESCENCE IN CORYMB (3-5)	Type: HERMAPHRODITE; Flowering	Reproduction: HERMAPHRODITE; Fragrant: NO
Fruit; SIZE: 6mm	Type: POME; Edible: NO	Color: RED; Fruiting season: OCT-MAR
Growth	Rate: MEDIUM	Longevity: 0-25 YEARS







ECOLOGY

Climate; ALTITUDE: 0-1000; IRRIGATION: MODERATE	Temperature: -5ºC,H4,Z6; Sun exposure: SUN/PARTIAL SHADE	Drought resistant: MODERATE; Frost resistant: MODERATE
Soil; pH: 6.5-7.5; FERTILITY: MODERATE	Texture: LOAM; Drainage: MODERATE	Salt resistant: MODERATE; Lime resistant: MODERATE

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	YES	HEDGE ROWS:	NO
POLLUTION:	MODERATE	RIVERBANKS:	NO	BORDERS:	NO
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Native to Western China, this species of shrub can reach heights of four meters. As its name indicates, it has leaves similar to those of willows, that is, long and narrow. Its arching branches help give it an elegant appearance. They are cultivated for their beautiful autumn fruits, as isolated shrubs and forming free-growing hedges.

SPACING: 3 M

PLANTING AND PLANT HEALTH

This shrub is resistant to cold and to all types of soil, but it prefers medium humidity and has low resistence to moisture in the soil. It prefers full sun, but can support full shade. The previous year's branches should be shortened at the end of spring, leaving the withered flowers to form the fruit in autumn. Propagation by semi-herbaceous cuttings and grafting. Pruning will shorten last year's branches in late spring, letting faded flowers develop fruit in the fall.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
				X	X	X	X				

Sowing | Planting | Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shapes
CT(5)	60-80	
CT(10)	80-100	
CT(30)	125-150	

Cytisus

ORNAMENTAL SHRUB

Cytisus scoparius

RETAMA BORDE	GINESTRELL	SCOTCH BROOM	GENÊT À BALAIS
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE

Shape	Height	Diameter
IRREGULAR	3 M	3 M
Texture	**Shade**	**Root**
MEDIUM	PARTIAL	SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	FABALES
FAMILY:	FABACEAE

VARIETIES

MORPHOLOGY

Trunk

Leaf

DECIDUOUS

SIZE: LEAF: 0.5 CM
LEAFLET:1-3 CM
COLOR: US: DK. GREEN
LS: GREEN
TEXTURE: US: SMOOTH
LS : SMOOTH

COMPOUND:	PINNATE
HARDNESS:	SOFT
ARRANGEMENT:	ALTERNATE
VENATION:	PINNATE
SHAPE:	OVOID
MARGIN:	ENTIRE
APEX:	ROUNDED
LEAF BASE:	ATTENUATE
PETIOLE:	SHORT

Flower

Type	Reproduction
HERMAPHRODITE	HERMAPHRODITE

SIZE AND TYPE: 1-2 CM

Flowering	Fragrant
SOLITARY OR IN PAIRS	NO

Fruit

SIZE:

Type	Color
LEGUME	GRAY/BLACK
Edible	**Fruiting season**

Growth

Rate	Longevity
MEDIUM	0-25 YEARS










ECOLOGY

Climate

ALTITUDE: 0-1000
IRRIGATION: MODERATE

Temperature	Drought resistant
-5ºC,H4,Z6	MODERATE
Sun exposure	**Frost resistant**
SUN	MODERATE

Soil

pH: 6.5-7.5
FERTILITY : MODERATE

Texture	Salt resistant
LOAMY	MODERATE
Drainage	**Lime resistant**
MODERATE	MODERATE

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	NO	HEDGE ROWS:	NO
POLLUTION:	MODERATE	RIVERBANKS:	NO	BORDERS:	NO
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Commonly known as broom or cythysse. These shrubs are resistant, fast-growing and are made up of multiple and very thin branches. It is recommended to plant brooms with other shrubs and perennial plants in groups to recreate scenes with a strong natural accent. Given its tendency to become bare at its lower part over time (which can be considered unsightly) planting smaller-growing species (such as medium-growing heathers) at its base is recommended. It is used as a rockery plant. Although it is considered a deciduous shrub, it acts as an evergreen.

SPACING:2 m

PLANTING AND PLANT HEALTH

They prefer sunny or very bright exposures but should be planted at a good distance from coastal areas. Although they prefer acidic soils, they support poor and loose ones. Prune only when absolutely necessary and after flowering. If pruned during the winter the following season's growth will be at risk. No more than half of the stems that have given flowers should be pruned. This shrubs supports moderate irrigation, without overwatering or waterlogging. Propagation is by seed. Hybrids are propagated by cuttings in summer, after flowering.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
							X	X	X	X	X

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shapes
CT(5)	60-80	
CT(10)	80-100	
CT(30)	125-150	

Datura

Datura arborea

ORNAMENTAL SHRUB

TROMPETA DEL JUICIO	TROMPO FRARE	PERUVIAN TRUMPETS	DATURA
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Shape: OVAL	Height: 3-5 M	Diameter: 3 M
Texture: MEDIUM	Shade: PARTIAL	Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	SOLANALES
FAMILY:	SOLANACEAE

VARIETIES

MORPHOLOGY

Trunk		
Leaf	COMPOUND: NO	
	HARDNESS: SOFT	
SEMI -PERSISTENT	ARRANGEMENT: ALTERNATE	
SIZE: LEAF:10-12CM	VENATION: PINNATE	
	SHAPE: OVOID	
COLOR: US: GREEN	MARGIN: ENTIRE	
LS:GREEN	APEX: ACUTE	
TEXTURE: US: PUBESCENT	LEAF BASE: ATTENUATE	
LS: PUBESCENT	PETIOLE: SHORT	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE AND TYPE: 15-30 CM, SINGLE INFLORESCENCE	Flowering	Fragrant: YES
Fruit	Type	Color
SIZE:	Edible	Fruiting season
Growth	Rate: MEDIUM	Longevity: 0-25 YEARS







ECOLOGY

Climate	Temperature: -3ºC.,H4,Z6	Drought resistant: MODERATE
ALTITUDE: 0-500	Sun exposure: SUN	Frost resistant: MODERATE
IRRIGATION: MODERATE		
Soil	Texture: LOAMY	Salt resistant: MODERATE
pH: 6.5-8	Drainage: MODERATE	Lime resistant: MODERATE
FERTILITY: MODERATE		

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	NO	HEDGE ROWS:	NO
POLLUTION:	MODERATE	RIVERBANKS:	NO	BORDERS:	NO
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Commonly known as "Trumpet of Judgment" or "Tree of Trumpets". It is native to Peru, Chile and Ecuador. Of medium-fast growth, it is used as an isolated shrub in gardens due to its striking tubular-bell-shaped hanging flowers which are fragrant at sunset. However, care must be taken due to its toxicity.

SPACING: 2 M

PLANTING AND PLANT HEALTH

Suitable for hot climates, it is sensitive to frost, although it resists light ones. It prefers hardy, light and healthy soils, rich in organic matter. Somewhat resistant to drought and partial shade, but better suited to sun and medium humidity. It requires severe pruning in early spring. Propagation is easy by herbaceous cuttings in spring.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
	X	X	X	X	X						

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shape
CT(5)	60-80	
CT(10)	80-100	
CT(30)	125-150	

Datura

Datura sanguinea

ORNAMENTAL SHRUB

SPANISH	VALENCIAN	ENGLISH	FRENCH
TROMPETA ROJA		RED ANGEL´S TRUMPET	DATURA

STRUCTURE		
Shape: OVAL	Height: 3-5 M	Diameter: 3 M
Texture: MEDIUM	Shade: PARTIAL	Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	SOLANALES
FAMILY:	SOLANACEAE

VARIETIES

MORPHOLOGY

Trunk		
Leaf: SEMI-PERSISTENT; SIZE: LEAF: 15-25CM; COLOR: US: GREEN, LS: GREEN; TEXTURE: US: PUBESCENT, LS :PUBESCENT	COMPOUND: NO; HARDNESS: SOFT; ARRANGEMENT: ALTERNATE; VENATION: PINNATE; SHAPE: OVOID; MARGIN: ENTIRE; APEX: ACUTE; LEAF BASE: ATTENUATE; PETIOLE: SHORT	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE AND TYPE: 15-20 CM, SINGLE INFLORESCENCE	Flowering	Fragrant: YES
Fruit: SIZE:	Type: CAPSULE	Color
	Edible	Fruiting season
Growth	Rate: MEDIUM	Longevity: 0-25 YEARS








ECOLOGY

Climate: ALTITUDE: 0-500; IRRIGATION: MODERATE	Temperature: -3ºC,H5,Z6	Drought resistant: MODERATE
	Sun exposure: SUN	Frost resistant: MODERATE
Soil: pH: 6.5-8; FERTILITY: MODERATE	Texture: LOAMY	Salt resistant: MODERATE
	Drainage: MODERATE	Lime resistant: MODERATE

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	NO	HEDGE ROWS:	No
POLLUTION:	MODERATE	RIVERBANKS:	NO	BORDERS:	No
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Native to Colombia, Chile and Peru. It is used as an isolated shrub or in shrub-tree compositions or mixed flowerbeds. It is very decorative due to its elegant flowering. Care must be taken due to its toxicity.

SPACING: 2 M

PLANTING AND PLANT HEALTH

Is sensitive to cold and does not tolerate strong frosts and therefore best adapted to warm climates. It requires hardy, moderately clayey, humus-rich soil with good drainage. Somewhat resistant to drought but welcomes a high irrigation programme in the summer. It is sensitive to root asphyxiation. It prefers medium humidity and sun, although it tolerates partial shade. After flowering it is advisable to reduce the length of the branches by pruning to stimulate new appearance of flowers. Propagation is easy by herbaceous cuttings in spring-summer. Layering to be carried out in spring.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
X	X									X	X

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shapes
CT(5)	60-80	
CT(10)	80-100	
CT(30)	125-150	

Deutzia

Deutzia scabra var. *candidissima*

ORNAMENTAL SHRUB

DEUTZIA SPANISH | DEUTZIA VALENCIAN | DEUTZIA ENGLISH | DEUTZIA FRENCH

STRUCTURE

Shape	Height	Diameter
IRREGULAR	1-3 M	3 M
Texture	**Shade**	**Root**
MEDIUM	PARTIAL	SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOYILEDONS
ORDER:	CORNALES
FAMILY:	HYDRANGEACEAE

VARIETIES

PRIDE OF ROCHESTER

MORPHOLOGY

Trunk

Leaf

DECIDUOUS

SIZE: LEAF: 3-8 CM

COLOR: US: DK. GREEN

LS: DK. GREEN

TEXTURE: LS: ROUGH

US: TOMENTOSE

COMPOUND:	NO
HARDNESS:	SOFT
ARRANGEMENT:	OPPOSITE
VENATION:	PINNATE
SHAPE:	OVAL
MARGIN:	DENTATE
APEX:	ACUTE
LEAF BASE:	ATTENUATE
PETIOLE:	2-4 mm

Flower

Type	Reproduction
HERMAPHRODITE	HERMAPHRODITE

SIZE AND TYPE: 2-4 CM; INFLORESCENCE IN RACEMES (6-12 CM)

Flowering | Fragrant: NO

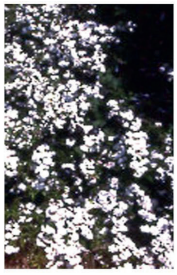
Fuit

SIZE:

Type	Color
CAPSULE	
Edible	Fruiting season

Growth

Rate	Longevity
MEDIUM	0-25 YEARS








ECOLOGY

Climate

ALTITUDE: 0-1000

IRRIGATION: MODERATE

Temperature	Drought resistant
-5ºC,H4,Z6	MODERATE
Sun exposure	**Frost resistant**
SUN/PARTIAL SHADE	MODERATE

Soil

pH: 6.5-7.5

FERTILITY: MODERATE

Texture	Salt resistant
LOAMY	MODERATE
Drainage	**Lime resistant**
MODERATE	MODERATE

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPE:	NO	HEDGE ROWS:	NO
POLLUTION:	MODERATE	RIVERBANKS:	NO	BORDERS:	NO
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Native to China and Japan. If this shrub has ample space to grow, it will bloom profusely. Given its medium size and low density, it is recommended in small gardens or to form groups in large gardens. It covers its graceful arching branches with snow white flowers in spring. It requires generously mulched soil, dappled shade, and weekly irrigation. Planting evergreens is recommended to hide its characteristic bare base.

SPACING: 1 M

PLANTING AND PLANT HEALTH

It resists frosts but it is affected by late ones. Although undemanding in terms of soil (as long as it is permeable) it prefers fertile ones. It is advisable to maintain a moderate irrigation programme in the summer. It adapts well to sunny or partial shade exposures and medium humidity. It is easy to grow and should be pruned every year after flowering, removing the stems that have flowered and also removing old, unproductive branches. Propagation by semi-woody or woody cuttings in summer-autumn.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
						X	X	X	X		

Sowing | Planting | Pruning X

Treatments Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary Shape
CT(5)	60-80	
CT(10)	80-100	
CT(30)	125-150	

Echium

Echium fastuosum

ORNAMENTAL SHRUB

VIVORERA (SPANISH) | VALENCIAN | PRIDE OF MADEIRA (ENGLISH) | VIPÉRINE DE MADÈRE (FRENCH)

STRUCTURE		
Shape: IRREGULAR	Height: 0.6-1 M	Diameter: 0.6-1 M
Texture: MEDIUM	Shade: PARTIAL	Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	BORAGINALES
FAMILY:	BORAGINACEAE

VARIETIES

MORPHOLOGY

Trunk		
Leaf: PERSISTENT; SIZE: LEAF 5-10 CM; COLOR: US: GREEN/GRAY, LS: GREEN; TEXTURE: US: TOMENTOSE, LS: TOMENTOSE	COMPOUND: NO; HARDNESS: SOFT; ARRANGEMENT: ALTERNATE; VENATION: PINNATE; SHAPE: LANCEOLATE; MARGIN: ENTIRE; APEX: ACUTE; LEAF BASE: ATTENUATE; PETIOLE: SHORT	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE AND TYPE:	Flowering: INFLORESCENCE IN PANICLE (15-25 CM)	Fragrant: NO
Fruit: SIZE:	Type: NUT	Color
	Edible	Fruiting season
Growth	Rate: MEDIUM	Longevity: 0-25 YEARS










ECOLOGY

Climate: ALTITUDE: 0-400; IRRIGATION: LOW	Temperature: 0ºC,H5,Z6	Drought resistant: MODERATE
	Sun Exposure: SUN	Frost resistant: LIGHT
Soil: pH: 6.5-7.5; FERTILITY: MODERATE	Texture: LOAMY	Salt resistant: MODERATE
	Drainage: MODERATE	Lime resistant: MODERATE

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	NO	HEDGE ROWS:	No
POLLUTION:	MODERATE	RIVERBANKS:	NO	BORDERS:	NO
WIND:	MODERATE	GROUPS:	NO	ISOLATED:	YES

POINTS OF INTEREST

Native to the Canary Islands. Given its beautiful flowering, it is primarily used in isolated groups. It is a striking and undemanding plant related to the edible borage.

SPACING : 1 M

PLANTING AND PLANT HEALTH

This shrub is delicate to the cold, requires good exposure. It is undemanding in terms of soil although it prefers light and loamy ones. Overwatering and waterlogging must be avoided. It is also hardy when it comes to humidity, preferring full sun. Dry flowering stems should be removed. It can be propagated by seed and cuttings.

CHROMATIC CALENDAR

Foliage, Flowering Fruiting season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
					X	X	X				

Sowing | Planting | Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shape
CT(5)	60-80	

Eleagnus

Eleagnus pungens

ORNAMENTAL SHRUB

ELEAGNO		SILVERBERRY, RUSSIAN OLIVE	CHALEF PIQUAN
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Shape: OVOID	Height: 1-4 M	Diameter: 1-3 M
Texture: MEDIUM	Shape: PARTIAL	Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOYILEDONS
ORDER:	ROSALES
FAMILY	ELEAGNACEAE

VARIETIES
AUREA
MACULATA

MORPHOLOGY

Trunk

Leaf
PERSISTENT
SIZE: LEAF: 4-8 CM
COLOR: US: DK. GREEN
LS: SILVER
TEXTURE: US: SMOOTH
LS :SMOOTH

COMPOUND: NO
HARDNESS: SOFT
ARRANGEMENT: ALTERNATE
VENATION: PINNATE
SHAPE: OBLONG
MARGIN: ENTIRE
APEX: ACUTE
LEAF BASE: ATTENUATE
PETIOLE: SHORT

Flower
SIZE AND TYPE: 1-1.2 CM, CLUSTERS OF 2 OR 3 FLOWERS
Type: HERMAPHRODITE
Reproduction: HERMAPHRODITE
Flowering: YES
Fragrant: YES

Fruit
SIZE: 1.5 CM
Type: BERRY
Color: RED
Edible: YES
Fruiting season

Growth
Rate: MEDIUM
Longevity: 0-25 YEARS



ECOLOGY

Climate
ALTITUDE: 0-1000
IRRIGATION: MODERATE
Temperature: -3ºC,H5,Z6
Drought resistant: MODERATE
Sun exposure: SUN/PARTIAL SHADE
Frost resistant: MODERATE

Soil
pH: 6.5-7.5
FERTILITY: MODERATE
Texture: LOAMY
Salt resistant: MODERATE
Drainage: MODERATE
Lime resistant: MODERATE

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	NO	HEDGE ROWS:	YES
POLLUTION:	MODERATE	RIVERBANKS:	NO	BORDERS:	NO
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Native to China and Japan. It has reddish-brown twigs, mostly spiny. It is cultivated for its foliage. It is easy-to-grow and very suitable for forming hedges in unsheltered places. It is adorned with small scented flowers and produces edible red berries.

PLANTING AND PLANT HEALTH

It prefers warm places, although it resists some cold. It is a hardy soil shrub, growing in any well-drained garden soil except shallow or calcareous ones. It prefers fertile, light and fresh soils, adapting to stony ones. It requires a normal irrigation programme. It is important to keep the soil moist and avoid waterlogging. It requires medium humidity and full sun or part-shade. Pruning is not necessary. In spring, simply cut off unwanted branches. Hedges to be trimmed in early and late summer. It propagates by seeds that germinate in the second year, cuttings from semi-woody branches, layering or grafting in July-August.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
			X	X	X	X	X	X	X		

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation (L)	Height(cm)	Topiary shape
CT(5)	60-80	
CT(10)	80-100	
CT(30)	125-150	

Escallonia

Escallonia rubra var. macrantha

ORNAMENTAL SHRUB

ESCALONIA SPANISH | VALENCIAN | ESCALONIA ENGLISH | ESCALLONIA FRENCH

STRUCTURE		
Shape: IRREGULAR	Height: 1-2 M	Diameter: 1-2 M
Texture: MEDIUM	Shade: PARTIAL	Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOYILEDONS
ORDER:	ESCALLONIALES
FAMILY:	ESCALLONIACEAE

VARIETIES

MORPHOLOGY

Trunk		
Leaf: PERSISTENT; SIZE: LEAF: 2-5 CM; COLOR: US: DK. GREEN, LS:GREEN; TEXTURE: US: SMOOTH, LS :SMOOTH	COMPOUND: NO; HARDNESS: CORIACEOUS; ARRANGEMENT: ALTERNATE; VENATION: PINNATE; SHAPE: OVAL; MARGIN: DENTATE; APEX: ACUTE; LEAF BASE: ATTENUATE; PETIOLE: SHORT	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE AND TYPE: 1.5-2 CM, INFLORESCENCE IN RACEMES	Flowering	Fragrant: NO
Fruit: SIZE:	Type: CAPSULE	Color
	Edible	Fruiting season
Growth	Rate: MEDIUM	Longevity: 0-25 YEARS








ECOLOGY

Climate	Temperature: -5ºC,H4,Z6	Drought resistant: MODERATE
ALTITUDE: 0-1000	Sun exposure: SUN/PARTIAL SHADE	Frost resistant: MODERATE
IRRIGATION: MODERATE		
Soil	Texture: LOAMY	Salt resistant: MODERATE
pH: 6.5-8	Drainage: MODERATE	Lime resistant: MODERATE
FERTILITY: MODERATE		

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	NO	HEDGE ROWS:	YES
POLLUTION:	MODERATE	RIVERBANKS:	NO	BORDERS:	NO
WIND:	MODERATE	GROUPS:	TES	ISOLATED:	YES

POINTS OF INTEREST

Native to South America, in particular from Chile and Argentina. The different species of escalonia adapt better to mild climates and mild winters. They grow very well in coastal areas where salt water and sea winds would otherwise kill other shrubs. They are also ideal for composing formal hedges that are frequently cut with pruning shears for topiary. It is often used as a border or natural fencing for gardens of single-family homes and because of their rapid growth,they quickly fulfill their purpose.

SPACING: 1 M

PLANTING AND PLANT HEALTH

In areas where strong and repeated frosts occur, they can suffer damage but if pruned, they sprout again in spring. Bright, sunny positions are best, but partial shade is recommended in places with strong summer sunshine. They need fertile soil with an abundance of organic matter, and even fertilizer during the warm season. Alkaline soils are not recommended. It is pruned in mid-spring and late summer to maintain its regular shape. If left to grow freely, it is advisable to cut the tips of the branches in winter so that they take on a more compact form.

CHROMATIC CALENDAR

Foliage, Flowering, Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
			X	X	X			X	X	X	X

Sowing Planting Pruning X

Treatments Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shape
CT(5)	60-80	
CT(10)	80-100	
CT(30)	125-150	

Euonymus

ORNAMENTAL SHRUB

Euonymus japonicus

BONETERO DEL JAPON (SPANISH) | VALENCIAN | JAPANESE SPINDLE (ENGLISH) | FUSAIN DU JAPON (FRENCH)

STRUCTURE

Shape	Height	Diameter
OVOID	2-7 M	2-4 M
Texture	**Shade**	**Root**
MEDIUM	PARTIAL	SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	CELASTRAES
FAMILY:	CELASTRACEAE

VARIETIES

ALBOMARGINATUS
AUREOMARGINATUS
PRESIDENT GAUTHIER

MORPHOLOGY

Trunk

Leaf

PERSISTENT
SIZE: LEAF: 3-7 CM
COLOR: US: DK. GREEN
LS: GREEN
TEXTURE: US: SMOOTH
LS: SMOOTH

COMPOUND:	NO
HARDNESS:	CORIACEOUS
ARRANGEMENT:	OPPOSITE
VENATION:	PINNATE
SHAPE:	OVAL
MARGIN:	ASERRATE
APEX:	ROUNDED
LEAF BASE:	ATTENUATE
PETIOLE:	SHORT

Flower

Type	Reproduction
HERMAPHRODITE	HERMAPHRODITE

SIZE AND TYPE: 0.5-0.8 CM, INFLORESCENCE IN CYMES (5-12 flowers)

Flowering | Fragant: NO

Fruit

SIZE: 8 MM

Type	Color
CAPSULE	RED
Edible	Fruiting season
NO. TOXIC	NOV-JAN

Growth

Rate	Longevity
MEDIUM	50 Years

ECOLOGY

Climate

ALTITUDE: 0-1000
IRRIGATION: MODERATE

Temperature	Drought resistant
-5ºC,H4,Z6	MODERATE
Sun Exposure	Frost resistant
SUN/PARTIAL SHADE	MODERATE

Soil

pH: 6.5-8
FERTILITY: MODERATE

Texture	Salt resistant
LOAMY	MODERATE
Drainage	Lime resistant
MODERATE	MODERATE

USES

Resistances		Applications			
COASTAL:	1ST LINE	SLOPES:	NO	HEDGE ROWS:	YES
POLLUTION:	MODERATE	RIVERBANKS:	NO	BORDERS:	YES
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	YES



POINTS OF INTEREST

It is a popular shrub used in gardening for its evergreen leaves and great decorative variety. It has rounded dark green leaves in the original species, but its varieties include different shades and spots of green in its margins. They are primarily used as low clipped hedges and topiary. However, if allowed to grow freely they acquire a very interesting irregular shape. Due to the numerous varieties available, it is important to consider and choose the one that best suits the landscape and the gardeners intended purpose. The names of species are endless but it is worth highlighting the cultivated and widely distributed variety "President Gauthier".

SPACING: 1.5 M

PLANTING AND PLANT HEALTH

They should be planted in rich soil to which large amounts of organic fertilizers have been added. They are very useful plants, especially for calcareous soils. It does not dry out in summer. They grow best with a regular irrigation programme. They tolerate all types of pruning. Normally, in order to keep their shape close and regular, hedges are pruned in mid-spring. It prefers a temperate climate and is resistant to heat. They also prefer moist environments. Propagation by semi-woody cutting in a propagation greenhouse, in spring-summer. It is very sensitive to powdery mildew and mealybugs.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
		X X X		X X X X				X	X X X		

Sowing | Planting | Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shapes
CT(5)	60-80	Yes
CT(10)	80-100	Yes
CT(30)	125-150	Yes

Genista *Genista monosperma*

ORNAMENTAL SHRUB

RETAMA BLANCA SPANISH	VALENCIAN	BROOM ENGLISH	GENÊT FRENCH

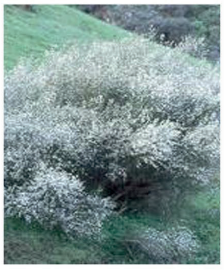
STRUCTURE		
Shape: EXTENDED	Height: 2-3 M	Diameter: 2-3 M
Texture: FINE	Shape: LIGHT	Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	FABALES
FAMILY:	LEGUMINOSAE

VARIETIES

MORPHOLOGY

Trunk		
Leaf DECIDUOUS; SIZE: LEAF:0.5-1.5cm; COLOR: US: LIGHT GREEN, LS: LIGHT GREEN; TEXTURE: US: PUBESCENT, LS: PUBESCENT	COMPOUND: NO; HARDNESS: BASAL TUFT/FLESHY; ARRANGEMENT: ALTERNATE; VENATION: PINNATE; SHAPE: LINEAR; MARGIN: ENTIRE; APEX: ACUTE; LEAF BASE: ATTENUATE; PETIOLE: SHORT	
Flower SIZE AND TYPE: 1-1.2 CM, INFLORESCENCE IN RACEMES (20-30 CM)	Type: HERMAPHRODITE; Flowering	Reproduction: HERMAPHRODITE; Fragrant: YES
Fruit SIZE: 1.5 CM	Type: LEGUME; Edible	Color: BROWN; Fruiting season
Growth	Rate: MEDIUM	Longevity: 50 YEARS






ECOLOGY

Climate ALTITUDE: 0-1000; IRRIGATION: MODERATE	Temperature: -5ºC,H4,Z6	Drought resistant: HIGH
	Sun exposure: SUN	Frost resistant: MODERATE
Soil pH: 6.5-8; FERTILITY: MODERATE	Texture: ALL TYPES	Salt resistant: MODERATE
	Drainage: MODERATE	Lime resistant: MODERATE

USES

Resistances		Applications			
COASTAL:	1ST LINE	SLOPES:	YES	HEDGE ROWS:	NO
POLLUTION:	MODERATE	RIVERBANKS:	NO	BORDERS:	NO
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

This shrub requires little maintenance. Its scientific name *Genista* , derives from the Celtic word "gen", which means "bush" and was already used in ancient Roman times to define the plants belonging to the genus *Genista* , *Spartium* and *Cytissus* . The genista broom belongs, like the *Cytisus* , to the populous family of legumes. They are useful for fixing dunes. The vivid color of its flowers and its particular size make this broom suitable for meadows and slopes, large rockeries and curbsides. It is advisable to plant genistas in combination with other shrubs and with perennials since this will ensure maxiumum potential of the plant.

SPACING: 2 M

PLANTING AND PLANT HEALTH

Soil must be poor, loose and not calcareous. Tolerates limestone and salt. To create a long lasting effect, it should be pruned severely in winter after flowering, but without cutting old branches. Blooms on wood of the same year. Dormant in summer, green but leafless, photosynthesis is limited to the stems. It supports drought. In general, this shrub requires a moderate irrigation programme but in the hot summer months, a high irrigation programme is recommended. The ideal altitude is less than 300 m. Propagation by seed, cutting, layering, sprouting and grafting. This shrub can be difficult to transplant in spring.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
				X	X	X	X				

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shape
CT(5)	60-80	
CT(10)	80-100	
CT(30)	125-150	

Hibiscus

Hibiscus rosa-sinensis

ORNAMENTAL SHRUB

ROSA DE CHINA (SPANISH) | VALENCIAN | ROSE OF CHINA (ENGLISH) | ROSE DE CHINE (FRENCH)

STRUCTURE

Shape	Height	Diameter
ROUND	2-4 M	2 M
Texture	**Shade**	**Root**
MEDIUM	PARTIAL	SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	MALVALES
FAMILY:	MALVACEAE

VARIETIES

MORPHOLOGY

Trunk

Leaf

EVERGREEN

SIZE: LEAF:10-15 CM

COLOR: US: DK. GREEN

LS: DK. GREEN

TEXTURE: US: SMOOTH

LS: SMOOTH

COMPOUND:	NO
HARDNESS:	SOFT
ARRANGEMENT:	OPPOSITE
VENATION:	PINNATE
SHAPE:	OVAL
MARGIN:	CRENATE
APEX:	ACUTE
LEAF BASE:	ATTENUATE
PETIOLE:	SHORT

Flower

Type	Reproduction
HERMAPHRODITE	HERMAPHRODITE

SIZE AND TYPE: 20-30 CM, SOLITARY OR DOUBLE

Flowering

Fragrant: NO

Fruit

SIZE:

Type	Color
CAPSULE	
Edible	Fruiting season

Growth

Rate	Longevity
FAST	0-25 YEARS








ECOLOGY

Climate

ALTITUDE: 0-500

IRRIGATION: MODERATE

Temperature	Drought resistant
-2ºC,H5,Z6	HIGH
Sun exposure	Frost resistant
SUN	LIGHT

Soil

pH: 6.5-7.5

FERTILITY: MODERATE

Texture	Salt resistant
LOAMY	NO
Drainage	Lime resistant
MODERATE	MODERATE

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	NO	HEDGE ROWS:	NO
POLLUTION:	MODERATE	RIVERBANKS:	NO	BORDERS:	YES
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Native to tropical Asia. It is recommended to place in heterogeneous shrubby groups or in groups that bring together different varieties of this same species. It can be used to create a good backdrop for mixed borders and is also suitable for emphasizing angles, marking doorways or serving as a pot plant.

SPACING: 2 M

PLANTING AND PLANT HEALTH

Hot spring and summer periods are necessary for the flowering to develop in all its splendor. In northern regions it is advisable to cultivate by taking advantage of the shelter of a south facing wall. Porous, lime, rather dry and poor soils are ideal for this shrub. The Hibiscus admits cutting and shaping. When flowering on the branches of the same season, it is advisable to severely prune the shoots of the previous year, shortening it to 3 buds on the main structure, at the beginning of spring and before the appearance of new stems.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
		X	X	X	X						

Sowing | Planting | Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shape
CT(5)	60-80	
CT(10)	80-100	
CT(30)	125-150	

Hibiscus

Hibiscus syriacus

ORNAMENTAL SHRUB

ROSA DE SIRIA (SPANISH) | VALENCIAN | ROSE OF SHARON (ENGLISH) | MAUVE EN ARBRE (FRENCH)

STRUCTURE		
Shape: OVOID	Height: 2.5-4 M	Diameter: 1.5 M
Texture: MEDIUM	Shade: DENSE	Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	MALVALES
FAMILY:	MALVACEAE

VARIETIES

MORPHOLOGY

Trunk

Leaf: DECIDUOUS
SIZE: LEAF: 5-8 CM; LEAFLET: 5-8
COLOR: US: MID GREEN; LS: SMOOTH
TEXTURE: US: SMOOTH; LS : SMOOTH

COMPOUND:	YES
HARDNESS:	SOFT
ARRANGEMENT:	ALTERNATE
VENATION:	PINNATE
SHAPE:	OBLONG
MARGIN:	LOBULATE
APEX:	ACUTE
LEAF BASE:	ATTENUATE
PETIOLE:	SHORT

Flower

Type	Reproduction
HERMAPHRODITE	HERMAPHRODITE

SIZE AND TYPE: 6-10 CM, SOLITARY | Flowering | Fragrant: NO

Fruit

Type	Color
CAPSULE	BROWN
Edible: NO	Fruiting season

SIZE:

Growth

Rate	Longevity
MEDIUM/FAST	25 YEARS





ECOLOGY

Climate: ALTITUDE: 0-1000; IRRIGATION: MODERATE

Soil: pH: 6-8; FERTILITY: MODERATE

Temperature: -6ºC,H4,Z6	Drought resistant: MODERATE
Sun exposure: FULL SUN	Frost resistant: YES
Texture: ALL TYPES	Salt resistant: MODERATE
Drainage: MODERATE	Lime resistant: MODERATE

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	NO	HEDGE ROWS:	NO
POLLUTION:	MODERATE	RIVERBANKS:	NO	BORDERS:	NO
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Native to tropical Asia. It is recommended to place in heterogeneous shrubby groups or in groups that bring together different varieties of this same spieces. It can be used to create a good backdrop for mixed borders and is also suitable for emphasizing angles, marking doorways or serving as a pot plant. It has given numerous cultivated varieties and interesting hues that can offer flowers of up to 12 cm.

SPACING: 2 M

PLANTING AND PLANT HEALTH

For temperate climate, it resists cold but is affected by late frosts. It adapts to a wide variety of soils and conditions, preferring well-drained, light, permeable and unfertilized ones (very rich, clayey soils do not favor growth). They require a high irrigation programme in the first months of growth and flowering but once established, it needs little irrigation. Prefers moderate humidity and full sun. Faded inflorescences must be deadheaded. When flowering on the branches of the same season, it is advisable to severely prune the shoots of the previous year, shortening it to 3 buds on the main structure, at the beginning of spring and before the appearance of new stems. Propagation is easy and carried out in summer by planting 5 cm semi-woody cuttings or tender cuttings in late spring.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing | Planting | Pruning [X]

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shape
CT(5)	60-80	
CT(10)	80-100	
CT(30)	125-150	

Jasminum

Jasminum officinale grandiflorum

ORNAMENTAL SHRUB

JAZMIN REAL	GESMILER	JASMINE	JASMIN
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE

Shape	Height	Diameter
ROUND	2-4 M	2 M
Texture	**Shade**	**Root**
MEDIUM	PARTIAL	SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	LAMIALES
FAMILY:	OLEACEAE

VARIETIES

MORPHOLOGY

Trunk

Leaf

EVERGREEN

SIZE: LEAF: 0-15CM
LEAFLET:1-7CM

COLOR: US: DK. GREEN
LS: DK. GREEN

TEXTURE: US: SMOOTH
LS: SMOOTH

COMPOUND:	YES. IMPARIPINNATE
HARDNESS:	SOFT
ARRANGEMENT:	OPPOSITES
VENATION:	PINNATE
SHAPE:	OVAL
MARGIN:	CRENATE
APEX:	ACUTE
LEAF BASE:	ATTENUATE
PETIOLE:	SHORT

Flower

SIZE AND TYPE: 2-3 CM; INFLORESCENCE IN PANICLE (2-10 FLOWERS)

Type	Reproduction
HERMAPHRODITE	HERMAPHRODITE
Flowering	**Fragrant**
	YES

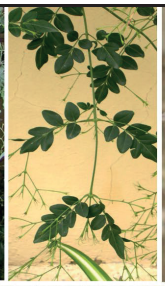
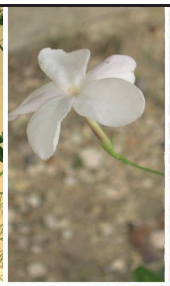
Fruit

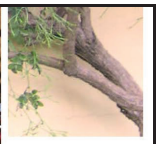
SIZE:

Type	Color
CAPSULE	
Edible	**Fruiting season**

Growth

Rate	Longevity
FAST	0-25 YEARS





ECOLOGY

Climate

ALTITUDE: 0-500
IRRIGATION: MODERATE

Temperature	Drought resistant
-2ºC,H5,Z6	HIGH
Sun Exposure	**Frost resistant**
SUN	LIGHT

Soil

pH: 6.5-7.5
FERTILITY: MODERATE

Texture	Salt resistant
LOAMY	NO
Drainage	**Lime resistant**
MODERATE	MODERATE

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	NO	HEDGE ROWS:	NO
POLLUTION:	MODERATE	RIVERBANKS:	NO	BORDERS:	NO
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Native to Central and Western Asia. In Spain it has found a suitable environment and where it has long been naturalized. It can be left to grow on a wall. Upon reaching the upper parts, it will develop ridges giving it a very interesting volume effect. It can also be used to cover part of a wall by tying down some of its main branches. It is preferable to place it near a living or transit area to enjoy its pleasant fragrance. It is an ideal species to include as a terrace or porch plant, where its aesthetic and fragrant effect will create a more pleasant space.

SPACING: 2 M

PLANTING AND PLANT HEALTH

It should be planted in full sun. In northern regions this species requires a sheltered garden area. Plenty of sunshine will guarantee rich and abundant blooms. Soil can be poor but must have good drainage. It is sensitive to cold, but recovers with pruning. It requires normal irrigation. Overwatering and waterlogging must be avioded. It prefers moderate humidity. Pruning is not necessary, although tolerated. After flowering, eliminate dead or unwanted stems. Propagation can be carried out in summer months by layering the branches or planting semi-woody cuttings.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
											X

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shape
CT(5)	60-80	
CT(10)	80-100	
CT(30)	125-150	

Lantana

Lantana camara

ORNAMENTAL SHRUB

BANDERITA ESPAÑOLA (SPANISH) | VALENCIAN | LANTANA (ENGLISH) | LANTANA (FRENCH)

STRUCTURE		
Shape: ROUND	Height: 1-2 M	Diameter: 1-2 M
Texture: COARSE	Shade: FULL	Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDON
ORDER:	LAMIALES
FAMILY:	VERBENACEAE

VARIETIES

MORPHOLOGY		
Trunk		
Leaf SEMI PERSISTENT; SIZE: LEAF: 2-10 CM; COLOR: US: DK. GREEN, LS: DK. GREEN; TEXTURE: US: PUBESCENT, LS: PUBESCENT	COMPOUND: NO; HARDNESS: SOFT; ARRANGEMENT: OPPOSITE; VENATION: PINNATE; SHAPE: OVAL; MARGIN: CRENATE; APEX: ACUTE; LEAF BASE: ATTENUATE; PETIOLE: SHORT	
Flower SIZE AND TYPE: 0.7-0.8 CM, INFLOR. IN FLOWERHEAD (CAPITULUM) or (3-5CM)	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE; Flowering; Fragrant: YES
Fruit SIZE: 3 MM	Type: DRUPE	Color: DARK BLUE; Edible; Fruiting season
Growth	Rate: FAST	Longevity: 0-25 YEARS

ECOLOGY		
Climate ALTITUDE: 0-500; IRRIGATION: MODERATE	Temperature: -2ºC,H5,Z6	Drought resistant: HIGH; Sun exposure; Frost resistant: LIGHT
Soil pH: 6.5-8; FERTILITY: MODERATE	Texture: TOLERANT/ALL TYPES	Salt resistant: MODERATE; Drainage: MODERATE; Lime resistant: MODERATE/HIGH

USES				
Resistances		Applications		
COASTAL: 1ST LINE		SLOPES: NO	HEDGE ROWS: NO	
POLLUTION: MODERATE		RIVERBANKS: NO	BORDERS: YES	
WIND: MODERATE		GROUPS: YES	ISOLATED: YES	



POINTS OF INTEREST

Commonly known as "Spanish flag". It is native to the tropics of America. It is a fast growing shrub and is used in groups or to create flower hedges. It is very effective for borders. Its flowery cascades achieve wonderful affects of density and abundance. To do this, it must be planted in a tall planter or on the top of a wall or slope. It spreads easily as a groundcover, colonizing the entire soil surface; as it is able to take root in branch nodes. Only a few specimens are needed to cover a large area.

SPACING: 1 M

PLANTING AND PLANT HEALTH

It is sensitive to cold, preferring warm climates. It should be planted in full sun and in areas with mild winters. Hardy to soils, although it prefers rich and well-drained ones. Tolerates drought, but grows vigorously with a normal garden irrigation programme. Indifferent to humidity, although it prefers medium to high levels. It recovers from the cold with pruning and propagates easily by cutting and by seed. It blooms on year-round wood, so pruning at the beginning of spring or the end of winter is recommended.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
	X	X	X	X	X						

Sowing | Planting | Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary Shape
CT(5)	60-80	

Laurus

Laurus nobilis

ORNAMENTAL SHRUB

LAUREL	LLORER	LAUREL, SWEET BAY	LAURIER FRANC
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE

Shape	Height	Diameter
PYRAMID	12-18 M	10 M
Texture	**Shade**	**Root**
COARSE	FULL	SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	LAURALES
FAMILY:	LAURACEAE

VARIETIES

MORPHOLOGY

Trunk

Leaf

EVERGREEN

SIZE: LEAF: 5-10 CM

COLOR: US: DK. GREEN

LS: DULL GREEN

TEXTURE: US: SMOOTH

LS: SMOOTH

COMPOUND:	NO
HARDNESS:	CORIACEOUS
ARRANGEMENT:	ALTERNATE
VENATION:	PINNATE
SHAPE:	OBLONG/LANCEOLATE
MARGIN:	ENTIRE
APEX:	ACUTE
LEAF BASE:	ATTENUATE
PETIOLE:	SHORT

Flower

SIZE AND TYPE: 0.1-1CM, INFLORESCENCE IN UMBEL (4-6 flowers)

Type	Reproduction
UNISEXUAL	DIOECIOUS
Flowering	**Fragrant**
	SCENTED LEAVES

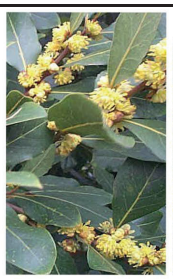
Fruit

SIZE: 1-2 CM

Type	Color
BERRY	BLACK
Edible	**Fruiting season**
NO	EARLY AUTUMN

Growth

Rate	Longevity
FAST	0-25 YEARS





ECOLOGY

Climate

ALTITUDE: 0-800

IRRIGATION: MODERATE

Temperature	Drought resistant
-10ºC,H3,Z5	MODERATE
Sun exposure	**Frost resistant**
SUN	MODERATE

Soil

pH: 6.5-8

FERTILITY: MODERATE

Texture	Salt resistant
LOAMY/SANDY	LOW
Drainage	**Lime resistant**
MODERATE	MODERATE

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	NO	HEDGE ROWS:	YES
POLLUTION:	HIGH	RIVERBANKS:	NO	BORDERS:	NO
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Native to the Mediterranean basin. Its name lends itself to many historical characters and reminds us of a past full of honors; people who achieved some act of bravery, courage or poetic quality were crowned with it. Painted, embroidered or sculpted laurel wreaths have adorned (still today) a multitude of places and public buildings and, to varying degrees to documents, seals or coats of arms. These large shrubs are ideal to be used isolated in some prominent position in the garden. This is an excellent specimen for topiary. Its leaves are very fragrant and can be used as a condiment.

SPACING: 2 M

PLANTING AND PLANT HEALTH

Laurels prefer sunny positions due to their Mediterranean origin. However, they adapt perfectly to shady areas. In fact, they seem to need protection during the first years of their lives. They are suitable for any soil that has excellent drainage capacity, including calcareous ones, but free of salt. Resists severe pruning and topiary. In spring, remove mis-shapen or damaged stems. Propagation by cutting, seed, layering, sapling and grafting. It is sensitive to coccidia attacks and subsequent damage from leafspot. This is a low maintenance shrub.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
		X	X	X	X	X	X	X	X	X	X

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shapes
CT(5)	60-80	
CT(10)	80-100	YES
CT(30)	125-150	YES

Myoporum

Myoporum tenuifolium

ORNAMENTAL SHRUB

MIOPORO SPANISH	MIOPOR VALENCIAN	MYOPORUM ENGLISH	MYOPORUM FRENCH

STRUCTURE		
Shape: ROUND	Height: 3.5 M	Diameter: 3.5 M
Texture: COARSE	Shade: FULL	Root: SCATTERED/FIBROUS

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	LAMIALES
FAMILY:	SCROPHULARIALES

VARIETIES

MORPHOLOGY

Trunk		
Leaf: PERSISTENT; SIZE: LEAF:4.5-10 CM; COLOR: US: DK. GREEN, LS: DK. GREEN; TEXTURE: US: SMOOTH, LS: SMOOTH	COMPOUND: NO; HARDNESS: SOFT; ARRANGEMENT: ALTERNATE; VENATION: PINNATE; SHAPE: OBLONG/LANCEOLATE; MARGIN: ENTIRE; APEX: ACUTE; LEAF BASE: ATTENUATE; PETIOLE: SHORT	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE AND TYPE: 1.2CM, INFLORESCENCE IN RACEMES (5-9 flowers)	Flowering	Fragrant: YES
Fruit; SIZE:	Type: DRUPE	Color: BLACK
	Edible: YES	Fruiting season
Growth	Rate: FAST	Longevity: 25-50 YEARS



ECOLOGY

Climate	Temperature: -5ºC,H4,Z6	Drought resistant: HIGH
ALTITUDE: 0-800; IRRIGATION: LOW	Sun exposure: SUN	Frost resistant: MODERATE
Soil	Texture: LOAMY/SANDY	Salt resistant: HIGH
pH: 6.5-8; FERTILITY: MODERATE	Drainage: MODERATE	Lime resistant: MODERATE

USES

Resistances		Applications			
COASTAL:	1ST LINE	SLOPES:	NO	HEDGE ROWS:	YES
POLLUTION:	MODERATE	RIVERBANKS:	NO	BORDERS:	NO
WIND:	HIGH	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Native to Australia and New Zealand. This shrub or small tree can be used in hedges for gardens and windbreakers against saline winds. It is an easy and fast-growing shrub. Tolerates most soils, position and is resistant to frost. Its beautiful flowers attract bees.

SPACING: 2 M

PLANTING AND PLANT HEALTH

It grows well in lowlands, perfectly resisting proximity to the sea and salinity. Soils can be hardy and they can grow in both sandy and clay-limestone but prefer porous ones. It needs good drainage. This shrub prefers moderate humidity and sun or partial shade. It supports pruning very well. Propagation can be carried out by cutting or by seed.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shape
CT(2)	30-40	NO
CT(3)	40-50	NO
CT(7)	50-60	NO
CT(30)	80-100	YES
CT(50)	125-150	YES
CT(70)	150-175	YES
CT(85)	175-200	YES

Myrtus

Myrtus communis

ORNAMENTAL SHRUB

MIRTO	MURTA	MYRTLE	MYRTE
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Shapes: ROUND	Height: 3-5 M	Diameter: 3 M
Texture: COARSE	Shade: FULL	Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	MYRTALES
FAMILY:	MYRTACEAE

VARIETIES

MORPHOLOGY

Trunk		
Leaf PERSISTENT	COMPOUND: NO	
SIZE: LEAF: 2-5 CM	HARDNESS: SOFT	
	ARRANGEMENT: OPPOSITE	
COLOR: US: DK. GREEN	VENTATION: PINNATE	
LS: DK. GREEN	SHAPE: OVAL/LANCEOLATE	
TEXTURE: US: SMOOTH	MARGIN: ENTIRE	
LS :SMOOTH	APEX: ACUTE	
	LEAF BASE: ATTENUATE	
	PETIOLE: SHORT	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE AND TYPE: 3 CM, SOLITARY	Flowering	Fragrant: YES
Fruit SIZE:	Type: BERRY	Color: BLACK
	Edible	Fruiting season
Growth	Rate: FAST	Longevity: 25-50 YEARS



ECOLOGY

Climate	Temperature: -3ºC,H5,Z6	Drought resistant: MODERATE
ALTITUDE: 0-500	Sun exposure: SUN/PARTIAL SHADE	Frost resistant: LIGHT
IRRIGATION: MODERATE		
Soil	Texture: LOAMY	Salt resistant: MODERATE/LOW
pH: 6.5-8	Drainage: MODERATE	Lime resistant: MODERATE
FERTILITY: MODERATE		

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	NO	HEDGE ROWS:	YES
POLLUTION:	MODERATE	RIVERBANKS:	NO	BORDERS:	NO
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

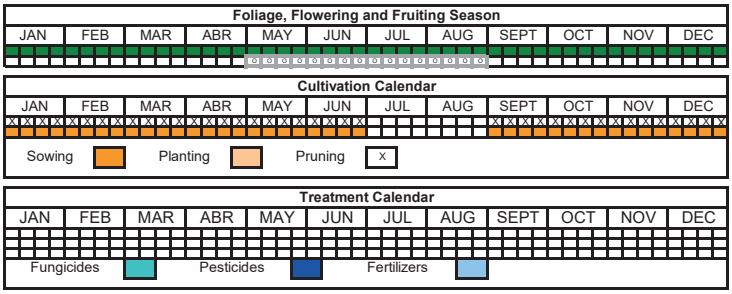
Commonly known as bayberry or myrtle. This is native to Mediterranean areas. It leaves and flowers are fragrant and thanks to its adaptability to the terrain, it can be used to create formal hedges of any shape. As a free-growing shrub it is suitable to mediterranean gardens together with oleanders, rockroses or potentillas. It lives comfortably in a pot. The myrtle is an inseparable part of the splendid Hispano-Arab palace of the Alhambra, growing and giving its name to one of its most famous interior patios. The *Patio de los Arrayanes* or *de Comares*, where it soberly frames the architecture that is reflected in the quadrangular pond.

SPACING: 1 M

PLANTING AND PLANT HEALTH

It is suitable to a sunny and warm exposure, typical of the Mediterranean environment to which it belongs. The soil should be well drained and preferably not too moist, but it will need a high irrigation programme during the hot summer months. This bush is not demanding in terms of soil. It can be pruned at any time, but avoid mid summer so as not to harm flowering and subsequent fruiting. In formal hedges it is best to remove spring budding in June and then cut back in October or November to maintain regularity. Propagation can be carried out in spring, sowing the seeds in glasshouses.

CHROMATIC CALENDAR



COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shape
CT(2)	15-20	No
CT(3)	20-25	No
CT(7)	25-30	Yes
CT(9)	30-40	Yes
CT(30)	60-80	Yes
CT(50)	80-100	Yes

Nerium

Nerium oleander

ORNAMENTAL SHRUB

ADELFA	BALADRE	OLEANDER, ROSE BAY	LAURIER-ROSE
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE

Shape	Height	Diameter
OVOID	4 M	4 M
Texture	**Shade**	**Root**
COARSE	FULL	SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONES
ORDER:	GENTIANALES
FAMILY:	APOCYNACEAE

VARIETIES

VARIEGATA

MORPHOLOGY

Trunk

Leaf

PERSISTENT

SIZE: LEAF: 20 CM

COLOR: US: DK. GREEN

LS: DK. GREEN

TEXTURE: US: SMOOTH

LS: SMOOTH

COMPOUND:	NO
HARDNESS:	CORIACEOUS
ARRANGEMENT:	OPPOSITE
VENATION:	PINNATE
SHAPE:	LANCEOLATE
MARGIN:	ENTIRE
APEX:	ACUTE
LEAF BASE:	ATTENUATE
PETIOLE:	SHORT

Flower

Type	Reproduction
HERMAPHRODITE	HERMAPHRODITE

SIZE AND TYPE: 5CM, INFLORESCENCE IN CYME

Flowering	Fragrant
	NO

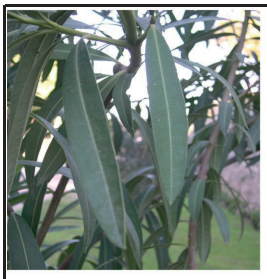
Fruit

SIZE: 8-16 CM

Type	Color
FOLLICLE	
Edible	Fruiting season

Growth

Rate	Longevity
FAST	0-25 YEARS









ECOLOGY

Climate

ALTITUDE: 0-500

IRRIGATION: MODERATE

Soil

pH: 6.5-8

FERTILITY: MODERATE

Temperature	Drought resistant
-5ºC,H4,Z6	MODERATE
Sun exposure	Frost resistant
SUN	MODERATE
Texture	Salt resistant
ALL TYPES	MODERATE
Drainage	Lime resistant
MODERATE	MODERATE

USES

Resistances		Applications			
COASTAL:	1ST LINE	SLOPES:	NO	HEDGE ROWS:	NO
POLLUTION:	MODERATE	RIVERBANKS:	NO	BORDERS:	NO
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Commonly known as oleander. It is native to the Mediterranean region and Portugal. Its leaves and flowers are toxic. It is the only European representative of a predominantly tropical family, the *Apocynaceae* , which characteristically present a milky juice in its leaves and stems, and which in many cases, like that of the oleander, is poisonous. It is cultivated as an ornamental in the form of an isolated shrub, in groups for large parks and in shrubby hedges, for its perennial foliage and showy flowering. It is used to correct unstable terrain and river beds.

SPACING: 2M

PLANTING AND PLANT HEALTH

This shrub grows very well in warm places with low altitude, such as areas near the sea. It resists frost although young branches can be affected. It tolerates a wide variety of well-drained soils. It requires a moderate irrigation programme. It is hardy in terms of environmental humidity and resists dry air. It adapts to all types of light, but does very well in full sun to achieve a more exuberant flowering. If its growth needs to be restricted, it can be pruned annually but generally it is not necessary. If pruned during the winter or before flowering, the plant will bloom profusely. Propagation is by seeds and by cutting.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
X	X	X	X	X	X	X	X				
				X	X						

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shapes
CT(5)	Shrub	60-80
CT(10)	Shrub	80-100
CT(30)	Shrub	125-150

Philadelphus

ORNAMENTAL SHRUB

Philadelphus coronarius

CELINDA (SPANISH) | VALENCIAN | SWEET MOCK-ORANGE (ENGLISH) | SERINGAT, SERINGA (FRENCH)

STRUCTURE		
Shape: OVOID/EXTENDED	Height: 2-4 M	Diameter: 2-4 M
Texture: COARSE	Shade: FULL	Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	CORNALES
FAMILY:	HYDRANGEACEAE

VARIETIES

MORPHOLOGY

Trunk

Leaf
DECIDUOUS
SIZE: LEAF: 4-8 CM
COLOR: US: LIGHT GREEN; LS: LIGHT GREEN
TEXTURE: US: SMOOTH; LS: SMOOTH

COMPOUND:	NO
HARDNESS:	SOFT
ARRANGEMENT:	OPPOSITE
VENATION:	PINNATE
SHAPE:	OVAL
MARGIN:	DENTATE
APEX:	ACUTE
LEAF BASE:	ATTENUATE
PETIOLE:	SHORT

Flor

SIZE AND TYPE: 2.5-3.5CM, INFLORESCENCE IN RACEMES (3-7 FLOWERS)	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
	Flowering	Fragrant: YES

Fruit
SIZE:

Type: CAPSULE	Color
Edilbe	Fruiting season

Growth

Rate: MEDIUM	Longevity: 0-25 YEARS








ECOLOGY

Climate
ALTITUDE: 0-800
IRRIGATION: MODERATE

Temperature: -5ºC,H4,Z6	Drought resistant: MODERATE
Sun Exposure: SUN/PARTIAL SHADE	Frost resistant: MODERATE

Soil
pH: 6.5-8
FERTILITY: MODERATE

Texture: LOAMY/CLAYEY	Salt resistant: LOW
Drainage: MODERATE	Lime resistant: MODERATE

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	NO	HEDGE ROWS:	NO
POLLUTION:	LOW	RIVERBANKS:	NO	BORDERS:	NO
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Commonly known by its Spainsh name Celinda. It is among the characteristic plants introduced by the Arabs. In ancient times, its branches devoid of pith were used to make flutes. Its large and fragrant flowers make it ideal to cultviate as an ornamental shrub in isolation or in flowerbeds.

SPACING: 1.5 M

PLANTING AND PLANT HEALTH

It prefers a temperate climate, although it resists the cold well. It tolerates all types of soil but does well in light and very siliceous soil mixed with humus. This shrub needs a low irrigation programme. It should be pruned after flowering, eliminating the branches that carry the flowers. The propagation is done by cuttings, during the winter and in a propagation greenhouse.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calandar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
						X	X				

Sowing | Planting | Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shapes
CT(5)	60-80	
CT(10)	80-100	
CT(30)	125-150	

Photinia

Photinia x fraseri "Red Robin"

ORNAMENTAL SHRUB

FOTINIA SPANISH | VALENCIAN | PHOTINIA ENGLISH | PHOTINIA FRENCH

STRUCTURE		
Shape: OVOID	Height: 5 M	Diameter: 3 M
Texture: COARSE	Shade: FULL	Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONES
ORDER:	ROSALES
FAMILY:	ROSACEAE

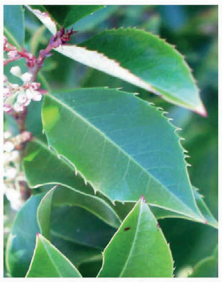
VARIETIES

MORPHOLOGY

Trunk		
Leaf EVERGREEN	COMPOUND: NO	
SIZE: LEAF:10-18CM	HARDNESS: CORIACEOUS	
COLOR: US: RED/GREEN	ARRANGEMENT: ALERNATE	
LS: LGT RED/GREEN	VENATION: PINNATE	
TEXTURE: US: SMOOTH	SHAPE: OVAL	
LS: SMOOTH	MARGIN: SERRATE	
	APEX: ACUTE	
	LEAF BASE: ATTENUATE	
	PETIOLE: SHORT	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE AND TYPE: 8 MM INFLORESCENCE IN SPIKE (10-16)	Flowering	Fragrant: NO
Fruit SIZE: 6MM	Type: POME	Color: RED/PURPLE
	Edible	Fruiting season
Growth	Rate: MEDIUM	Longevity: 0-25 YEARS









ECOLOGY

Climate	Temperature: -5ºC,H4,Z6	Drought resistant: MODERATE
ALTITUDE: 0-800	Sun exposure: SUN/PARTIAL SHADE	Frost resistant: MODERATE
IRRIGATION: MODERATE		
Soil	Texture: LOAMY/SANDY	Salt resistant: LOW
pH: 6.5-7.5	Drainage: MODERATE	Lime resistant: MODERATE
FERTILITY: MODERATE		

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	NO	HEDGE ROWS:	NO
POLLUTION:	LOW	RIVERBANKS:	NO	BORDERS:	NO
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

This hybrid made its appearance in 1955 and has become a worthy shrub among garden plants. It is grown more for its foliage than for its flowers and as an isolated plant on flowerbeds or bushy hedges. With the common name fotinia, the tones of its intensely red sprouts stands out, which are present almost all year round. It forms excellent backdrops, informal hedges; either monospecific or in combination with abelias, pieris or evonyms with shaded leaves. It is also used in mixed borders as it will provide a showy touch, especially in the early spring weeks when the garden is somewhat lacking in colour.

SPACING: 2 M

PLANTING AND PLANT HEALTH

It does well in sunny exposures. However, in areas of intense frosts it should be kept sheltered. They thrive in all types of soils including calcareous. These plants; compact by nature and of uniform development; do not require pruning. To force the appearance of new red shoots, deadhead the new ones as soon as they begin to lose their color. Requires a normal irrigation programme. Prefers medium humidity. This shrub can be affected by powdery mildew. Propagation can be carried out by semi-woody cuttings in summer.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing | Planting | Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shape
CT(5)	60-80	
CT(10)	80-100	
CT(30)	125-150	

Pistacia

Pistacia lentiscus

ORNAMENTAL SHRUB

LENTISCO	LLENTISCLE	MASTIC TREE	ARBRE AU MASTIC
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Shape: EXTENDED	Height: 3 M	Diameter: 3 M
Texture: COARSE	Shade: FULL	Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONES
ORDER:	SAPINDALES
FAMILY:	ANACARDIACEAE

VARIETIES

MORPHOLOGY

Trunk

Leaf
EVERGREEN
SIZE: LEAF: 10 CM, LEAFLET:6-12mm
COLOR: US: GREEN, LS: GREEN
TEXTURE: US: SMOOTH, LS :SMOOTH
COMPOUND: YES, PARIPINNATE
HARDNESS: CORIACEOUS
ARRANGEMENT: ALTERNATE
VENATION: PINNATE
SHAPE: OBLONG/LANCEOLATE
MARGIN: SMOOTH
APEX: ACUTE
LEAF BASE: ATTENUATE
PETIOLE: SHORT

Flower
Type: UNISEXUAL
Reproduction: DIOECIOUS
SIZE AND TYPE: APETALOUS, INFLORESCENCE IN PANICLE
Flowering: Fragrant: NO

Fruit
SIZE: 0.4 CM
Type: BERRY
Color: RED
Edible: NO
Fruiting season: AUTUMN

Growth
Rate: MEDIUM
Longevity: 100 YEARS



ECOLOGY

Climate
ALTITUDE: 0-800
IRRIGATION: LOW
Temperature: -8ºC,H4,Z6
Drought resistant: HIGH
Sun Exposure: SUN/PARTIAL SHADE
Frost resistant: MODERATE/HIGH

Soil
pH: 6.5-8
FERTILITY: MODERATE
Texture: LOAMY/SANDY
Salt resistant: LOW
Drainage: MODERATE
Lime resistant: MODERATE/HIGH

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	NO	HEDGE ROWS:	NO
POLLUTION:	LOW	RIVERBANKS:	NO	BORDERS:	NO
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Commonly known as lentisco. Its wood has been used in the lumber industry. This species has been cultivated for its ornamental-landscape value. When the stems are bled (making a small cut), a fragrant and astringent resinous juice is released. It has been used as a varnish for paintings, in perfumery, drugs and dentistry. It is also used as chewing gum and for flavouring. From the fruits you can extract an oil for lighting, which is also edible. Firewood is a wonderful fuel and provides top quality charcoal. The lentisco was already used for its resin in the time of the Pharaohs.

SPACING: 1.5 M

PLANTING AND PLANT HEALTH

It tolerates light frosts and resists proximity to the sea. It is part of the maquia, both coastal and continental, in low plant formations and in open areas at the foot of mountains. Its presence will decrease as latitude and continentality increase. It looks spectacular in areas with hot and dry summers. It is indifferent to soils and adapts to dry and rocky soils. It resists drought but benefits from a moderate irrigation programme. It is important not to overwater and to avoid waterlogging. Hardy in humidity, tolerates pruning and propagates by seed and suckers.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shapes
CT(5)	60-80	
CT(10)	80-100	

Pittosporum

ORNAMENTAL SHRUB

Pittosporum tobira

PITOSPORO (SPANISH) · VALENCIAN · JAPANESE PITTOSPORUM (ENGLISH) · PITTOSPORUM (FRENCH)

STRUCTURE		
Shape: ROUND	Height: 8 M	Diameter: 8 M
Texture: COARSE	Shade: FULL	Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONES
ORDER:	ROSALES
FAMILY:	PITTOSPORACEAE

VARIETIES

MORPHOLOGY

Trunk		
Leaf: EVERGREEN; SIZE: LEAF: 5-8 CM; COLOR: US: GREEN, LS: GREEN; TEXTURE: US: SMOOTH, LS :SMOOTH	COMPOUND: NO; HARDNESS: CORIACEOUS; ARRANGEMENT: ALTERNATE; VENATION: PINNATE; SHAPE: OBLONG/LANCEOLATE; MARGIN: SMOOTH; APEX: ROUND; LEAF BASE: ATTENUATE; PETIOLE: SHORT	
Flower: SIZE AND TYPE: 1 CM, INFLORESECENCE IN UMBEL	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE; Flowering; Fragrant: Yes
Fruit: SIZE: 12MM	Type: CAPSULE; Edible	Color; Fruiting season
Growth	Rate: MEDIUM	Longevity: 25-50 YEARS



ECOLOGY

Climate: ALTITUDE: 0-400; IRRIGATION: MODERATE	Temperature: -2ºC,H5,Z6	Drought resistant: MODERATE
	Sun exposure: SUN/PARTIAL SHADE	Frost resistant: LIGHT
Soil: pH: 6.5-8; FERTILITY: MODERATE	Texture: LOAMY/SANDY	Salt resistant: LOW
	Drainage: MODERATE	Lime resistant: MODERATE/HIGH

USES

Resistances		Applications			
COASTAL:	1ST LINE	SLOPES:	NO	HEDGE ROWS:	YES
POLLUTION:	MODERATE	RIVERBANKS:	NO	BORDERS:	NO
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Native to Southern Japan, Korea and China. Its generic name derives from the Greek "pita", which means resin, and "spora", meaning seed, alluding to the seeds that are impregnated with a viscous mucilage. It is used to raise hedges that maintain a good density if they are trimmed regularly. They provide good protection in gardens exposed to the sea wind. They grow well in containers, either in free form or with a well-defined shape.

SPACING: 2 M

PLANTING AND PLANT HEALTH

Hardy shrub with respect to temperature. Withstands proximity to the sea (60-70 cm from the shore). Very hardy to soils, it adapts to sandy and limestone. It requires a normal irrigation programme but avoid overwatering and waterlogging. This shrub is prone to fungi attack when the environment is very humid. Tolerates shady spots and pruning is not essential (except to form hedges or clipped shapes). Propagation occurs by seed in places with a temperate climate, and by cuttings that root easily.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Planting Pruning X

Treatments Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shape
CT(5)	60-80	Yes
CT(10)	80-100	Yes

Polygala

Polygala myrtifolia

ORNAMENTAL SHRUB

POLIGALA (SPANISH) · VALENCIAN · SEPTEMBER BUSH (ENGLISH) · POLYGALE (FRENCH)

STRUCTURE		
Shape: STRAIGHT/BRANCHED	Height: 2 M	Diameter: 2 M
Texture: COARSE	Shade: FULL	Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONES
ORDER:	POLYGALALES
FAMILY:	POLYGALACEAE

VARIETIES

GRANDIFLORA

MORPHOLOGY

Trunk

Leaf
EVERGREEN
SIZE: LEAF: 2.5-5CM
COLOR: US: GREEN, LS: GREEN
TEXTURE: US: SMOOTH, LS: SMOOTH

COMPOUND: NO
HARDNESS: SOFT
ARRANGEMENT: ALTERNATE
VENATION: PINNATE
SHAPE: OBOVATE
MARGIN: SMOOTH
APEX: ACUTE
LEAF BASE: ATTENUATE
PETIOLE: SHORT

Flower
SIZE AND TYPE: 2-3 CM, INFLORESECENCE IN UMBEL
Type: HERMAPHRODITE
Reproduction: HERMAPHRODITE
Flowering
Fragant: NO

Fruit
SIZE:
Type: CAPSULE
Color
Edible
Fruiting season

Growth
Rate: MEDIUM
Longevity: 25 YEARS



ECOLOGY

Climate
ALTITUDE: 0-400
IRRIGATION: MODERATE
Temperature: -2ºC,H5,Z6
Drough resistant: MODERATE
Sun exposure: SUN/PARTIAL SHADE
Frost resistant: LIGHT

Soil
pH: 6.5-8
FERTILITY: MODERATE
Texture: LOAMY/SANDY
Salt resistant: LOW
Drainage: MODERATE
Lime resistant: MODERATE/HIGH

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	NO	HEDGE ROWS:	NO
POLLUTION:	MODERATE	RIVERBANKS:	NO	BORDERS:	NO
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Native to the Cape of South Africa. Planted in dry, sunny areas. Throughout the year (except in the hottest months), it bears pea-like purple flowers on evergreen stems. The **grandiflora** variety has the largest flowers. It responds well to a light pruning that promotes a more compact growth. *Polygala myrtifolia* can be easily propagated from seed and cuttings, preferably in spring or autumn.

SPACING: 2 M

PLANTING AND PLANT HEALTH

This shrub thrives in humus-rich soils, sunny or partially shaded areas, and with a low irrigation programme in summer. Due to the different species available, it is recommended to consider which one is better suited to the environmnent in which it will be placed.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
X	X	X	X	X	X	X	X				

Sowing · Planting · Pruning (X)

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides · Pesticides · Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shapes
CT(5)	60-80	

Pyracantha

ORNAMENTAL SHRUB

Pyracantha coccinea

ESPINO DE FUEGO (SPANISH) | VALENCIAN | FIRETHORN (ENGLISH) | FEAUDORN (FRENCH)

STRUCTURE		
Shape: ROUND	Height: 4-6 M	Diameter: 4-6 M
Texture: COARSE	Shade: FULL	Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONES
ORDER:	ROSALES
FAMILY:	ROSACEAE

VARIETIES

MORPHOLOGY		
Trunk		
Leaf: PERSISTENT; SIZE: LEAF: 2-6.5 CM; COLOR: US: GREEN, LS: LIGHT GREEN; TEXTURE: US: SMOOTH, LS: PUBESCENT	COMPOUND: NO; HARDNESS: CORIACEOUS; ARRANGEMENT: ALTERNATE; VENATION: PINNATE; SHAPE: LINEAR/LANCEOLATE; MARGIN: SOMEWHAT SERRATED; APEX: ACUTE; LEAF BASE: ATTENUATE; PETIOLE: SHORT	
Flower: SIZE AND TYPE: 0.8 CM, INFLORESCENCE IN UMBEL (2.5-4cm)	Type: HERMAPHRODITE; Flowering	Reproduction: HERMAPHRODITE; Fragrant: NO
Fruit: SIZE: 0.5-0.6 CM	Type: POME; Edible: NO	Color: ORANGE; Fruiting season: SEPT-FEB
Growth	Rate: MEDIUM	Longevity: 25 YEARS







ECOLOGY		
Climate: ALTITUDE: 0-1000; IRRIGATION: MODERATE	Temperature: -5ºC,H4,Z6; Sun exposure: SUN	Drought resistant: MODERATE; Frost resistant: HIGH
Soil: pH: 6.5-8; FERTILITY: MODERATE	Texture: LOAMY/SANDY; Drainage: MODERATE	Salt resistant: LOW; Lime resistant: MODERATE/HIGH

USES				
Resistances		Applications		
COASTAL:	NO	SLOPES:	YES	HEDGE ROWS: YES
POLLUTION:	MODERATE	RIVERBANKS:	NO	BORDERS: NO
WIND:	MODERATE	GROUPS:	YES	ISOLATED: YES

POINTS OF INTEREST

Commonly known by its English name - firethorn. This shrub is native to Western Asia, Italy and northeast of the Iberian Peninsula. It is highly prized for its evergreen leaves and decorative fruit. They are an interesting species to decorate copses and also to form scattered groups or as isolated specimens. They are often positioned against a north-facing wall, which they quickly cover in a few years. They form impregnable hedges that can be trimmed to give them a geometric appearance without affecting their ability to bear abundant fruit.

SPACING: 1.5 M

PLANTING AND PLANT HEALTH

Resists extreme temperatures. Tolerates most soils (including limestone) but prefers rich, well-drained, light and cool ones. It is also resistant to drought but appreciates a normal irrigation programme (if there is good drainage). Also hardy in terms of humidity. Pruning is not very convenient, but unwanted stems must be removed immediately after flowering (white or pinkish-yellow flowers). It propagates by sowing seeds in glasshouses in spring, or by planting semi-ripe cuttings in summer, also by layering or grafting. Transplanting is difficult and preferably in a container to generate rooting.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
X	X	X	X	X	X	X	X				
						X	X				

Sowing | Planting | Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary
CT(5)	60-80	Yes
CT(10)	80-100	Yes

Rhamnus *Rhamnus alaternus*

ORNAMENTAL SHRUB

ALADIERNO	ALADERM	ITALIAN BUCKTHORN	NERPRUN ALATERNE
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE

Shape	Height	Diameter
OVOID	1-6 M	1-6 M
Texture	**Shade**	**Root**
COARSE	FULL	SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONES
ORDER:	ROSALES
FAMILY:	RHAMNACEAE

VARIETIES

MORPHOLOGY

Trunk

Leaf
PERSISTENT
SIZE: LEAF: 2-6 CM
COLOR: US: GREEN
LS: LIGHT GREEN
TEXTURE: US: SMOOTH
LS: SMOOTH

COMPOUND:	NO
HARDNESS:	CORIACEOUS
ARRANGEMENT:	ALTERNATE
VENATION:	PINNATE
SHAPE:	OBLONG
MARGIN:	DENTATE
APEX:	ACUTE
LEAF BASE:	ATTENUATE
PETIOLE:	SHORT

Flower
SIZE AND TYPE: ♂/M 0.3CM, ♀F 0.3 CM

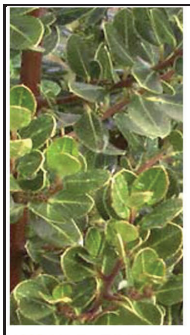
Type	Reproduction
UNISEXUAL	DIOCEIOUS
Flowering	Fragrant
INFLOR. IN UMBEL	UNPLEASANT

Fruit
SIZE: 0.4-0.6

Type	Color
DRUPE	RED
Edible	Fruiting season
NO	SUMMER/AUTUMN

Growth

Rate	Longevity
MEDIUM	25 YEARS








ECOLOGY

Climate
ALTITUDE: 0-400
IRRIGATION: MODERATE

Temperature	Drought resistant
-3ºC,H5,Z6	HIGH
Sun Exposure	Frost resistant
SUN	LOW

Soil
pH: 6.5-8
FERTILITY: MODERATE

Texture	Salt resistant
LOAMY/SANDY	HIGH
Drainage	Lime resistant
MODERATE	MODERATE/HIGH

USES

Resistances		Applications			
COASTAL:	YES	SLOPES:	NO	HEDGE ROWS:	YES
POLLUTION:	MODERATE	RIVERBANKS:	NO	BORDERS:	NO
WIND:	HIGH	GROUPS:	YES	ISOLATED:	NO

POINTS OF INTEREST

Native to the Mediterranean region and Portugal. Commonly known by its Spanish name - "Aladierno". This species is popular in gardening for its beautiful foliage, and in the ability to form high or low hedges as it easily supports trimming. The wood is good for turning and cabinet making, although both wood and bark give off an unpleasant odour. The bark is used as a purgative as it contains anthraquinonic principles. The leaves and branches are astringent since they contain a large amount of tannins.

SPACING: 1.5 M

PLANTING AND PLANT HEALTH

It is a hardy shrub in relation to temperatures. It tolerates the maritime environment well, being able to grow 30-40 m from the shore. Also hardy with soils, it grows even on sandy and rocky ones, but it prefers clayey-limestone. It tolerates drought but thrives best with some constant moisture. It is hardy in terms of environmental humidity and accepts pruning. It propagates by semi-ripe cutting, obtained in summer.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shape
CT(5)	60-80	

Senecio

Senecio maritima

ORNAMENTAL SHRUB

CINERARIA MARITIMA		DUSTY MILLER	CINERAIRE MARITIME
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Shape: ROUND	Height: 0.6-1 M	Diameter: 0.6-1 M
Texture: MEDIUM	Shape: PARTIAL	Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONES
ORDER:	ASTERALES
FAMILY:	COMPOSITAE

VARIETIES

MORPHOLOGY

Trunk		
Leaf: PERSISTENT; SIZE: LEAF: 5-15 CM; COLOR: US: WHITE, LS: WHITE; TEXTURE: US: TOMENTOSE, LS: TOMENTOSE	COMPOUND: NO; HARDNESS: SOFT; ARRANGEMENT: ALTERNATE; VENATION: PINNATE; SHAPE: OBLONG; MARGIN: PINNATISECT; APEX: ROUND; LEAF BASE: ATTENUATE; PETIOLE: SHORT	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE AND TYPE: 1-1.5 CM, INFLORESCENCE IN CAPITULUM (1-1.5)	Flowering	Fragrant: NO
Fruit: SIZE:	Type: ACHENE	Color
	Edible	Fruiting season
Growth	Rate: FAST	Longevity: 0-25 YEAR



ECOLOGY

Climate	Temperature: -2ºC,H5,Z6	Drought resistant: MODERATE
ALTITUDE: 100-500	Sun exposure: SUN	Frost resistant: LIGHT
IRRIGATION: MODERATE		
Soil	Texture: LOAMY/SANDY	Salt resistant: MODERATE/HIGH
pH: 6,5-8	Drainage: HIGH	Lime resistant: MODERATE/HIGH
FERTILITY: MODERATE		

USES

Resistances		Applications			
COASTAL:	1ST LINE	SLOPES:	NO	HEDGE ROWS:	NO
POLLUTION:	MODERATE	RIVERBANKS:	NO	BORDERS:	NO
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Native to the Mediterranean region and commonly known as "cineraria de mar". It is used as an ornamental shrub in groups of bushes and in rockeries. Senecio is highly valued in popular medicine both for its refreshing and emollient properties and for the possibility of extracting from medication against epilepsy,hemorrhages, eye diseases and sore throats. The name Senecio, derives from the Latin "senex" meaning old man (probably due to the white fluff that covers the seeds of these plants).

SPACING: 0.6 M

PLANTING AND PLANT HEALTH

It is a temperate climate shrub that only tolerates light frosts. It grows very well near coastal areas.It prefers loose, rocky, sandy and well-drained soils. Tolerates limestone. It requires a normal irrigation programme but overwatering and waterlogging should be avoided. Prefers medium humidity. Diseased or old branches must be removed. Trim in winter to shape. It can be propagated by cutting.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
X	X	X	X	X	X	X	X				

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary Shapes
CT(5)	60-80	

Senecio

Senecio petasitis

ORNAMENTAL SHRUB

SENECIO (SPANISH) | VALENCIAN | CALIFORNIA GERANIUM (ENGLISH) | SÉNEÇON (FRENCH)

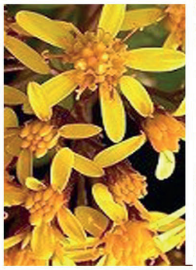
STRUCTURE		
Shape: OVOID	Height: 2 M	Diameter: 2 M
Texture: COARSE	Shape: DENSE	Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONES
ORDER:	ASTERALES
FAMILY:	COMPOSITAE

VARIETIES

MORPHOLOGY

Trunk		
Leaf: PERSISTENT; SIZE: LEAF:15-30CM; COLOR: US: GREEN, LS: GRAY; TEXTURE: US: TOMENTOSE, LS: TOMEMTOSE	COMPOUND: NO; HARDNESS: SOFT; ARRANGEMENT: ALTERNATE; VENATION: PINNATE; SHAPE: ROUND; MARGIN: LOBED; APEX: ROUND; LEAF BASE: ROUND; PETIOLE: LONG	
Flower: SIZE AND TYPE: 1-1.5 CM, INFLORESCENCE IN PANICLE	Type: HERMAPHRODITE; Flowering	Reproduction: HERMAPHRODITE; Fragrant: NO
Fruit: SIZE:	Type: ACHENE; Edilbe	Color; Fruiting season
Growth	Rate: MEDIUM	Longevity: 0-25 YEARS







ECOLOGY

Climate: ALTITUDE: 0-400; IRRIGATION: MODERATE	Temperature: -2ºC,H5,Z6; Sun Exposure: SUN	Drought resistant: MODERATE; Frost resistant: LIGHT
Soil: pH: 6.5-8; FERTILITY: MODERATE	Texture: LOAMY; Drainage: MODERATE	Salt resistant: MODERATE; Lime resistant: MODERATE/HIGH

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	NO	HEDGE ROWS:	NO
POLLUTION:	MODERATE	RIVERBANKS:	NO	BORDERS:	NO
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Native to Southern Mexico. Commonly known as senecio, its name derives from the Latin "senex" meaning old man (probably due to the white fluff that covers the seeds of these plants). It is interesting for its winter flowering and its beautiful velvety foliage. Senecios are highly valued in popular medicine both for their refreshing and emollient properties and for the possibility of extracting medication that can be used against epilepsy, hemorrhages, eye diseases and sore throats.

SPACING: 2 M

PLANTING AND PLANT HEALTH

This shrub should be protected from frost. Prefers rich, well-drained, cool and light soils. It requires a normal irrigation programme but drought and waterlogging must be avoided. Adapted to moderate humidity. Prune after flowering to slightly shorten the branches that have laready flowered. It can be propagated with semi-ripe cuttings in spring-summer.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
				X	X	X					

Sowing | Planting | Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary Shapes
CT(5)	60-80	
CT(10)	80-100	
CT(30)	125-150	

Solanum

ORNAMENTAL SHRUB

Solanum rantonnetti

SOLANO DE FLOR AZUL (SPANISH) | VALENCIAN | BLUE POTATO BUSH (ENGLISH) | ARBRE AUX GENTIANES (FRENCH)

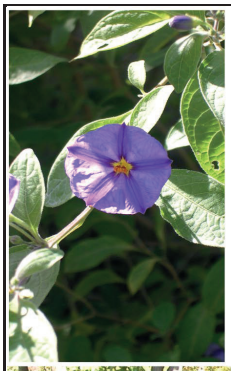
STRUCTURE		
Shape: OVOID	Height: 2 M	Diameter: 2 M
Texture: COARSE	Shade: FULL	Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISIN:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	POLEMONIALES
FAMILY:	SOLANACEAE

VARIETIES

MORPHOLOGY

Trunk		
Leaf	COMPOUND: NO	
PERSISTENT	HARDNESS: SOFT	
SIZE: LEAF: 6-15 CM	ARRANGEMENT: ALTERNATE	
	VENATION: PINNATE	
	SHAPE: LANCEOLATE	
COLOR: US: GREEN	MARGIN: SMOOTH	
LS: LIGHT GREEN	APEX: SHARP	
TEXTURE: US: SMOOTH	LEAF BASE: ATTENUATE	
LS: TOMENTOSE	PETIOLE: SHORT	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE AND TYPE: 2-2.5 CM, INFLORESCENCE IN AXILLARY	Flowering	Fragrant: NO
Fruit	Type: BERRY	Color: RED
SIZE: 2.5 CM	Edible: NO	Fruiting season: JUN-AUG
Growth	Rate: MEDIUM	Longevity: 0-25 YEARS








ECOLOGY

Climate	Temperature: -2ºC,H5,Z6	Drought resistant: MODERATE
ALTITUDE: 0-400	Sun exposure: SUN	Frost resistant: LIGHT
IRRIGATION: MODERATE		
Soil	Texture: LOAMY	Salt resistant: MODERATE
pH: 6.5-8	Drainage: MODERATE	Lime resistant: MODERATE/HIGH
FERTILITY: MODERATE		

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	NO	HEDGE ROWS:	NO
POLLUTION:	MODERATE	RIVERBANKS:	NO	BORDERS:	NO
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	NO

POINTS OF INTEREST

Spreading and rounded shrub suitable for being shaped as a tree or on walls. Its clusters of bluish-violet flowers, with a yellow button, appear from summer to autumn, giving rise to hanging cord-shaped red fruits. This shrub is a combination of species made for its ornamental use, especially in flowerbeds and as an ornamental climber on sheltered walls. The closest wild plants come from Central America. It is pruned to keep it well shaped, removing any damaged or unwanted stems.

SPACING: 1.5 M

PLANTING AND PLANT HEALTH

It requires tropical or subtropical conditions and an abundant irrigation programme during the first stages of growth and then reducing the amount in summer. It is pruned immediately after flowering or in the spring before budding. Trim vigorous stems and remove weak and crowded shoots. Propagation by seed or cutting as well as division of the root ball in summer.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing | Planting | Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shapes
CT(5)	60-80	

Spartium

Spartium junceum

ORNAMENTAL SHRUB

RETAMA	GINESTA	SPANISH BROOM	SPANTIER JONC
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE

Shape	Height	Diameter
OVOID	4 M	4 M
Texture	**Shade**	**Root**
MEDIUM	PARTIAL	SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	FABALES
FAMILY:	LEGUMINOSAE

VARIETIES

MORPHOLOGY

Trunk

Leaf

DECIDUOUS

SIZE: LEAF:1-3 CM

COLOR: US: BLUE/GREEN

LS: LGT BLUE/GRN

TEXTURE: US: SMOOTH

LS: TOMENTOSE

COMPOUND:	NO
HARDNESS:	SOFT
ARRANGEMENT:	ALTERNATE
VENATION:	PINNATE
SHAPE:	LANCEOLATE
MARGIN:	SMOOTH
APEX:	SHARP
LEAF BASE:	ATTENUATE
PETIOLE:	SHORT

Flower

Type	Reproduction
HERMAPHRODITE	HERMAPHRODITE

SIZE AND TYPE: 2.5 CM — INFLORESCENCE IN RACEMES (20-25)

Flowering — Fragrant: YES

Fruit

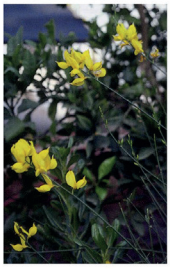
SIZE: 4-8 CM

Type	Color
LEGUME	BLACK
Edible	Fruiting season

Growth

Rate	Longevity
FAST	0-25 YEARS











ECOLOGY

Climate

ALTITUDE: 0-400

IRRIGATION: MOD/LOW

Temperature	Drought resistant
-3ºC,H5,Z6	HIGH
Sun exposure	Frost resistant
SUN	LIGHT

Soil

pH: 6.5-8

FERTILITY: MODERATE

Texture	Salt resistant
TOLERANT	MODERATE
Drainage	Lime resistant
MODERATE	MODERATE/HIGH

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	YES	HEDGE ROWS:	NO
POLLUTION:	HIGH	RIVERBANKS:	NO	BORDERS:	NO
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	NO

POINTS OF INTEREST

Commonly known as - fragrant broom- It owes its scientific name *-junceum-* to the bareness of its stems, which resemble reeds; a distinguishing feature from other brooms. This shrub has almost ceased to emit leaves, since it uses the greenery of its branches to carry out the photosynthesis process. It is a suitable shrub for scenes with a marked natural accent, in which it is complemented by other shrub species dressed in various foliar tones, specifically from the green to yellow range. It is a good honey plant. It is also used as a producer of textile fibers used to make ropes. Its stems, branches and flowers can be used in the dying process.

SPACING: 1.5 M

PLANTNG AND PLANT HEALTH

Commonly found in the dry lands of the Mediterranean and Portugal. Somewhat hardy but does not tolerate harsh winters. It has some resistance to pollution and fire. It is hardy to soils, although it prefers deep, fresh, limestone and permeable ones. It is indifferent to environmental humidity. In the month of March, the previous years' stems can be cut to about 5 cm. Propagation in summer by cuttings and by seed. In cold areas, sowing should be carried out in late spring and the plants should spend the winter months in the greenhouse.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
		X	X	X	X						

Sowing — Planting — Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides — Pesticides — Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shapes
CT(5)	60-80	

Spiraea

ORNAMENTAL SHRUB

Spiraea x arguta

ESPIREA (SPANISH) | VALENCIAN | SPIREA (ENGLISH) | SPIRÉE (FRENCH)

STRUCTURE		
Shape: OVOID	Height: 2 M	Diameter: 2.5 M
Texture: MEDIUM	Shade: PARTIAL	Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERAS
TYPE:	DICOTYLEDONS
ORDER:	ROSALES
FAMILY:	ROSACEAE

VARIETIES

MORPHOLOGY		
Trunk		
Leaf: DECIDUOUS; SIZE: LEAF: 2-8 CM; COLOR: US: GREEN, LS:LIGHT GREEN; TEXTURE: US: SMOOTH, LS :SMOOTH	COMPOUND: NO; HARDNESS: SOFT; ARRANGEMENT: ALTERNATE; VENATION: PINNATE; SHAPE: OBOVATE/OBLONG; MARGIN: DOUBLE DENTATE; APEX: ACUTE; LEAF BASE: ATTENUATE; PETIOLE: SHORT	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE AND TYPE: 0.7 CM, INFLORESCENCE IN CORYMB (3-5)	Flowering	Fragrant: NO
Fruit; SIZE:	Type: CAPSULE	Color
	Edible	Fruiting season
Growth	Rate: MEDIUM	Longevity: 0-25 YEARS

ECOLOGY		
Climate	Temperature: -5ºC,H4,Z6	Drought resistant: MODERATE
ALTITUDE: 0-1000; IRRIGATION: MODERATE	Sun exposure: SUN	Frost resistant: MODERATE
Soil	Texture: LOAMY/SANDY	Salt resistant: LOW
pH: 6.5-7.5; FERTILITY: MODERATE	Drainage: MODERATE	Lime resistant: MODERATE/HIGH

USES				
Resistances		Applications		
COASTAL: 2ND LINE		SLOPES: NO	HEDGE ROWS: NO	
POLLUTION: MODERATE		RIVERBANKS: NO	BORDERS: NO	
WIND: MODERATE		GROUPS: YES	ISOLATED: YES	



POINTS OF INTEREST

Commonly known as Spirea. It is a plant of horticultural origin. From the hybridization of S. thunbergii with S. multiflora. It is one of the prettiest spring Spiraea. It is used to create groups and bushy compositions. They are also suitable for forming part of irregular hedges made up of various species of shrubs. They belong to the Rosaceae family, so a generous and showy bloom can be expected.

SPACING: 1.5 M

PLANTING AND PLANT HEALTH

This shrub is resistant to extreme temperatures. It prefers well-drained soils and with a normal irrigation programme. The soil must be well fertilized before planting. It prefers moderate humidity. To obtain abundant flowering, it is necessary to prune about 15 cm from the ground once flowering has completed. Propagation is by cutting.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing | Planting | Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizer

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shapes
CT(5)	60-80	
CT(10)	80-100	

Syringa

Syringa vulgaris

ORNAMENTAL SHRUB

LILA (SPANISH) | VALENCIAN | LILAC (ENGLISH) | LILAS COMMUN (FRENCH)

STRUCTURE		
Shape: OVOID	Height: 3-5 M	Diameter: 3 M
Texture: MEDIUM	Shade: PARTIAL	Roor: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	LAMIALES
FAMILY:	OLEACEAE

VARIETIES

MORPHOLOGY

Trunk

Leaf
DECIDUOUS
SIZE: LEAF: 5-15 CM
COLOR: US: GREEN; LS: LIGHT GREEN
TEXTURE: US: SMOOTH; LS:SMOOTH

COMPOUND:	NO
HARDNESS:	SOFT
ARRANGEMENT:	OPPOSITE
VENATION:	PINNATE
SHAPE:	OVAL/CORDIFORM
MARGIN:	SMOOTH
APEX:	ACUTE
LEAF BASE:	ATTENUATE
PETIOLE:	LONG

Flower

Type	Reproduction
HERMAPHRODITE	HERMAPHRODITE

SIZE AND TYPE: 0.8-1.9 CM; INFLORESCENCE IN RACEMES-10-20 CM

Flowering	Fragant
	YES

Fruit
SIZE:

Type	Color
CAPSULE	
Edible	Fruiting season

Growth

Rate	Longevity
MEDIUM	0-25 YEARS









ECOLOGY

Climate
ALTITUDE: 0-1000
IRRIGATION: MODERATE

Temperature	Drought resistant
-5ºC,H4,Z6	MODERATE
Sun exposure	Frost resistant
SUN	MODERATE/HIGH

Soil
Ph: 6.5-7.5
FERTILITY: MODERATE

Texture	Salt resistant
LOAMY/SANDY	LOW
Drainage	Lime resistant
MODERATE	MODERATE/HIGH

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	NO	HEDGE ROWS	NO
POLLUTION:	MODERATE	RIVERBANKS:	NO	BORDERS:	NO
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Native to Asia Minor and Southeast and Western Europe. The generic name derives from the Greek *syrinx* (small tube), as its hollowed-out branches were used by Greek shepherds to make their reed flutes (pipes). Due to its ornamental value, it is used in shrubby groups or as part of mixed borders. To appreciate its fragrance, it should be placed in living areas or where people pass through. The flowers are placed in vases. Its essence is used in perfumery. In popular medicine, its leaves have been used as a tonic and febrifuge. The cultivated varieties are very numerous and must be chosen in the nursery. The one with golden leaves stands out, called "Aurea".

SPACING: 1.5 M

PLANTING AND PLANT HEALTH

It is very resistant to cold, it is the most hardy of the genus. It adapts to any garden soil, although they do better in calcareous, deep and fresh ones. It lives on rocky slopes. It requires a normal irrigation programme and moderate environmental humidity. It must be pruned immediately after flowering, eliminating thin and unproductive branches. Deadhead to make the shrub more compact. To achieve single-trunk growth, suckers must be removed periodically. Propagation by graft in the case of varieties, through tender cuttings or layering in summer and by seed for botanical species.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
					X	X	X				

Sowing | Planting | Pruning X

Treatments Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shapes
CT(5)	60-80	
CT(10)	80-100	
CT(30)	125-150	

Teucrium

Teucrium fruticans

ORNAMENTAL SHRUB

OLIVILLA (SPANISH) | VALENCIAN | SHRUBBY GERMANDER (ENGLISH) | GERMANDRÉE ARBUSTIVE (FRENCH)

STRUCTURE		
Shape: ROUND	Height: 0.8-2.5 M	Diameter: 0.8-2.5 M
Texture: FINE	Shade: LIGHT	Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	LAMIALES
FAMILY:	LAMIACEAE

VARIETIES

MORPHOLOGY

Trunk

Leaf
EVERGREEN
SIZE: LEAF: 2-4 CM
COLOR: US: GRAY; LS: GRAY
TEXTURE: US: TOMENTOSE; LS: TOMENTOSE

COMPOUND:	NO
HARDNESS:	SOFT
ARRANGEMENT:	OPPOSITE
VENATION:	PINNATE
SHAPE:	OVAL/LANCEOLATE
MARGIN:	SMOOTH
APEX:	ACUTE
LEAF BASE:	ATTENUATE
PETIOLE:	SHORT

Flower

Type	Reproduction
HERMAPHRODITE	HERMAPHRODITE

SIZE AND TYPE: 1.5-2.5 CM; INLFORESCENCE IN RACEMES
Flowering
Fragrant: No

Fruit
SIZE:

Type	Color
Edible	Fruiting season

Growth

Rate	Longevity
MEDIUM	0-25 YEARS








ECOLOGY

Climate
ALTITUDE: 0-500
IRRIGATION: MOD/LOW

Temperature	Drought resistant
-3ºC,H5,Z6	MODERATE
Sun Exposure	Frost resistant
SUN	LIGHT

Soil
pH: 6.5-8
FERTILITY: MODERATE

Texture	Salt resistant
TOLERANT	HIGH
Drainage	Lime resistant
MODERATE	MODERATE/HIGH

USES

Resistances		Applications			
COASTAL:	1ST LINE	SLOPES:	NO	HEDGE ROWS:	YES
POLLUTION:	MODERATE	RIVERBANKS:	NO	BORDERS:	NO
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Commonly known in Spanish as "olivilla". Native to the entire Mediterranean area, where it grows on dry hills. This shrub creates interesting foliar contrasts thanks to its general greyish appearance, in mixed plantations or in heterogeneous bush groups. With this bush, irregular geometric figures can be made -cubes, spheres, cones,... It is also very common to use as formal hedges and achieved perfectly due to its rapid growth and the dense branching caused by regular pruning. It was once highly valued as a medicinal plant.

SPACING: 1.5 M

PLANTING AND PLANT HEALTH

This is a hardy shrub in term of temperatures, although it prefers rather mild climates. Also hardy to soils (even limestone) but it prefers well-drained ones. It needs very sunny situations where its coloring will stand out. It resists drought but appreciates a moderate watering. In terms of environmental humidity, it prefers dry places. Pruning is a common practice in this shrub, which is usually maintained with regular or irregular, well-defined shapes. The propagation is easily done by seed, division of bush and by herbaceous cutting under cover.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing | Planting | Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary Shapes
CT(5)	60-80	
CT(10)	80-100	YES

Viburnum

Viburnum tinus

ORNAMENTAL SHRUB

DURILLO		LAURUSTINUS	VIORNE
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Shape: OVAL	Height: 2-4 M	Diameter: 1.5 M
Texture: COARSE	Shape: FULL	Root: SCATTERED

DIVISION:	PHANEROGAMS	**VARIETIES**
SUBDIVISION:	ANGIOSPERMS	*LUCIDUM*
TYPE:	DICOTYLEDONS	
ORDER:	DIPSACALES	
FAMILY:	CAPRIFOLIACEAE	

MORPHOLOGY

Trunk

Leaf
PERSISTENT
SIZE: LEAF: 4-9 CM
COLOR: US: DK. GREEN
LS: LIGHT GREEN
TEXTURE: US: SMOOTH
LS: TOMENTOSE

COMPOUND:	NO
HARDNESS:	CORIACEOUS
ARRANGEMENT:	OPPOSITE
VENATION:	PINNATE
SHAPE:	OVAL
MARGIN:	SMOOTH
APEX:	ACUTE
LEAF BASE:	ATTENUATE
PETIOLE:	SHORT

Flower
SIZE AND TYPE: 0.5-0.6 CM, INFLORESCENCE IN CORYMB (7-10 CM)

Type	Reproduction
HERMAPHRODITE	HERMAPHRODITE

Flowering | Fragrant: NO

Fruit
SIZE: 1CM

Type	Color
OVAL DRUPE	DARK BLUE
Edible: NO	Fruiting season: SUMMER/AUTUMN

Growth

Rate	Longevity
FAST	25-50 YEARS



ECOLOGY

Climate
ALTITUDE: 0-500
IRRIGATION: MODERATE

Temperature	Drought resistant
-5ºC,H4,Z6	MODERATE
Sun exposure	Frost resistant
SUN/PARTIAL SHADE	MODERATE

Soil
pH: 6.5-8
FERTILITY: MODERATE

Texture	Salt resistant
LOAMY/SANDY	MODERATE
Drainage	Lime resistant
MODERATE	HIGH

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	NO	HEDGE ROWS:	YES
POLLUTION:	MODERATE	RIVERBANKS:	NO	BORDERS:	NO
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Commonly known by its English name "Laurustinus". This popular European persistent shrub is highly recommended for its persistent leaves and winter flowering. Viburnums are all excellent shrubs and suitable for the decoration of flowerbeds and rockeries. The leaves are very bitter and have been used as an antifebrifuge in the form of a decoction. The fruits have been used as purgatives and to combat hydropsy.

SPACING: 2 M

PLANTING AND PLANT HEALTH

Delicate to excessive heat and strong frosts. It lives in forests and evergreen thickets and resists sea winds. It prefers a rich, deep, fresh, somewhat sandy soil,with abundant humus and well- drained (although it can tolerate limestone and stony soils). Excessive watering will cause chlorosis resulting in suffocation. It adapts better to moderate-high humidity. It is pruned by removing old or damaged branches after flowering or in May. However, pruning is not necessary unless the aim is to rejuvenate. Propagation by seed in autumn by layering the branches, or in summer by planting semi-woody cuttings.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
				X	X	X	X	X	X		

Sowing | Planting | Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shapes
CT(5)	60-80	
CT(10)	80-100	
CT(30)	125-150	

Vitex

ORNAMENTAL SHRUB

Vitex agnus-castus

SAUZGATILLO		CHASTE TREE	GATTILIER
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Shape: OVOID	Height: 2-4 M	Diameter: 2,5 M
Texture: MEDIUM	Shade: PARTIAL	Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	LAMIALES
FAMILY:	LAMIALCEAE

VARIETIES

MORPHOLOGY

Trunk		
Leaf	COMPOUND: PALMATE	
DECIDUOUS	HARDNESS: SOFT	
SIZE: LEAF: 10 CM	ARRANGEMENT: OPPOSITE	
LEAFLET:5-7CM	VENATION: PINNATE	
COLOR: US: GREEN/GRAY	SHAPE: LANCEOLATE	
LS: GRAY	MARGIN: SMOOTH	
TEXTURE: US: SMOOTH	APEX: ACUTE	
LS:TOMENTOSE	LEAF BASE: ATTENUATE	
	PETIOLE: SHORT	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE AND TYPE: 0.8 CM	Flowering: INFLORESCENCE IN SPIKES (10-18 CM)	Fragrant: YES
Fruit	Type: ROUND	Color: BLACK/RED
SIZE:	Edible: YES	Fruiting season
Growth	Rate: MEDIUM	Longevity: 25-50 YEARS









ECOLOGY

Climate	Temperature: -5ºC,H4,Z6	Drought resistant: MODERATE
ALTITUDE: 0-500	Sun exposure: SUN/PARTIAL SHADE	Frost resistant: MODERATE
IRRIGATION: MODERATE		
Soil	Texture: Loamy/sandy	Salt resistant: MODERATE
pH: 6.5-8	Drainage: MODERATE	Lime resistant: HIGH
FERTILITY: MODERATE		

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	NO	HEDGE ROWS:	NO
POLLUTION:	MODERATE	RIVERBANKS:	NO	BORDERS:	NO
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Native to southern Europe, Western Asia and the Mediterranean region. Among its most common names are chaste tree, chasteberry and Monk's pepper and it is a colonizing plant. Widely used as a hedge and in private gardens. It has ornamental uses in shrubby groups or isolated, for its abundant flowers. The fruit has an acrid and aromatic flavor and is used as a spice in some regions. When split, it gives off an unpleasant odor and has stimulating properties. It is prevalent for counterfeit pepper.

SPACING: 2 M

PLANTING AND PLANT HEALTH

This shrub is resistant to extreme temperatures and proximity to the sea. It is hardy in terms of soils, adapting to light and dry, even limestone and saline ones. Although it can resist drought, it appreciates a normal irrigation programme. Hardy to ambient humidity. It is necessary to severely prune lower the branches in winter, to obtain good flowering. Propagation by seeds, cuttings from semiherbaceous branches, layering or grafting.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
X	X	X	X	X	X	X	X				

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary Shapes
CT(5)	60-80	
CT(10)	80-100	
CT(30)	125-150	

Subchapter 5.3 Commercialization, use and planting

COMMERCIALIZATION OF SHRUBS

The commercial formats of shrubs are based on their height for those species or cultivars that have a predominant vertical growth (Table 5.3.1.), and on their span in those with an extended or horizontal size (Table 5.3.2.).

Height in cm
10/20
20/40
40/60
60/80
80/100
100/125
125/150
150/175
175/200
200/225
225/250

Table 5.3.1.: Measurements for classifying shrubs by height

Average diameter of crown in cm.
10/20
20/40
40/60
60/80
80/100

Table 5.3.2.: Measurements for classifying shrubs by crown dimension

A good indication of the format and complexion of the specimen is by the number of main stems that occupy the lower third of the plant. The number of branches or main stems that the shrubs present should be of regular distribution as well as its length and thickness. These features will give an idea of the vigor, balance, and density that the shrub will have in its adulthood.

For example, *Arbutus, Choisya, Garrya, Mahonia, Salix caprea* and *Tamarix* should have a minimum of two stems. In *Atriplex, Budleya, Cercis, Cotoneaster, Scallonia, Genista, Hibiscus, Jasminum, Ligustrum, Myoporum, Philadelphus* and *Spiraea* a minimum of three. Four or more in *Brunfelsia, Deutzia, Duranta, Justicia, Leonotis, Myrtus, Potentilla* and *Viburnum davidii*. A minimum of six is recommended in some *Citrus, Hebe*, and *some Rhododendron*.

In the case of large shrubs, the perimeter of the main stem can also be relevant.

Shrub plants intended as hedges must have particularly dense foliage and have a notable basal branching. Tall bushes should have a straight, vertical stem on which a well-shaped crown develops at a certain height above the ground. Suckers, sprouts, and excess branches must have been eliminated to obtain a clear shape in the crown. It is necessary to specify the total height and the stem length if applying this format.

ROOT FORMATS

The production of shrubs in nurseries follows four procedures:

1. **Bare-root deciduous shrubs**: After a first cycle corresponding to the propagation of the young plants, they are planted in the field. Once the desired formats and sizes have been achieved, they are uprooted and marketed in bare root form.

2. **Evergreen shrubs with root ball**: After a first cycle corresponding to the propagation of the young plants, they are planted in the field. Once the desired formats and sizes have been achieved, they are uprooted and marketed in root ball form.

3. **Shrubs with mixed field/container cultivation**: After a first cycle corresponding to the propagation of the young plants, they are planted in the field. Once the desired formats and sizes have been achieved, they are uprooted and potted in a container. After a period of rooting and adaptation to the new environment, the plants are marketed.

4. **Container-grown shrubs**: After a first cycle corresponding to the propagation, the young plants are potted in progressively larger containers, at least every one or two years depending on the container volume and the vigor and growth of the plant. Once the desired cultivated formats and sizes have been achieved, the plants are marketed.

When dealing with tap root species or varieties, care must be taken to ensure that the tap root has a length of about 20 cm on which sufficient secondary roots have been produced.

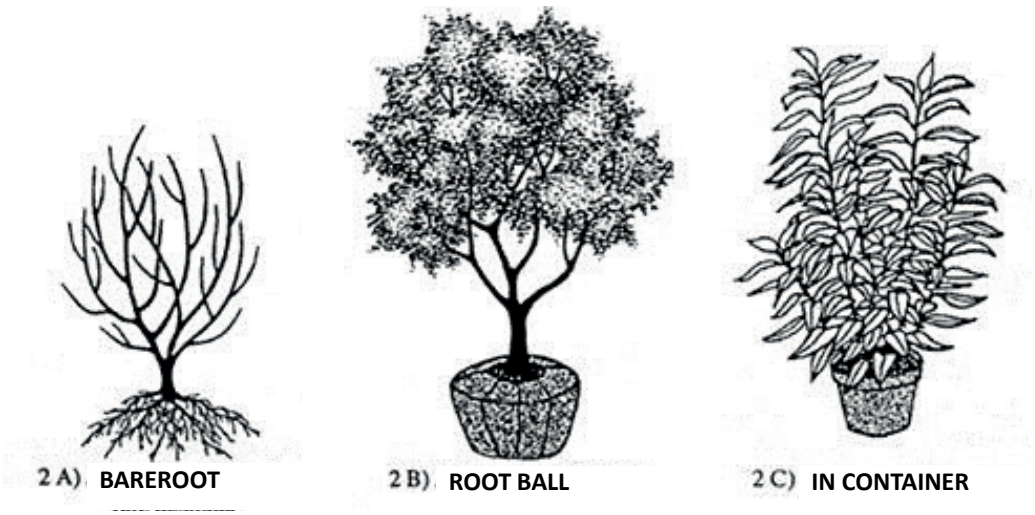


Figure 5.3.1: Root formats of shrubs. 2a – bareroot, 2b – root ball 2c in container (NTJ07F).

DECIDUOUS SHRUBS SUPPLIED IN BARE ROOT

The root system must be consistent with a minimum size stipulated for the species or commercial variety. For example, a shrub of 40/60 cm height should have a root system with a minimum diameter of 20/25 cm. Another shrub measuring 80/100 cm in height, should have a root system with a minimum width of 30 cm and a shrub 125/150 cm tall should have a set of roots greater than 40 cm in diameter. The supply of bare root shrubs should be made from nurseries located in climates similar to where they will be planted.

Generally, bare-root shrubs are supplied by grouping plants of the same format into homogeneous bundles containing 5 to 10 units.

EVERGREEN SHRUBS SUPPLIED IN ROOT BALL

In the case of shrubs supplied with a root ball, the mass of soil should be homogeneous in quality and no added substrate. The root balls will have a volume proportional to the aerial part of the shrub and must be protected and wrapped with a biodegradable mesh that decomposes within 1.5 years from the moment of planting and tied with a similar degradable material. In the case of large specimens, the root ball has a supplementary protection consisting of a non-galvanized metal mesh wrapper or reinforced plaster with non-galvanized mesh.

In the case of large specimens supplied bare root or with root ball, a record of how many times they have been root pruned must be made. This is an important indication of quality, especially in the case of shrubs with a taproot system where the longitudinal growth of the main root has been limited to ensure the development of secondary roots.

Evergreen shrub species should have been periodically root pruned at least every two or three years, depending on the species or commercial variety. This will ensure optimum conditions for the good rooting of the plant in the garden. At least one growing season should have elapsed between the last root pruning and the uprooting of the plant in the nursery. The action of uprooting the shrub prior to its commercialization should not be considered as root pruning.

Height of shrub in cm	Minimum diameter of the root ball	Minimum depth of rootball
20/40	20	15
40/60	20/25	15/20
60/80	25	20
80/100	25/30	20/35
100/125	30/35	25/30
125/150	35/40	30
150/175	40/45	30
175/200	45/50	35
200/225	50/55	35
225/250	55/60	40

Table 5.3.3: Recommended minimum diameter and depth of the root ball according to the height of the shrub. From N.T.J.P. (C.I.T.A.P.A.C.)

SHRUBS SUPPLIED IN CONTAINERS

The production and supply of shrubs in containers eliminate the severe constraints of bare-root planting in winter and root ball planting in spring and fall, since container-produced shrubs can be planted practically any time of the year, except for the months with the highest evapotranspiration. A good indication of quality containerized shrubs is the absence of root spiraling. This phenomenon of hypogeal

growth will impede the future development of the roots of the shrub in the garden. In addition, roots that protrude from the container's drainage holes will affect future development as well as the use of pots or containers with non-degradable meshes, which in the latter case is unacceptable.

Height of shrub in cm	Recommended minimum volume of container in litres	Upper and exterior diameter of container in cm
20/40	1.5/2	15/16
40/60	2	16
60/80	3	18
80/100	3-5	18/22
100/125	5	22
125/150	7.5	24
150/175	10	26

Table 5.3.4.: Minimum recommended volume of container in terms of height N.TJ.P. (C.I.T.A.P.A.C.)

SUBSTRATE

The substrate used in the production of containerized shrubs must have a composition that does not cause undesirable water movements leading to serious excesses or defects in moisture in the roots after planting.

In the case of acid soil shrubs (*Rhododendron, Hydrangea, Camellia*…), a substrate with physical-chemical characteristics adapted to this type of plant must be used.

The presence of evergreen weeds and mosses must be avoided and inspected at the source.

PLANT HEALTH

Irrespective of the species, the shrubs should show obvious health, as well as having a good development and a balanced and proportionate shape. Likewise, balance and proportion in the size of the root ball or obtained in a container is required.

Shrubs should show no signs of diseases, pests, nutritional deficiencies or symptoms of phytotoxicity. Their trunks, stems and branches must be free of burns or wounds and no broken branches or buds must be observed. The roots must not show damage or rot.

The supplier must comply with the current legislation on plant health, especially regarding quarantines for harmful organisms and the supply of the required phytosanitary passport.

LABELING AND DOCUMENTATION

The supplier must identify at least 5% of the shrubs in each lot with a durable label that is correctly and solidly attached to the shrub or to the substrate, with indelible, visible characters, recording: its species

and variety, the material used for rootstock and grafting, number of shrubs in the lot and its commercial format (total height and/or span and container volume, if applicable).

In addition, the plants for their commercialization will be accompanied by a delivery note issued by the supplier in which the following administrative information will be indicated:

- Indication: “CEE quality”
- Member State Code
- Name or identification code of the responsible official body.
- Identification of the nursery or supplier (name and registration or authorization number).
- Document issue date.
  - Individual serial or batch number
  - Where applicable, Phytosanitary Passport number.
- Where applicable, Ornamental Label.
- In the case of imports from third countries, the name of the country of production.
- The indication of the Technological Standard NTJ 07F: 1998 on a product represents the commitment by the producer that the product meets the requirements of the Technological Standard.

And the following technical information:

- Botanical name.
- Cultivar denomination.
- Number of shrubs.
- Presentation of the root system.
  - Bare Root: BR.
  - Container: C
  - Pot: P
  - Root ball: RB.
  - Gypsum root ball: RB in Gypsum
  - Root ball with metal mesh: RB - M.M.
- Total height and/or span, depending on the case.
- Stem height, in the case of tall shrubs.
- Volume or diameter of the container, indicating after the letter C (container) the volume in liters, or detailing after the letter P (Pot) a figure indicating the upper and outer width of a square pot or the diameter top and outside of a round pot. In this second case, the letter “r” will be placed after the number.
- If the shrubs supplied come from a forest or an existing garden, the extraction must have been carried out in accordance with the provisions of current legislation, and this origin must be recorded on the delivery note.

Additional important descriptions:

- Denomination of the rootstock, if applicable.
- Sex, in the case of dioecious plants with interesting fruit.
- Number of trunks or main stems.
- Number of root prunes, if applicable.
- Presence of a leader, if applicable.
- Thinning, if applicable.
- Cutting back, if applicable.

- Approximate weight of the plant, counting that of the root ball and that of the container, if applicable.
- Last phytosanitary treatment carried out (active material and date).

The plantation framework (spacing) will depend on the adult size and vigor of the species or cultivar being used, the quality of the soil and other characteristics of the medium and cultivation.

SHRUBS - PLANTING

The following general recommendations should be considered when planting shrubs (Table 5.3.5):

Soil conditioning	The soil will be worked at a depth of 60cm.
	The soil layer will be 40cm deep.
General planting of shrubs	The planting pit will be 15cm wider than the width of the roots.
	The pit will be filled up to half with fertile soil enriched with organic matter, subsequently compacting it by tapping down. Then, it will be completely filled and then tapped down again.
Planting climbers	Before planting climbers, the support they will need will be placed. This support will be temporary for those plants that are capable of climbing by themselves
	The trellis will be placed some distance away from the wall
	The planting pit will be 30cm wider than the width of the roots and will be 50cm deep.
	When the plantation is next to the wall, its impermeability to water will be ensured.
	The supports for the branches will be made with non-abrasive material.

Table 5.3.5: Planting requirements - N.TJ.P. (C.I.T.A.P.A.C.)

Subchapter 5.4 Maintenance

BASE DRESSING/FERTILIZATION

Medium to large sized shrubs.

- Interest for its foliage: 0.5 Kg/hole of 8-8-8 (ratio N-P-K)
- Interest for its flowering: 0.5 Kg/hole of 6-9-14 (ratio N-P-K)

Small shrubs and bushes.

- Interest for its foliage: 0.5 Kg/hole of 8-8-8 (ratio N-P-K)
- Interest for its flowering: 0.5 Kg/hole of 6-9-14 (ratio N-P-K)

FERTILIZATION

Ammonium nitrate: 3Kg/hectare
Lime superphosphate : 2.5 Kg/hectare
Potassium superphosphate: 1.5 Kg/hectare
Ammonium Nitrate: 1.5 Kg/hectare
Lime superphospate: 2.5 Kg/hectare
Potassium sulphate: 1.5 Kg/hectare
Ammonium nitrate: 1.5 Kg/hectare

Table 5.4.1.: Fertilizing

IRRIGATION

Nº of watering	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
		1	1	1	2	3	3	2	1			

Table 5.4.2.: Monthly irrigation

A guideline to monthly irrigation:

Doses: Average: 5 liters per foot of watering/irrigation
Maximum: 10 liters per foot of watering /irrigation

PRUNING

Prune for free shapes

Including:

1. Deciduous shrubs
2. Flowering shrubs
3. Evergreen shrubs

The specialist, once in the garden will study how the shrubs or bushes need to be pruned, making a note of the number of old branches, suckers, interior branches, etc. Once analyzed, the removal of all the old branches can begin, ensuring healthy vegetation. When it comes to small and thin branches, secateurs or hand shears are used. If cuts need to be made at great height, a long reach looper is used and if necessary, with extendable handles. When dealing with thick branches, a prune saw is used and if tears occur, they can be filed down.

Once the removal of old branches has been completed, the suckers can be removed. The purpose of this pruning is to maintain the vegetative balance of the bush or shrub , preventing these branches from diminishing the plant's vigor.

Then, the removal of interior branches takes place to allow light and air to penetrate the entire plant, and the shortening of excessively thick branches that prevent the bush from developing a homogenous thickness in all its branches. Finally, the trimming of branches that "invade" other bushes or cover the visibility of lampposts, windows... is carried out. In this cut, an attempt is made to maintain an upright structure, since with subsequent development, the bush tends to open up to the sides.

Once the pruning is finished, a fungicidal paint is applied to all the cuts with a diameter bigger than 2 cms.

Green pruning can be carried out every month and includes the removal of withered branches and flowers. At no time will severe pruning be carried out that could damage the bush.

Formative pruning

It includes pruning for the formation of hedges and subsequently their maintenance.

Guides (strings that stretch over the hedges) are placed and arranged according to the desired shape. If hedges are different heights and you want them uniform, the guide is placed taking the lowest of them as a reference.

With the guide positioned at the top of a hedge, the specialist will make the first cut above the guide; if it is not matched, he passes again in the same direction and then in the opposite direction. When the top is trimmed, the specialist can begin to trim the inner and outer sides equally.

The degree of intervention required will depend on the species and the form it presents, as well as the desired objective. In cypress hedges, 50% of the sprouts should not be cut back more than 10 cm.

Then the adjacent paths are swept and the remains of the pruning are collected and taken directly to the landfill or left in piles that will later be collected and adequately disposed of.

PHYTOSANITARY TREATMENTS

The treatments are carried out at the times indicated below, with the consent of the owner and taking into consideration the species, products and methods. (c.p. = commercial product)

March: Treatment against insects, mites and cryptogamic diseases.
- Abamectin: 0.35 cc/l c.p.
- Thiram 80%: 2.5 g/l

May: Treatment against wax scales, other insects and cryptogamic diseases.
- Metilpirimifos: 1.75 g/l c.p.
- Thiram 80%: 2.5 g/l c.p.

June: Treatment against sucking insects, chewing insects and mites.
- Fenvalerate: 0.75 cc/l p.c.
- Dienochlor: 0.9 g/l p.c.

September: Treatment against sucking insects, chewing insects and mites.
- Abamectina: 0.35 cc/l p.c.
- Thiram 80%: 2.5 g/l

December: Zineb 80%: 2.5 g/l p.c.

February: Zineb 80%: 2.5 g/l p.c.

The presence and symptoms of specific pests and diseases in some plants should be monitored throughout the year:

- Aphids/mites: Treat with Abamectin at 0.75 cc/l p.c. or with Ethiofencarb at 1 cc/l c.p.
- Powdery mildew: White spots on the leaves. Treat with Benomyl at 0.6 g/l as soon as it appears and monitor euonymus in a special way.
- Mealybugs: In oleanders and laurels, especially.
- Snails and slugs: Treat late in the day and water with Metaldehyde at a rate of 10-15 granules/m^2.
- Citrus whitefly: Butracarboxim at 1.5 cc/l c.p.
- Garden whitefly: Sumimix at 1.2 cc/l c.p.
- Orange miner: Treat with Abamectin + moisturizer at 0.4 and 0.5 cc/l c.p.
- Chlorosis (iron deficiency): Sequestrene 138 F at 3 g/m^2.

The material and equipment used for the treatment will include:

- Low toxicity phytosanitary product
- Wetting
- Small tank
- Vehicle for displacement
- Masks, aprons, forearm gloves, boots.

The treatment requires only one specialist/technician , who prepares the mixture in the tank or backpack and sprays the infected species.

Phytosanitary treatments are preferably carried out during hours of minimal inconvenience, prior to notifying the owners.

WEEDING AND LIGHT DIGGING

Calendar and frequency

Throughout the year, at least once a month in autumn and winter and twice a month in spring and summer. The material used will include baskets, hoes and rakes, curved knives, small sickles and backpacks for herbicide treatments.

Description

Weeding is carried out by lightly digging the entire surface, although sometimes it also includes mechanical means (low mowing) or chemical means (with non-toxic selective herbicides).

Weeding in clumps of shrubs, flower beds, or ornamental hedges should be made by superficially digging the soil between the plants with a hoe. At the same time, the clods of soil should be crumbled and the uprooted weeds removed. After these operations, the soil should be leveled and raked so that the surface is uniform and free of stones or objects. Finally, the weeds are collected and disposed of in the landfill.

CALENDAR OF OPERATIONS

MONTH	OPERATION
MARCH	Transplanting to bareroot Formative pruning
APRIL	Transplanting of evergreen Substrate
MAY	Maintenance pruning
JUNE **JULY** **AUGUST**	Deadhead the flowers from shrubs and trees
OCTOBER **NOVEMBER**	Deep substrate Maintenance pruning Transplanting evergreen species
DECEMBER **JANUARY**	Transplanting and pruning (weather permitting)
FEBRUARY	Formative pruning and transplanting of deciduous species

Table 5.4.3: Calendar of annual operations

FREQUENCY OF OPERATIONS

<table>
<tr><th>OPERATION</th><th colspan="4">FREQUENCY</th></tr>
<tr><td rowspan="4">Irrigating in beds and platforms</td><td></td><td colspan="2">1 Mar / 31 Oct</td><td>1 Nov / 28 Feb</td></tr>
<tr><td>Shrubs with or without trees</td><td colspan="2">3 times a week</td><td>Once a week</td></tr>
<tr><td>Pots</td><td colspan="2">3 times a week</td><td>Once a week</td></tr>
<tr><td>Trees, shrubs and hedges</td><td colspan="3">3 times a year as indicated in Dirección Técnica</td></tr>
<tr><td>Base dressing/fertilizing</td><td colspan="4">Prior to any planting</td></tr>
<tr><td>Fertilizing: Renewal of substrate or remedies</td><td colspan="4">As indicated D. T.</td></tr>
<tr><td>Weeding or light digging</td><td colspan="4">Once a month</td></tr>
<tr><td rowspan="2">Cover fertilizing</td><td>Spring and Autumn</td><td colspan="3">Winter</td></tr>
<tr><td>5-8 mineral fertilizers</td><td colspan="3">1 organic fertilizer</td></tr>
<tr><td>Restocking</td><td>Shrubs and hedges</td><td colspan="3">As indicated by D. T.</td></tr>
<tr><td rowspan="3">Formative pruning</td><td>Free shapes</td><td>Green pruning, light pruning once a month</td><td colspan="2">Formative pruning and rejuvenation: once as indicated by D.T.</td></tr>
<tr><td>In rose bushes</td><td>Traditional pruning (topping and finishing) winter</td><td colspan="2">Remove wilted flowers: spring, summer, and autumn</td></tr>
<tr><td>In trained forms</td><td>Trimming: Once a month</td><td colspan="2">2 trimmings as indicated by D.T.</td></tr>
<tr><td>Phytosanitary treatments</td><td colspan="4">From April to November or as indicated by D.T.</td></tr>
<tr><td>Herbicides</td><td colspan="4">Monthly</td></tr>
</table>

Table 5.4.4: Calendar of operations and frequency (D.T Technical Director)

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6
GROUNDCOVERS

Chapter 6 GROUNDCOVERS

Subchapter 6.1 Introduction
Subchapter 6.2 Species
Subchapter 6.3 Commercialization, use and planting
Subchapter 6.4 Maintenance

Subchapter 6.1 Introduction

INTRODUCTION

In Tudor England, walkable meadows in garden areas were reclaimed meadows cut with scythes. In the 16th century, they were created with chamomile and grass that, according to a gardener of the time, "the more you stepped on it, the faster it grew." Short-stem aromatic plants became popular in the 17th century and native thyme, mints and chamomiles were frequently used in England. One of the most famous chamomile tapestries in Britain is that of Buckingham Palace, which is mixed with grass and cut with a lawn mower. There, even in the driest summers, *Anthemis nobilis* (Figure 6.1.1) withstands heavy use and maintains its greenness even when the grass has lost it. The best is the *Treneague* variety for its compactness.



Figure 6.1.1: Anthemis nobilis

In today's gardens, land without herbaceous vegetation around trees and shrubs has low aesthetic value, in addition to being prone to weeds resulting in increased maintenance costs. The absence of plant cover also brings with it greater aridity since there is no shade to screen the direct sunlight on the ground and prevent water evaporation. In nature, if soil moisture and fertility are good, it is unusual to see bare land.

Therefore, the introduction of groundcovers is not about establishing walkable meadows throughout the garden, but rather creating a low-height green carpet by using plants that form dense groups and have short stems, or creeping species that cover the ground with their foliage.

On other occasions the situation is different. For example, when there are areas in the garden that, due to excess shade, drought, or humidity, do not allow a lawn to grow correctly. There, a series of non-grass groundcover species can grow and replace the classical meadow although, in some cases, they might not tolerate trampling.

In general, ground cover plants are those species that naturally and without cutting reach a height that ranges between 2 and 30 cm, although in a broader sense they might also include species more than 1 m tall.

They can be annual, biennial or perennial, woody, succulent or herbaceous. Its growth habit can be widely varied and have an extensive or concentrated growth pattern, vigorous or slow development, and different shapes and profiles. We can find deciduous, semi-persistent and evergreen species, conifers, and angiosperms.

Within all the diversity that can be found among groundcover plants, there is one constant characteristic; the abundance of vegetation when the correct species is properly chosen, planted and cultivated. Groundcovers can be ground-hugging plants such as *Saxifraga* and *Thymus*, or low evergreen shrubs such as creeping juniper, *Erica and Cotoneaster horizontalis*. Even the tallest shrubs, such as *Berberis, Choisya, Eleagnus* and *Potentilla*, have low branches thick enough to inhibit most weeds. Other non-woody species with large leaves that cover the ground during the summer are also suitable for this purpose, such as *Hosta, Acanthus* and *Ligularia dentata*.

The best species for dry shade are *Vinca minor* (20 cm), especially the varieties Bowles' Variety or *La Graveana, Coerulea Plena* and *Multiplex*; *Pachysandra terminalis* its *Variegata* form, *P. procumbens, Lysimachia nummularia Aurea* and *Lamium maculatum*. In sun and shade the following species do well: *Coprosma x Kirkilii, Duchesnea indica, Fragaria vesca, Polygonum capitatum* and *Dichondra repens* (deep shade or sun).

In the case of areas with steep slopes, species that retain the soil efficiently should be chosen (*Nepeta spp., Juniperus sabina, "Tamariscifolia"* (50 cm tall) and different varieties of *J. horizontalis* (40 cm), *Cotoneaster horizontalis, C. adpressus* and *C. microphyllus* (10cm), Vinca major (20cm), *Hypericum calycinum* (30 cm)

For places with moist soil, species such as *Cotoneaster dammeri* (30cm), *Lysimachia nummularia* and its "Aurea form", or the creeping *Cornus canadensis* can be chosen; in waterlogged areas, the *Myosotis palustris* and the water clover *Menyanthes palustris* are suitable.

Among the flowering plants, the *Arabis, Auberieta, Epimedium, Tiarella, Nepeta* and *Phlox subulata* are recommended, which give attractive blooms in spring. *Saponaria ocymoides* creeps among rocks and covers bare ground but needs sun and good drainage; the *Hypericum calycinum* is ideal for shady places and soil with some constant humidity; *Galium odoratum (Asperula odorata)* is interesting, as are the creeping species of the Cytisus genus, such as *Cytissus x kewensis* and *C. procumbens*.

Groundcover species with colored foliage can be of interest such as *Heuchera* "Palace Purple," *Pachysandra terminalis* "Variegata" and species of Epimedium, *Juniperus sabina* "Tamariscifolia" (50cm), *V. procumbens* "Nana", *Picea abies* "Procumbens" and yews *Taxus baccata* "Cavendishisi" and T.b. "Procumbens".

Among the deciduous species are *Ajuga reptans* "Variegata" (20cm) with cream variegated foliage, A. r. "Atropurpurea" with purple leaves and the A. r. "Multicolor" or "Rainbow", with bronze, pink and yellow leaves. There is a purple four-leaf clover (*Trifolium repens* "Purpurascens") and *Lamium maculatum* is also of interest.

There are also groundcover plants with silver leaves for sunny and dry places. Among them are *Artemisia schmidtiana* "Nana," *A. brachyloba*, Stachys lanata "Sylver carpet" and *S. byzantina. Cerastium tomentosum* (10cm). In addition, *Nepeta hederaceae* "Variegata" are also highly recommended.

Certain short-stemmed plants resist trampling from time to time, although it should not be abused. Some of the most tolerant are *Sagina glabra* (S. filifera), of which the "Aurea" variety is especially showy. The

Minuartia (*Arenaria or Alsina*) *verna caespitosa* "Aurea" is also recommended. Among the species which prefers moist and well-drained soils we can find *Acaena buchanani* and *A. microphylla* (20cm), *Sedum acre, Phyla nodiflora* (*Lippea repens*) (deciduous), *Armeria caespitosa, Achillea millefolium, Arctotheca calendula* (invasive), *Fragaria chilloensis, Gazania, Grevillea rosmarinifolia, Verbena peruviana, Cotula squalida* and *Mentha pulegium*.

The *Dichondra repens* is noteworthy as it can withstand light trampling. It is a non-grass species with small, rounded leaves that can cover large surfaces with a 5 to 10 cm high carpet. It is not recommended in cold areas (resists up to -9 ºC).



Figure 6.1.2. *Dichondra*.

Other groundcover species such as: *Pachysandra, Hedera, Lysimachia nummularia, Chysanthemum (Tanacetum) haradjanii, Erigeron harvinskianus* (*E. mucronatus*) cannot tolerate trampling. Species such as *Frankenia laevis* and *Campanula cochleariifolia* (*C. pusilla*) also form attractive carpets however they also cannot tolerate trampling.

Also recommended are *Raoulia hookeri, R. australis* and *R. tenuicaulis, Gypsophila repens* "Fratensis" and *Globularia meridionalis (G. bellidifolia)*, which grow well on limestone soils. *Parochetus communis* is suitable for moist, shady gardens.

The following species are suitable for the Mediterranean garden and form a carpet with an irregular surface: *Achillea tomentosa, Baccharis pilularis, Felicia amelloides, Helianthemum nummularium, Lantana montevidensis, Lithiodora diffusa, Osteospermum fruticosum, Pelargonium tomentosum* and *Teucrium chamaedrys.*

The "cushion-like" species used in Mediterranean gardens are usually plants that require special drainage: *Aurinia saxatilis, Ballota, Cerastium, Dianthus deltoides, Erigeron karvinskianus, Iberis saxatilis, I. sempervirens, Lavandula, Phylica ericoides, Rosmarinus officinalis* "Prostratus," *Santolina spp.* and the *Verbena tenuisecta*, (very tolerant to drought).

Some species recommended for the Mediterranean garden have bushy growth and are between 20 and 40 cm tall: *Arctostaphylos hookeri* "Monterrey Carpet", *Ceanothus thyrsiflorus* var. *repens* (100cm) and *Cotoneaster dammeri* "Lowfast".

In addition to those mentioned in previous paragraphs, there are also climbers and twiners that are excellent groundcovers in Mediterranean gardens, such as: *Macfadyena (Doxantha) unguis-cati, Hardenia violacea,*

Lonicera japonica, L. pileata, Pelargonium peltatum, Trachelospermum jasminoides and *Tropaeolum majus* for full sun, *Vinca difformis and Ficus repens* for sun and shade, and *x Fatsedara lizei* for shade.

Other groundcover species that are suitable for Mediterranean gardens are: *Carissa grandiflora* "Postrata," *Coprosma repens, Cornus canadensis, Ostheosporum (Dimorphoteca) repens, Euonymus fortunei, Hypericum x moserianum, Lamium maculatum, Lysimachia nummularia, Drosanthemum spp, Aptenia cordifolia, Muehlembeckia complexa, Myoporum parvifolium, Nepeta x faasenii, Ophiopogon japonicus, O. jaburan, Verbena radicans, V. repens.* The succulent species *Lampranthus spp., Carpobrotus spp.* are also interesting species.

Many varieties of thyme can be used as groundcovers, all of which are evergreen, aromatic and with white, pink or red flowers. Thyme masses or clumps can be made using one or several of its species such as: *Thymus serphyllum (T. drucei)*, mainly its "Pink Chintz" and "Snowdrift" varieties, *T. X citriodorus* "Aureus" (20cm in size) and the variegated form "Silver Queen", *T. herba-barona*, and *T. drucei var*. pseudolanuginosus.

Species such as: *Saxifraga paniculata (S. aizoon) S. burseniana*, S. x "Jenkinsae" and *Oxalis magellanica* are ideal for shaded areas.

The following groundcover plants are also of special interest: *Cotoneaster dammneri* "Major" (10 cm high), *C. microphyllus* "Streib´s Finding" (10cm), *C.salicifolius* var. *repens* (20cm), *Hedera helix* "Shamrock"(20cm), *Rosa* "Snow carpet"(10cm), *Rubus* "Betty Ashurner"(30cm), *Rubus tricolor* (30cm), *Juniperus horizontalis* "Andorra Compacta" (40cm), *J. squamata* "Blue carpet"(30cm), *Acaena microphylla* (20cm), *Alyssum saxatile* (20cm), *Arabis blepharophylla* (10cm), *Festuca glauca* (30cm), *Polygonum affine* (30cm), *Sagina subulata* (10cm) and *Salvia officinalis* "Purpuracens" (30cm).

TYPOLOGY OF GROUNDCOVER PLANTS

In the following figures 6.1.3 and 6.1.4 we can appreciate the different types of groundcover plants.

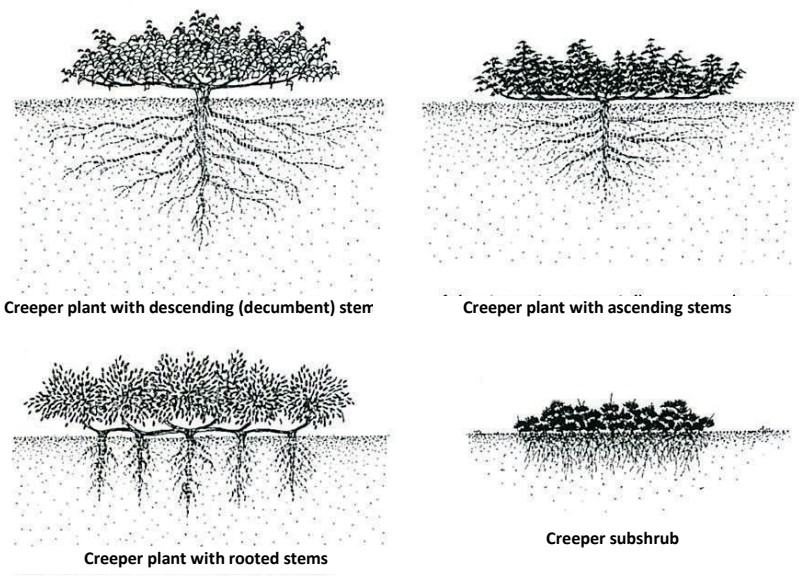


Figure 6.1.3: Types of groundcovers plants I (NTJ 07J C.O.I.T.A.P.A.C.)

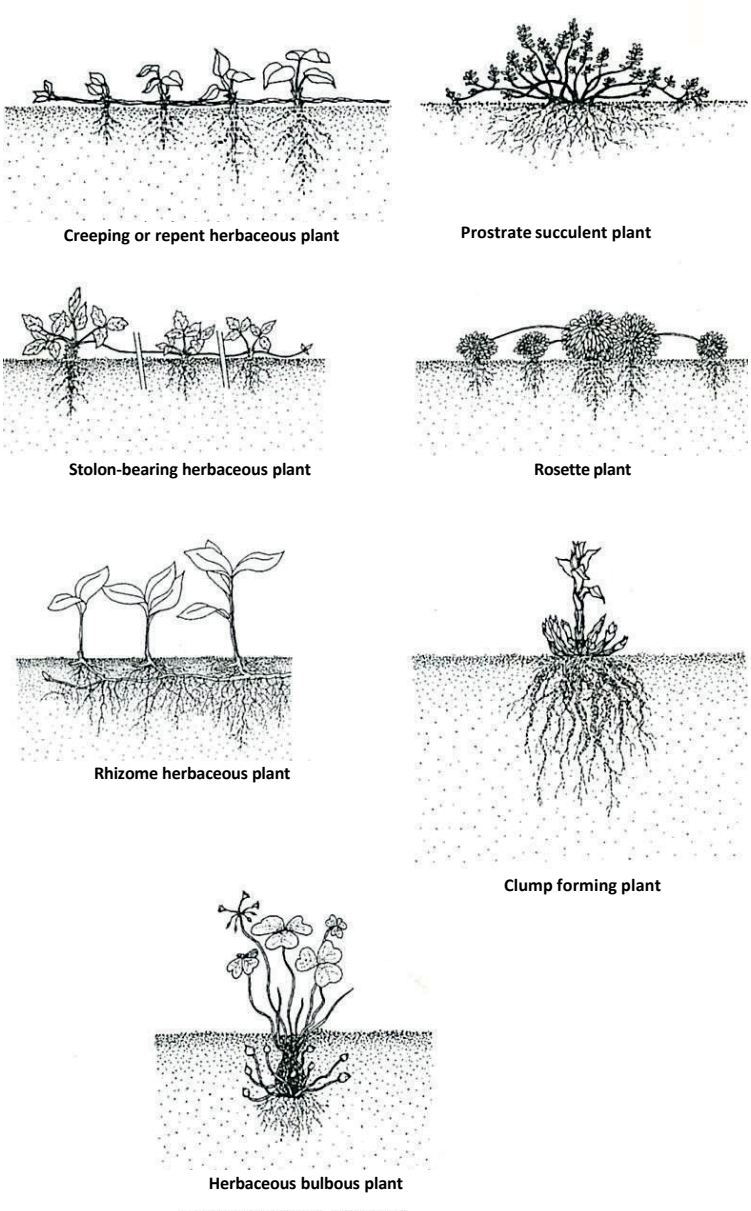


Figura 6.1.4: Types of II (NTJ 07J C.O.I.T.A.P.A.C.)

ADVANTAGES OF USING GROUNDCOVERS AND CREEPERS

Soil

They improve the stabilization of sloping soils, preventing erosion. They increase the porosity of the soil and prevent compaction, in addition to enriching it with organic matter from its plant residues.

Maintenance

The maintenance of most groundcover plants is notably cheaper than that of lawns, both in open areas and in areas that are difficult for machinery to access (patios, large halls in commercial areas, street medians, patches of garden at the foot of trees or shrubs, places with steep slopes...) In addition, these plants save irrigation water by reducing the evaporation of soil moisture.

Aesthetic

Groundcover plants, properly chosen and planted together, can unify compositions including different materials. They also serve to soften angular built elements (paths, facades, enclosures) and better integrate them into the greenery of the garden.

The perception of dimensions in the garden can be modified through a careful selection and use of groundcovers, choosing them according to their textures and colors. Small textures and neutral or cold colors increase the feeling of amplitude and big textures and warm colors have the opposite effect.

The considerable number of groundcover species create and endless number of combinations thus avoiding monotonous or repeated a landscape designs.

Recommendations

1- Using too many species in a composition with groundcovers should be avoided. Ideally only one or few species should be used, even for big areas.

2- In general, the species with larger leaves should be planted in parks or garden areas where the scale is greater, and those with small leaves in small gardens or in secluded corners.

3- The soil, irrigation, temperature, and lighting needs of the groundcover plants and the other species that will form the set must be considered, and the choice must be made based on the compatibility of the ecological requirements of each species.

Subchapter 6.2 Species

This chapter outlines **18 species of groundcover plants** used in landscape design. They have been selected primarily for their ornamental use, botanical interest, or other characteristics. As a result, an in-depth analysis is carried out in this subchapter.

Firstly, a table shows the different parameters and values that have been used to describe each species in its specific botanic datasheet.

Each datasheet describes for each species its botanical and ecological aspects, uses, cultivation, and other characteristics of interest, including its commercialization. This information is complemented by photographic information, which shows the general appearance of the species and different morphological details.

PARAMETERS AND VALUES USED IN THE BOTANIC DATASHEET	
TAXONOMY	
TAXONOMIC RANKS	DIVISION, SUBDIVISION, TYPE, ORDER, FAMILY
VARIETIES	OTHER VARIETIES OF INTEREST
STRUCTURE	
SHAPE	ROUNDED, OVAL, COLUMNAR, CONE, EXTENDED, IRREGULAR, PARASOL, FAN-SHAPED, HORIZONTAL, PALMIFORM, PENDULAR, HERBACEOUS, GRAMINOID
HEIGHT	AS APPROPRIATE- IN METERS OR CENTIMETERS
DIAMETER	AS APPROPRIATE -IN METERS OR CENTIMETERS
TEXTURE	TEXTURE: LEAVES>10CM= COARSE. LEAVES OR LEAFLETS BETWEEN 2-10CM= MEDIUM. LEAVES OR LEAFLETS <2CM= FINE
SHADE	LIGHT, FULL, DENSE
ROOT	TAPROOT, SCATTERED, OBLIQUE, HORIZONTAL, AERIAL, ADVENTITIOUS
MORPHOLOGY	
TRUNK	
BARK	SMOOTH, VERTICAL FISSURES, LONGITUDINAL FISSURES, DIAGONAL FISSURES; ROUGH, SCALY, CORKY WITH PLATES
COLOR OF BARK	GREYS; GREEN/GREY OR BLUE/GREY. SILVER; LIGHT GREEN, YELLOW, LIGHT BROWN, DARK, GREEN, RED; RED. PURPLE; YELLOW; BLACK; MARBLED; TWO-TONED; THREE-TONED; LIGHT GREY, DARK GREY;
LEAF	
TYPE	EVERGREEN, SEMI-EVERGREEN DECIDUOUS, SEMI-DECIDUOUS
SIZE OF LEAF	LENGTH OF LEAF (cm)
SIZE OF LEAFLET	LENGTH OF LEAFLET (cm)
COLOR OF UPPER SIDE (US)	PALE GREEN, LIGHT GREEN, DARK GREEN, BLUE/GREEN, GREY, PURPLE; PALE; YELLOW; VARIEGATED
COLOR OF LOWER SIDE (LS)	GREEN, LIGHT GREEN, DARK GREEN, BLUE/GREEN, GREY PURPLE; PALE; YELLOW; VARIEGATED; RUST COLORED; SILVER
TEXTURE OF UPPER SIDE (US)	SHINY, ROUGH, GLABROUS, TOMENTOSE, HAIRY, ROUGH, SCALY, VISCOSE
TEXTURE OF LOWER SIDE (LS)	SHINY, ROUGH, GLABROUS, TOMENTOSE, HAIRY, ROUGH, SCALY, VISCOSE
COMPOUNDS	NO COMPOUND LEAVES YES. COMPOUNDS: IMPARIPINNATE, PARIPINNATE, TRIFOLIATE, PALMATE, PALMIFORM, PALM, PINNATE, BIPINNATE
HARDNESS	CORIACEOUS, SOFT, SUCCULENT, HARD, SUB CORIACEOUS
ARRANGEMENT	OPPOSITE, ALTERNATE, ROSETTE, VERTICAL
VENATION	PINNATE, PALMATE, PARALLEL, RETICULATE, SCALY, A3 MAIN VEINS

SHAPE	ROUNDED, LINEAR, LANCEOLATE, FALCATE, OVAL, OBLONG, ELLIPTIC, DELTOID, RHOMBOID, SPATULATE, ACICULAR GROUPS 2, ACICULAR GROUPS 3, ACICULAR GROUPS 5, ACICULAR GROUPS, ACICULAR IN 1 PLANE, ACICULAR IN SPIRAL, SCALY, PALM 7 LOBES, PALM 5 LOBES- PALM 3 LOBES, POLYMORPHIC; PANDURIFORM; PINNATIFID
LEAF MARGIN	ENTIRE, CILIATE, DENTATE, CRENATE, SERRATED, DOUBLE SERRATED, LOBED, DOUBLE LOBED
APEX	ACUTE, CUSPIDATE, OBTUSE, RETUSE,
LEAF BASE	ATTENUATE, CORDATE, ROUNDED, ASYMMETRIC
PETIOLE	LONG, SHORT, SESSILE, WIDE
FLOWER	
SIZE	HERMAPHRODITE (MALE/FEMALE FLOWERS): (CM OR MM)
TYPE	UNISEXUAL, HERMAPHRODITE
REPRODUCTION	MONOECIOUS, DIOECIOUS, HERMAPHRODITE, POLYGAMY, SYNOICOUS, STERILE
FLOWERING	SINGLE, INFLORESCENCE IN CORYMB, CYMOSE, RACEME, SPIKE, UMBEL, CATKIN, SPADIX, FLORET OR CAPITULUM, PANICLE (+ INFLORESCENCE SIZE (IN CM OR MM))
FRAGRANCE	YES, NO, UNPLEASANT
FRUIT	
SIZE	IN CM OR MM
TYPE	FOLLICLE, PLURIFOLLICLE, LEGUME, LOMENT, SAMARA, DOUBLE SAMARA, PLURISAMARA, CAPSULE, POLYATHENE, TETRACHENE, NUT, ACHENE; SYCONIUM, HESPERIDIUM, PLURISAMARA, ACORN, COMPOUND FRUIT, PLURIFOLLICLE, BERRY, RACEME, POME, BALAUSTA, DRUPE, CONIFER CONE, PSEUDO CONIFER, PINE CONE
EDIBLE FRUIT	YES, NO
COLOR OF FRUIT	RED, GREEN, YELLOW, BROWN, BLACK, PALE, WHITE, PURPLE
FRUITING SEASON	INTERVAL OF MONTHS: JAN, FEB, MAR, APR, MAY, JUN, JUL, AGO, SEP, OCT, NOV, DEC
DEVELOPMENT	
GROWTH	SLOW, VERY SLOW, MEDIUM, FAST, VERY FAST
LONGEVITY	<25 YEARS, 25 YEARS, 50 YEAR, 75 YEARS, 100 YEARS, 150 YEARS, 200 YEARS, 250 YEARS, 300 YEARS, >300 YEARS
ECOLOGY	
CLIMATE	
ALTITUDE	NATURAL HEIGHT OF THE PLANT: interval of sea level altimetry
IRRIGATION	++HIGH, MODERATE, LOW, ++LOW (very low/low < 350 mm; Very high/high > 750 mm)

MINIMUM TEMPERATURE AND INTERNATIONAL CLASSIFICATION	MINIMUM TEMPERATURES: DEGREES CELSIUS **CLASSIFICATION ACCORDING TO EUROPEAN REGULATION**: (SEE MAP) G2____ HOT GREENHOUSES IN SOUTHERN EUROPE G1____ COLD GREENHOUSES IN SOUTHERN EUROPE H5____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM OºC TO -5ºC H4____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM -5ºC TO -10ºC H3____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM -10ºC TO -15ºC H2____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM -15ºC TO -20ºC H1____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM -20 **CLASSIFICATION INTERNATIONAL REGULATIONS.** ACCORDING TO MINIMUM TEMPERATURE RANGES Z1____SUPPORT MINIMUM TEMPERATURES OF -50ºC Z2____ SUPPORT MINIMUM TEMPERATURES OF -50ºC TO -40ºC Z3____ SUPPORT MINIMUM TEMPERATURES OF -40ºC TO -30ºC Z4____ SUPPORT MINIMUM TEMPERATURES OF -30ºC TO -20ºC Z5____ SUPPORT MINIMUM TEMPERATURES OF -20ºC TO -10ºC Z6____ SUPPORT MINIMUM TEMPERATURES OF -10ºC TO -0ºC Z7____ SUPPORT MINIMUM TEMPERATURES OF -0ºC TO 10ºC Z8____ SUPPORT MINIMUM TEMPERATURES OF 10ºC TO 20ºC Z9____ SUPPORT MINIMUM TEMPERATURES OF 20ºC TO 30ºC Z10___ SUPPORT MINIMUM TEMPERATURES OF 30ºC TO 40ºC Z11___ SUPPORT MINIMUM TEMPERATURES OF MORE THAN 40ºC
EXPOSURE TO SUNLIGHT	FULL SUN, FULL SHADE, SHADE, PART SHADE
DROUGHT RESISTANCE	YES, NO, MODERATE
FROST RESISTANCE	YES, NO, MODERATE
SOIL	
PH OPTIMUM	PH: ALL TYPES; NEUTRAL, ACID, BASIC (OR INTERVAL OF PH)
LEVEL OF FERTILITY	FERTILE, AVERAGE, POOR
TEXTURE OF SOIL	SANDY, SLIT OR LOAMY, CLAY, SANDY LOAM, CLAY LOAM - ALL TYPES
DRAINAGE	HIGH, MODERATE, LOW
RESISTANCE TO SEA	YES, NO, MODERATE
RESISTANCE TO LIME	YES, NO, MODERATE
USES	
RESISTANCES	
COASTAL	1ST LINE, 2ND LINE, NO.
POLLUTION	HIGH, MODERATE, LOW
WIND	HIGH, MODERATE, LOW
APPLICATIONS	

IN SLOPES CLIMBERS HANGING PAVEMENTS ISOLATED	YES, NO
SPACING	MINIMUM RECOMMENDED DISTANCE BETWEEN PLANT: M, CM
PLANTING AND PLANT HEALTH	
PLANTING AND PLANT HEALTH	
CALENDARS	
CHROMATIC CALENDAR	FOLIAGE, FLOWERING, FRUITING SEASON: the color white represented with grey or black cell
CULTIVATION CALENDAR	SOWING, PLANTING, PRUNING
TREATMENTS CALENDAR	FUNGICIDES, PESTICIDES, FERTILIZERS, HERBICIDES
COMMERCIALIZATION	
PRESENTATION	BR (BARE ROOT), CT (CONTAINER or POT (LITERS), CE (ROOT BALL), CEY (ROOT BALL IN GYPSUM), ROOT BALL IN MESH
STEM GIRTH(TREE)	GIRTH (perimeter): CM or years or SAMPLE, or shrubs (in tree species)
HEIGHT (SHRUBS, CONIFERS AND PALMS)	HEIGHT: CM, M

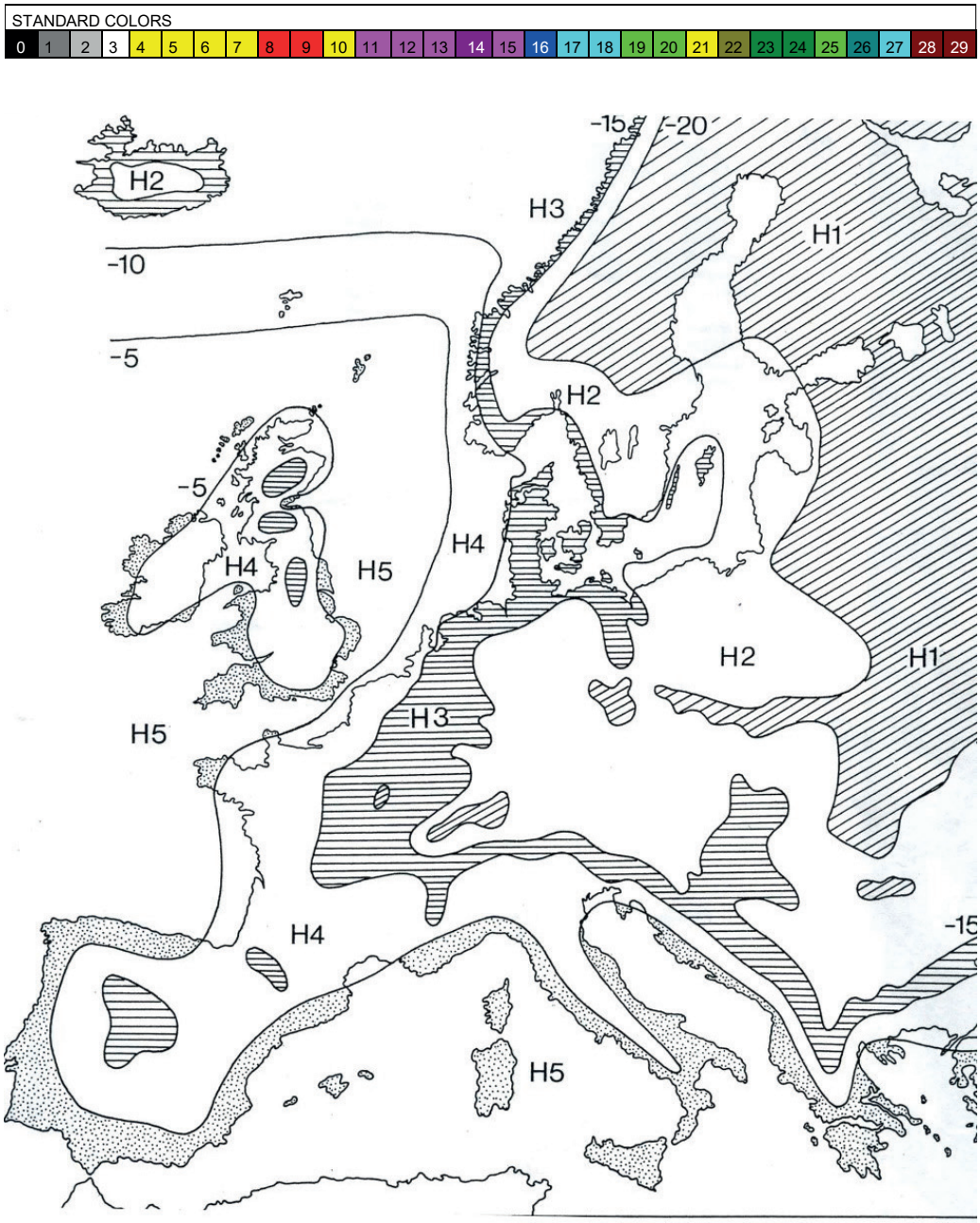


Figure 6.2.1: Thermal classification map according to European regulations

LIST OF GROUNDCOVER SPECIES DESCRIBED

1. *Aptenia cordifolia*
2. *Asparagus densiflorus*
3. *Carpobrotus acinaciformis*
4. *Carpobrotus edulis*
5. *Cerastium tomentosum*
6. *Drosanthemum floribundum*
7. *Felicia amelloides*
8. *Festuca cinerea*
9. *Gazania x hybrida*
10. *Hedera helix*
11. *Hypericum calycinum*
12. *Lampranthus aureus*
13. *Lampranthus spectabilis*
14. *Lantana montevidensis*
15. *Lobularia maritima*
16. *Ophiopogon japonicus*
17. *Verbena x hybrida*
18. *Vinca Major*

APTENIA

GROUND COVER

Aptenia cordifolia

APTENIA (SPANISH) | VALENCIAN | ROCK ROSE (ENGLISH) | APTENIA (FRENCH)

STRUCTURE		
Shape: EXTENDED	Height: 0.05-0/20 M	Diameter: 4-6 M
		Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	CARYOPHYLLACEAE
FAMILY:	AIZOACEAE

VARIETIES
RED APPLE
VARIEGATA
SUNNY SUE

MORPHOLOGY

Stem: UNDERG NO; CREEPING YES; WOODY NO; CLIMBING NO

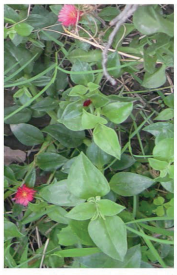
Leaf: EVERGREEN; SIZE: 1.5-5.5 CM; COLOR: US:GREEN, LS:GREEN; TEXTURE: US: SMOOTH, LS: SMOOTH
COMPOUND: NO; HARDNESS: FLESHY; ARRANGEMENT: OPPOSITE; VENATION: PINNATE; SHAPE: OVATE; MARGIN: ENTIRE; APEX: ACUTE; LEAF BASE: ATTENUATE; PETIOLE: SHORT

Flower: SIZE: 1 CM
Type: HERMAPHRODITE; Reproduction: HERMAPHRODITE; Flowering; Fragrant: NO

Fruit: SIZE:
Type: CAPSULE; Color; Edible; Fruiting season

Growth
Rate: MODERATE; Longevity: VIGOROUS







ECOLOGY

Climate: ALTITUDE: 0-200; IRRIGATION: LOW
Temperature: 0ºC,H5,Z7; Drought resistant: MODERATE; Sun exposure: FULL SUN; Frost resistant: NO

Soil: pH: 6.5-8; FERTILITY: MODERATE
Texture: LOAMY/SANDY; Salt resistant: MODERATE/HIGH; Drainage: HIGH; Lime resistant: MODERATE

USES

Resistances: COASTAL: YES; POLLUTION: MODERATE; WIND: MODERATE

Applications: SLOPES: YES; CREEPER: NO; HANGING: YES; + PAVEMENT: NO; ISOLATED: YES

POINTS OF INTEREST

Succulent ground cover plant with bright green fleshy leaves and profuse flowering. It densely covers the ground and has a tendency to branch abundantly, which makes it especially suitable for covering walls and slopes. Due to its resistance to the coastal environment, it makes it an ideal species in coastal gardens. The natural density of the carpet inhibits the development of weeds.

SPACING: 0.50 M

PLANTING AND PLANT HEALTH

Despite its resistance to drought, it needs a regular irrigation programme and well-drained soil. Given its sensitivity to frost, in cold areas it is convenient to protect the area of the garden where it is located or plant cuttings in protected pots to transplant the following spring. Despite its rusticity in terms of soil, it is convenient to fertilize lightly in autumn and spring with any type of organic fertilizer.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calandar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing ☐ Planting ☐ Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides ☐ Pesticides ☐ Fertilizers ☐

COMMERCIALIZATION

Presentation (L)	Length (m)	Topiary shapes
CT(2)		
CT(3)		

ASPARAGUS *Asparagus densiflorus*

GROUND COVER

ESPARRAGUERA AFRICANA (SPANISH) | VALENCIAN | SPRENGUER'S ASPARAGUS FERN (ENGLISH) | ASPARAGUS (FRENCH)

STRUCTURE

Shape	Height	Diameter
EXTENDED	1-2 M	1-2 M
		Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOYILEDONS
ORDER:	ASPARAGACEAES
FAMILY:	ASPARAGACEAE

VARIETIES
SPRENGERI

MORPHOLOGY

Stem
UNDERG CREEPING: NO / YES
WOODY: NO
CLIMBING: NO

Leaf
EVERGREEN (CLADODES)
SIZE: 0.5-1.5 CM
COLOR: US: GREEN; LS: GREEN
TEXTURE: US: SMOOTH; LS: SMOOTH

COMPOUND:	NO
HARDNESS:	SOFT
ARRANGEMENT:	VERTICILATE
VENATION:	
SHAPE:	LINEAR
MARGIN:	SMOOTH
APEX:	ACUTE
LEAF BASE:	ATTENUATE
PETIOLE:	SESSILE

Flower
SIZE: 0.2-0.5 CM

Type	Reproduction
HERMAPHRODITE	HERMAPHRODITE
Flowering	Fragrant
	NO

Fruit
SIZE:

Type	Color
BERRY	RED
Edible	Fruiting season

Growth

Rate	Longevity
MODERATE	VIGOROUS



ECOLOGY

Climate
ALTITUDE: 0-400
IRRIGATION: MOD/HIGH

Temperature	Drought resistant
0ºC,H5,Z7	NO
Sun exposure	Frost resistant
SHADE	NO

Soil
pH: 6.5-7.5
FERTILITY: MODERATE

Texture	Salt resistant
LOAMY	NO
Drainage	Lime resistant
MODERATE	MODERATE

USES

Resistances		Applications			
COASTAL:	LOW	SLOPES:	YES	HANGING:	YES
POLLUTION:	LOW	CLIMBERS:	YES	+PAVEMENTS:	NO
WIND:	MODERATE			ISOLATED:	YES

POINTS OF INTEREST

Originally from Southern Africa and tropical Asia, in their natural state, asparagus grows as climbers supported by larger plants. Of the many species that make up the genus, only a few are used for their ornamental value. In general, they are very easy to grow species, adaptable to the outdoors. Its feathery appearance always stands out especially if used as a hanging plant.

SPACING: 0.50-1 M

PLANTING AND PLANT HEALTH

Not demanding in environmental humidity. However, they are not resistant to dry environments. They prefer moderate temperatures, although they tolerate notable differences. Branches will yellow in poor lighting or direct sunlight. They are rustic in terms of soils but appreciate a spring-summer fertilization and a moderate irrigation programme. In the spring, the clumps can be divided by arranging them in new smaller pots.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing ☐ Planting ▭ Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides ▭ Pesticides ▭ Fertilizers ▭

COMMERCIALIZATION

Presentation (L)	Diameter (cm)	Topiary shapes
CT(2)	15	
CT(3)	18	
CT(7)	22	
CT(10)	24	
CT(30)	36	

CARPOBROTUS

GROUND COVER

Carpobrotus acinaciformis

FLOR DEL CUCHILLO (SPANISH) | VALENCIAN | ELANDS SOURFIG (ENGLISH) | GRIFFE, DOIGT DE SORCIÈRE (FRENCH)

STRUCTURE		
Shape: EXTENDED	Height: 0.15 M	Diameter: 4-6 M
		Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOYILEDONS
ORDER:	CARYOPHYLLACEAE
FAMILY:	AIZOACEAE

VARIETIES

MORPHOLOGY

Stem	UNDERG: NO / CREEPING: YES	WOODY: NO / CLIMBING: NO
Leaf	COMPOUND: NO	
EVERGREEN	HARDNESS: FLESHY	
SIZE: 9 CM	ARRANGEMENT: OPPOSITE	
	VENATION:	
	SHAPE: CYLINDRICAL/CURVED	
COLOR: US:GREEN	MARGIN:	
LS:GREEN	APEX: POINTED	
TEXTURE: US:SMOOTH	LEAF BASE: ROUNDED	
LS:SMOOTH	PETIOLE: SESSILE	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE: 12 CM	Flowering	Fragrant: NO
Fruit	Type: CAPSULE	Color
	Edible	Fruiting Season
SIZE:		
Growth	Rate: FAST	Longevity: VIGOROUS











FERTILITY:

Climate	Temperature: 0ºC,H5,Z7	Drought resistant: MODERATE
ALTITUDE: 0-200	Sun exposure: FULL SUN	Frost resistant: NO
IRRIGATION: LOW	Texture: LOAMY/SANDY	Salt resistant: YES
Soil	Drainage: HIGH	Lime resistant: MODERATE
pH: 6.5-8		
FERTILITY: MODERATE		

USES

Resistances		Applications			
COASTAL:	YES	SLOPES:	YES	HANGING	YES
POLLUTION:	MODERATE	CLIMBERS:	NO	+PAVEMENTS:	NO
WIND:	MODERATE			ISOLATED:	YES

POINTS OF INTEREST

Native to South Africa. With succulent foliage and creeping branched stems, it is used as an extensive ground cover for dunes and sandy areas. Its high water content makes it heavy and as a result, can be slippery on very sloping ground. It has attractive flowers of variable colors although pink-yellow tones predominate. They produce an edible fruit. Its fast growth and low irrigation programme make it a great value in gardening. However, its invasive nature and its naturalization have made it a threat to the local flora in coastal and dune areas. Given its high water content, it is an excellent fire retardant. The species *Carpobrotus acinaciformis* is used, fundamentally, for terracing of landscaped rocky areas and in dune areas for the protection of the "mounds". In general, this species is widely distributed throughout the Andalusian coast.

SPACING: 0.50 M

PLANTING AND PLANT HEALTH

This species of groundcover needs good lighting, sunny exposure, temperate climate (although it can tolerate frost). It accepts all type of soil and is resistant to salt.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing | Planting | Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation	Length (cm)	Topiary shapes
CT	15	
CT	20	

CARPOBROTUS *Carpobrotus edulis*

GROUND COVER

UÑA DE GATO/LEON (SPANISH) | VALENCIAN | HOTTENTOT FIG (ENGLISH) | GRIFFES DE SORCIÉRE (FRENCH)

STRUCTURE		
Shape: EXTENDED	Height: 0.15 M	Diameter: 4-6 M
		Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOYILEDONS
ORDER:	CARYOPHYLLACEAE
FAMILY:	AIZOACEAE

VARIETIES

MORPHOLOGY		
Stem	UNDERG: NO; CREEPING: YES	WOODY: NO; CLIMBING: NO
Leaf	COMPOUND: NO; HARDNESS: FLESHY; ARRANGEMENT: OPPOSITE; VENTATION:	SHAPE: CYLINDRICAL/CURVED; MARGIN: SMOOTH; APEX: SHARP; LEAF BASE: ROUND; PETIOLE: SESSILE
EVERGREEN; SIZE: 4-13 CM; COLOR: US:GREEN LS:GREEN; TEXTURE: US:SMOOTH LS:SMOOTH		
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE: 8-10 CM	Flowering: FLORET	Fragrant: NO
Fruit	Type: CAPSULE	Color
SIZE:	Edible: YES	Fruiting Season
Growth	Rate: FAST	Longevity: VIGOROUS

ECOLOGY		
Climate	Temperature: 0ºC,H5 ,Z7	Drought resistant: TOLERANT
ALTITUDE: 0-200; IRRIGATION: LOW	Sun exposure: FULL SUN	Frost resistant: NO
Soil	Texture: LOAMY/SANDY	Salt resistant: YES
pH: 6.5-8; FERTILITY: LOW	Drainage: HIGH	Frost resistant: YES

USES		
Resistances	Applications	
COASTAL: YES	SLOPES: YES	HANGING: YES
POLLUTION: MODERATE	CLIMBERS: NO	+PAVEMENT: NO
WIND: MODERATE		ISOLATED : YES



POINTS OF INTEREST

Originally from South Africa. With succulent foliage and creeping branched stems, it is used as an extensive ground cover for dunes and sandy areas. Its high water content makes it heavy and as a result, can be slippery on very sloping ground. It has attractive flowers of variable color although pink-yellow tones predominate. They produce an edible fruit. Its fast growth rate and its low irrigation programme makes it a great value in gardening. However, its invasive nature and its naturalization has made it a threat to the local flora in coastal and dune areas. Given its high water content, it is an excellent fire retardant.

PLANTING AND PLANTING HEALTH

It needs good lighting, sunny exposure, temperate climate, although it can tolerate frost. This species accepts all types of soil and is very resistant to salinity.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing | Planting | Pruning x

Treatment Calendar

ENE	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation	Length (cm)	Topiary shapes
CT	15	
CT	20	

CERASTIUM

Cerastium tomentosum

GROUND COVER

ROCALLA BLANCA (SPANISH) · VALENCIAN · SNOW IN SUMMER (ENGLISH) · CERAISTE VELU (FRENCH)

STRUCTURE		
Shape: ROUND	Height: 0.15-0.20 M	Diameter: 0.25-0.30 M
		Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	CARYOPHYLLALES
FAMILY:	CARYOPHYLLACEAE

VARIETIES

MORPHOLOGY

Stem	UNDERG: YES; CREEPING: YES	WOODY: NO; CLIMBING: NO
Leaf	COMPOUND: NO	
EVERGREEN	HARDNESS: SOFT	
SIZE: 1-3 CM	ARRANGEMENT: OPPOSITE	
	VENATION: PINNATE	
	SHAPE: LINEAR-LANCEOLATE	
COLOR: US:DULL GRAY LS:DULL GRAY	MARGIN: OVAL/CURVED AT ENDS	
	APEX: ACUTE	
TEXTURE: US:TOMENTOSE LS:TOMENTOSE	LEAF BASE: ATTENUATE	
	PETIOLE: SHORT	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE: 2.5 CM	Flowering: ISOLATED	Fragrant: NO
Fruit	Type: CAPSULE	Color
SIZE:	Edible	Fruiting Season
Growth	Rate: FAST	Longevity: VIGOROUS



ECOLOGY

Climate	Temperature: 0ºC, H5, Z7	Drought resistant: MODERATE
ALTITUDE: 0-200	Sun exposure: FULL SUN	Frost resistant: NO
IRRIGATION: MODERATE		
Soil	Texture: LOAMY	Salt resistant: NO
pH: 6.5-7.5	Drainage: HIGH	Lime resistant: YES
FERTILITY: POOR		

USES

Resistances		Applications			
COASTAL:	MODERATE	SLOPES:	YES	HANGING:	NO
POLLUTION:	MODERATE	CLIMBERS:	NO	+PAVEMENT:	NO
WIND:	MODERATE			ISOLATED:	YES

POINTS OF INTEREST

This species of cerastium produces numerous thin shoots. Tomentose refers to the silky, silvery, frizzy and entangled hairs that cover the leaves. It develops in tight clusters that grow adapting to the shape of the land or fall like vegetable hair if they are planted on top of a low wall or in some type of container. It is suitable for marginal areas of the garden, between rocks or on slopes. It produces a special effect on the top of stone walls or growing on the edges or between the steps of a staircase. It is ideal for framing a path made with stone slabs. It can also be planted in flower boxes on terraces and balconies.

SPACING: 0.30 M

PLANTING AND PLANT HEALTH

It needs permeable and well-drained soil. In areas that are too dry and hot, it requires complementary weekly irrigations. It grows best in alkaline soils that are poor in nutrients, which helps maintain the gray color of its leaves. To densify its growth prune after flowering. Propagation is simple by dividing the bushes in autumn or spring and by means of non-flowering cuttings taken in early or late summer.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing ☐ Planting ■ Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides ■ Pesticides ■ Fertilizers ■

COMMERCIALIZATION

Presentation (L)	Length (cm)	Topiary shapes
CT(2)	15	

DROSANTHEMUM

GROUND COVER

Drosanthemum floribundum

MESEM PENDULA, ROCIO ROSA (SPANISH) | VALENCIAN | PURPLE CARPET (ENGLISH) | DROSANTHÈME FLORIFÈRE (FRENCH)

STRUCTURE		
Shape: EXTENDED	Height: 0.05-0.10 M	Diameter: 0.6-2 M
		Root: SCATTERED

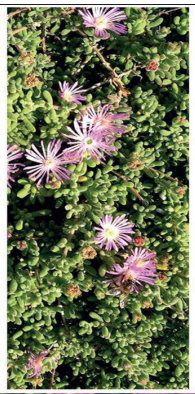
DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	CARYOPHYLLACEAE
FAMILY:	AIZOACEAE

VARIETIES

MORPHOLOGY

Stem	UNDERG: NO; CREEPING: YES	WOODY: NO; CLIMBING: NO
Leaf	COMPOUND: NO	
EVERGREEN	HARDNESS: FLESHY	
SIZE: 0.7-1.2 CM	ARRANGEMENT: OPPOSITE	
	VENATION:	
	SHAPE: CYLINDRICAL	
COLOR: US:GREEN/GRAY	MARGIN: SMOOTH	
LS:GREEN/GRAY	APEX: ROUND	
TEXTURE: US:TOMENTOSE	LEAF BASE: ROUND	
LS:TOMENTOSE	PETIOLE: SHORT	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE: 2-3.5 CM	Flowering: FLORET	Fragant: NO
Fruit	Type: CAPSULE	Color
SIZE:	Edible	Fruiting season
Growth	Rate: FAST	Longevity: VIGOROUS








ECOLOGY

Climate	Temperature: 0ºC,H5,Z7	Drought resistant: MODERATE
ALTITUDE: 0-200	Sun exposure: FULL SUN	Frost resistant: NO
IRRIGATION: LOW		
Soil	Texture: LOAMY/SANDY	Salt resistant: MODERATE/HIGH
pH: 6.5-8	Drainage: HIGH	Lime resistant: MODERATE
FERTILITY: MODERATE		

USES

Resistances		Aplicaciones			
COASTAL:	YES	SLOPES:	YES	HANGING:	YES
POLLUTION:	MODERATE	CLIMBERS:	NO	+PAVEMENT:	NO
WIND:	MODERATE			ISOLATED:	YES

POINTS OF INTEREST

This species is both botanically and morphologically related with those of the genus *Lampranthus*. Its name comes from the Greek words "Drosos" meaning dew and "Anthos" flower, referring to the luminous appearance of many of the species of the genust that "collect" the morning dew on its tomentose leaves. It is the ideal plant to cover coastal gardens in hot summer areas. Normally, the flowers that give it the nickname of "purple carpet" open at noon and close again in the afternoon, except on gray days, when they remain closed. An individual plant can cover up to 2 m^2 during its 5 to 7 years of life. Trimming after flowering allows it to maintain its compactness.

SPACING: 0.50 M

PLANTING AND PLANT HEALTH

A very hardy species, this plant resists heat, frost and drought in any type of garden, except in clay soils. They can be propagated by rooted twigs or cuttings, although they usually propagate by seed.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing ☐ Planting ■ Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides ■ Pesticides ■ Fertilizers ■

COMMERCIALIZATION

Presentation	Length (cm)	Topiary shapes

FELICIA

Felicia amelloides

GROUND COVER

MARGARITA AZUL SPANISH | VALENCIAN | BLUE DAISY ENGLISH | MARGUERITE DU CAP FRENCH

STRUCTURE		
Shape: ROUND/EXTENDED	Height: 10-25 CM	Diameter: 1-2 M
		Root: SCATTERED

DIVISION:	PHFANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOYILEDONS
ORDER:	ASTERALES
FAMILY:	COMPOSITAE

VARIETY
JOLLY (DWARF)

MORPHOLOGY		
Stem	UNDERG: NO	WOODY: NO
	CREEPING: YES	CLIMBING: NO
Leaf	COMPOUND: NO	
EVERGREEN	HARDNESS: SOFT	
SIZE: up to 3CM	ARRANGEMENT: ALTERNATE	
	VENATION: PINNATE	
	SHAPE: OBLONG	
COLOR: US:GREEN LS:GREEN	MARGIN: ENTIRE	
	APEX: ACUTE	
TEXTURE: US:SMOOTH LS:SMOOTH	LEAF BASE: ATTENUATE	
	PETIOLE: SESSILE	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE:	Flowering:	Fragrant: NO
INFLORESCENCE IN FLORET (4CM)		
Fruit	Type: ACHENE	Color:
SIZE:	Edible:	Fruiting season:
Growth	Rate: MODERATE	Longevity: VIGOROUS

ECOLOGY		
Climate	Temperature: 0ºC	Drought resistant: NO
ALTITUDE: 0-400	Sun exposure: SUN/PARTIAL SHADE	Frost resistant: NO
IRRIGATION: MOD/HIGH		
Soil	Texture: LOAMY	Salt resistant: NO
pH: 6.5-7.5	Drainage: MODERATE	Lime resistant: MODERATE
FERTILITY: MODERATE		

USES		
Resistances	Applications	
COASTAL: LOW	SLOPES: YES	HANGING: NO
POLLUTION: LOW	CLIMBERS: NO	+PAVEMENT: NO
WIND: MODERATE		ISOLATED: YES



POINTS OF INTEREST

Native to South Africa. It is commonly known as the blue daisy. It is a spreading shrub that quickly covers the ground and nearby plants. It blooms all year. It can live indoors but is usually planted in gardens in full sun, in pots, on balconies or hanging baskets. The flower remains closed on cloudy days. The cut of the first flowers allows to have a second flowering at the beginning of autumn. The "Jolly" variety is dwarf.

SPACING: 0.30-0.50 M

PLANTING AND PLANT HEALTH

Trimming the blue daisy favors more intense flowering and compact growth (severe pruning in summer). It accepts most types of soil and is resistant to drought. This species is suitable for sunny coastal locations both in the garden and in a pot. It is easily propagated with cuttings or seeds. It requires a moderate irrigation programme as well as light, well-drained soils.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
							X	X	X		

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Length (cm)	Topiary shapes

FESTUCA

Festuca cinerea

GROUND COVER

FESTUCA (SPANISH)	VALENCIAN	BLUE FESCUE (ENGLISH)	FÉTUQUE BLEUE (FRENCH)

STRUCTURE

Shape	Height	Diameter
GRAMINOID/GRAMINEAE	0.10-0.12 M	20-25 M
		Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	POALES
FAMILY:	GRAMINAE

VARIETIES

MORPHOLOGY

Stem: UNDERG NO; CREEPING NO; WOODY NO; CLIMBING NO

Leaf: EVERGREEN; SIZE: 10-12 CM; COLOR: US:LIGHT BLUE, LS:LIGHT BLUE; TEXTURE: US: SMOOTH, LS: SMOOTH

COMPOUND:	NO
HARDNESS:	SOFT
ARRANGEMENT:	
VENATION:	LINEAR
SHAPE:	LINEAR
MARGIN:	ENTIRE
APEX:	ACUTE
LEAF BASE:	ATTENUATE
PETIOLE:	SESSILE

Flower: SIZE:

Type	Reproduction
HERMAPHRODITE	HERMAPHRODITE
Flowering: INFLORESCENCE IN SPIKE (30 MM)	Fragrant: NO

Fruit: SIZE:

Type	Color
Edible	Fruiting season

Growth

Rate	Longevity
MEDIUM	VIGOROUS



ECOLOGY

Climate: ALTITUDE: 0-400; IRRIGATION: MODERATE

Temperature	Drought resistant
-5ºC	YES
Sun exposure	Frost resistant
SUN/PARTIAL SHADE	MODERATE

Soil: pH: 6.5-8; FERTILITY: MODERATE

Texture	Salt resistant
LOAMY	NO
Drainage	Lime resistant
HIGH	MODERATE

USES

Resistances		Applications			
COASTAL:	YES	SLOPES:	YES	HANGING:	NO
POLLUTION:	MODERATE	CLIMBERS:	NO	+PAVEMENT:	NO
WIND:	YES	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

This species is known for its exotic icy blue color that thrives in summer months and is ideal as an ornamental grass. Perfect as a garden border or ground cover, it is widely planted in rock gardens or in dry riverbeds. Highly prized in Asian gardens and landscapes in areas prone to drought. Combines well with small perennials that will not outgrow it. Planted in compact groups, it forms a surprising carpet that maintains its bluish color while other grasses turn yellow in summer.

SPACING: 0.25 M

PLANTING AND PLANT HEALTH

Constant watering during the initial growing season is recommended so that a deep and extensive root system can be established. To achieve a neat appearance, old foliage must be removed so that new leaves can emerge. Divide the bushes every 2 or 3 years in early spring to maintain their vigor thereby achieving propagation that maintains the features of the original plant.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing ☐ Division ☐ Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides ☐ Pesticides ☐ Fertilizers ☐

COMMERCIALIZATION

Presentation (L)	Length (cm)	Topiary shapes
CT(2)	30	
CT(3)	30	

GAZANIA

Gazania x hybrida

GROUND COVER

GAZANIA SPANISH	VALENCIAN	AFRICAN DAISY, GAZANIA ENGLISH	GAZANIE FRENCH

STRUCTURE

Shape	Height	Diameter
EXTENDED	0.15-2.5 M	1.5-2.5 M
		Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	ASTERALES
FAMILY:	ASTERACEAE

VARIETIES

MORPHOLOGY

Stem	UNDERG NO / CREEPING YES	WOODY NO / CLIMBING NO
Leaf	COMPOUND: NO	
EVERGREEN	HARDNESS: SOFT	
SIZE: 9 CM	ARRANGEMENT: ALTERNATE	
	VENATION: PINNATE	
	SHAPE: PINNATIFID/LOBED	
COLOR: US:LIGHT GREEN LS:BLUE GREEN	MARGIN: ENTIRE	
	APEX: ACUTE	
TEXTURE: US:TOMENTOSE LS: TOMENTOSE	LESF BASE: ATTENUATE	
	PETIOLE: SHORT	
Flower	Type: HERMAPHRODUTE	Reproduction: HERMAPHRODITE
SIZE: 7-10 CM	Flowering: INFLORESCENCE IN FLORET (7)	Fragrant: NO
Fruit	Type: ACHENE	Color
SIZE:	Edible	Fruiting season
Growth	Rate: HIGH	Longevity: VIGOROUS



ECOLOGY

Climate	Temperature: -2ºC, H5, Z6	Drought resistant: MODERATE
ALTITUDE: 0-400	Sun exposure: FULL SUN	Frost resistant: LIGHT
IRRIGATION: MODERATE		
Soil	Texture: LOAMY	Salt resistant: MODERATE
pH: 6,5-8	Drainage: MODERATE	Lime resistant: MODERATE
FERTILITY: MODERATE		

USES

Resistances		Applications			
COASTAL:	MOD/HIGH	SLOPES:	YES	HANGING:	YES
POLLUTION:	MOD/HIGH	CLIMBERS:	NO	+PAVEMENT:	NO
WIND:	MOD/HIGH			ISOLATED	YES

POINTS OF INTEREST

Native to South Africa. This plant has dense clusters of foliage that form a carpet on slopes as well as in rockeries. The best blooms occur with warm temperatures (>24ºC), night temperatures above 10ºC and full sun exposure. The flowers close at night and the rosette leaves fold upwards. It blooms mainly during the summer and also intermittently throughout the year. Suitable for rocky or coastal gardens, to fix soils and to stabilize slopes.

SPACING: 0.40 M

PLANTING AND PLANT HEALTH

Gazanias can accept all types of soil as long as they are well drained. In summer it has to be watered once or twice a month, but keeping the leaves dry. Gravel mulch is beneficial. Propagation occurs by division, cutting, and more slowly by seed.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation (L)	Length (cm)	Topiary shape
CT(2)	20	

HEDERA

Hedera helix

GROUND COVER

HIEDRA	HEURA	IVY	LIERRE
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE

Shape	Height	Diameter
CLIMBING	10-25 M	5 M
		Root
		SCATTERING

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	UMBELLALES
FAMILY:	ARALIACEAE

VARIETIES

There are many varieties with different shapes including the variegated variety and those with different colored leaves.

MORPHOLOGY

Stem	UNDERG	Yes	WOODY	Yes
	CREEPING	Yes	CLIMBING	Yes
Leaf	COMPOUND:	NO		
	HARDNESS:	SOFT		
EVERGREEN	ARRANGEMENT:	ALTERNATE		
SIZE: 5 CM	VENATION:	PINNATE		
	SHAPE:	RHOMBOID		
COLOR US:DARK GREEN	MARGIN:	ENTIRE		
LS:LIGHT GREEN	APEX:	ACUTE		
TEXTURE: US:SMOOTH	LEAF BASE:	ATTENUATE		
LS:SMOOTH	PETIOLE:	LONG		
Flower	Type	HERMAPHRODITE	Reproduction	HERMAPHRODITE
SIZE:	Flowering	UMBLES IN RACEMES (4-5)	Fragrant	NO
Fruit	Type	BERRY	Color	BLACK
SIZE: __	Edible		Fruiting season	MARCH
Growth	Rate	FAST	Longevity	>100 YEARS



ECOLOGY

Climate	Temperature	-5ºC ,H4 ,Z6	Drought resistant	MODERATE
ALTITUDE: 0-1000	Sun exposure	SUN/SHADE	Frost resistant	MODERATE
IRRIGATION: MODERATE				
Soil	Texture	ALL TYPES	Salt resistant	LOW
pH: 6.5-8	Drainage	__	Lime resistant	MODERATE
FERTILITY: MODERATE				

USES

Resistances		Aplicaciones			
COASTAL:	MODERATE	SLOPES:	YES	HANGING:	YES
POLLUTION:	MODERATE	CLIMBERS:	YES	+PAVEMENT:	NO
WIND:	MODERATE			ISOLATED	YES

POINTS OF INTEREST

Ivy is versatile and very easy to grow both in the garden and on terraces. As climbing plants they can quickly cover walls using their adventitious roots. The ivy is also a ground cover plant since it can easily emit new adventitious roots in the nodes that touch the ground. Ivy can cover large areas of the ground, such as those located under trees that do not have very dense crowns, slopes or herbaceous covers. It prefers medium-high humidity and although it adapts to both sunny and shaded exposure, it prefers the latter. Pruning includes trimming the edges once or twice a year (in February or March) so that new shoots come out in spring and avoid disheveled and loose plants. When tying them to walls, a long shoot can also be tied horizontally so that, from this horizontal guide, new vertical shoots emerge that allow the plant to be widened from the base.

PLANTING AND PLANT HEALTH

Its propagation is normally carried out by cutting the apical stem 7.5 to 10 cm in length or by cuttings of one or three nodes with leaves. It is preferable to place them directly in the pot where they are going to be grown to avoid casualties in the transplant. In nurseries, the temperature must be kept close to 20ºC and using a mist or fogging system is convenient. The ease and time of rooting vary according to the varieties; the green ones for instance are faster than the variegated species. Cutting can be done at any time of the year. *Xanthomonas*, *Colletrotrichum* and *Alternaria* fungi cause the appearance of leaf spots and are combated with products containing copper. If the ivy is attacked by the cochineal bug, the leaves will weaken and therefore fall. Those attacked by aphids show twisted terminal stems in spring.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
X	X	X	X	X	X	X	X				

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation(L)	Length (cm)	Topiary shapes
CT(2)	80/100	
CT(3)	100/125	
CT(7)	125/150	
CT(30)	150/175	
CT(50)	175/200	
CT(85)	200/250	

HYPERICUM

GROUND COVER

Hypericum calycinum

HIPERICO SPANISH | VALENCIAN | ROSE OF SHARON ENGLISH | MILLEPERTUIS FRENCH

STRUCTURE		
Shape	Height	Diameter
EXTENDED	0.3-0.6 M	1.5 M +
		Root
		SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	THEALES
FAMILY:	GUTTIFERAE

VARIETIES

MORPHOLOGY		
Stem	UNDERG NO	WOODY YES
	CREEPING NO	CLIMBING NO
Leaf	COMPOUND:	NO
	HARDNESS:	SOFT
SEMI-EVERGREEN	ARRANGEMENT:	ALTERNATE
SIZE: 4.5-10 CM	VENATION:	PINNATE
	SHAPE:	OVATE
COLOR: US:GREEN	MARGIN:	ENTIRE
LS:GREEN	APEX:	ACUTE
TEXTURE: US: SMOOTH	LEAF BASE:	ATTENUATE
LS: SMOOTH	PETIOLE:	SESSILE
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE: 2.5-4 CM	Flowering: SOLITARY	Fragrant: NO
Fruit	Type: CAPSULE	Color
SIZE:	Edible	Fruitign season
Growth	Rate: MEDIUM	Longevity: 0-20 YEARS

ECOLOGY		
Climate	Temperature: -5ºC,H4,Z6	Drought resistant: LOW
ALTITUDE: 0-1000	Sun exposure: SUN/PARTIAL SHADE	Frost resistant: MODERATE
IRRIGATION: MODERATE		
Soil	Texture: AL TYPES	Salt resistant: HIGH
pH: 6.5-7.5	Drainage: MODERATE	Lime resistant: MODERATE/HIGH
FERTILITY: POOR		

USES		
Resistances	Applications	
COASTAL: YES	SLOPES: YES	HANGING: NO
POLLUTION: MODERATE	CLIMBERS: NO	+PAVEMENT: NO
WIND: MOD/HIGH		ISOLATED: YES



POINTS OF INTEREST

Native to Southeastern Europe and Western Asia Minor. This species of groundcover is an evergreen carpet that spreads rapidly which, together with the abundance, duration and color of its flowering, makes it very suitable for flower beds and to cover steep slopes. It prefers exposure to full sun, blooming less if it is located in semi-shade. This is an invasive species of ground cover.

SPACING : 0.50 M

PLANTING AND PLANT HEALTH

If cut every other year to the ground in early spring (March) it blooms on new growth. In the annual pruning it is advisable to cut the stems in half at the end of spring. The larger ones require a less drastic cutting. In spring the upper third of the branches are removed. It tolerates drought and it is necessary to avoid waterlogging. It accepts all types of soils but prefers loose ones. It grows very well on sandy soils and tolerates salinity.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing ☐ Planting ☐ Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides ☐ Pesticides ☐ Fertilizers ☐

COMMERCIALIZATION

Presentation (L)	Length (cm)	Topiary shapes
CT(20)	30-40	
CT(25)	40-60	

LAMPRANTHUS

Lampranthus aureus

GROUND COVER

MESEM		GOLDEN ICE PLANT, VYGIE	VYGIE
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE

Shape	Height	Diameter
EXTENDED	0.30-0.40 M	40 M
		Root
		SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	CARYOPHYLLACEAE
FAMILY:	AIZOACEAE

VARIETIES

MORPHOLOGY

Stem	UNDERG	NO	WOODY	NO
	CREEPING	YES	CLIMBING	NO
Leaf	COMPOUND:	NO		
EVERGREEN	HARDNESS:	FLESHY		
SIZE: 5 CM	ARRANGEMENT:	OPPOSITE		
	VENATION:			
	SHAPE:	CYLINDRICAL		
COLOR: US:GREEN/GRAY	MARGIN:			
LS:GREEN/GRAY	APEX:	OBTUSE		
TEXTURE: US:SMOOTH	LEAF BASE:	ROUNDED		
LS:SMOOTH	PETIOLE:	SHORT		
Flower	Type		Reproduction	
SIZE: 2.5-3.5 CM	HERMAPHRODITE		HERMAPHRODITE	
	Flowering		Fragrant	
	FLORET		NO	
Fruit	Type		Color	
	CAPSULE			
SIZE:	Edible		Fruiting season	
Growth	Rate		Longevity	
	MODERATE		VIGOROUS	











ECOLOGY

Climate	Temperature	Drought resistant
	0ºC	MODERATE
ALTITUDE: 0-200	Sun exposure	Frost resistant
IRRIGATION: LOW	FULL SUN	NO
Soil	Texture	Salt resistant
	LOAMY/SANDY	MODERATE/HIGH
pH: 6.5-8	Drainage	Lime resistant
FERTILITY: MODERATE	HIGH	MODERATE

USES

Resistances		Applications			
COASTAL:	MODERATE	SLOPES:	YES	HANGING:	YES
POLLUTION:	MODERATE	CREEPING:	NO	+PAVEMENT:	NO
WIND:	MODERATE			ISOLATED	YES

POINTS OF INTEREST

This species, like the *Mesembryamthemum* species, is native to South Africa. It forms a 25 cm high carpet that can be spread over large surfaces. Pink flowers perists over long period of time. It is a hardy species that prefers sandy and well-drained soils and is somewhat drought resistant during the summer months. The flowers open in spring, carpeting the countryside with their vivid color. Since it is not walkable, the arrangement of interspersed slabs on the ground between the plants allows pedestrian to circulate and to maintain the plant. Cut back slightly after flowering.

SPACING: 0.50M.

PLANTING AND PLANT HEALTH

Propagation by cuttings to be cut after flowering and inserted into the ground or between sunny rocks. It can also be propagated by seeds.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing ☐ Planting ▭ Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides ▭ Pesticides ▭ Fertilizers ▭

COMMERCIALIZATION

Presentation	Length (cm)	Topiary forms
CT	<15	
CT	15-20	

LAMPRANTHUS

GROUND COVER

Lampranthus spectabilis

MESEM ROSADO, LAMPRANTHUS (SPANISH) | (VALENCIAN) | TRAILING ICE PLANT (ENGLISH) | LAMPRANTHUS (FRENCH)

STRUCTURE		
Shape: EXTENDED	Height: 0.15-0.30 M	Diameter: 0.40-1 M
		Root: SCATTERED

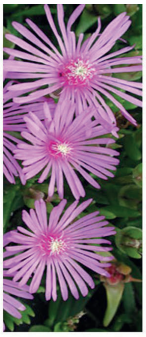
DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	CARYOPHYLLACEAE
FAMILY:	AIZOACEAE

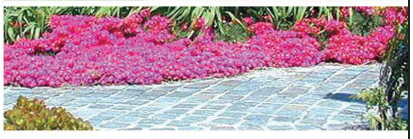
VARIETIES

MORPHOLOGY		
Stem	UNDERG: NO; CREEPING: YES	WOODY: NO; CLIMBING: NO
Leaf	COMPOUND: NO; HARDNESS: FLESHY; ARRANGEMENT: OPPOSITE; VENATION: —; SHAPE: CYLINDRICAL; MARGIN: ENTIRE; APEX: POINTED; LEAF BASE: ROUNDED; PETIOLE: SHORT	
EVERGREEN		
SIZE: 5-8 CM		
COLOR: US:GREEN/GRAY; LS:GREEN/GRAY		
TEXTURE: US: SMOOTH; LS: SMOOTH		
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE: 5-7 CM	Flowering: FLORET	Fragrant: NO
Fruit	Type: CAPSULE	Color
	Edible	Fruiting season
SIZE:		
Growth	Rate: MODERATE	Longevity: VIGOROUS

ECOLOGY		
Climate	Temperature: 0ºC,H5	Drought resistan: MODERATE
ALTITUDE: 0-200	Sun exposure: FULL SUN	Frost resistant: NO
IRRIGATION: LOW		
Soil	Texture: LOAMY/SANDY	Salt resistant: MODERATE/HIGH
pH: 6.5-8	Drainage: HIGH	Lime resistant: MODERATE
FERTILITY: MODERATE		

USES				
Resistances		Applications		
COASTAL:	MOD/HIGH	SLOPES:	YES	HANGING: YES
POLLUTION:	MODERATE	CLIMBER:	NO	+PAVEMENT: NO
WIND:	MODERATE			ISOLATED: YES


POINTS OF INTEREST

This species, like the *Mesembryanthemum* species,is Native to South Africa. It forms a 25 cm high carpet that can be spread over large surfaces. Pink flowers perists over long period of time. It is a highly rustic species that prefers sandy and well-drained soils and is somewhat drought resistant during the summer months. The flowers open in spring, carpeting the countryside with their vivid color. Since it is not walkable, the arrangement of interspersed slabs on the ground between the plants allows pedestrian to circulate and to maintain the plant. Cut back slightly after flowering.

SPACING: 0.50 M

PLANTING AND PLANT HEALTH

Propagation is done by cuttings to be cut after flowering and inserted into the ground or between sunny rocks. It can also be propagated by seeds.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calender

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing ☐ Planting ☐ Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides ☐ Pesticides ☐ Fertilizers ☐

COMMERCIALIZATION

Presentation	Length (cm)	Topiary shapes
CT	<15	
CT	15-20	

LANTANA

Lantana montevidensis

GROUND COVER

LANTANA (SPANISH) · VALENCIAN · TRAILING LANTANA (ENGLISH) · LANTANA (FRENCH)

STRUCTURE		
Shape: EXTENDED	Height: 0.25-0.40 M	Diameter: Up to 2 M
		Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONES
ORDER:	LAMIALES
FAMILY:	VERBENACEAE

VARIETIES

MORPHOLOGY		
Stem	UNDERG: NO / CREEPING: YES	WOODY: NO / CLIMBING: NO
Leaf	COMPOUND: NO	
EVERGREEN	HARDNESS: SOFT	
SIZE: 3.5 CM	ARRANGEMENT: OPPOSITE	
	VENATION: PINNATE	
	SHAPE: OVATE	
COLOR: US:GREEN/GRAY	MARGIN: DENATE	
LS:GREEN/GRAY	APEX: ACUTE	
TEXTURE: US:TOMENTOSE	LEAF BASE: ATTENUATE	
LS:TOMENTOSE	PETIOLE: SHORT	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHROPDITE
SIZE: 7-8 MM	Flowering: INFLORESCENCE IN FLORET (2.5-3.5 CM)	Fragrant: YES
Fruit	Type	Color
SIZE:	Edible	Fruiting season
Growth	Rate: MODERATE	Longevity: VIGOROUS







ECOLOGY		
Climate	Temperature: 0ºC,H5,Z7	Drought resistant: MODERATE
ALTITUDE: 0-400	Sun exposure: SUN	Frost resistant: LIGHT
IRRIGATION: MODERATE		
Soil	Texture: LOAMY	Salt resistant: MODERATE
pH: 6.5-8	Drainage: MODERATE	Lime resistant: MODERATE
FERTILITY: MODERATE		

USES		
Resistances	Applications	
COASTAL: MODERATE	SLOPES: YES	HANGING: YES
POLLUTION: MODERATE	CLIMBER: NO	+PAVEMENT: NO
WIND: MOD/HIGH		ISOLATED: YES

POINTS OF INTEREST

Native to Central and South America. This groundcover shrub guarantees long-lasting and colorful flowering. In warm climates it is evergreen and produces flowers for most of the year. In cooler climates it is deciduous and produces flowers from summer to late fall. It is resistant and easy-to-grow that can hang down walls and pots. Lilac verbena-like flowers cover the leaves during the hottest season.

SPACING: 0.40 M

PLANTING AND PLANT HEALTH

It needs full sun exposure and mild winters. It tolerates most soil types but requires good drainage. Responds well to mulching. It requires a high irrigation programme once or twice a month. Pruning in spring causes vigorous growth but if the aim is to contain its development, pruning only the tips is recommended. Propagation occurs by cuttings although it can also be done by seed. It is considered an invasive species in South Africa.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
			X	X	X	X	X	X			

Sowing ☐ Planting ■ Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides ■ Pesticides ■ Fertilizers ■

COMMERCIALIZATION

Presentation (L)	Length (cm)	Topiary shapes
CT(2)		
CT(3)		
CT(7)		

LOBULARIA

GROUND COVER

Lobularia maritima

LOBULARIA SPANISH | VALENCIAN | SWEET ALYSSUM ENGLISH | ALISE ODORANTE FRENCH

STRUCTURE		
Shape: EXTENDED	Height: 0.5-0.20 M	Diameter: 25 M
		Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	PAPAVERALES
FAMILY:	BRASSICACEAE

VARIETIES

CARPET OF SNOW

MORPHOLOGY		
Stem	UNDERG: NO; CREEPING: YES	WOODY: NO; CLIMBING: NO
Leaf	COMPOUND: NO; HARDNESS: SOFT; ARRANGEMENT: ALTERNATE; VENATION: PINNATE; SHAPE: LANCEOLATE; MARGIN: ENTIRE; APEX: ACUTE; LEAF BASE: ATTENUATE; PETIOLE: SHORT	
EVERGREEN; SIZE: 1-4 CM; COLOR: US:GREEN LS:GREEN; TEXTURE: US:TOMENTOSE LS:TOMENTOSE		
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE: 0.3-0.4 CM	Flowering: CORYMB (2-3 CM)	Fragrance: NO
Fruit	Type	Color
SIZE:	Edible	Fruiting season
Growth	Rate: MODERATE	Longevity: VIGOROUS

ECOLOGY		
Climate	Temperature: 0ºC,H5 ,Z7	Drought resistant: NO
ALTITUDE: 0-400	Sun exposure: FULL SUN	Frost resistant: NO
IRRIGATION: MODERATE		
Soil	Texture: ALL TYPES	Salt resistant: LOW
pH: 6.5-7.5	Drainage: MODERATE	Lime resistant: MODERATE
FERTILITY: MODERATE		

USES		
Resistances	Applications	
COASTAL: MODERATE	SLOPES: YES	HANGING: YES
POLLUTION: MODERATE	CLIMBER: YES	+PAVEMENT: NO
WIND: MODERATE		ISOLATED: YES



POINTS OF INTEREST

The sea cress is an annual or perennial creeping groundcover (20 cm) that produces a profuse white bloom. It grows very well in hot climates and tolerates maritime conditions. It also grows well on dry, sandy soils and dry walls. Despite being a short-cycle perennial, it loses its compact growth habit if grown for more than a year and is therefore often grown as an annual. The *Carpet of Snow* variety, with larger flowers, forms a dense white carpet especially valued in rockeries. In Spain it was traditionally used to combat scurvy given its vitamin C content as well as its diuretic properties. The leaves, stems and young flowers can be used as a dressing in salads and other dishes.

SPACING: 0.25 M.

PLANTING AND PLANT HEALTH

Pruning after flowering is recommended. After planting, it grows rapidly, and can become invasive.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing | Planting | Pruning (X)

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation	Length (cm)	Topiary shapes
CT(2L)		
CT(3L)		

Ophiopogon

GROUND COVER

Ophiopogon japonicus

OFIOPOGON (SPANISH) | VALENCIAN | FOUNTAIN PLANT, MONKEY GRASS (ENGLISH) | BARBE DE SERPENT (FRENCH)

STRUCTURE		
Shape: GRAMINOIDS	Height: 0.15-0.20 M	Diameter: 0.20-0.25 M
		Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	LILIALES
FAMILY:	LILIACEAE

VARIETIES

ALBUS

KYOTO - DWARF

MORPHOLOGY		
Stem	UNDERG: NO; CREEPING: YES	WOODY: NO; CLIMBING: NO
Leaf	COMPOUND: NO; HARDNESS: SOFT; ARRANGEMENT: ROSETTE; VENATION: LINEAR; SHAPE: LINEAR; MARGIN: ENTIRE; APEX: ACUTE; LEAF BASE: ATTENUATE; PETIOLE: SESSILE	
EVERGREEN		
SIZE: 10-20 CM		
COLOR: US:GREEN; LS:GREEN		
TEXTURE: US: SMOOTH; LS: SMOOTH		
Flower	Type: HERMAPHODRITE	Reproduction: HERMAPHRODITE
SIZE:	Flowering: INFLORESCENCE IN SPIKE (5-10 CM)	Fragrant: NO
Fruit	Type: CAPSULE	Color: DARK BLUE
SIZE:	Edible	Fruiting season
Growth	Rate: MODERATE/FAST	Longevity: VIGOROUS

ECOLOGY		
Climate	Temperature: -2ºC (H5, Z6)	Drought resistant: LOW
ALTITUDE: __	Sun exposure: SHADE/PARTIAL SHADE	Frost resistant: LIGHT
IRRIGATION: MODERATE		
Soil	Texture: LOAMY	Salt resistant: LOW
Ph: 6.5-8	Drainage: MODERATE	Lime resistant: MODERATE
FERTILITY: MODERATE		

USES		
Resistances	Applications	
COASTAL: MODERATE	SLOPES: NO	HANGING: NO
POLLUTION: MODERATE	CLIMBER: NO	+PAVEMENT: NO
WIND: MOD/HIGH		ISOLATED: YES



POINTS OF INTEREST

Its linear leaves create a surface that is similar to grass, which it can replace in small areas. It is also used for borders or as a background for more colorful plants. In summer it forms inflorescences that grow from long stolons and tuberous roots, forming short and erect racemes of lilac or purple-colored flowers of little interest since they remain hidden among the dense foliage as well as the small blue fruits that follow them. The "Albus" variety is white, "Kyoto Dwarf" is dense and 3-5 cm tall. Both plants produce small dark blue fruits.

SPACING: 0.30 M

PLANTING AND PLANT HEALTH

This is an undemanding and slow-growing species which grows easily in mulched humus enriched soil and adapts well to poorer soils. The soil must be kept moist although the plant has some resistance to drought. Propagation by seed or the rhizomes can be divided in spring. Requires very little maintainance.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing ☐ Planting ■ Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides ■ Pesticides ■ Fertilizers ■

COMMERCIALIZATION

Presentation (L)	Length (cm)	Topiary shapes
CT(1)	20	
CT(2)	25	
CT(3)	30	

Verbena

Verbena x hybrida

GROUND COVER

VERBENA SPANISH | VALENCIAN | HYBRID VERBENA ENGLISH | VERBEINE HYBRIDE FRENCH

STRUCTURE		
Shape: EXTENDED	Height: 0.30-0.40 M	Diameter: 0.80-1.5 M
		Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	LAMIALES
FAMILY:	VERBENACEAE

VARIETIES

MORPHOLOGY

Stem	UNDERG: NO; CREEPING: YES	WOODY: NO; CLIMBING: NO
Leaf	COMPOUND: NO	
EVERGREEN	HARDNESS: SOFT	
SIZE: 8 CM	ARRANGMENT: OPPOSITE	
LEAFLET: NO	VENATION: PINNATE	
COLOR: US:GREEN LS:GREEN	SHAPE: OVAL	
	MARGIN: DENTATE	
TEXTURE: US:SMOOTH LS:SMOOTH	APEX: ACUTE	
	LEAF BASE: ATTENUATE	
	PETIOLE: SHORT	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE: 2-3 CM	Flowering: INFLORESCENCE IN CORYMB	Fragrant: YES
Fruit	Type	Color
SIZE:	Edible	Fruiting season
Growth	Rate: MODERATE	Longevity: VIGOROUS



ECOLOGY

Climate	Temperature: 0ºC,H5,Z7	Drought resistant: MODERATE
ALTITUDE: 0-400	Sun exposure: FULL	Frost resistant: LIGHT
IRRIGATION: MODERATE		
Soil	Texture: LOAMY	Salt resistant: MODERATE
pH: 6.5-8	Drainage: MODERATE	Lime resistant: MODERATE
FERTILITY : MODERATE		

USES

Resistances		Applications			
COASTAL:	MODERATE	SLOPES:	YES	HANGING:	YES
POLLUTION:	MODERATE	CLIMBER:	NO	+PAVEMENT:	NO
WIND:	MOD/HIGH			ISOLATED:	YES

POINTS OF INTEREST

The verbena forms a compact floral carpet thanks to its abundant branches covered by cleft leaves. It is a fast growing plant that quickly covers the ground around it within a few weeks. When hanging down slopes they generate a very showy flowery green carpet. They are often used to decorate raised planters or hanging baskets. They are sensitive to fungal attack, so an interspersed irrigation programme in large doses is recommended at mid-morning.

SPACING: 0.40 M

PLANTING AND PLANT HEALTH

Verbena seeds should be germinated at the beginning of March in a warm seedbed and in small pots that facilitate their subsequent transplant. Once germinated and somewhat developed, the most vigorous one will be selected in each pot, discarding the others. After a short hardening period, they will be moved to their final location in April, beginning to flower after three or five weeks. In places with a mild winter, a second budding in spring may occur, which will be more intense if all the plants are pruned flush in November or December.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
										X	X X X X X X X X

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation (L)	Length (cm)	Topiary shapes
CT(1)		
CT(3)		

Vinca

Vinca major

GROUND COVER

HIERBA DONCELLA (SPANISH) | VALENCIAN | BIGLEAF PERYWINKLE (ENGLISH) | GRANDE PERVENCHE (FRENCH)

STRUCTURE		
Shape: EXTENDED	Height: 0.20-0.30 M	Diameter: Up to 2 M
		Root: SCATTERED

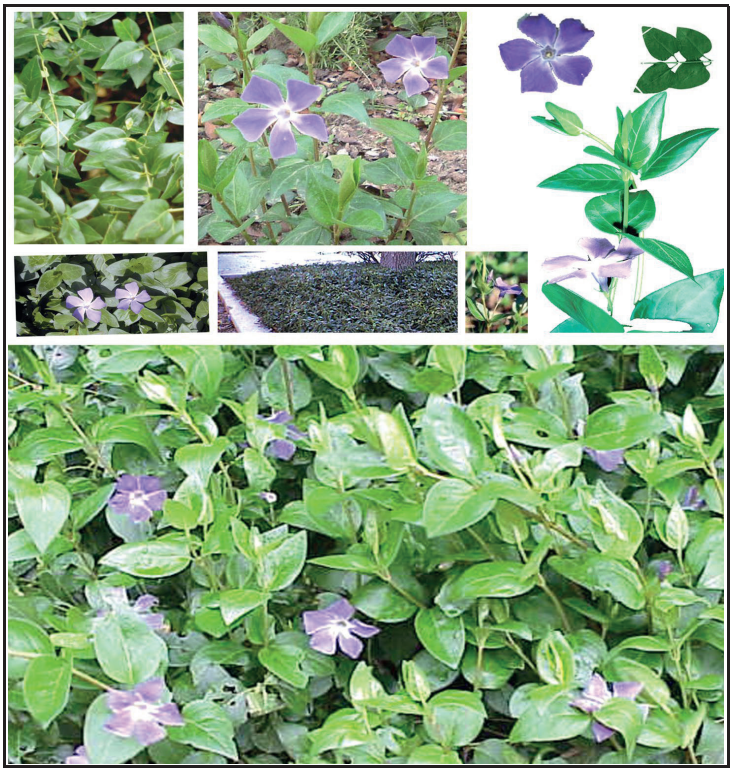
DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	GENTIANALES
FAMILY:	APOCYNACEAE

VARIETIES

MORPHOLOGY		
Stem	UNDERG: No / CREEPING: Yes	WOODY: No / CLIMBING: No
Leaf	COMPOUND: NO HARDNESS: SOFT ARRANGEMENT: OPPOSITE VENATION: PINNATE SHAPE: OVAL MARGIN: ENTIRE APEX: ACUTE LEAF BASE: ATTENUATE PETIOLE: SHORT	
EVERGREEN SIZE: 3-5.5 CM COLOR: US:GREEN LS:GREEN TEXTURE: US:SMOOTH LS:SMOOTH		
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE: 4-4.5 CM	Flowering: ISOLATED	Fragrant: NO
Fruit	Type: FLORET	Color
SIZE:	Edible	Fruiting season
Growth	Rate: MODERATE/HIGH	Longevity: VIGOROUS

ECOLOGY		
Climate	Temperature: -3ºC	Drought resistant: MODERATE
ALTITUDE: 0-400	Sun exposure: SHADE/PARTIAL SHADE	Frost resistant: LIGHT
IRRIGATION: MODERATE		
Soil	Texture: LOAMY	Salt resistant: LOW
pH: 6.5-8	Drainage: MODERATE	Lime resistant: MODERATE
FERTILITY: MODERATE		

USES		
Resistances	Applications	
COASTAL: MODERATE	SLOPES: YES	HANGING: YES
POLLUTION: MODERATE	CLIMBER: NO	+PAVEMENT: NO
WIND: MOD/HIGH		ISOLATED: YES



POINTS OF INTEREST

Its main use is in gardening, small hedges, humid corners,clearings, and filling the bases of trees and especially for the attractiveness of its 3 to 5 cm flowers that range from blue to purple. It requires very little maintainance and thrives in sun or shade, although most varieties are better suited to shade. It is ideal for controlling soil erosion or shading slopes, for ground cover under trees and shrubs, and for window planters.

SPACING : 0.40 M

PLANTING AND PLANT HEALTH

They adapt well to loose, humus-rich, moist soils. Most varieties spread quickly and may require pruning. If planted with the spacing recommended, it should provide complete cover in one year except on very dry soils. Depending on whether it is located in the sun or in the shade, it will produce more flowers or more foliage. Propagate by cuttings or by separating a piece of shoot that has rooted.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing | Planting | Pruning (x)

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation (L)	Length (cm)	Topiary shapes
CT(2)	45	
CT(3)	45	

Subchapter 6.3 Commercialization, use and planting

COMMERCIALIZATION

Groundcover plants can be commercialized: bare root, root ball or container. Although the most usual format is in a container.

Groundcover plants cultivated in containers

Firstly, the plants must have a sufficiently developed root system before planting. This can be checked when the plant is removed from the container since the root ball should be cohesive enough to maintain its shape.

Types of containers:

- Container
- Truncated cone pot
- Truncated pyramid pot
- Seed plug tray (for seedlings and rooted cuttings)

Plant size

The indications on Tables 6.3.1 and 6.3.2 should be followed:

Classification of width (cm)	Classification according to number of main stems and stolons.
5/10	1
10/20	2
20/30	3/4
30/40	5/7
40/60	8/12
60/80	
80/100	

Table 6.3.1: Classification of groundcover plants according to width and number of main stems (NTJ 07J C.O.I.T.A.P.A.C.)

Plant width in cm	Minimum volume of container in liters	
	Shrub and subshrubs	Herbaceous plants
5/10	0.5	0.5
10/20	0.5/1	0.5
20/30	1/1.5	1
30/40	1.5/2	
40/60	2/2.5	
60/80	3/5	
80/100	5/7.5	

Table 6.3.2: Minimum recommend volume of container according to plant width (NTJ 07J C.O.I.T.A.P.A.C.)

USES

Façade base and vegetative elements

Groundcover plants can be used to hide undesirable aspects in the lower parts of façades or to create and highlight a visual base besides a building. They can also be used to accentuate the appearance of a monument or some special specimen of trees or bushes.

When buildings have noticeable vertical lines, a green layer or base that clearly marks a horizontal line a few decimeters from the ground can be of interest. In this situation, water runoff from the roofs and the necessary waterproofing of the lower part of the façades must be considered. Plants that grow near façades receive less light and therefore the appropriate species must be chosen. In these cases, a gentle slope on the ground towards the outside is of interest, which in certain compositions should not influence the horizontality of the upper plane of the plant set. Likewise, the effect of the groundcovers root system on different infrastructures (water, electricity, drainage…) must be considered when they are located around one building.

The use of groundcover plants as a visual base for larger plants is an important topic in garden design and should be given proper attention. In some cases, it deals with framing the presence of trunks or bush bases; on others, the objective is to achieve the visual connection of different trees or shrubs through a green base with a homogeneous and continuous texture and chromatic tone.

Grasses for pavements

To soften the harsh effects of the pieces that make up the pavement of a pathway, or an esplanade, plants can be grown in their interstices. For this, the soil must be well prepared at a depth of about 15-20 cm.

If quick covering is needed, Aubrieta, Helianthemum and Phlox subulata, are recommended which give internal spots of pink, white, red, purple, orange and yellow, and should be cut back to 15 cm after flowering. The following species are also suitable for this purpose: *Armeria caespitosa, Thymus serphyllum, Dianthus gratianopolitanus* (D. caesius)*, D. arenarius, D x arvernensis, Veronica prostrata* (V. rupestris)*, Hypericum reptans, Linaria alpina, Acantholimon glumaceum, Globularia meridionalis (G. bellidifolia), Androsace sarmentosa, Gentiana acaulis, G. septemfida, Campanula pulla,* and *C. x haylodgensis*.

Other uses

Some groundcovers, especially those with fleshy stems and leaves, function as firebreaks in places where there are barbecues. In these sites, the use of resinous and other flammable species must be avoided.

It can sometimes be of interest to intersperse some bulbous plants among the groundcover set. The use of tulips, hyacinths or daffodils add a special attraction and provide a remarkable chromatic touch at the beginning of spring, when some of the groundcover species are still in their winter stage and display their worst characteristics. With the same objective, annual flower or foliage species can be planted, but always considering the main rule of interspersing, which determines the size ratio and indicates that the height of the groundcover should not be greater than 1/3 to ½ of the size of the foliage of the bulbous or annuals.

Using groundcovers as mulch can inhibit the development of weeds. These “mulch” species can sometimes replace grass in areas where trampling is not frequent (*Ophiopogon*) and ornamental meadows or lawns are not required.

Groundcover species can play an interesting role when used to visually accentuate a special element of the landscape such as stairs, entrances, rock gardens, and various ornamental elements. By considering the

groundcover features (foliage, bark, stems, flowers) and proportions, a slight, medium, or intense emphasis can be achieved.

Another common use for this group of species is to mark limits, delineate boundaries, identify zones, and protect embankments (see Table 6.3.3).

Plant	Height (cm)	Ornamental purpose
Acaena buchanii	10	Yellow flowering in warm season
Achillea millefolium	15	White flowering in warm season
Ajuga reptans	10	Blue flowering in warm season
Anthemis tinctoria	40	Yellow flowering in warm-temperate season
Armeria maritime	10-20	Pink flowering in warm season
Bergenia cordifolia	20-30	Red flowering in cold season
Capparia spinosa	20-50	white bloom
Carpobrothus	15-20	Red-yellow flowering in warm season
Cerastium tomentosum	5-10	White flowering in warm-temperate season
Dichondra repens	5-10	Evergreen foliage
Drosanthemum floribundum	5-10 15-20	Violet flowering in warm season
Gazania splendens	5-10	Yellow flowering in warm season
Glechoma hederacea	10-20	Tinged foliage
Hedera helix	3-5	Intense foliage
Helxine soleirolii	15-20	compact foliage
Hypericum clycinum	10-20	Yellow flowering in warm season
Lamprantrus	3-5	Orange flowering in warm season
Lippia canescens	30-50	White flowering in warm season
Lysimachia nummularia	20-30	Yellow flowering in warm season
Nepeta musinii	10-15	Blue flowering in warm season
Ononis	15-20	Yellow flowering in warm season
Ophipogon japonicum	15-25	Lilac flowering in warm season
Pachysandra terminalis	30-60	White flowering in warm season
Pyracantha	2-3	Red fruiting in cold season
Sagina subulata	10-20	White flowering in warm season
Saxifraga	10-15	White flowering in warm season
Sedum	10-25	Varied flowering in warm season
Spergularia rubra	10-20	Violet flowering in warm-temperate season
Stachys lanata	5-10	Silver foliage
Thymus serpyllum	10-20	Violet flowering in warm season
Tradescantia	3-6	Glossy foliage
Verbena repens	10-20	Violet flowering in warm season
Vinca	10-20	Blue flowering in warm-temperate season
Viola		Violet flowering in warm-temperate season

Table 6.3.3: Groundcover plants to protect embankments

PLANTING AND SOWING

Plants are supplied in different formats depending on the plant group to which they belong: herbaceous plants in an 8-12 cm pot or container, or in plug trays. Groundcover shrubs and conifers in a 15 or 17 cm container.

There are more groundcover species suited for humid shady areas than for dry sunny areas. As a result, an adequate preparation of the soil is recommended and enhancing it with organic matter and peat to achieve greater moisture retention. In subsequent years, new organic contributions must be carried out for this same purpose.

The best time to plant groundcovers depend on the species and the climatic conditions of the area in question. In cold areas, planting in spring is more recommended however it can also be carried out in the summer months. It is nevertheless advisable not to postpone it until the end of summer since the plants may not be sufficiently settled when the cold arrives. In warm temperate zones they can be planted in early spring or autumn.

Most creepers and groundcover plants are soil hardy nevertheless they prefer well prepared, enhanced, fertilized and well-drained soil. Likewise, temperature, lighting and water requirements of different species must be studied, so that the most appropriate ones are chosen for each climate and microclimate.

Before planting, it is necessary to carry out the normal preparatory tasks including the elimination of weeds and their roots. The soil will be ameliorated by providing 400-800 Kg/area (100 m^2) of organic matter, which can be quality manure or the material commonly used in gardening (2% of urban organic waste free of glass, metal and plastic + 60 % pomace + 20% manure). In very clayey soils, it is advisable to add 2-3 m^3/area of siliceous sand, especially if mediterranean or xerophyte species are to be planted. Mineral or inorganic fertilizers will be provided at a rate of 8-13 grams/m^2 of complex 9-18-27.

Plant	Standards (cm)	Nº Plants/m^2 or linear meter
Shrubs		
Dwarf or slow growth	45-60	3-5
Medium	100-120	1
Vigorous	150-180	1 plant/2-3 m^2
Rose bushes	45-60	3-4
Perennials		
Medium	30-50	4-11
Vigorous	60-150	1-3
Small herbaceous	20-30	11-25

Table 6.3.4: Planting standards

In some groundcover species, such as *Dichondra repens*, sowing is recommended and can be done from May to October, using a dose of 5gr/m^2.

Subchapter 6.4 Maintenance

GENERAL CONDITIONS OF MAINTENANCE

Groundcover species require minimal maintenance and although this is one of their most interesting features, this could lead to their abandonment. Periodic watering, occasional weeding (until it has the adequate density that inhibits weed development), soil improvement, trimming, pest and disease control, and replanting are still necessary.

Consistent watering is especially important immediately after planting; this will prevent wilting and encourage a strong root system. Many groundcover species have a certain resistance to drought, so once established, excesses should be avoided, especially in autumn, winter and the first part of spring.

Weed control - which is minimal once the groundcovers have grown - must be thorough and consistent in the first months after planting. This will become less necessary once good preventive practices for eliminating weeds have been carried out on the ground. Residual pre-emergence herbicides can also be used to prevent the appearance of these undesirable species during the planting period.

For most groundcover plants, an annual pruning or trimming is ideal. This improves light penetration inside the plants and better ventilation resulting in vigorous budding and development, and subsequently, plants become more branched and leafier.

The spring-flowering species should be cut back immediately after flowering ends, while those that flower in summer and autumn should be cut back in spring. For herbaceous species that lose their foliage in winter, dead stems and leaves should be removed in the fall or winter. In the case of sub-woody or woody species, the removal of no more than a third of the length of the branches is recommended. In other groundcovers such as Dichondra, watering is less frequent than in the case of lawns (once a month at most).

Most groundcover species need an adequate fertilization program. In general, slow releasing fertilizers of nitrogen and potassium are sufficient; Phosphorus does not need to be provided in a slow releasing format since it has low solubility.

The recommended N-P-K (Nitrogen, Phosphorus and Potassium) ratio is usually 2-1-2, for example a 10-5-10 formulation and can be applied at a rate of 0.75 kg N per area (100m2) in mid-spring and 0.5kg N per area in early autumn. Likewise, it will be convenient to make regular contributions of organic matter, preferably in November and at a rate of 150 kg/area and year.

Some groundcover species, especially those that propagate vegetatively by dividing the bush, develop so densely that they become overpopulated, with which growth is limited and flowering is reduced in quantity and showiness. To stop this from occurring, an annual thinning is recommended and adding organic matter and new soil to the thinning sites.

In order to establish groundcovers correctly, careful, attention must be given to the distribution of the plants in the assigned surface. This will ensure quick coverage and avoid competition for available space or the loss of its distinguishing features.

Therefore, prior to planting, it is convenient to know each plant’s potential and to calculate its approximate extension and to consider the root and stolon development.

Hummock-like species are the most controllable, however, other species, such as *Hypericum calycinum* and peppermint, grow through underground roots, which can create an invasive habit. Species such as

Campanula gromerata, Euphorbia robbiae and *Anaphales triplinervis* also spread through their roots.

Other plants (*Tiarella, Symphytum grandiflorum, Stachys lanata* and *Ajuga)* spread by rooting from the nodes of the stems and branches. This makes easy to control their growth by cutting the branches in the area where there is excess.

Others, like *Alchemilla mollis*, multiply by seed with impressive speed. It is advisable to avoid planting *Saponaria officinalis* among other shrubs and *Mentha gentilis* in a mix of herbaceous plants since both species are so expansive that they should only be used where the growth of any other plant is not required.

Maintenance Schedule

March
Treatment with Abamectina 0.35 cc p.c./ l + Thiram 80% 2.5 g p.c./l
General adjustments planting

April
Planting and fertilizers

May
Treatment with Metilpirimifos 1.75 g p.c./ l + Thiram 80% 2.5 g p.c./l
Remove weeds
Maintenance pruning

June
Deadheading

July
Treatment with Fenvalerato 0.75 cc p.c./ l +Dienocloro 0.9 g p.c./l
Deadheading

August
Deadheading

September
Treatment with Abamectina 0.35 cc p.c./ l + Thiram 80% 2.5 g p.c./l

October and November
Planting
Maintenance pruning
Deep fertilizers

December
Treatment with Zineb 80% 2.5 g p.c./l
Weeding

February
Treatment with Zineb 80% 2.5 g p.c./l
Planting
Pruning

7
CLIMBERS

Chapter 7 CLIMBERS

Subchapter 7.1 Introduction
Subchapter 7.2 Species
Subchapter 7.3 Commercialization, use and planting
Subchapter 7.4 Maintenance
Subchapter 7.5 Recommended bibliography

Subchapter 7.1 Introduction

INTRODUCTION

Climbing plants or climbers refer to species capable of ascending vertically or adhere naturally to different types of supports (walls, trees, rocks…) This particular type of species is often confused with other species that have long sarmentose-type stems that can cover walls in height and width when there is an artificial anchor to fix them. This second group is known as sarmentose.

Most climbing plants inhabit wooded places and need trees as support to climb in search of light (necessary for the correct functioning of its upper part) However, its roots are accustomed to a shady soil and low temperatures. This thermal need gradient must then be considered when placed on a sunny garden wall.

Climbing plants in a broad sense have developed various anchoring systems; Some, like ivy, have sticky pads on their adventitious roots and others with pads that are shaped like suckers.

Other climbers, such as the vine, adhere and ascend using tendrils, which are like long leaf petioles devoid of limbs that through circular oscillatory movements (known as circumnutation) find contact with an element that serves as a grip. Then, the adaxial (upper side) cells grow at a much higher rate than the abaxial (lower side) ones, so that the development of the tendril takes place in a helical manner, repeatedly surrounding the object. Many *Clematis* use a similar system; however, they do not possess these specialized tendrils and so wrap their long petioles over anything that can support them.

The most common technique is the coiling of the stems that allow the plant to curl around the support and climb. This is typical of honeysuckle (*Lonicera spp*.), wisteria (*Wisteria spp*.) and many jasmine species (*Jasminum spp*.).

Sarmentose plants are limited to producing long and flexible stems in order to reach high points that will support them; the most common example is that of climbing roses, which in the case of not having an adequate support to which their stems can hook, or unless a new shoot finds the branch of a bush or a tree above its apex, will curve towards the ground. Subsequently, other stems will grow that, finding no support, will fall on the previous ones, so that this sarmentose plant can take on the appearance of a very untidy bush.

Using climbing plants in the landscape requires the application of the compositional principles that rule garden design (especially regarding colors, textures and flowering times). An early flowering climber can be planted next to a late flowering climber or vine or tree, or vice versa, thus achieving a longer total flowering period.

Likewise, the blooms, foliage, and autumn tones of climbers and sarmentose can be combined with the fronds, fruits and blooms of other climbing or sarmentose plants and trees.

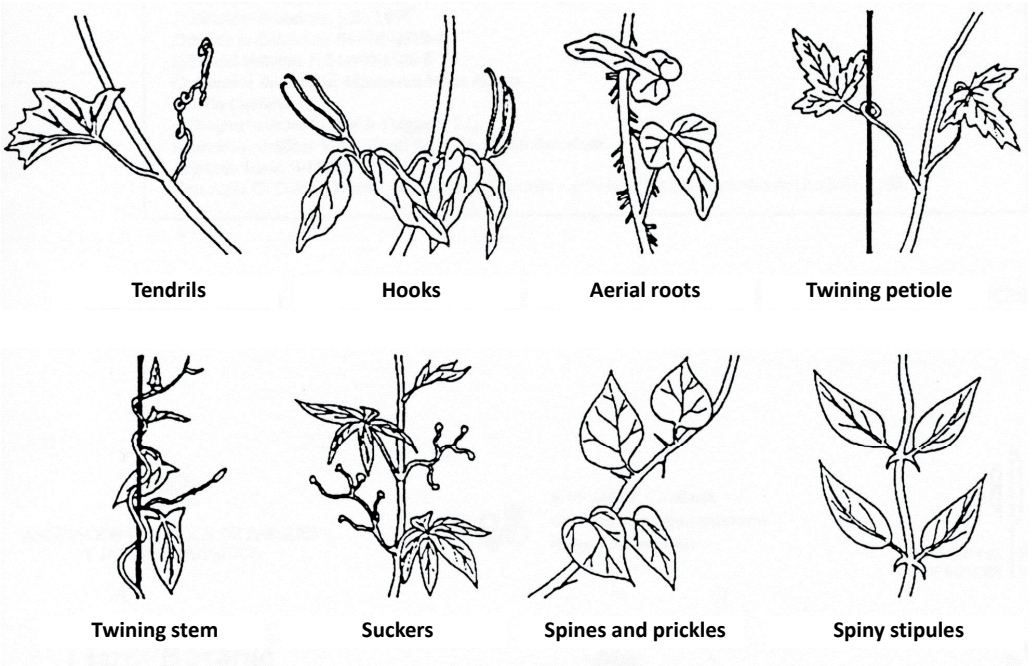


Figure 7.1.1: Different ways climbers attach themselves to surfaces (From: Normas Tecnológicas de Jardinería y Paisajismo (C.O.E.T.A.P.A.C.))

Climbers are a versatile group of garden plants in which species with flowers or foliage of intense color can be chosen to create a visual accent, and others can provide a diffuse and subtle background; some, such as *Wisteria* and *Vitis*, also show interesting architectural forms when they lose their leaves in winter.

Over time, climbers will complement and even disguise a support, be it a wall, a fence or trellis. They also highlight the warm tones of the stone or brick and soften the hard architectural lines, while being able to cover the less attractive parts of the building and other constructions present in the garden. They can also serve as dense visual screens or shelter from the wind if grown on trellis-type supports.

Sarmentose species such as yellow jasmine (*Jasminum mesnyi*) are a very effective ground cover and have a particularly interesting effect when they are placed near a bench or spread over the edges of a terrace.

Both climbers and sarmentose species can be included in mixed shrub beds to which they contribute with their curved growth and their special texture.

Genus and species	Flower (time of year)	Climate	Attachment system
Ampelopsis veitchii	Red leaf (IX -X)	Warm/temperate	Adventitious Roots
Asparagus sprengeri		Warm/temperate	Twining
Bignonia ungis-cati	Yellow (IV-VI)	Warm/temperate, sunny	Tendrils
Bougainvillea glabra	Red-rose-orange	Hot	Training
Campsis radicans	Red (VIII-X)	Indifferent	Adventitious Roots
Clerodendrum thomsoniae	White-red (V-VIII)	Hot, shade	Twining
Ficus radicans (F. repens)		Shade	Adventitious Roots
Hedera canariensis variegata	Green-yellow leaf	Partial shade	Adventitious Roots
Hedera helix		Indifferent	Adventitious Roots
Ipomoea sp	Purple, white (V-X)	Hot, sunny	Twining
Jasminum azoricum	White ((V-IX)	Hot	Twining
Jasminum nitidum	White (IV-XI)	Hot, sunny	Twining
Jasminum nudiflorum	Yellow (IV-V)	Warm/temperate	Training
Jasminum offlcinale	White (V-X)	Hot	Twining
Jasminum polyanthum	White rose (III)	Hot	Twining
Jasminum sambac	Double White (IV-IX)	Hot	Twining
Jasminum simplicifolium	White (V-VIII)	Hot, sunny	Twining
Lonicera caprifolium	Yellow (V-VIII)	Warm/temperate	Twining
Lonicera peryclimenum	Yellow (VII-VIII)	Hot	Twining
Pandorea jasminoides	White-red (VI-IX)	Warm/temperate	Twining
Parthenocissus sp	Reddish leaf (IX -X)	Indifferent, sunny	Sucker
Passiflora x alatocaerulea	Violet(IV-X)	Hot, sunny, partial shade	Tendrils
Passiflora x "Amethystina"	Red-White all year round	Hot, sunny	Tendrils
Passiflora caerulea	White -blue (VI)	Resists cold temperatures	Tendrils
Passiflora edulis	White (V-VI)	Hot, sunny	Tendrils
Passiflora quadrangularis	Red -cream-violet	Hot, sunny	Tendrils
Plumbago auriculata	Blue (VI-IX)	Warm/temperate	Training
Podranea ricasoliana	Red (VI – VIII)	Warm/temperate	Training
Pysostegia venusta	Orange(II-IV)	Hot, sunny, partial shade	Tendrils
Rosa banksiae	White yellow	Warm/temperate	Training
Rosa x hybrida	Various	Warm/temperate, sunny	Training
Senecio scandens	Yellow (X-I)	Hot, sunny	Twining
Senecio confusus	Red (III-XI)	Hot, sunny	Twining
Solandra grandiflora	Yellow (XII-VI)	Hot, sunny	Training
Tecomaria capensis	Red	Hot	Training
Thunbergia grandiflora	Blue (IV-XI)	Hot, sunny	Twining
Trachelospermum jasminoides	White (V-VI)	Warm/temperate, partial shade	Twining
Wisteria sinensis	Purple(IV)	Indifferent	Twining

Table 7.1.1: Climbers and Sarmentose plants (Roman numerals refer to time of flowering months (January =I and December =XII)

Red	Blue, Mauve Violet	Yellow	Orange	Red	White
Bauhinia	*Clematis*	*Allamanda*	*Bougainvillea*	*Bougainvillea*	*Bougainvillea*
Bougainvillea	*Clitoria*	*Bignonia*	*Lonicera*	*Clematis*	*Calonyction*
Campsis	*Heliotropium*	*Bougainvillea*	*Mutisia*	*Mandevilla*	*Clematis*
Clematis	*Ipomoea*	*Campsis*	*Pyrostegia*	*Podranea*	*Clerodendrum*
Clerodendrum	*Passiflora*	*Hibbertia*	*Thunbergia*	*Antigonon*	*Jasminum*
Dipladenia	*Plumbago*	*Jasminum*	*Rosa*	*Rosa*	*Mandevilla*
Distictis	*Solanum*	*Kerria*			*Pandorea*
Lonicera	*Thunbergia*	*Lonicera*			*Phaseolus*
Passiflora	*Wisteria*	*Muehlenbeckia*			*Polygonum*
Quisqualis		*Rosa*			*Quisqualis*
Rosa		*Senecio*			*Solanum*
Tecomaria		*Solandra*			*Stephanotis*
Tropaeolum		*Tecoma*			*Thunbergia*
Parthenocissus		*Thunbergia*			*Wisteria*
Senecio		*Hedera*			*Rosa*
					Trachelospermum

Table 7.1.2: Climbers and Sarmentose plants categorized by color

Trellis and patios:	Fences and exterior walls:
Allamanda	*Campsis*
Bougainvillea	*Distictis*
Jasminum	*Heliotropium*
Passiflora	*Ipomoea*
Podranea	*Jasminum*
Polygonum	*Kerria*
Pyrostegia	*Lonicera*
Quisqualis	*Mikania*
Rosa	*Pandorea*
Solandra	*Passiflora*
Solanum	*Phaseolus caracalla*
Thunbergia	*Plumbago*
Wisteria	*Podranea*
	Polygonum
Walls:	*Pyrostegia*
	Rosa
Ampelopsis	*Solandra*
Bignonia ungis-cati	*Solanum*
Campsis radicans	*Stephanotis*
Ficus repens	*Tecoma*
Hedera helix	*Tecomaria*
Parthenocissus	*Thunbergia*
	Trachelospermum

Tabla 7.1.3: Climbers and Sarmentose plants for different applications

Climbers for North and East walls:
Akebia quinata
Celastrus orbiculatus
Clematis montana
Hedera colchica
H. helix
Humulus lupulus
Hydrangea anomala subesp. petiolaris
Lathyrus latifolius
Lonicera x americana
L. x brownii
L. sempervivens
L. x tellmanniana
Pileostegia viburnoïdes
Schizophragma integrifolium
Tropaeolum speciosum
Vitis coignetiae

Climbers that tolerate air pollution:
Campsis radicans
Fallopia baldschuanicum
Hydrangea anomala subesp. *periolaris*

Climbers for alkaline soils:
Akebia quinata
Jasminum officinale
Wisteria sinensis
Hedera canadiensis (This species is rather more delicate than other ivies and therefore in harsh winters pruning is recommended)

Tabla 7.1.4: Climbers and Sarmentose plants for different applications

Common ivy (*Hedera helix*) resists cold weather and has numerous green and variegated forms with leaves of varying sizes. Their completely green varieties are also decorative, especially those with extremely lobed leaves.

Among the most colorful climbing plants, the virgin vine stands out. *Parthenocissus tricuspidata* 'Veitchii' gives rise to a purple carpet on the walls in autumn. *Parthenocissus quinquefolia*, with five leaflets, is another virgin vine with foliage that is green when in season and scarlet or orange in autumn.

Subchapter 7.2 Species

This subchapter outlines **15 species of climbing plants** used in landscape design. They have been selected primarily for their ornamental use, botanical interest, or other characteristics. As a result, an in-depth analysis is carried out in this subchapter.

Firstly, a table shows the different parameters and values that have been used to describe each species in its specific botanic datasheet.

Each datasheet gathers the information of each species and describes its botanical and ecological aspects, uses, cultivation, and other characteristics of interest, including its commercialization. This information is complemented by photographic information, which shows the general appearance of the described species and different morphological details.

PARAMETERS AND VALUES USED IN THE BOTANIC DATASHEET	
TAXONOMY	
TAXONOMIC RANKS	DIVISION, SUBDIVISION, TYPE, ORDER, FAMILY
VARIETIES	OTHER VARIETIES OF INTEREST
STRUCTURE	
SHAPE	ROUNDED, OVAL, COLUMNAR, CONE, EXTENDED, IRREGULAR, PARASOL, FAN-SHAPED, HORIZONTAL, PALMIFORM, PENDULAR, HERBACEOUS, GRAMINOID
HEIGHT	AS APPROPRIATE- IN METERS OR CENTIMETERS
DIAMETER	AS APPROPRIATE -IN METERS OR CENTIMETERS
TEXTURE	TEXTURE: LEAVES>10CM= COARSE. LEAVES OR LEAFLETS BETWEEN 2-10CM= MEDIUM. LEAVES OR LEAFLETS <2CM= FINE
SHADE	LIGHT, FULL, DENSE
ROOT	TAPROOT, SCATTERED, OBLIQUE, HORIZONTAL, AERIAL, ADVENTITIOUS
MORPHOLOGY	
STEM	
TYPES OF STEM	UNDERGROUND, CREEPING, WOODY, CLIMBERS; YES, NO
LEAF	
TYPE	EVERGREEN, SEMI-EVERGREEN DECIDUOUS, SEMI-DECIDUOUS
SIZE OF LEAF	LENGTH OF LEAF (cm)
SIZE OF LEAFLET	LENGTH OF LEAFLET (cm)
COLOR OF UPPER SIDE (US)	PALE GREEN, LIGHT GREEN, DARK GREEN , BLUE/GREEN, GREY, PURPLE; PALE; YELLOW; VARIEGATED
COLOR OF LOWER SIDE (LS)	GREEN, LIGHT GREEN, DARK GREEN, BLUE/GREEN, GREY PURPLE; PALE; YELLOW; VARIEGATED; RUST COLORED; SILVER
TEXTURE OF UPPER SIDE (US)	SHINY, ROUGH, GLABROUS, TOMENTOSE, HAIRY, ROUGH, SCALY, VISCOSE
TEXTURE OF LOWER SIDE (LS)	SHINY, ROUGH, GLABROUS, TOMENTOSE, HAIRY, ROUGH, SCALY, VISCOSE
COMPOUNDS	NO COMPOUND LEAVES YES. COMPOUNDS: IMPARIPINNATE, PARIPINNATE, TRIFOLIATE, PALMATE, PALMIFORM, PALM, PINNATE, BIPINNATE
HARDNESS	CORIACEOUS, SOFT, SUCCULENT, HARD, SUB CORIACEOUS
ARRANGEMENT	OPPOSITE, ALTERNATE, ROSETTE, VERTICAL
VENATION	PINNATE, PALMATE, PARALLEL, RETICULATE, SCALY, A3 MAIN VEINS
SHAPE	ROUNDED, LINEAR, LANCEOLATE, FALCATE, OVAL, OBLONG, ELLIPTIC, DELTOID, RHOMBOID, SPATULATE, ACICULAR GROUPS 2, ACICULAR GROUPS 3, ACICULAR GROUPS 5, ACICULAR GROUPS, ACICULAR IN 1 PLANE, ACICULAR IN SPIRAL, SCALY, PALM 7 LOBES, PALM 5 LOBES- PALM 3 LOBES, POLYMORPHIC; PANDURIFORM; PINNATIFID
LEAF MARGIN	ENTIRE, CILIATE, DENTATE, CRENATE, SERRATED, DOUBLE SERRATED, LOBED, DOUBLE LOBED
APEX	ACUTE, CUSPIDATE, OBTUSE, RETUSE,
LEAF BASE	ATTENUATE, CORDATE, ROUNDED, ASYMMETRIC
PETIOLE	LONG, SHORT, SESSILE, WIDE
FLOWER	
SIZE	HERMAPHRODITE (MALE/FEMALE FLOWERS): (CM OR MM)
TYPE	UNISEXUAL, HERMAPHRODITE
REPRODUCTION	MONOECIOUS, DIOECIOUS, HERMAPHRODITE, POLYGAMY, SYNOICOUS, STERILE

FLOWERING	SINGLE, INFLORESCENCE IN CORYMB, CYMOSE, RACEME, SPIKE, UMBEL, CATKIN, SPADIX, FLORET OR CAPITULUM, PANICLE (+ INFLORESCENCE SIZE (IN CM OR MM))
FRAGRANCE	YES, NO, UNPLEASANT
FRUIT	
SIZE	IN CM OR MM
TYPE	FOLLICLE, PLURIFOLLICLE, LEGUME, LOMENT, SAMARA, DOUBLE SAMARA, PLURISAMARA, CAPSULE, POLYATHENE, TETRACHENE, NUT, ACHENE; SYCONIUM, HESPERIDIUM, PLURISAMARA, ACORN, COMPOUND FRUIT, PLURIFOLLICLE, BERRY, RACEME, POME, BALAUSTA, DRUPE, CONIFER CONE, PSEUDO CONIFER, PINECONE
EDIBLE FRUIT	YES, NO
COLOR OF FRUIT	RED, GREEN, YELLOW, BROWN, BLACK, PALE, WHITE, PURPLE
FRUITING SEASON	INTERVAL OF MONTHS: JAN, FEB, MAR, APR, MAY, JUN, JUL, AGO, SEP, OCT, NOV, DEC
DEVELOPMENT	
GROWTH	SLOW, VERY SLOW, MEDIUM, FAST, VERY FAST
LONGEVITY	<25 YEARS, 25 YEARS, 50 YEAR, 75 YEARS, 100 YEARS, 150 YEARS, 200 YEARS, 250 YEARS, 300 YEARS, >300 YEARS
ECOLOGY	
CLIMATE	
ALTITUDE	NATURAL HEIGHT OF THE PLANT: interval of sea level altimetry
IRRIGATION	++HIGH, MODERATE, LOW, ++LOW (very low/low < 350 mm; Very high/high > 750 mm)
MINIMUM TEMPERATURE AND INTERNATIONAL CLASSIFICATION	MINIMUM TEMPERATURES: DEGREES CELSIUS **CLASSIFICATION ACCORDING TO EUROPEAN REGULATION**: (SEE MAP) G2____ HOT GREENHOUSES IN SOUTHERN EUROPE G1____ COLD GREENHOUSES IN SOUTHERN EUROPE H5____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM OºC TO -5ºC H4____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM -5ºC TO -10ºC H3____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM -10ºC TO -15ºC H2____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM -15ºC TO -20ºC H1____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM -20 **CLASSIFICATION INTERNATIONAL REGULATIONS.** ACCORDING TO MINIMUM TEMPERATURE RANGES Z1____SUPPORT MINIMUM TEMPERATURES OF -50ºC Z2____ SUPPORT MINIMUM TEMPERATURES OF -50ºC TO -40ºC Z3____ SUPPORT MINIMUM TEMPERATURES OF -40ºC TO -30ºC Z4____ SUPPORT MINIMUM TEMPERATURES OF -30ºC TO -20ºC Z5____ SUPPORT MINIMUM TEMPERATURES OF -20ºC TO -10ºC Z6____ SUPPORT MINIMUM TEMPERATURES OF -10ºC TO -0ºC Z7____ SUPPORT MINIMUM TEMPERATURES OF -0ºC TO 10ºC Z8____ SUPPORT MINIMUM TEMPERATURES OF 10ºC TO 20ºC Z9____ SUPPORT MINIMUM TEMPERATURES OF 20ºC TO 30ºC Z10___ SUPPORT MINIMUM TEMPERATURES OF 30ºC TO 40ºC Z11___ SUPPORT MINIMUM TEMPERATURES OF MORE THAN 40ºC
EXPOSURE TO SUNLIGHT	FULL SUN, FULL SHADE, SHADE, PART SHADE
DROUGHT RESISTANCE	YES, NO, MODERATE
FROST RESISTANCE	YES, NO, MODERATE

SOIL	
PH OPTIMUM	PH: ALL TYPES; NEUTRAL, ACID, BASIC (OR INTERVAL OF PH)
LEVEL OF FERTILITY	FERTILE, AVERAGE, POOR
TEXTURE OF SOIL	SANDY, SLIT OR LOAMY, CLAYEY, SANDY/LOAMY, CLAYEY LOAMY - ALL TYPES
DRAINAGE	HIGH, MODERATE, LOW
RESISTANCE TO SEA	YES, NO, MODERATE
RESISTANCE TO LIME	YES, NO, MODERATE
USES	
RESISTANCES	
COASTAL	1ST LINE, 2ND LINE, NO.
POLLUTION	HIGH, MODERATE, LOW
WIND	HIGH, MODERATE, LOW
APPLICATIONS	
SLOPE **CARPET** **GROUPS** **WALLS** **TRELLIS** **ISOLATED**	YES, NO
PARAMETERS AND VALUES USED IN THE BOTANIC DATASHEET	
SPACING	MINIMUM RECOMMENDED DISTANCE BETWEEN PLANT: M, CM
PLANTING AND PLANT HEALTH	
PLANTING AND PLANT HEALTH	
CALENDARS	
CHROMATIC CALENDAR	FOLIAGE, FLOWERING, FRUITING SEASON: the color white represented with gray or black cell
CULTIVATION CALENDAR	SOWING, PLANTING, PRUNING
TREATMENTS CALENDAR	FUNGICIDES, PESTICIDES, FERTILIZERS, HERBICIDES
COMMERCIALIZATION	
PRESENTATION	BR (BARE ROOT), CT (CONTAINER or POT (LITERS), CE (ROOT BALL), CEY (ROOT BALL IN GYPSUM), ROOT BALL IN MESH
SIZE OF CONTAINER	LITERS
TOTAL HEIGHT	CM, M OR YEARS
TRUNK HEIGHT	CM, M

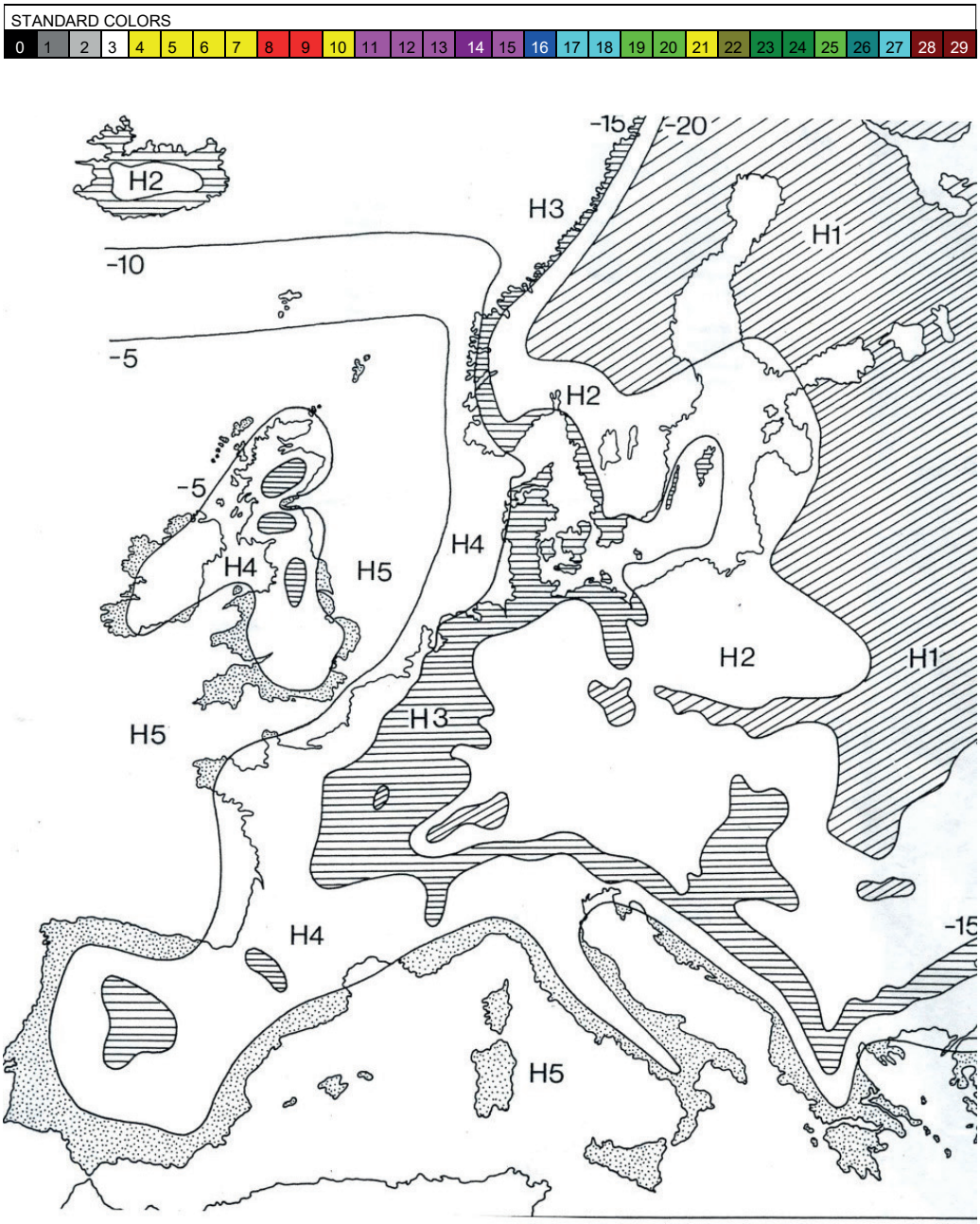


Figure 7.2.1: Thermal classification map according to European regulations

LIST OF CLIMBING SPECIES DESCRIBED

1. *Bougainvillea glabra*
2. *Campsis x hybrida*
3. *Ficus repens*
4. *Hedera helix*
5. *Jasminum mesnyi*
6. *Jasminum officinale*
7. *Lonicera japonica*
8. *Macfadyena ungis-cati*
9. *Parthenocissus tricuspidata*
10. *Plumbago auriculata*
11. *Solandra maxima*
12. *Solanum jasminoides*
13. *Tecomaria capensis*
14. *Vitis vinifera*
15. *Wisteria sinensis*

BOUGANVILLEA

CLIMBER

Bougainvillea glabra

BUGANVILLA (SPANISH) · (VALENCIAN) · PAPER FLOWER, BOUGANVILLEA (ENGLISH) · BOUGANVILLÉE (FRENCH)

STRUCTURE		
Shape: SARMENTOSE	Height: 5 M	Diameter: 3 M
Texture: MEDIUM	Shade: PARTIAL	Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	CARYOPHYLLALES
FAMILY:	NYCTAGINACEAE

VARIETIES

MORPHOLOGY		
Stem	UNDERG: NO	WOODY: YES
	CREEPING: NO	CLIMBING: NO
Leaf	COMPOUND: NO	
EVERGREEN	HARDNESS: SOFT	
SIZE: 4-6 CM	ARRANGEMENT: ALTERNATE	
	VENATION: PINNATE	
	SHAPE: OVAL/LANCEOLATE	
COLOR: US: DARK GREEN	MARGIN: ENTIRE	
LS: DARK GREEN	APEX: ACUTE	
TEXTURE: US: SMOOTH	LEAF BASE: ATTENUATE	
LS: SMOOTH	PETIOLE: SHORT	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE: 3-4 cm	Flowering: RACEMES	Fragrant: NO
Fruit	Type: ACHENE	Color
	Edible	Fruiting season
SIZE:		
Growth	Rate: MEDIUM	Longevity: 50 YEARS

ECOLOGY		
Climate	Temperature: -7ºC,H4,Z6	Drought resistant: MODERATE
ALTITUDE: 0-400	Sun exposure: FULL SUN	Frost resistant: MODERATE
IRRIGATION: MODERATE		
Soil	Texture: ALL TYPES	Salt resistant: MODERATE
pH: 6.5-8	Drainage: MODERATE	Lime resistant: HIGH
FERTILITY: MODERATE		

USES				
Resistances		Applications		
COASTAL: MODERATE		SLOPES: YES	WALLS: YES	
POLLUTION: MODERATE		CARPET: NO	TRELLIS: YES	
WINDY: MODERATE		GROUP: YES	ISOLATED: YES	



POINTS OF INTEREST

Native to Brazil, this is a very popular climbing plant for its spectacular flowering that in adequate conditions of sunlight and orientation will provide continuous blooms for several months. This species has produced multiple varieties with colors that vary from white, violet-purple, red, yellow, salmon to purple and that are provided by the bracts that accompany some insignificant flowers. It needs to be cut back to control growth. In late autumn, cut the shoots close to the main structure, cutting the secondary shoots leaving only 2 or 3 leaves. However, if it continues to flower until the end of the year, it is possible to delay pruning until the beginning of the following spring and before it starts to grow. This variety of climber requires support.

SPACING: 3 M

PLANTING AND PLANT HEALTH

This species of climbers adapts well to the Mediterranean climate, tolerating temperatures as low as -7ºC. In the coldest regions it is recommended to use them in coastal places and facing south. It adapts well to different soil conditions, but prefers fertile and light ones. It requires moderate watering and easily resists drought (it is even convenient to not water it during the summer months). It prefers moderate-high humidity and full sun. Propagation by cutting of flowering branches.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
X	X	X	X	X	X	X	X				

Sowing ☐ Planting ■ Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides ■ Pesticides ■ Fertilizers ■

COMMERCIALIZATION

Presentation (L)	Length (cm)	Topiary shapes
CT(5)	60-80	
CT(10)	80-100	
CT(30)	125-150	

CAMPSIS

CLIMBER

Campsis x híbrida

JAZMÍN DE VIRGINIA (SPANISH) | VALENCIAN | BIGNONE (ENGLISH) | BIGNONE DE VIRGINIE (FRENCH)

STRUCTURE		
Shape: SARMENTOSE	Height: 15 M	Diameter: 5 M
Texture: MEDIUM	Shade: PARTIAL	Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	SCROPHULARIALES
FAMILY:	BIGNONIACEAE

VARIETIES
"FLAVA"

MORPHOLOGY		
Stem	UNDERG: NO; CREEPING: NO	WOODY: YES; CLIMBING: NO
Leaf	COMPOUND: IMPARIPINNATE; HARDNESS: SOFT; ARRANGEMENT: OPPOSITE; VENATION: PINNATE; SHAPE: OVAL; MARGIN: SERRATE; APEX: ACUMINATE; LEAF BASE: ATTENUATE; PETIOLE: SHORT	
DECIDUOUS		
SIZE: 15-20 CM (LEAFLET:2-10CM)		
COLOR: US: GREEN; LS: GREEN		
TEXTURE: US: SMOOTH; LS: HAIRY		
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE: 5-8CM	Flowering: CORYMB	Fragrant: NO
Fruit	Type: CAPSULE	Color
SIZE:	Edible	Fruiting season
Growth	Rate: FAST	Longevity: 50 YEARS

ECOLOGY		
Climate	Temperature: -3ºC	Drought resistant: MODERATE
ALTITUDE: 0-400	Sun exposure: SUN/PARTIAL SHADE	Frost resistant: MODERATE
IRRIGATION: MODERATE		
Soil	Texture: LOAMY/SANDY	Salt resistant: LOW
pH: 6.5-7.5	Drainage: MODERATE	Lime resistant: MODERATE
FERTILITY: MODERATE		

USES				
Resistances		Applications		
COASTAL: MODERATE		SLOPES: NO	WALLS: YES	
POLLUTION: MODERATE		CARPET: NO	TRELLIS: YES	
WIND: MODERATE		GROUP: YES	ISOLATED: YES	



POINTS OF INTEREST

Native to Canada. It is a deciduous climber with a trunk that can thicken considerably and with exfoliating plates on the bark. Predomninately red-bearing flowers although red-orange and yellow varieties do exist. (var. 'Flava').

SPACING: 3 M

PLANTING AND PLANT HEALTH

It has no special requirements. When pruning, remove the lower suckers early. To control growth, cut back shoots from the previous year, leaving two shoots at the end of winter. In summer, trim untidy branches.Propagation is done in summer by layering branches. It can also be done using cuttings from young semi-withered branches, or from roots. For the varieties, grafting is carried out in the months of April-May.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
X	X	X	X	X	X	X	X				
						X	X	X			

Sowing ☐ Planting ■ Pruning X ☐

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides ■ Pesticides ■ Fertilizers ■ ☐

COMMERCIALIZATION

Presentation(L)	Length (cm)	Topiary shapes
CT(5)	60-80	
CT(10)	80-100	
CT(30)	125-150	

FICUS

Ficus repens

CLIMBER

FICUS TREPADOR (SPANISH) | VALENCIAN | CLIMBING FIG (ENGLISH) | FIGUIER NAIN / GRIMPANT (FRENCH)

STRUCTURE		
Shape: SARMENTOSE	Height: 6 M	Diameter: 3 M
Texture: MEDIUM	Shade: PARTIAL	Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	URTICALES
FAMILY:	MORACEAE

VARIETIES

MORPHOLOGY		
Stem	UNDERG: NO; CREEPING: NO	WOODY: YES; CLIMBING: YES
Leaf EVERGREEN	COMPOUND: NO	
SIZE: 2-3 CM	HARDNESS: CORIACEOUS	
COLOR: US:DARK GREEN, LS: LIGHT GREEN	ARRANGEMENT:	
TEXTURE: US: SMOOTH, LS: SMOOTH	VENATION: PINNATE	
	SHAPE: OVAL	
	MARGIN: ENTIRE	
	APEX: OBTUSE	
	LEAF BASE: ASYMMETRIC	
	PETIOLE: SHORT	
Flower SIZE:	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
	Flowering: RARELY	Fragrance: NO
Fruit SIZE:	Type: SYCONIUM	Color
	Edible: NO	Fruiting season
Growth	Rate: MEDIUM	Longetivty: 25 YEARS

ECOLOGY		
Climate ALTITUDE: 0-200, IRRIGATION: MODERATE	Temperature: 0ºC	Drought resistant: LOW
	Sun exposure: PARTIAL SHADE	Frost resistant: LOW
Soil pH: 6.5-7.5, FERTILITY: MODERATE	Texture: LOAMY	Salt resistant: LOW
	Drainage: MODERATE	Lime resistant: MODERATE

USES		
Resistances	Applications	
COASTAL: MODERATE	SLOPES: NO	WALLS: YES
POLLUTION: MODERATE	CARPET: NO	TRELLIS: NO
WIND: MODERATE	GROUPS: NO	ISOLATED: NO








POINTS OF INTEREST

Commonly known as climbing ficus or "Ficus pumila". It is an ideal choice for a houseplant. In its place of origin (tropical Asia and Australia) it can be both a climber and a creeper. It attaches itself to the ground or support elements with a glue-like material secreted from its aerial roots. When growing in a pot, it develops a bushy habit, losing elasticity in its stems. It needs indirect light, warm environments and cool temperatures. It is recommended to spray the leaves and keep the soil slightly moist. In the case of shrubby species, leaves are larger and generate flowers (although rarely) and fruits (which is why the species is also known as a climbing fig tree).

SPACING: 2 M

PLANTING AND PLANT HEALTH

Propagation can be done by cutting or layering (it is sufficient to put young stems in contact with peat so that they emit roots). Excessive moisture in the soil should be avoided since it can provoke rot.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing ☐ Planting ☐ Pruning ☒ ☐

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides ☐ Pesticides ☐ Fertilizers ☐ ☐

COMMERCIALIZATION

Presentation (L)	Length (cm)	Topiary shapes
CT(5)	60-80	
CT(10)	80-100	
CT(30)	125-150	

HEDERA

Hedera helix

CLIMBER

HIEDRA	HEURA	IVY	LIERRE
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE

Shape	Height	Diameter
SARMENTOSE	10-25 M	5 M
		Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	UMBELLALES
FAMILY:	ARALIACEAE

VARIETIES

MANY VARIETIES EXIST WITH DIFFERENT SIZES AND COLORS

MORPHOLOGY

Stem	UNDERG: NO CREEPING: YES	WOODY: YES CLIMBING: YES
Leaf	COMPOUND: NO HARDNESS: SOFT ARRANGEMENT: ALTERNATE VENATION: PINNATE SHAPE: RHOMBOID MARGIN: ENTIRE APEX: ACUTE LEAF BASE: ATTENUATE PETIOLE: LONG	
EVERGREEN SIZE: 5 CM COLOR: US:DARK GREEN LS: PALE GREEN TEXTURE: US: SMOOTH LS: SMOOTH		
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE:	Flowering: UMBELS IN RACEMES (4-5)	Fragrance: NO
Fruit	Type: BERRY	Color: BLACK
SIZE: __	Edible	Fruiting season: MARCH
Growth	Rate: FAST	Longevity: >100 YEARS



ECOLOGY

Climate	Temperature: -5ºC,H4,Z6	Drought resistant: MODERATE
ALTITUDE: 0-1000	Sun exposure: SHADE/SUN	Frost resistant: MODERATE
IRRIGATION: MODERATE		
Soil	Texture: ALL TYPES	Salt resistant: LOW
pH: 6,5-8	Drainage: __	Lime resistant: MODERATE
FERTILITY: MODERATE		

USES

Resistances		Applications			
COASTAL:	MODERATE	SLOPES:	YES	WALLS:	YES
POLLUTION:	MODERATE	CARPET:	YES	TRELLIS:	NO
WIND:	MODERATE	GROUP:	YES	ISOLATED:	YES

POINTS OF INTEREST

Ivy is versatile and very easy to grow both in the garden and on terraces. As climbing plants they quickly cover walls and other support elements to which they are attached by adventitious roots. The ivy is also a ground cover plant, since it emits new roots very easily in the nodes that touch the ground. Ivy can cover large surfaces such as those located under trees that have less dense crowns, slopes or herbaceous covers. It prefers moderate-high humidity and although it adapts to both sunny and shaded exposure, it prefers the latter. Pruning includes trimming the edges once or twice a year (in February or March) so that new shoots come out in spring and avoid disheveled and loose plants. At the time of tying them to walls, a long shoot can also be tied horizontally so that, from this horizontal guide, new vertical shoots emerge that allow the plant to be widened from the base.

PLANTING AND PLANT HEALTH

Propagation is normally carried out by means of apical cuttings of the stem of 7.5 to 10 cm in length or cuttings of one or three nodes with leaves. It is preferable to place them directly in the pot where they are going to be grown to avoid casualties in the transplanting stage. In nurseries, the temperature must be kept at approximately 20ºC and misting or fogging is convenient. The ease and time of rooting vary according to the varieties, faster for the green ones than for the variegated ones. Cutting can be done at any time of the year. *Xanthomonas*, *Colletrotrichum* and *Alternaria* fungi cause the appearance of leaf spots and are combated with products containing copper. The ivy attacked by the cochineal show a weakening of the leaves and consequently their fall. Those attacked by aphids show twisted terminal stems in spring.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
X	X	X	X	X	X	X	X				

Sowing ☐ Planting ▭ Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides ▭ Pesticides ▭ Fertilizers ▭

COMMERCIALIZATION

Presentation (L)	Length (cm)	Topiary shapes
CT(2)	80/100	
CT(3)	100/125	
CT(7)	125/150	
CT(30)	150/175	
CT(50)	175/200	
CT(85)	200/250	

JASMINUM *Jasminum mesnyi*

CLIMBER

JAZMIN AMARILLO (SPANISH) · GESMILER GROC (VALENCIAN) · PRIMROSE JASMINE (ENGLISH) · JASMIN PRIMEVÈRE (FRENCH)

STRUCTURE

Shape	Height	Diameter
SARMENTOSE	UP TO 5 M	5 M
Texture	**Shade**	**Root**
MEDIUM	PARTIAL	SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	GENTIANALES
FAMILY:	OLEACEAE

VARIETIES

MORPHOLOGY

Stem

UNDERG	NO	WOODY	YES
CREEPING	NO	CLIMBING	NO

Leaf

EVERGREEN

SIZE: 3-8 CM

3 LEAFLETS (2x7CM)

COLOR: US: DARK GREEN; LS: DARK GREEN

TEXTURE: US: SMOOTH; LS: SMOOTH

COMPOUND:	IMPARIPINNATE
HARDNESS:	SOFT
ARRANGEMENT:	OPPOSITE
VENATION:	PINNATE
SHAPE:	LANCEOLATE
MARGIN:	ENTIRE
APEX:	ACUTE
LEAF BASE:	ATTENUATE
PETIOLE:	SHORT

Flower

SIZE: 4 CM

Type	Reproduction
HERMAPHRODITE	HERMAPHRODITE
Type	**Fragrant**
SUBTERMINAL PANNICLE	YES

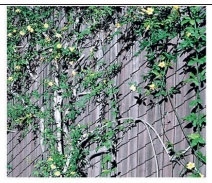
Fruit

SIZE:

Type	Color
BERRY	
Edible	**Fruiting season**

Growth

Rate	Longevity
MEDIUM	25-50 YEARS





ECOLOGY

Climate

ALTITUDE: 0-300

IRRIGATION: MODERATE

Temperature	Drought resistant
-2ºC	MODERATE
Sun exposure	**Frost resistant**
SUN/PARTIAL SHADE	LIGHT

Soil

pH: 6.5-8

FERTILITY: MODERATE

Texture	Salt resistant
ALL TYPES	LOW
Drainage	**Lime resistant**
MODERATE	MODERATE

USES

Resistances		Applications			
COASTAL:	MODERATE	SLOPES:	YES	WALLS :	YES
POLLUTION:	MODERATE	CARPET:	NO	TRELLIS:	YES
WIND:	MODERATE	GROUP:	YES	ISOLATED:	YES

POINTS OF INTEREST

Native to Southwestern China. This species is a loosely compact evergreen climber. Ideal to cover walls, trellises or to decorate copses. Also used to cover slopes. It supports light frosts and regrows from the base in case of losing the aerial part due to intense winter cold. When flowering on the wood of the previous sprouting, it is advisable to prune it after flowering. Cut the least productive stems to the ground and the best flowering stems to a strong bud or to a lower stem. In case of growing in a limited space, yellow jasmine may need several prunings per year. This species of climber needs support.

SPACING: 2 M

PLANTING AND PLANT HEALTH

This species prefers warm places and light soils although it will grow in any type (except waterlogged soils). It requires normal garden watering and moderate ground humidity. Propagation is carried out by cutting the semi woody stem at the end of summer or by seed.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
X	X	X	X	X	X	X	X	X	X	X	X

Sowing ☐ Planting ☐ Pruning ☒ ☐

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides ☐ Pestcides ☐ Fertilizers ☐ ☐

COMMERCIALIZATION

Presentation (L)	Length (cm)	Topiary shapes
CT(5)	60-80	
CT(10)	80-100	
CT(30)	125-150	

JASMINUM

CLIMBER

Jasminum officinale

JAZMIN REAL	GESMILER	COMMON JASMINE	JASMIN COMMUN
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Shape: SARMENTOSE	Height: 5-12 M	Diameter: 5 M
Texture: MEDIUM	Shade: PARTIAL	Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	GENTIANALES
FAMILY:	OLEACEAE

VARIETIES

MORPHOLOGY

Stem	UNDERG: NO	WOODY: YES
	CREEPING: NO	CLIMBING: NO
Leaf	COMPOUND: IMPARIPINNATE	
EVERGREEN	HARDNESS: SOFT	
SIZE: 7-11 CM	ARRANGEMENT: OPPOSITE	
LEAFLETS:(5-9)	VENTATION: PINNATE	
COLOR: US: DARK GREEN	SHAPE: OVATE	
LS: LIGHT GREEN	MARGIN: ENTIRE	
TEXTURE: US: SMOOTH	APEX: ACUTE	
LS: SMOOTH	LEAF BASE: ATTENUATE	
	PETIOLE: SHORT	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE: 2-4 CM	Type: SUBTERMINAL PANNICLE	Fragrant: YES
Fruit	Type: BERRY	Color
SIZE:	Edible	Fruiting season
Growth	Rate: FAST	Longevity: 50 YEARS



ECOLOGY

Climate	Temperature: -2ºC	Drought resistant: MODERATE
ALTITUDE: 0-300	Sun exposure: SUN	Frost resistant: LIGHT
IRRIGATION: MODERATE		
Soil	Texture: LOAMY/SANDY	Salt resistant: LOW
pH: 6.5-8	Drainage: GOOD	Lime resistant: MODERATE
FERTILITY: HARDY		

USES

Resistances		Applications			
COASTAL:	MODERATE	SLOPES:	YES	WALLS:	YES
POLLUTION:	MODERATE	CARPET:	NO	TRELLIS:	YES
WIND:	MODERATE	GROUP:	YES	ISOLATED:	YES

POINTS OF INTEREST

Species native to China and the Himalayas but naturalized in the Mediterranean area. When growing on a wall, it usually forms a compact mass at the top of it. By tying down one of the main branches, it can be made to cover part of a wall. By placing it near a living or passage area, the intense aroma of its flowers will be better appreciated. Cultivated in a pot, it can be placed on terraces or porches. It requires little pruning however since the flowers appear mostly on stems from the previous year, it is advisable to prune at the end of flowering. This climber needs support.

SPACING: 3 M

PLANTING AND PLANT HEALTH

Plenty of sunshine will guarantee rich and abundant blooms. Although this species does not resist frost, it can recover when pruned. Propagation can be carried out in summer months by layering the branches or planting semi-woody cuttings.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
X	X	X	X	X	X	X	X			X	X

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation (L)	Length (cm)	Topiary shapes
CT(5)	60-80	
CT(10)	80-100	
CT(30)	125-150	

LONICERA

Lonicera japonica

CLIMBER

MADRESELVA	LLIGABOSC	JAPANESE HONEYSUCKLE	CHÈVREFEUILEE DU JAPON
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE

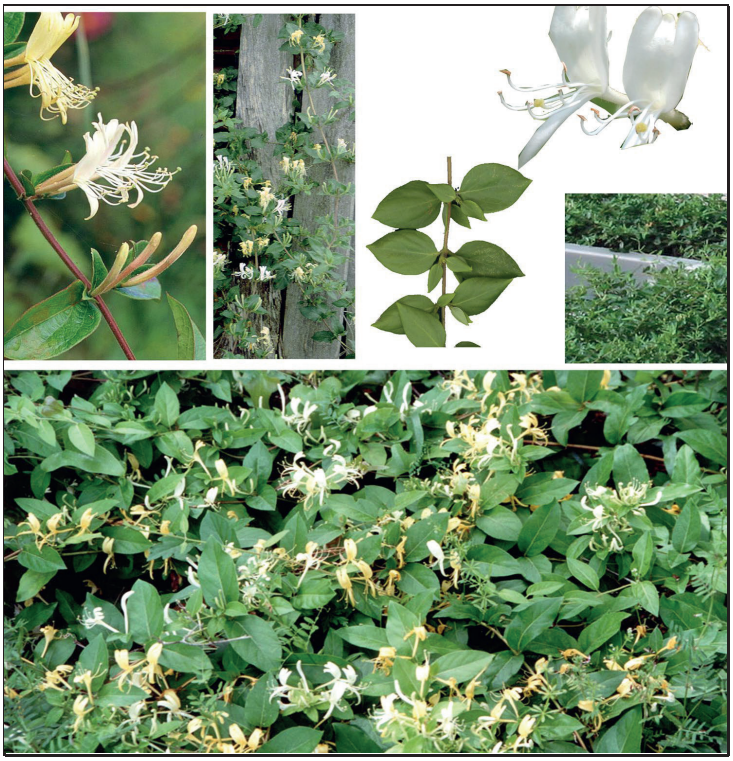
Shape	Height	Diameter
TWINING CLIMBER	Up to 10 M	5 M
Texture	**Shade**	**Root**
MEDIUM	PARTIAL	SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	DIPSACALES
FAMILY:	CAPRIFOLIACEAE

VARIETIES

MORPHOLOGY

Stem	UNDERG	NO	WOODY	YES
	CREEPING	NO	CLIMBING	YES
Leaf	COMPOUND:	NO		
EVERGREEN	HARDNESS:	SOFT		
SIZE: 3-8 CM	ARRANGEMENT:	OPPOSITE		
	VENATION:	PINNATE		
	SHAPE:	OVAL		
COLOR: US:MID GREEN	MARGIN:	ENTIRE		
LS: LIGHT GREEN	APEX:	ACUTE		
TEXTURE: US: SMOOTH	LEAF BASE:	ATTENUATE		
LS: PUBESCENT	PETIOLE:	SHORT		
Flower	Type	HERMAPHRODITE	Reproduction	HERMAPHRODITE
SIZE: 3-5 CM	Flowering		Fragrant	YES
Fruit	Type	BERRY	Color	BLACK
SIZE:	Edible	TOXIC	Fruiting season	
Growth	Rate	FAST	Longevity	25-50 YEARS



ECOLOGY

Climate	Temperature	-3ºC; Z5; H5	Drought resistant	MODERATE
ALTITUDE: 0-400	Sun exposure	SUN/PARTIAL SHADE	Frost resistant	LIGHT
IRRIGATION: MODERATE				
Soil	Texture	LOAMY/SANDY	Salt resistant	LOW
pH: 6.5-8	Drainage	MODERATE	Lime resistant	MODERATE
FERTILITY: MODERATE				

USES

Resistances		Applications			
COASTAL:	MODERATE	SLOPE:	YES	WALLS:	YES
POLLUTION:	MODERATE	CARPET:	NO	TRELLIS:	YES
WIND:	MODERATE	GROUP:	YES	ISOLATED:	YES

POINTS OF INTEREST

Native to East Asia. This species is very popular for its persistent and beautiful foliage and for its continuous and aromatic flowering. They are ideal to cover upper parts of walls only (not suitable for the entire wall), low roofs of auxiliary constructions, metal frameworks, lattices, trunks and slopes. To give it shape, pruning is recommended and is easily carried out by simply removing dead branches and by trimming overgrown shoots after flowering. It can also be pruned back to the stump when it gets too strong. This species needs support.

SPACING: 2.5 M

PLANTING AND PLANT HEALTH

They can be planted in the sun or in partial shade. In areas prone to frost, they should be arranged so that they do not receive the morning sun's rays. They require a normal irrigation programme. Propagation is carried out by woody cuttings at the end of autumn, or semi-woody in summer, and by seed.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
		X X X								X X X X	X X X X

Sowing ☐ Planting ■ Pruning X ☐

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides ■ Pesticides ■ Fertilizers ■ ☐

COMMERCIALIZATION

Presentation(L)	Length (cm)	Topiary shape
CT(5)	60-80	
CT(10)	80-100	
CT(30)	125-150	

MACFADYENA

CLIMBER

Macfadyena ungis-cati

PETEGLORIO (SPANISH) | VALENCIAN | CAT CLAW IVY (ENGLISH) | GRIFFE DE CHAT (FRENCH)

STRUCTURE		
Shape: SARMENTOSE	Height: 5-12 M	Diameter: 5 M
Texture: MEDIUM	Shade: PARTIAL	Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	SCROPHULARIALES
FAMILY:	BIGNONIACEAE

VARIETIES

MORPHOLOGY		
Stem	UNDERGR: NO; CREEPING: NO	WOODY: YES; CLIMBING: YES
Leaf	COMPOUND: NO; HARDNESS: SOFT; ARRANGEMENT: OPPOSITE; VENATION: PINNATE; SHAPE: OVATE; MARGIN: ENTIRE; APEX: ACUTE; LEAF BASE: ATTENUATE; PETIOLE: SHORT	
EVERGREEN; SIZE: 4-8 CM; COLOR: US:DARK GREEN, LS:LIGHT GREEN; TEXTURE: US:SMOOTH, LS:SMOOTH		
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE: 3-5 CM	Flowering	Fragrant: NO
Fruit	Type: CAPSULE	Color: BROWN
SIZE:	Edible: NO	Fruiting season
Growth	Rate: FAST	Longevity: 50 YEARS

ECOLOGY		
Climate	Temperature: -3ºC	Drought resistant: MODERATE
ALTITUDE: 0-300	Sun exposure: SUN	Frost resistant: LIGHT
IRRIGATION: MODERATE		
Soil	Texture: ALL TYPES	Salt resistant: LOW
pH: 6.5-8	Drainage: MODERATE	Lime resistant: MODERATE
FERTILITY: MODERATE		

USES				
Resistances		Applications		
COASTAL: MODERATE		SLOPES: NO	WALLS: NO	
POLLUTION: MODERATE		CARPET: NO	TRELLIS: YES	
WIND: MODERATE		GROUPS: NO	ISOLATED: NO	



POINTS OF INTEREST

Native to Mexico and Argentina. This climber grows rapidly (up to 8 m) or can hang down to form a type of golden tapestry. It needs support on fences and bars. It is an invasive species and climbs by means of foliar tendrils, triffids and hooks. If this occurs, its fleshy roots must be pulled up.

SPACING: 3 M

PLANTING AND PLANT HEALTH

In warm areas it functions as an evergreen plant. It requires full sun and withstands severly dry conditions. Once established, it is drought tolerate. This species grows well in any drained, mulched soil. To achieve an adequate structure, it must be pruned after flowering. Propagation by seed and cuttings.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
						X	X	X	X		

Sowing | Planting | Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation (L)	Length (cm)	Topiary shapes
CT(5)	60-80	
CT(10)	80-100	
CT(30L)	125-150	

PARTHENOCISSUS

Parthenocissus tricuspidata

CLIMBER

PARRA VIRGEN (SPANISH) · VALENCIAN · JAPANESE CREEPER (ENGLISH) · VIGNE-VIERGE JAPONAISE (FRENCH)

STRUCTURE		
Shape: SARMENTOSE	Height: 5-20 M	Diameter: 5-10 M
Texture: MEDIUM	Shade: PARTIAL	Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	RHAMNALES
FAMILY:	VITACEAE

VARIETIES

MORPHOLOGY		
Stem	UNDERG: NO	WOODY: YES
	CREEPING: NO	CLIMBING: YES
Leaf	COMPOUND: NO	
DECIDUOUS	HARDNESS: SOFT	
SIZE: 5-20 CM	ARRANGEMENT: ALTERNATE	
	VENATION: PINNATE	
	SHAPE: LOBED	
COLOR: US:GREEN/RED LS:GREEN/RED	MARGIN: SERRATE	
	APEX: ACUTE	
TEXTURE: US: SMOOTH LS: SMOOTH	LEAF BASE: ATTENUATE	
	PETIOLE: SHORT	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE:	Flowering:	Fragrant: NO
INFLORESCENCE IN CYMOSE		
Fruit	Type: BERRY	Color: BLACK/BLUE
SIZE: 6-8 MM	Edible	Fruiting season
Growth	Rate: FAST	Longevity: 100 YEARS

ECOLOGY		
Climate	Temperature: -10ºC	Drought resistant: MODERATE/HIGH
ALTITUDE: 0-1000	Sun exposure: SUN/SHADE	Frost resistant: MODERATE
IRRIGATION: MODERATE		
Soil	Texture: LOAMY/CLAYEY	Salt resistant: LOW
pH: 6.5-8	Drainage: MODERATE	Lime resistant: MODERATE
FERTILITY: FERTILE		

USES		
Resistances	Applications	
COASTAL: MODERATE	SLOPES: NO	WALLS: YES
POLLUTION: MODERATE	CARPET: NO	TRELLIS: YES
WIND: MODERATE	GROUPS: NO	ISOLATED: NO



POINTS OF INTEREST

Native to China, Japan and Korea. This species is widely used to completely cover the walls of houses. It can cover small auxiliary buildings, walls, trellises or any type of structure. This climber can also be a good carpet groundcover (in this case care must be taken to ensure that it does not climb up nearby trees or bushes). Although it is a self-adhesive climber, it requires initial support until suckers have sufficiently developed. The autumnal reddish color of its leaves is more intense in cold climates.

SPACING: 3-5M

PLANTING AND PLANT HEALTH

It prefers a fertile, permeable humus-rich soil. It requires a normal irrigation programme and is somewhat drought resistant. Hardy to humidity. Pruning can be carried out by removing unwanted or damaged growth. Propagation by cutting, seed and layering is very easy. Graft on *P. quinquefolia*.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
X	X	X	X	X	X	X	X				

Sowing ☐ Planting ☐ Pruning X ☐

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides ☐ Pesticides ☐ Fertilizers ☐

COMMERCIALIZATION

Presentation (L)	Length (cm)	Topiary shapes
CT(5)	60-80	
CT(10)	80-100	
CT(30)	125-150	

PLUMBAGO

Plumbago auriculata

CLIMBER

JAZMIN AZUL (SPANISH) | VALENCIAN | LEADWORT, SKYFLOWER (ENGLISH) | DENTELAIRE DU CAP (FRENCH)

STRUCTURE		
Shape: SARMENTOSE	Height: 1-3 M	Diameter: 2-3 M
Texture: MEDIUM	Shade: PARTIAL	Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	PLUMBAGINALES
FAMILY:	PLUMBAGINACEAE

VARIETIES

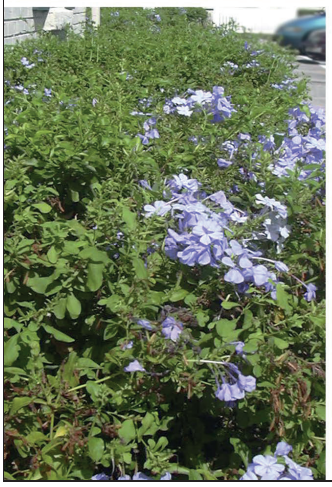
MORPHOLOGY		
Stem	UNDERG: NO; CREEPING: NO	WOODY: YES; CLIMBING: NO
Leaf	COMPOUND: NO; HARDNESS: SOFT; ARRANGEMENT: ALTERNATE; VENATION: PINNATE; SHAPE: OBLONG/SPATULATE; MARGIN: SMOOTH; APEX: ACUTE; LEAF BASE: ATTENUATE; PETIOLE: SHORT	
EVERGREEN; SIZE: 5-6 CM; COLOR: US:GREEN, LS:GREEN; TEXTURE: US:SMOOTH, LS:SMOOTH		
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE: 2.5-3 CM	Flowering: INFLORESCENCE IN RACEME	Fragrant: NO
Fruit	Type: CAPSULE	Color
SIZE:	Edible	Fruiting season
Growth	Rate: FAST	Longevity: 0-25 YEARS

ECOLOGY		
Climate	Temperature: -2ºC	Drought resistant: LOW
ALTITUDE: 0-300	Sun exposure: SUN/PARTIAL SHADE	Frost resistant: LIGHT
IRRIGATION: MODERATE		
Soil	Texture: ALL TYPES	Salt resistant: LOW
pH: 6.5-8	Drainage: HIGH	Lime resistant: MODERATE
FERTILITY: MODERATE		

USES				
Resistances		Applications		
COASTAL: MODERATE		SLOPES: YES	WALLS: NO	
POLLUTION: MODERATE		CARPET: NO	TRELLIS: NO	
WIND: MODERATE		GROUPS: YES	ISOLATED: YES	








POINTS OF INTEREST

Commonly known as Leadwort, this species of Jasmine is native to South Africa (The Cape), Southeast Asia and the Malay Archipelago. It is widely as a shrub for enclosures and to cover fences due to its profuse flowering. The root contains juices that can be used against bad teeth and inflammation of the gums. It needs protection and support. The scientific name *Plumbago* is of uncertain origin; some attribute it to the leaden color of the flowers of some species, while others derive it from the Latin word *plumbum* which means lead, since these plants can contribute to a valuable medicine against poisoning caused by lead fumes.

SPACING: 2 M

PLANTING AND PLANT HEALTH

Since it is a warm temperate shrub it is sensitive to cold. When exposed to full sun it requires fertile, rich and well-drained soils. In poor soils, light shade is advisable. It requires a high irrigation programme during growth and low when dormant. It is hardy to humidity and light and requires annual pruning. Once it has flowered, it is convenient to cut the flowering stems. It blooms more intensely when exposed to full sun. It propagates by cuttings from non-flowering shoots in the summer and at approximately 18ºC.

CHROMATIC CALENDAR

Foliage, Floration and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
X	X	X	X							X	X

Sowing | Planting | Pruning (X)

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation (L)	Length (cm)	Topiary shapes
CT(5)	60-80	
CT(10)	80-100	
CT(30)	125-150	

SOLANDRA

Solandra maxima

CLIMBER

SOLANDRA (SPANISH) · VALENCIAN · CUP OF GOLD VINE (ENGLISH) · LIANE TROMPETTE (FRENCH)

STRUCTURE

Shape	Height	Diameter
SARMENTOSE	3-5 M	3 M
Texture	**Shade**	**Root**
FINE	LIGHT/PARTIAL	SCATTERED

DIVISION: PHANEROGAMS
SUBDIVISION: ANGIOSPERMS
TYPE: DICOTYLEDONS
ORDER: POLEMONIALES
FAMILY: SOLANACEAE

VARIETIES

MORPHOLOGY

Stem
UNDERGR NO · WOODY YES
CREEPING NO · CLIMBING YES

Leaf
EVERGREEN
SIZE: UP TO 15CM
COLOR: US:DARK GREEN LS:LIGHT GREEN
TEXTURE: US:SMOOTH LS:SMOOTH

COMPOUND:	NO
HARDNESS:	CORACIOUS
ARRANGEMENT:	PETIOLED
VENATION:	PINNATE
SHAPE:	ELLIPTICAL
MARGIN:	SMOOTH
APEX:	ACUTE
LEAF BASE:	ATTENUATE
PETIOLE:	SHORT

Flower
SIZE: 20 CM

Type	Reproduction
HERMAPHRODITE	HERMAPHRODITE
Flowering	**Fragrance**
	AT NIGHT

Fruit
SIZE:

Type	Color
BERRY	WHITE/PALE YELLOW
Edible	**Fruiting season**
TOXIC	

Growth

Rate	Longevity
MEDIUM	0-25 YEARS











ECOLOGY

Climate
ALTITUDE: 0-200
IRRIGATION: MODERATE

Temperature	Drought resistant
0ºC; H5; Z6	MODERATE
Sun exposure	**Frost resistant**
SUN/PARTIAL SHADE	LOW

Soil
pH: 6.5-7.5
FERTILITY: MODERATE

Texture	Salt resistant
LOAMY	LOW
Drainage	**Lime resistant**
MODERATE	MODERATE

USES

Resistances		Applications			
COASTAL:	MODERATE	SLOPES:	NO	WALLS:	YES
POLLUTION:	MODERATE	CARPET:	NO	TRELLIS:	YES
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Commonly known as cup of gold. This species of climber is native to Mexico. In warm climates its leaves are persistantly green. When trimmed, the glossy foliage is the perfect contrast to the large trumpet-shaped flowers that appear in winter and summer.

SPACING: 2 M

PLANTING AND PLANT HEALTH

This species has low resistant to cold temperatures (minimum 10ºC). It needs full sun and fertile, well-drained soil. It needs a high irrigation programme during the summer months. It needs to be tied down to some kind of support. Prune bushy branches after flowering. It is propagated by semi-ripe cuttings in the summer.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
X	X	X	X	X	X	X					

Sowing ☐ Planting ☐ Pruning X ☐

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides ☐ Pesticides ☐ Fertilizers ☐ ☐

COMMERCIALIZATION

Presentation(L)	Length (cm)	Topiary shape
CT(5)	60-80	
CT(10)	80-100	
CT(30)	125-150	

SOLANUM

CLIMBER

Solanum jasminoides

DULCAMARA (SPANISH) | VALENCIAN | POTATO VINE (ENGLISH) | MORELLE FAUX JASMIN (FRENCH)

STRUCTURE		
Shape: SARMENTOSE	Height: 5-8 M	Diameter: 5 M
Texture: FINE	Shade: PARTIAL	Root: SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	POLEMONIALES
FAMILY:	SOLANACEAE

VARIETIES

MORPHOLOGY		
Stem	UNDERG: NO; CREEPING: NO	WOODY: YES; CLIMBING: YES
Leaf SEMI - PERSISTENT; SIZE: 3-7 CM; COLOR: US:DARK GREEN, LS:DARK GREEN; TEXTURE: US: SMOOTH, LS: SMOOTH	COMPOUND: NO; HARDNESS: SOFT; ARRANGEMENT: ALTERNATE; VENATION: PINNATE; SHAPE: OVAL-LANCEOLATE; MARGIN: SMOOTH; APEX: ACUTE; LEAF BASE: ATTENUATE; PETIOLE: SHORT	
Flower SIZE: 2.5 CM	Type: HERMAPHRODITE; Flowering: INFLORESCENCE IN CYMOSE	Reproduction: HERMAPHRODITE; Fragrant: NO
Fruit SIZE:	Type: BERRY; Edible	Color: PURPLE; Fruiting season: SEPT-NOV
Growth	Rate: FAST	Longevity: 0-25 YEARS

ECOLOGY		
Climate ALTITUDE: 0-200; IRRIGATION: MODERATE	Temperature: 0ºC; Sun exposure: PARTIAL SHADE	Drought resistant: MODERATE; Frost resistant: LOW
Soil pH: 6.5-7.5; FERTILITY: MODERATE	Texture: LOAMY/SANDY; Drainage: MODERATE	Salt resistant: LOW; Lime resistant: MODERATE

USES		
Resistances: COASTAL: MODERATE; POLLUTION: MODERATE; WIND: MODERATE	Applications: SLOPES: NO; CARPET: NO; GROUPS: NO	WALLS: YES; TRELLIS: YES; ISOLATED: NO







POINTS OF INTEREST

Native to Brazil. The potato vine is a very decorative climber species which produces purple fruit berries in autumn. If left to grow freely, it will form a large creeping bush or perch on other hardier bushes. It is much more conspicuous if grown on a sunny wall, a screen or a trellis; in this way, its large flower clusters will be more impressive.

SPACING: 3 M.

PLANTING AND PLANT HEALTH

The potato vine is sensitive to frost and therefore warm temperatures are ideal. It prefers well-drained, fertile and light soils. It is resistant to drought but requires a high irrigation programme watering at the time of flowering. The shoots are pruned and cut in spring (although not always necessary). Propagation can be carried out by semi-woody cuttings in summer and by layering.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
			X	X	X						

Sowing | Planting | Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation (L)	Length (cm)	Topiary shape
CT(5)	60-80	
CT(10)	80-100	
CT(30)	125-150	

TECOMARIA

Tecomaria capensis

CLIMBER

BIGNONIA ROJA (SPANISH) · VALENCIAN · CAPE HONEYSUCKLE (ENGLISH) · BIGNONE DU CAP (FRENCH)

STRUCTURE

Shape	Height	Diameter
SEMI-SARMENTOSE	3 M	2 M
Texture	**Shade**	**Root**
FINE	PARTIAL	SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	SCROPHULARIALES
FAMILY:	BIGNONIACEAE

VARIETIES

MORPHOLOGY

Stem

UNDERG	NO	WOODY	YES
CREEPING	NO	CLIMBING	SEMI

Leaf

EVERGREEN

SIZE: 10-16 CM

LEAFLETS:5-11

COLOR: US: DARK GREEN

LS: DARK GREEN

TEXTURE: US:SMOOTH

LS:SMOOTH

COMPOUND:	IMPARIPINNATE
HARDNESS:	SOFT
ARRANGEMENT:	OPPOSITE
VENATION:	PINNATE
SHAPE:	OVATE
MARGIN:	SERRATE
APEX:	ACUTE
LEAF BASE:	ATTENUATE
PETIOLE:	SHORT

Flower

SIZE: 5 CM

INFLORESCENCE IN RACEMES

Type	Reproduction
HERMAPHRODITE	HERMAPHRODITE
Flowering	**Fragrant**
	NO

Fruit

SIZE:

Type	Color
CAPSULES	
Edible	**Fruiting season**

Growth

Rate	Longevity
MEDIUM	0-25 YEARS











ECOLOGY

Climate

ALTITUDE: 0-200

IRRIGATION: MODERATE

Temperature	Drought resistant
0ºC	MODERATE
Sun exposure	**Frost resistant**
SUN	LOW

Soil

pH: 6.5-7.5

FERTILITY: MODERATE

Texture	Salt resistant
LOAMY	LOW
Drainage	**Lime resistant**
MODERATE	MODERATE

USES

Resistances		Applications			
COASTAL:	MODERATE	SLOPES:	NO	WALLS:	YES
POLLUTION:	MODERATE	CARPETS:	NO	TRELLIS:	YES
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	NO

POINTS OF INTEREST

Commonly known as red bignonia. This speices is native to South Africa. It is a semi-climbing shrub that is easy to grow in large pots. If supported, it makes for a good climber. In various Indian tribes and in Mexico, tecomaria flowers are used as ornaments during some religious ceremonies or on occasions of marriage or magical initiation rites.

SPACING: 2 M

PLANTING AND PLANT HEALTH

Adapted to warm climates, it does well in coastal areas. It is hardy to soils but prefers well-drained and light ones. It requires a high irrigation programme in the summer and moderate to high humidity. Pruning must be very light in order to clean and eliminate any unwanted branches. Propagation by seed, cuttings from parched branches or layering. Graft on root of *Campsis radicans* (the trumpet vine).

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
X	X	X	X	X	X	X					

Sowing ☐ Planting ☐ Pruning X ☐

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides ☐ Pesticides ☐ Fertilizers ☐ ☐

COMMERCIALIZATION

Presentation (L)	Length (cm)	Topiary shaoes
CT(5)	60-80	
CT(10)	80-100	
CT(30)	125-150	

VITIS *Vitis vinifera*

CLIMBER

PARRA SPANISH | PARRA VALENCIAN | GRAPE VINE ENGLISH | VIGNE FRENCH

STRUCTURE

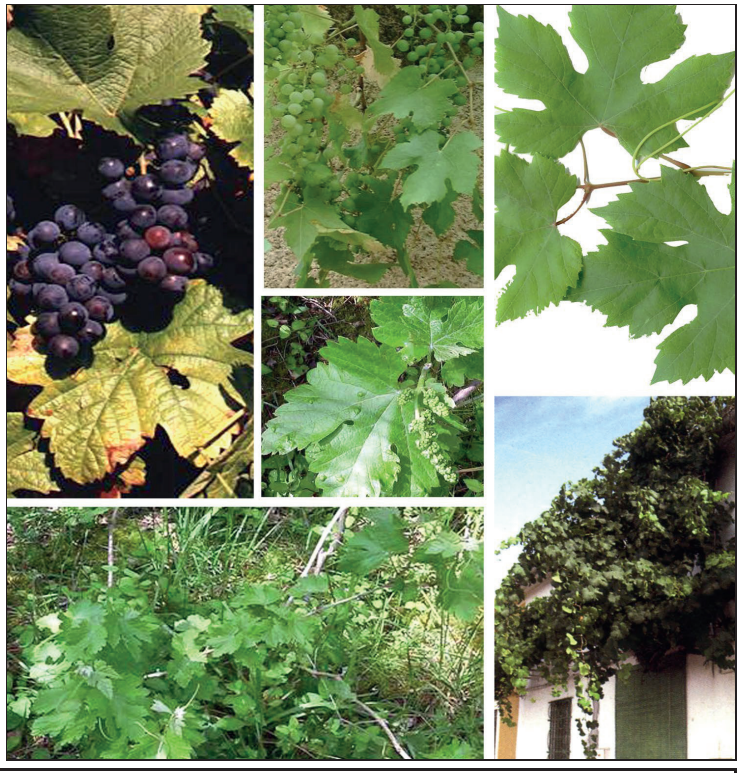
Shape	Height	Diameter
SARMENTOSE	Up to 20 M	10 M
Texture	**Shade**	**Root**
FINE	PARTIAL	SCATTERED

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	FABALES
FAMILY:	LEGUMINOSAE

VARIETIES

MORPHOLOGY

Stem	UNDERG NO	WOODY YES
	CREEPING NO	CLIMBING YES
Leaf	COMPOUND: NO	
DECIDUOUS	HARDNESS: SOFT	
SIZE: 7-15 M	ARRANGEMENT: ALTERNATE	
	VENATION: PALMATE	
	SHAPE: LOBED	
COLOR: US:GREEN	MARGIN: DENTATE	
LS:GREEN	APEX: ACUTE	
TEXTURE: US:SMOOTH	LEAF BASE: CORDATE	
LS:TOMENTOSE	PETIOLE: SHORT	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE:	Flowering: INFLORESCENCE IN RACEME	Fragrant: NO
Fruit	Type: BERRY	Color: GREEN/BLACK
SIZE:	Edible: YES	Fruiting season: SEPT-OCT
Growth	Rate: FAST	Longevity: 120 YEARS



ECOLOGY

Climate	Temperature: -10ºC	Drought resistant: HIGH
ALTITUDE: 0-1000	Sun exposure: SUN	Frost resistant: HIGH
IRRIGATION: MODERATE		
Soil	Texture: ALL TYPES	Salt resistant: LOW
pH: 7-8	Drainage: MODERATE	Lime resistant: MODERATE
FERTILITY: MODERATE		

USES

Resistances		Applications			
COASTAL:	LOW	SLOPES:	NO	WALLS:	YES
POLLUTION:	MODERATE	CARPETS:	NO	TRELLIS:	YES
WIND:	MODERATE	GROUPS:	NO	ISOLATED:	NO

POINTS OF INTEREST

This vine is native to the Caspian Sea,West India and the Caucasus. They are ideal for decorating large walls, high trellises and branches of large trees. Vines, in addition to its food, have given rise to the typical trellises of Mediterranean gardens. It has numerous varieties that have been selected over centuries for cultivation.

SPACING: 3 M

PLANTING AND PLANT HEALTH

It requires warm and dry environments to grow normally. Low temperatures and persistent rains are unfavorable. Tolerates proximity to the sea. It is not very demanding in terms of soil, but light, rocky and well-drained ones are preferable. It requires a normal irrigation programme and excess moisture is not recommended. It must be pruned to obtain vigorous shoots. Propagation is by seed, cutting or grafting.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
X	X	X	X	X	X	X	X				

Sowing | Planting | Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation (L)	Length (cm)	Topiary shapes
CT(5)	60-80	
CT(10)	80-100	
CT(30)	125-150	

WISTERIA

Wisteria sinensis

CLIMBER

GLICINIA (SPANISH) | VALENCIAN | CHINESE WISTERIA (ENGLISH) | GLYCINE DE CHINE (FRENCH)

STRUCTURE

Shape	Height	Diameter
SARMENTOSE	5-10 M	5 M
Texture	**Shade**	**Root**
FINE	PARTIAL	SCATTERED

DIVISION

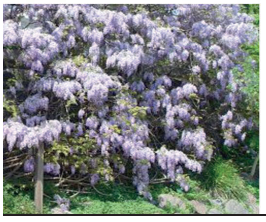
DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	FABALES
FAMILY:	LEGUMINOSAE

VARIETIES

MORPHOLOGY

Stem	UNDERG	NO	WOODY	YES
	CREEPING	NO	CLIMBING	YES
Leaf	COMPOUND:	YES. IMPARIPINNATE		
DECIDUOUS	HARDNESS:	SOFT		
SIZE: 30 CM	ARRANGEMENT:	OPPOSITE		
LEAFLETS:3-8 CM	VENATION:	PINNATE		
COLOR: US:GREEN	SHAPE:	LANCEOLATE		
LS:GREEN	MARGIN:	ENTIRE		
TEXTURE: US:SMOOTH	APEX:	ACUTE		
LS:SMOOTH	LEAF BASE:	ATTENUATE		
	PETIOLE:	SHORT		
Flower	Type	HERMAPHRODITE	Reproduction	HERMAPHRODITE
SIZE:	Flowering		Fragrant	NO
INFLORESCENCE IN RACEME (up to 60 cm)				
Fruit	Type	LEGUME	Color	WHITE/VIOLET/BLUE
SIZE:	Edible	NO	Fruiting season	
Growth	Rate	MEDIUM	Longevity	120 YEARS









ECOLOGY

Climate	Temperature	-5ºC	Drought resistant	MODERATE
ALTITUDE: 0-1000	Sun exposure	SUN/PARTIAL SHADE	Frost resistant	MODERATE
IRRIGATION: MODERATE				
Soil	Texture	LOAMY	Salt resistant	LOW
pH: 6.5	Drainage	MODERATE	Lime resistant	NO
FERTILITY: MODERATE				

USES

Resistances		Applications			
COASTAL:	LOW	SLOPES:	NO	WALLS:	YES
POLLUTION:	MODERATE	CARPETS:	NO	TRELLIS:	YES
WIND:	MODERATE	GROUPS:	NO	ISOLATED:	NO

POINTS OF INTEREST

Native to China and Japan. Wisteria can cover tops of walls, trellises, railings and trunks with their deciduous foliage. It is not advisable to plant them next to walls of houses as they usually get into drains and under the tiles. In order to prevent the wisteria from damaging the support, it is advisable to have hoops. The hanging flower clusters are spectacular. The yearly stems or shoots can grow considerably in thickness and length, which gives the plant a woody and solid appearance. It must be isolated on a trellis since another neighboring climber (even if it is less vigorous) can suffocate it. They cling to supports or man-made structures by counterclockwise-twining stems.

SPACING: 3 M

PLANTING AND PLANT HEALTH

Although this climbing species resists cold tempartures, it prefers temperate climates. It adapts to any garden soil but prefers consistent, fresh, drained and lime-free ones as it is sensitive to iron chlorosis. It requires a normal irrigation programme and moderate humidity. It is necessary to direct the young shoots so that they cover the desired areas and thye need to be pruned each year (generally last year's branches to within 10 cm of the junction with the oldest branch) to stimulate their flowering. As a result, a kind of corolla is formed, on which short and pointed branches develop that should not be pruned as they are floriferous. Conversely, long and sterile branches can be pruned.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
X	X	X	X	X	X	X	X	X	X	X	X

Sowing ☐ Planting ☐ Pruning ☒ ☐

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides ☐ Pesticides ☐ Fertilizers ☐

COMMERCIALIZATION

Presentation (L)	Length (cm)	Topiary shapes
CT(5)	60-80	
CT(10)	80-100	
CT(30)	125-150	

Subchapter 7.3 Commercialization, use and planting

COMMERCIAL FORMATS OF CLIMBING AND SARMENTOSE PLANTS

The commercial formats of climbing and sarmentose plant relates to their height (Table 7.3.1) in the case of species or cultivars of erect bearing, and to the size in those of extended or horizontal bearing.

Height in cm
10/20
20/40
40/60
60/80
80/100
100/125
125/150
150/175
175/200
200/225
225/250

Table 7.3.1: Measurements to classify climbing and sarmentose plants according to their height when supplied (*Normas Tecnológicas de Jardinería y Paisajismo*. (C.I.T.A.P.A.C.))

ROOT FORMATS

The production of climbing and sarmentose plants in nurseries follows four procedures:

1. **Bare-root deciduous plants:** Once the propagation of the young plants has been completed, they are planted in the field. Once the desired formats and sizes have been achieved, they are uprooted and supplied in bare root form.

2. **Evergreen plants with root ball:** Once the propagation of the young plants has been completed, they are planted in the field. Once the desired formats and sizes have been achieved, they are uprooted and supplied in root ball form.

3. P**lants with mixed field/container cultivation:** After a first cycle corresponding to the propagation of the young plants, they are planted in the field. Once the desired formats and sizes have been achieved, they are uprooted and potted in a container. After a period of rooting and adaptation to the new environment, the plants are supplied for their commercialization.

4. **Container-grown plants:** After propagation, the young plants are potted in progressively larger containers, at least every one or two years depending on the container volume and the vigor and growth of the plant. Once the desired cultivated formats and sizes have been achieved, the plants are supplied for their commercialization.

When dealing with tap root species or varieties, care must be taken to ensure that the tap root has a length of about 20 cm on which sufficient secondary roots have been produced.

DECIDUOUS CLIMBING AND SARMENTOSE PLANTS SUPPLIED IN BARE ROOT

The root system must be consistent with a minimum size stipulated for the species or commercial variety. For example, a plant of 40/60 cm height should have a root system with a minimum diameter of 20/25 cm. Another plant measuring 80/100 cm should have a minimum width of 30 cm in its root system and a plant 125/150 cm tall should have a set of roots greater than 40 cm in diameter. The supply of bare root plants should be made from nurseries located in climates similar to where they will be planted.

Generally, bare-root climbing and sarmentose plants are supplied by grouping plants of the same format into homogeneous bundles containing 5 to 10 units.

EVERGREEN CLIMBING AND SARMENTOSE PLANTS SUPPLIED IN ROOT BALL

In the case of plants supplied with a root ball, the mass of soil should be homogeneous in quality and have no supplementary added substrate. The root balls will have a volume proportional to the aerial part of the plants and must be protected and wrapped with a biodegradable mesh that decomposes within 1.5 years of planting and tied with a similar degradable material. In the case of large specimens, the root ball must have a supplementary protection consisting of a non-galvanized metal mesh wrapper or reinforced plaster with non-galvanized mesh.

In the case of large specimens supplied bare root or with root ball, a record of how many times they have been root pruned must be made. This is an important indication of quality, especially in the case of plants with a taproot system where the longitudinal growth of the main root has been limited to ensure the development of secondary roots.

Evergreen climbing and sarmentose plant species should have been periodically root pruned at least every two or three years, depending on the species or commercial variety. This will ensure optimum conditions for the good rooting of the plant in the garden. At least one growing season should have elapsed between the last root pruning and the planting. The action of uprooting the plant prior to its commercialization should not be considered as root pruning.

Height of climbing plant in cm	Minimum diameter of root ball in cm	Minimum depth of root ball
20/40	20	15
40/60	20/25	15/20
60/80	25	20/30
80/100	25/30	25/30
100/125	30/35	25/30
125/150	35/40	30
150/175	40/45	30
175/200	45/50	35
200/225	50/55	35
225/250	55/60	40

Table 7.3.2: Recommended minimum diameter and depth of the root ball according to the height of the climbing and sarmentose plants when supplied. From N.T.J.P. (C.I.T.A.P.A.C.)

CLIMBING AND SARMENTOSE PLANTS SUPPLIED IN CONTAINERS

The production of plants in container eliminates the severe constraints of bare-root planting in winter and root ball planting in spring and fall, since container-produced plants can be planted practically any time of the year, except for the months with the highest evapotranspiration.

A good indication of quality containerized climbing plants is the absence of root spiraling since this hypogeal growth will impede the future development of the roots in the garden. In addition, roots that protrude from the container's drainage holes will affect future development as well as the use of pots or containers with non-degradable meshes, which in the latter case is unacceptable.

Minimum height of the plant in cm	Recommended minimum volume of container in liters	Upper and lower diameter of container in cm
20/40	1.5/2	15/16
40/60	2	16
60/80	3	18
80/100	3/5	18/22
100/125	5	22

Tabla 7.3.3: Minimum recommended volume of container in terms of height N.TJ.P. (C.I.T.A.P.A.C.)

SUBSTRATE

The substrate used in the production of containerized climbing and sarmentose plants must have a composition that does not create interfaces with undesirable water movement leading to serious excesses or defects in moisture in the root volume after planting.

In the case climbing and sarmentose plants growing in acid soils (e.g. *Wisteria*), a substrate with physical-chemical characteristics adapted to this type of plant must be applied.

The presence of evergreen weeds and mosses must be avoided and inspected at the source.

PLANT HEALTH

Irrespective of the species, the plants should show obvious health, as well as having a good development and a balanced and proportionate shape. Likewise, balance and proportion in the size of the root ball extracted or obtained in a container is required.

The plants should show no signs of diseases, pests, physiopathies, nutritional deficiencies or symptoms of phytotoxicity. Their trunks, stems and branches must be free of burns or wounds and no broken branches or buds must be observed. The roots must not show damage or rot.

The supplier must comply with the current legislation on plant health specially regarding harmful quarantine organisms and the required phytosanitary passport.

LABELLING AND DOCUMENTATION

The supplier must identify at least 5% of the plants in each lot with a durable label correctly and solidly attached to the plants or to the substrate, with indelible, visible characters, recording: its species and variety, the material used for rootstock and grafting, number of plants in the lot and its commercial format (total height and/or span and container volume, if applicable).

In addition, the supplied plants will be accompanied by a delivery note issued by the supplier in which the following **administrative information** will be indicated:

- Indication: "CEE quality"[1]
- Member State Code[1]
- Name or identification code of the responsible official body[1]
- Identification of the nursery or supplier (name and registration or authorization number)[2]
- Document issue date
- Individual serial or batch number
- Where applicable, Phytosanitary Passport number
- Where applicable, Ornamental Label
- In the case of imports from third countries, the name of the country of production
- The indication of the Technological Standard NTJ 07F: 1998 on a product represents the commitment by the producer that the product meets the requirements of the Technological Standard

[1] Only in the case of specifically regulated species or cultivars, which must comply with current legal regulations. If desired, this information can be printed on the delivery note.

[2] If desired, this information can be printed on the delivery note.

And the following technical information:

- Botanical name.
- Cultivar denomination.
- Number of plants.
- Presentation of the root system.
  - · Bare Root: BR
  - · Container: CT
  - · Pot: P
  - · Root ball: CE
  - · Gypsum root ball: CEY in Gypsum
  - · Root ball with metal mesh: RB - M.M.
- Total height and/or span, depending on the case.
- Stem height, in the case of tall plants.
- Volume or diameter of the container, indicating after the letter C (indicating container) the volume in liters, or designating behind the letter P (indicating pot) a figure indicating the upper and outer width of a square pot or the diameter top and outside of a round pot. In this second case, the letter "r" will be placed behind the number.

If the climbing plants supplied come from the forest or existing gardens, the extraction must have been carried out in accordance with the provisions of current legislation, and this origin must be recorded on the delivery note.

Additional important descriptions

- Denomination of the rootstock, if applicable.
- Sex, in the case of dioecious plants with interesting fruit.
- Number of trunks or main stems.
- Number of root prunes, if applicable.
- Presence of a leader, if applicable.
- Thinning, if applicable.
- Cutting back, if applicable.
- Approximate weight of the plant, counting that of the root ball and that of the container, if applicable.
- Last phytosanitary treatment carried out (active material and date).

The plantation framework (spacing) will depend on the adult size and vigor of the species or cultivar being used, the quality of the soil and other characteristics of the medium and cultivation.

Subchapter 7.4 Maintenance

FERTILIZER

Base dressing

Medium and large climbers and sarmentose plants

- Decorative for its foliage: 0.5 Kg/hole of 8-8-8 fertilizer
- Decorative for its flowering: 0.5 Kg/hole of 6-9-14 fertilizer

Fertilizing

Month	Types and doses
November	Organic material: 150 Kg/100m^2
March	Ammonium nitrate: 3Kg/100m^2
	Lime superphosphate: 2.5 Kg/100m^2
	Potassium superphosphate: 1.5 Kg/100m^2
May	Ammonium Nitrate: 1.5 Kg/100m^2
July	Lime superphospate: 2.5 Kg/100m^2
	Potassium sulphate: 1.5 Kg/100m^2
August	Ammonium nitrate: 1.5 Kg/100m^2

WATERING

The following table includes a guideline for Monthly Irrigation

Nº of watering	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
		1	1	1	2	3	3	2	1			

Table 7.4.1: Monthly irrigation or climbing plants

Average dose: 5 liters of water per foot

PRUNING

This operation depends on the type of plants:

1. Climbers and sarmentose plants with deciduous leaves
2. Flowering climbers and sarmentose plants
3. Climbers and sarmentose plants with evergreen leaves

The specialist, once in the garden will study how the climbers and sarmentose plants need to be pruned, making a note of the number of old branches, suckers, interior branches, etc. Once analyzed, the removal of all the old branches can begin. This will ensure healthy vegetation.

When it comes to small and thin branches, hand shears are used. If cuts need to be made at great height, a long reach looper is used and if necessary, with extendable handles. When dealing with thick branches, a prune saw is used and if tears occur, they can be filed down.

Once the removal of old branches has been completed, the suckers can be removed. The purpose of this pruning is to maintain the vegetative balance of the climbers and sarmentose plants, preventing suckers from diminishing the plant's vigor.

Finally, the cutting of interior branches takes place to allow light and air to penetrate the entire plant and finally, the trimming of branches that "invade" other bushes or cover the visibility of lampposts, windows is carried out.

Once the pruning is finished, a fungicidal paint is applied to all the cuts with a diameter over 2 centimeters.

Green pruning is usually carried out every month and includes the removal of withered branches and flowers, at no time will severe pruning be carried out since it can damage the climber and sarmentose plants

Then the adjacent paths are swept, and the remains of the pruning are collected and taken directly to the landfill or left in piles that will later be collected and adequately disposed of.

PHYTOSANITARY TREATMENTS

The treatments are carried out at the times indicated below, with the consent of the owner and taking into consideration the the species, products, and methods (c.p. = commercial product).

March
Treatment against insects, mites and cryptogamic diseases.
- Abamectin: 0.35 cc/l c.p.
- Thiram 80%: 2.5 g/l

May
Treatment against wax scales, other insects and cryptogamic diseases.
- Metilpirimifos: 1.75 g/l c.p.
- Thiram 80%: 2.5 g/l c.p.

July
Treatment against sucking insects, chewing insects and mites.
- Fenvalerate: 0.75 cc/l p.c.
- Dienochlor: 0.9 g/l p.c.

September
Treatment against sucking insects, chewing insects and mites.
- Abamectina: 0.35 cc/l p.c.
- Thiram 80%: 2.5 g/l June:

December
Zineb 80%: 2.5 g/l p.c.

February
Zineb 80%: 2.5 g/l p.c.

The presence and symptoms of specific pests and diseases in some plants should be monitored throughout the year:

- Aphids/mites: Treat with Abamectin at 0.75 cc/l p.c. or with Ethiofencarb at 1 cc/l c.p.
- Powdery mildew: White spots on the leaves. Treat with Benomyl at 0.6 g/l as soon as it appears.
- Snails and slugs: Treat late in the day and water with Metaldehyde at a rate of 10-15 granules/m^2.
- Chlorosis (iron deficiency): Sequestrene 138 F at 3 g/m^2.

For the application of phytosanitary treatments, the following equipment can be used:

- Low toxicity phytosanitary product
- Wetting
- Small tank
- Vehicle for displacement
- Masks, aprons, forearm gloves, boots.

The treatment requires only one specialist/technician, who prepares the mixture in the tank or backpack and sprays the indicated species or specimens.

Phytosanitary treatments are preferably carried out during hours of minimal inconvenience, prior to notifying the owners or users of the green area.

WEEDING AND LIGHT DIGGING

This operation should be carried out throughout the year, at least once a month in autumn and winter and twice a month in spring and summer.

Material used: Baskets, hoes and rakes, curved knives, small sickles, and backpacks for herbicide treatments.

Weeding is carried out by lightly digging the soil surface, although sometimes it also includes mechanical means (low mowing) or chemical means (with non-toxic selective herbicides).

The superficial digging should be made between the plants forming a compact group using a hoe. At the same time, the remaining clods of soil should be crumbled and the weeds removed. When the entire clump is undercut, the soil should be leveled and raked so that the surface is uniform and free of stones or objects.

The weeds are then collected and disposed of. The operation ends with the transfer of the remains to the landfill.

MONTH	OPERATION
MARCH	Transplanting of bareroot plants Formative training / pruning
APRIL	Transplanting of evergreen species Fertilizing
MAY	Maintenance pruning
JUNE **JULY** **AUGUST**	Cut wilted spring flowers from climbing plants (head
OCTOBER **NOVEMBER**	Base dressing Maintenance pruning Transplanting of evergreen species
DECEMBER **JANUARY**	Transplanting and pruning weather permitting
FEBRUARY	Formative pruning and transplanting of deciduous species

Table 7.4.2: Calendar of annual operations

FREQUENCY

OPERATION	FREQUENCY		
Irrigation in planting beds		**1 Mar / 31 Oct**	**1 Nov / 28 Feb**
	Climbers and Sarmentose plants	3 times a week	Once a week
	Pots	3 times a week	Once a week
Base Dressing	Prior to any planting		
Renewal of substrate or ameliorations	As indicated D. T.		
Weeding or light digging	Once a month		
Fertilizing	**Spring and Autumn**	**Winter**	
	5-8 mineral substrates	1 organic substrate	
Replanting	Climbers and Sarmentose plants	As indicated by D. T.	
Formative pruning	Free shapes	Green pruning once a month	Formative pruning and rejuvenation: once as indicated by D.T.
	In rose bushes	Traditional pruning (topping and finishing) winter	Remove wilted flowers: spring, summer, and autumn
	In trained forms	Trimming: Once a month	2 trimmings as indicated by D.T.
Phytosanitary treatments	From April to November or as indicated by D.T.		
Herbicides	Monthly		

Table 7.4.3: Operations and frequencies (D.T.: technical director)

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8

MEDICINAL AND AROMATIC PLANTS

Chapter 8 MEDICINAL AND AROMATIC PLANTS

Subchapter 8.1 Introduction
Subchapter 8.2 Species
Subchapter 8.3 Commercialization, use and planting
Subchapter 8.4 Maintenance

Subchapter 8.1 Introduction

INTEREST IN MEDICINAL PLANTS

In Spain there are more than 1,000 endemic plants compared to the more than 8,000 species of plants present in our territory, which, at a European level, is an exceptional case. This is a result of the great variety of environmental conditions (climate, soil) that can be found in the Iberian Peninsula. Interestingly, many of such endemic plants are considered medicinal, however, many of them are barely known. This enormous wealth deserves great attention from the point of view of the conservation, recovery, and increased knowledge of these plant species.

The combination of botanical, medicinal, environmental, agricultural and ornamental factors make the *Lamiaceae* botanical family the most represented in the group of medicinal plant species of interest. The *Asteraceae* and *Apiaceae* families are also well represented.

Medicinal plants are aptly named since they contain or produce products called “active substances”. Such substances exert effects, beneficial or harmful, on living beings. They can be classified into:

- **Aromatic plants** are medicinal plants whose active principles are volatile substances or essential oils.
- **Condiment plants** are medicinal plants used for their organoleptic properties.
- **Medicinal plants** have pharmacological properties, acting by themselves or being able to form part of the composition of medicines.
- **Beekeeping or melliferous plants** are plants that attract bees, from which the elaborated honey is subsequently used.
- **Biocidal plants** contain active ingredients with a repellent and/or have a toxic effect against larger organisms (plants, animals).
- **Natural dye plants** present usable substances to color fabrics or other objects.

Medicinal plants are essential in addressing three major areas in the environmental sphere:

- **Reforestation and re-vegetation**. These plants have great adaptability and hardiness. As a result, they are excellent species to “colonize” areas in the first phases of the regeneration of mountains (lavender, rosemary, thyme, santolina...), especially after fires. They are also useful to prevent erosion and soil degradation in slopes and free surfaces generated after public works.

- **Active substances**. Of pharmacological, aromatic or condiment nature, these plants can be consumed or used by humans. They are an ideal species to reintroduce a profitable agricultural activity in poor areas as they can be cultivated for the industrial sector (production of essential oils for perfumes, condiments, liqueurs, etc. all of them open to extensive trade and exports).

- **Ornamental plants**. Excellent species due to their ease of handling and low environmental requirements. Since they have not been exposed to breeding and genetic improvement, they

are generally not affected by pests and diseases. As a result, they are adaptable, resistant, and tolerant against adverse factors, both environmental and health related. This makes them a group of plants with enormous potential in Mediterranean areas, where the prevailing environmental conditions (low average annual rainfall, high summer temperatures...) combined with the growing problems of water availability (both concerning quantity and quality), and the edaphic characteristics of the soils, limit the durable and feasible introduction of other species. In addition, the selection of attractive medicinal and aromatic species and the development of new, more showy varieties, will help us increase the botanic palette in Mediterranean gardens and offer new alternatives to classical or conventional gardens. Furthermore, we should not forget that the gardens that use medicinal and aromatic plants can fulfill an excellent educational mission (knowledge of their applications, aromatic gardens for disabled people, etc.).

Along with the points considered above, medicinal and aromatic plants have at least two other factors in their favor:

- Many of them can be cultivated or kept in a garden for multi-annual periods.
- Due to the adaptation of many medicinal plants to Mediterranean environmental conditions, they are not prone to pests and diseases.

HISTORICAL POINTS

Humans have learned since prehistoric times to take advantage of the properties that plants had to offer, both from a nutritional point of view and from a medicinal perspective (heal wounds, cure ailments...). For this, the observation of animal behavior was essential. It is conceivable, therefore, that the learning process has been slow and costly, transmitting knowledge from generation to generation.

For centuries, different civilizations have taken advantage of the benefits of medicinal plants and have gathered an enormous amount of information on them. The Chinese for example, already knew about the properties of pomegranate, the opium poppy, the rhubarb (2000 BC); the Egyptians knew numerous medicinal plants, from which they also obtained cosmetic products, ointments, distilled essences... (3000 - 4000 BC); In India (1300 B.C.) a medicinal culture was developed that still exists today (the “Ayurveda” medicine) and that is based on the use of plants. Many of the examples cited are well-grounded even today.

It was the Greeks who amalgamated Eastern and Western knowledge, expanding it, and creating many of the foundations of current medicine. The knowledge in this regard of Hippocrates (who described the properties of about 200 plants), Theophrastus (about 350 plants) and Dioscorides (about 700 plants) stand out. This advance in knowledge had its continuation in the Roman Empire, highlighting the works of Galen and Pliny the Elder.

During the Middle Ages, the obscurantism and scientific stagnation relegated, like so many other branches of science, this knowledge to oblivion, preserving most of it in monasteries, along with the teachings of the Arabs, great connoisseurs in the management of essential oils.

The time of the geographical discoveries of the fifteenth and sixteenth centuries held great importance. The introduction of American and African plants in therapeutics, as well as the invention of the printing press, represented a great advance in the dissemination of medicinal knowledge as well as a great expansion of it. In the sixteenth century the Western pharmacopoeias were already very extensive.

The subsequent centuries witnessed the advancement of sciences such as Chemistry, Physics and Botany, as well as an enormous development of Phyto pharmacy and phytotherapy. At the beginning of the 20th

century, this trend was broken with the development of chemotherapy to the detriment of phytotherapy. In the mid-1950s, the toxicities, secondary effects, intolerances, attributable to the chemical compounds used in chemotherapy were of concern. With the advances in Chemistry and Pharmacy, it was possible in the mid-1960s to identify many compounds with pharmacological effects on plants, with similar or identical efficacy to chemical products, awakening, once again, interest in medicinal plants. The new techniques allow the rapid and simple extraction of such components, being able to dose and formulate compounds with a similar action or, at least, complementary to the chemical or synthetic ones.

Similar evolution occurred with the condiment plants. Its knowledge has been widely spread since the time of discoveries. Perhaps it has been the improvement of communications, especially in this century, which has allowed and accelerated transfer of knowledge from one geographical area to another. The benefits of condiment plants have not only been extended to the gastronomic field (and, therefore, seasoning) itself, but also to the associated medicinal field. It should be highlighted that a large part of seasoning properties is coupled with medicinal properties, which are not always well known. It is conceivable that such properties are what confer the beneficial nature of a certain diet in a specific geographical area.

The higher standard of living is leading, increasingly, to the knowledge and use of condiment plants seeking, in many cases, either to counteract the harmful effects of an unbalanced diet, or to diversify gastronomic habits.

Aromatic plants have been known since ancient times. Many of the well-known ancient civilizations took advantage of essences based on plant extracts. This has always been a sign of distinction, in many cases with beneficial effects such as relaxing. Even today, some medicinal techniques rely on the use of aromas (aromatherapy), especially in the treatment of chronic conditions.

MEDICINAL PLANTS IN THE GARDEN

For as long as we can remember medicinal plants have been associated with rites and cults. Many of the aspects that help to “fit” or “justify” the use of these plants in gardens (in addition to those described above for environmental reasons) are based on religious knowledge and traditions inherited from the Egyptians, Christians, and Arabs. Thus, Islamic gardens assumed the close link between housing and cultivation/use of plants. They were enclosed gardens with shadows, fresh water, flowers, and exquisite fruits. Roses, jasmine, lilies were present along with trees such as apricot trees, almond trees, pomegranate trees and myrtle hedges.

Christian monasteries inherited the geometric and formal style of Roman gardens. Rosemary, laurel, myrtle, and ornamental hedges were common. Monastic gardening, adopting ancient Egyptian, Syrian and Persian trends, associated these plants with other “useful” ones that were fenced in to prevent the access of animals and take advantage of their fruits and shade.

The cultivation of plants and the creation of gardens in the monasteries reached such a significance in Italy that, by the middle of the sixth century, only prayer was more important than gardening and the cultivation of plants. The cultivation of vegetables, fruit trees, vines, herbs, dyeing and aromatic plants for incense was regulated. In the monasteries, self-sufficiency was achieved in many cases, emphasizing the cultivation of herbs to obtain remedies to cure the sick. Flavoring and condiment plants were selected to give flavor to vegetarian stews, an excellent knowledge of the techniques of making beers, wines, and spirits, as well as cosmetics (based on the use of lemon balm) was achieved.

During the 13th century, the popularity of plants for medicinal use increased, spreading their plantation to the gardens of important families and the orchards of family houses, sharing cultivation with vegetables and flower plants.

Starting in the 16th century, medicinal plant gardens began to be designed in universities to teach botany and medicine, areas of knowledge closely linked until then. The first of these "medicinal gardens" in Padua (Italy) created in 1545 is of special importance.

As knowledge (both botanical and medical) increased and explorers and navigators brought new exotic species, gardens of herbs and medicinal plants grew in variety and relevance, being the forerunners of today's botanical gardens. There are references of important facts of medicinal plants and their cultivation from the Aztec culture through the Spanish conquerors. Hernán Cortés alluded to Moctezuma's fabulous gardens in Huaxtepec (now Oaxtepec).

From the 17th and 18th centuries, famous gardens were created that combined classical ornamental plants with medicinal plants, following both a formal style based on lines, symmetries and geometric compositions, as well as a more informal style, with country and rural overtones.

Nowadays, thanks to the availability of more showy varieties, with longer flowering periods and more intense aromas, medicinal plants have been successfully incorporated into the list of plants suitable for contemporary gardens and are considered beyond their purely "medicinal" aspect.

This aspect is especially striking in Mediterranean areas since many of these plants (as indicated above) are very well adapted to typically Mediterranean environmental conditions. This leads to their frequent use in gardening in both private and public spaces (parks and gardens, highway and motorway medians, service areas, revegetation of slopes, roundabouts, etc.).

With the current trends of urbanization of coastal and mountainous areas (chalets, second homes, apartments, leisure areas, sea promenades, etc.) we are increasingly using plant species adapted to the conditions of each site and learning to give special attention to medicinal plants (fundamentally from the subgroup of aromatic plants).

Subchapter 8.2 Species

This chapter outlines **30 species of medicinal and aromatic plants** used in landscape design. They have been selected primarily for their ornamental use, botanical interest, or other characteristics. As a result, an in-depth analysis is carried out in this subchapter.

Firstly, a table shows the different parameters and values that have been used to describe each species in its specific botanic datasheet.

Each botanic datasheet gathers the information of a species and describes its botanical and ecological aspects, uses, cultivation, and other characteristics of interest, including its commercialization. This information is complemented by photographic information, which shows the general appearance of the described species and different morphological details.

PARAMETERS AND VALUES USED FOR THE BOTANIC DATASHEET	
TAXONOMY	
TAXONOMIC RANKS	DIVISION, SUBDIVISION, TYPE, ORDER, FAMILY
VARIETIES	VARIETIES OF INTEREST
STRUCTURE	
SHAPE	GLOBE-SHAPED/ROUND, OVAL, COLUMNAR, CONE, EXTENDED, IRREGULAR, PARASOL, FAN-SHAPED, HORIZONTAL, PALMIFORM, PENDULAR, WEEPING,
HEIGHT	AS APPROPRIATE- IN METERS OR CENTIMETERS
DIAMETER	AS APPROPRIATE -IN METERS OR CENTIMETERS
TEXTURE	TEXTURE: LEAVES>10CM= COARSE. LEAVES OR LEAFLETS BETWEEN 2-10CM= MEDIUM. LEAVES OR LEAFLETS <2CM= FINE
SHADE	LIGHT, MEDIUM, DENSE,
ROOT	TAPROOT, FASCICULATE, OBLIQUE, HORIZONTAL, AERIAL, ADVENTITIOUS
MORPHOLOGY	
TRUNK	
BARK	SMOOTH, VERTICAL FISSURES, LONGITUDINAL FISSURES, DIAGONAL FISSURES; ROUGH, SCALY, CORKY WITH PLATES
COLOR OF BARK	GREYS; GREENISH GREY OR BLUISH GREY. SILVER, LIGHT GREEN, YELLOWISH, LIGHT BROWN, DARK, GREEN, RED, PURPLE, YELLOW, BLACK, MARBLED, TWO-TONED, THREE-TONED, LIGHT GREY, DARK GREY;
FOLIAGE	
LEAF TYPE	EVERGREEN, DECIDUOUS, SEMI-DECIDUOUS OR SEMI-EVERGREEN
LEAF SIZE	LENGTH (cm)
SIZE OF LEAFLET	LENGTH (cm)
COLOR OF UPPER SIDE (US)	PALE GREEN, LIGHT GREEN, DARK GREEN, BLUE/GREEN, GREY, PURPLE; PALE; YELLOW; VARIEGATED
COLOR OF LOWER SIDE (LS)	PALE GREEN, LIGHT GREEN, DARK GREEN, BLUE/GREEN, GREY PURPLE, PALE, YELLOW, VARIEGATED, RUST COLORED, SILVER
TEXTURE OF UPPER SIDE (US)	GLOSSY, ROUGH, GLABROUS, TOMENTOSE, HAIRY, ROUGH, SCALY, VISCOSE
TEXTURE OF LOWER SIDE (LS)	GLOSSY, ROUGH, GLABROUS, TOMENTOSE, HAIRY, ROUGH, SCALY, VISCOSE
COMPOUND LEAF	NO COMPOUND LEAVES YES. IMPARIPINNATE, PARIPINNATE, TRIFOLIATE, PALMATE, PALMIFORM, PALM, PINNATE, BIPINNATE
HARDNESS	CORIACEOUS, SOFT, SUCCULENT, HARD
ARRANGEMENT	OPPOSITE, ALTERNATE, WHORLED, ROSETTE
VENATION	PINNATE, PALMATE, PARALLEL, RETICULATE, ARCUATE, A3 MAIN VEINS
LEAF SHAPE	ROUNDED, LINEAR, LANCEOLATE, FALCATE, OVAL, OBLONG, ELLIPTIC, DELTOID, RHOMBOID, SPATULATE, ACICULAR GROUPS OF 2, ACICULAR GROUPS OF 3, ACICULAR GROUPS OF 5, ACICULAR GROUPS, ACICULAR IN 1 PLANE, ACICULAR IN SPIRAL, SCALE, PALMATE 7 LOBES, PALMATE 5 LOBES- PALMATE 3 LOBES, POLYMORPHIC, PANDURIFORM, PINNATIFIDA, SAGITATE, RENIFORM, CORDATE, ORBICULAR, OBOVATE, OBLANCEOLATE, LIRATE, HASTATE, RUNCINATE
LEAF MARGIN	ENTIRE, CILIATE, DENTATE, CRENATE, SERRATE, DOUBLY SERRATE, LOBED, DOUBLE LOBED
APEX	ACUTE, CUSPIDATE, OBTUSE, RETUSE, MUCRONATE
LEAF BASE	ATTENUATE, CORDATE, ROUNDED, CUNEATE, OBLIQUE, SAGITATE, AURICULATE, HASTATE, ASYMMETRIC
PETIOLE	LONG, SHORT, SESSILE, WIDE
FLOWER	
SIZE	HERMAPHRODITE (OR MALE/FEMALE FLOWERS): CM OR MM

TYPE	UNISEX, HERMAPHRODITE
REPRODUCTION	MONOECIOUS, DIOECIOUS, HERMAPHRODITE, POLYGAMY, SYNOICOUS, STERILE
FLOWER TYPE	SOLITARY, INFLORESCENCE IN CORYMB, IN CYMOSE, IN RACEME, IN SPIKE, IN UMBEL, IN CATKIN, IN SPADIX, IN FLORET OR CAPITULUM, IN PANICLE (+ INFLORESCENCE SIZE (IN CM OR MM))
FRAGRANCE	YES, NO, UNPLEASANT
FRUIT	
SIZE	IN CM OR MM
TYPE	FOLLICLE, PLURIFOLLICLE, LEGUME, LOMENT, SAMARA, DOUBLE SAMARA, PLURISAMARA,CAPSULE, ACHENE, TETRACHENE, POLYACHENE, NUT, ACORN, SYCONIUM, HESPERIDIUM, SOROSIS, BERRY, RACEME, POME, BALAUSTA, DRUPE, STROBILUS, PSEUDO STROBILUS, CONE
EDIBLE FRUIT	YES, NO
COLOR	RED, GREEN, YELLOW, BROWN, BLACK, PALE, WHITE, PURPLE
FRUITING SEASON	INTERVAL OF MONTHS: JAN, FEB, MAR, APR, MAY, JUN, JUL, AGO, SEP, OCT, NOV, DEC
DEVELOPMENT	
GROWTH	VERY SLOW, SLOW, MEDIUM, FAST, VERY FAST
LONGEVITY	<25 YEARS, 25 YEARS, 50 YEARS, 75 YEARS, 100 YEARS, 150 YEARS, 200 YEARS, 250 YEARS. 300 YEARS, >300 YEARS
ECOLOGY	
CLIMATE	
ALTITUDE	INTERVAL OF ALTITUDE / ELEVATION ABOVE SEA LEVEL
IRRIGATION	++HIGH, MODERATE, LOW; ++LOW (very low/low < 350 mm. Very high/high > 750 mm)
MINIMUM TEMPERATURE AND INTERNATIONAL CLASSIFICATION	MINIMUM TEMPERATURES: DEGREES CELSIUS **CLASSIFICATION ACCORDING TO EUROPEAN REGULATION**: (SEE MAP) G2____ HOT GREENHOUSES IN SOUTHERN EUROPE G1____ COLD GREENHOUSES IN SOTHERN EUROPE H5____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM 0ºC TO -5ºC H4____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM -5ºC TO -10ºC H3____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM -10ºC TO -15ºC H2____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM -15ºC TO -20ºC H1____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM -20 ºC **CLASSIFICATION INTERNATIONAL REGULATIONS.** ACCORDING TO MINIMUM TEMPERATURE RANGES Z1____SUPPORT MINIMUM TEMPERATURES OF -50ºC Z2____ SUPPORT MINIMUM TEMPERATURES OF -50ºC TO -40ºC Z3____ SUPPORT MINIMUM TEMPERATURES OF -40ºC TO -30ºC Z4____ SUPPORT MINIMUM TEMPERATURES OF -30ºC TO -20ºC Z5____ SUPPORT MINIMUM TEMPERATURES OF -20ºC TO -10ºC Z6____ SUPPORT MINIMUM TEMPERATURES OF -10ºC TO -0ºC Z7____ SUPPORT MINIMUM TEMPERATURES OF -0ºC TO 10ºC Z8____ SUPPORT MINIMUM TEMPERATURES OF 10ºC TO 20ºC Z9____ SUPPORT MINIMUM TEMPERATURES OF 20ºC TO 30ºC Z10___ SUPPORT MINIMUM TEMPERATURES OF 30ºC TO 40ºC Z11___ SUPPORT MINIMUM TEMPERATURES OF MORE THAN 40ºC
EXPOSURE TO SUNLIGHT	FULL SUN, FULL-SHADE; PART SHADE, SHADE
DROUGHT RESISTANCE	YES, NO, MODERATE
RESISTANCE TO FROST	YES, NO, MODERATE
SOIL	
OPTIMUM PH	ALL TYPES: NEUTRAL, ACIDIC, BASIC OR ALKALINE (OR INTERVAL OF PH)
FERTILITY LEVEL	FERTILE, MODERATE, POOR
TEXTURE OF SOIL	SANDY, SILT OR LOAMY, CLAYEY, SANDY/LOAMY, CLAYEY/LOAMY, ALL TYPES

DRAINAGE	HIGH, MODERATE, LOW
RESISTANCE TO SALT	YES, NO, MODERATE
RESISTANCE TO LIME	YES, NO, MODERATE
USES	
RESISTANCES	
COASTAL	1st LINE; 2ND LINE, NO, MODERATE
POLLUTION	HIGH, MODERATE, LOW
WIND	HIGH, MODERATE LOW
USE	
IN SLOPES **IN LINES** **ON RIVERBANKS** **AS WIND BREAKERS** **IN HEDGES** **IN FIELD BORDERS** **IN GROUPS** **ISOLATED**	YES, NO
SPACING	MINIMUM RECOMMENDED DISTANCE BETWEEN PLANTS: METERS; CENTIMETERS
PLANTING AND PLANT HEALTH	
PLANTING AND PLANT HEALTH	
CALENDAR	
CHROMATIC CALENDAR	FOLIAGE, FLOWERING, FRUITING SEASON: the color white represented with grey or black cell
CULTIVATION CALENDAR	SOWING, PLANTING, PRUNING
TREATMENTS CALENDAR	FUNGICIDES, PESTICIDES, FERTILIZERS, HERBICIDES
COMMERCIALIZATION	
PRESENTATION	RD (BARE ROOT), CT (CONTAINER or POT (in liters), CE (ROOT BALL), CEY (ROOT BALL IN GYPSUM), ROOT BALL IN MESH
STEM GIRTH (TREES)	CENTIMETERS (usually measured at 1 meter above ground) or years
HEIGHT	CENTIMETERS, METERS

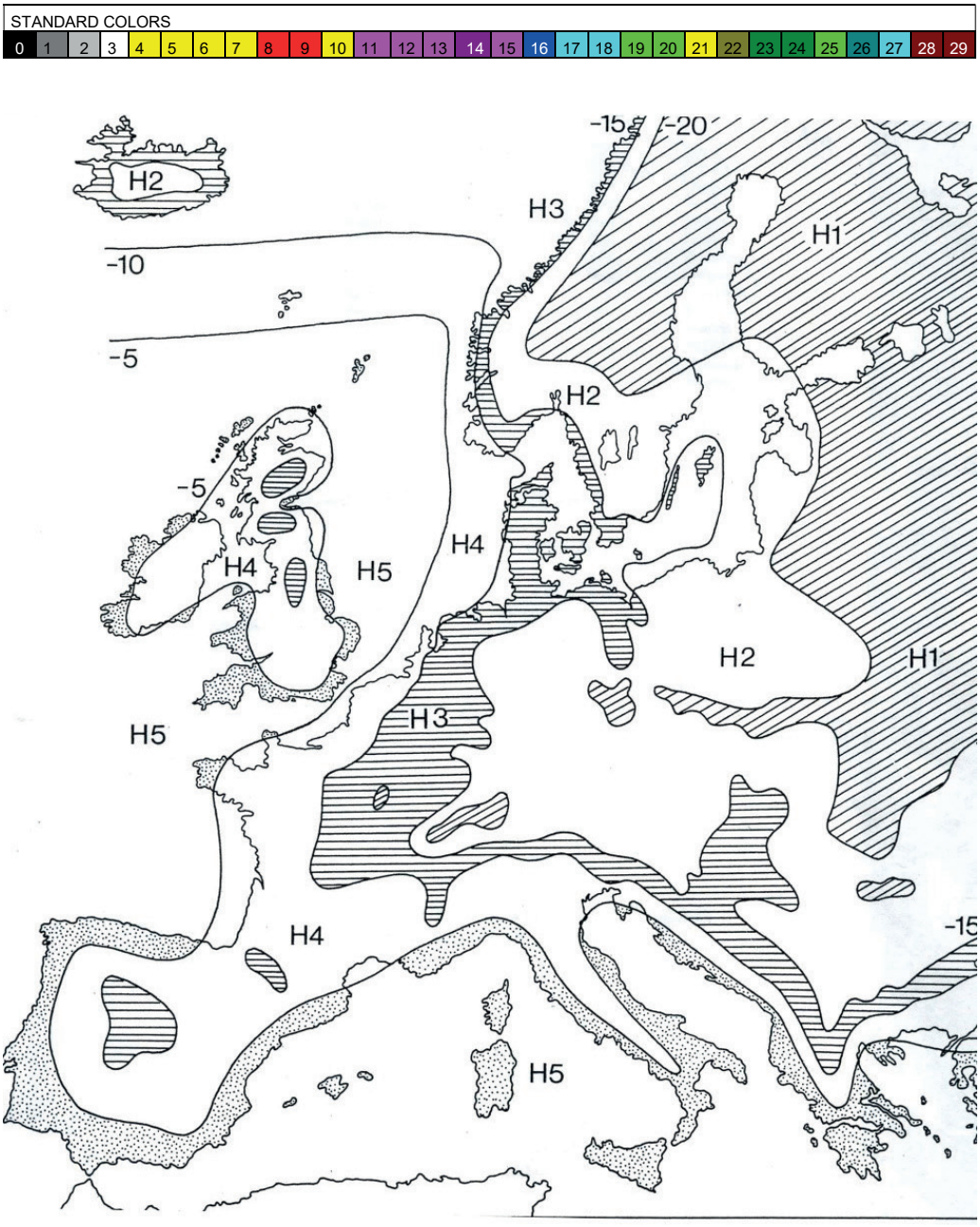


Figure 8.2.1: Thermal classification map according to European regulations

LIST OF MEDICINAL AND AROMATIC SPECIES DESCRIBED

1. *Acanthus mollis*
2. *Artemisia absinthium*
3. *Chamomilla recutita*
4. *Helichrysum stoechas*
5. *Hyssopus officinalis*
6. *Lavandula angustifolia*
7. *Lavandula dentata*
8. *Lavandula hybrida*
9. *Lavandula latifolia*
10. *Lavandula stoechas*
11. *Lippia thriphylla*
12. *Melissa officinalis*
13. *Mentha piperita*
14. *Mentha pulegium*
15. *Mentha spicata*
16. *Micromeria fruticosa*
17. *Nepeta cataria*
18. *Origanum majorana*
19. *Origanum vulgare*
20. *Ricinus communis*
21. *Rosmarinus officinalis*
22. *Ruta graveolens*
23. *Salvia microphylla*
24. *Salvia officinalis*
25. *Salvia sclarea*
26. *Sambucus nigra*
27. *Santolina chamaecyparissus*
28. *Satureja montana*
29. *Sideritis angustifolia*
30. *Thymus vulgaris*

ACANTHUS

Acanthus mollis L.

MEDICINAL AND AROMATIC

ACANTO (SPANISH) | CARNERA, ACANT (VALENCIAN) | BEAR'S BREECH(ES) (ENGLISH) | BRANCHE URSINE, PIED D'OURS (FRENCH)

STRUCTURE		
Shape: EXTENDED	Height: 40-120 CM	Diameter: Up to 200 CM
Texture: THICK	Shade: FULL	Root

DIVISION:	MAGNOLIOPHYTA
SUBDIVISION:	
TYPE:	MAGNOLIOPSIDA
ORDER:	SCROPHULARIALES
FAMILY:	ACANTACEAE

VARIETIES

OAKLEAF

FIELDING GOLD

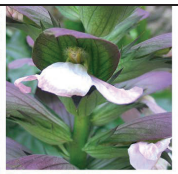
NEW ZEALAND GOLD

RUE LENDAN, *HOLLARD'S GOLD*

MORPHOLOGY		
Stem	Bark	Color: GREEN
Leaf: EVERGREEN; SIZE: 20-100 CM; COLOR: DARK GREEN; TEXTURE: GLOSSY	COMPOUND: NO; HARDNESS: SOFT; ARRANGEMENT: ROSETTE BASAL; VENATION: PINNATE; SHAPE: PINNATE/LOBED; MARGIN: INCISE-DENTATE; APEX: ACUTE; LEAF BASE: ATTENUATE; PETIOLE: LONG 20-60 CM	
Flower: SIZE: 3.5-5 CM	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
	Flowering: SPIKE (30 CM+)	Fragrant: NO
Fruit: SIZE: 2-3.5 CM	Type: CAPSULE	Color
	Edible	Fruiting season
Growth	Rate: FAST	Longevity













ECOLOGY		
Climate: ALTITUDE: 0-700; IRRIGATION: HIGH	Temperature: -6ºC; H4; Z5	Drought resistant: YES
	Sun exposure: SUN/PARTIAL SHADE	Frost resistant: Up to -15ºC
Soil: pH: INDIFFERENT; FERTILITY: HIGH	Texture: ALL TYPES	Salt resistant: __
	Drainage: MODERATE	Lime resistant: __

USES		
Resistances	Applications	
COASTAL: __	SLOPES: NO	HEDGE ROWS: NO
POLLUTION: HIGH	RIVERRBANKS: YES	BORDERS: YES
WIND: MODERATE	GROUPS: YES	ISOLATED: YES

POINTS OF INTEREST

"Akanthos" (Greek) = thorn; "Mollis" (Latin) = soft; motif of the Corinthian capitals created by the Greek sculptor Callimachus.

Origin/distribution: Mediterranean Europe / shady and humid places, rich soils with a high N content / **Active substances:** essential oil (variable: rich in resins, tannins and organic acids), mucilages, ... / **Uses**: Medicinal (astringent , vulnerary , choleretic, antidiarrheal, expectorant,...)

SPACING: 200 CM

PLANTING AND PLANT HEALTH

Propagation: by seed or by dividing the bush.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Planting

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary Shape
11TA (0.6)	10-20	No
CT14 (1.6)	30-40	
CT17 (2.8)	30-40/40-60	
CT20 (5)	40-50	

ARTEMISIA

MEDICINAL AND AROMATIC

Artemisia absinthium L.

AJENJO	ENCENS	ABSINTH, WORMWOOD	GRANDE ABSINTHE
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE

Shape	Height	Diameter
ROUND	30-125 CM	60-90 CM
Texture	**Shade**	**Root**
MEDIUM	PARTIAL	TAP ROOT

DIVISION:	MAGNOLIOPHYTA
SUBDIVISION:	
TYPE:	MAGNOLIOPSIDA
ORDER:	ASTERALES
FAMILY:	ASTERACEAE

VARIETIES

LAMBROOK SILVER

MORPHOLOGY

Stem	Bark	Color: LIGHT GREEN
Leaf	COMPOUND: BI- TRIPINNATISECT	
EVERGREEN	HARDNESS: SOFT	
SIZE:	ARRANGEMENT: ALTERNATE	
	VENATION: PINNATE	
	SHAPE: OVAL	
COLOR: US: LIGHT GREEN	MARGIN: LOBED	
LS: LIGHT GREEN	APEX: ACUTE	
TEXTURE: TOMENTOSE	LEAF BASE: ATTENUATE	
	PETIOLE: LONG	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE: 2-3 MM	Flowering: CAPSULE/PANICLE 3-4.5MM	Fragrance: YES
Fruit	Type: ACHENE	Color: GRAY
SIZE:	Edible: NO	Fruiting season
Growth	Rate: FAST	Longevity: 20 YEARS



ECOLOGY

Climate	Temperature: -6ºC,H4,Z6	Drought resistant: YES
ALTITUDE: 0-2300	Sun exposure: SUN /PARTIAL SHADE	Frost resistant: Up to -5ºC
IRRIGATION: LOW		
Soil	Texture: LOAMY	Salt resistant
pH: INDIFFERENT	Drainage: HIGH	Lime resistant: YES
FERTILITY: MODERATE		

USES

Resistances	Applications			
COASTAL:	SLOPES: NO	HEDGEROWS: YES		
POLLUTION:	RIVERBANKS: NO	BORDERS: YES		
WIND: MODERATE	GROUP: YES	ISOLATED: YES		

POINTS OF INTEREST

"Artemisia" = name of the goddess to whom the plant was dedicated; "ab/sinthium" = without/sweetness = bitter

Origin/distribution: Orient / in most of Europe, Western Asia and Northern Africa; in non-cultivated nitrified media; all types of soils / **Active substances:** essential oil (variable: thujones (toxic), thiol, linalool, absintin, absinthe, pinene, flavonoids, tannins,...); content: 0.5-2% (on dry matter) / **Uses:** officinal (tonic, vermifuge or anthelmetic, digestive, stomach...), liquor (vermouths and aperitifs with extracts with a low level of thujone)

Very hardy plant. **Toxic.**

SPACING: 40-50 CM

PLANTING AND PLANT HEALTH

Propagation: by seed, cutting, division of the bush. Number of seeds in 1 g = 9,700-11,500 seeds. Germination in 15-30 days, germination power: 2-4 years. **Pests/diseases**: aphids (biological control, do not cause apparent damage to the plant), *Puccinia absinthii* , *Phacopsora compositarum* , *Armillaria mellea* . Weed control with diuron, propizamide.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Height(cm)	Topiary shapes
C 1L		No

CHAMOMILLA

MEDICINAL AND AROMATIC

Chamomilla recutita (L.) (sin. *Matricaria chamomilla* L.)

MANZANILLA DULCE O COMÚN (SPANISH) | CAMAMIRLA, CAMAMILLA (VALENCIAN) | CHAMOMILE (ENGLISH) | CAMOMILLE ALLEMANDE (FRENCH)

STRUCTURE

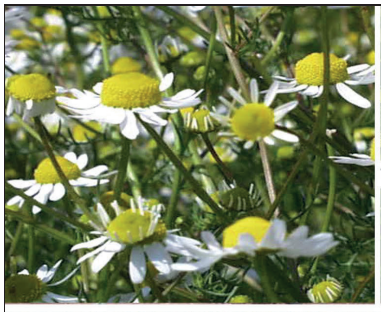
Shape	Height	Diameter
ROUND	30-80 CM	30-60 CM
Texture	**Shade**	**Root**
MEDIUM	LIGHT	TAP ROOT

DIVISION:	MAGNOLIOPHYTA
SUBDIVISION:	
TYPE:	MAGNOLIOPSIDA
ORDER:	ASTERALES
FAMILY:	ASTERACEAE

VARIETIES

MORPHOLOGY

Stem	Bark	Color: GREEN
Leaf	COMPOUND: BIPINNATISECT HARDNESS: SOFT ARRANGEMENT: ALTERNATE VENATION: SHAPE: FEATHERY PINNATE MARGIN: DIVIDED APEX: ACUTE LEAF BASE: ATTENUATE PETIOLE: LONG	
ANNUAL SIZE: 4-7 CM COLOR: US:GR./GRAY LS: LIGHT GR. TEXTURE: TOMENTOSE		
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE: 3-4.5 MM	Flowering: CAPSULE	Fragrant: YES
Fruit	Type: ACHENE	Color: GRAY
SIZE: Up to 1 MM	Edible: NO	Fruiting season
Growth	Rate: FAST	Longevity









ECOLOGY

Climate	Temperature: -6ºC,H4,Z6	Drought resistant: NO
ALTITUDE: 0-2300 M IRRIGATION: MODERATE	Sun exposure: SUN/PARTIAL SHADE	Frost resistant: UP TO 15ºC
Soil	Texture: LOAMY	Salt resistant: YES
Ph: 6-8 FERTILITY: FERTILE	Drainage: HIGH	Lime resistant: YES

USES

Resistances	Aplicaciones	
COASTAL:	SLOPES: NO	HEDGE ROWS: NO
POLLUTION:	RIVERBANKS: YES	BORDERS: YES
WIND: NO	GROUPS: YES	ISOLATED: YES

POINTS OF INTEREST

Matricaria derives from "mater" Latin) = mother; "chamaimelon" (Greek) = little earth apple (alluding to the shape and smell of the inflorescences).
Origin/Distribution: Eurasian / most of Europe, North Africa, Asia; cosmopolitan and cultivated, spontaneous ruderal, prefers limestone soils. **Active substances**: essential oil (variable: chamazulene, flavonoids, coumarins, phenolic acids,...), mucilage,...; content in essence: 0.4-1.2% (on dry matter). **Uses**: Medicinal (anti-inflammatory, washing wounds, febrifuge, stomach, sedative,...), cosmetics, hair coloring, liquor,...
It can cause allergies.

SPACING: 50 cm

PLANTING AND PLANT HEALTH

Propagation: by seed; 1 g = 7,000 seeds, germination in 28 days. Pests/diseases: fungi (Peronospora radii, P. leptosperma), aphids,... Weeds: control with linuron, MCPA
Vegetative period of about 210 days.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Planting

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shapes
CT13 (1)		No

HELICHRYSUM *Helichrysum stoechas* (L.) Moench.

MEDICINAL AND AROMATIC

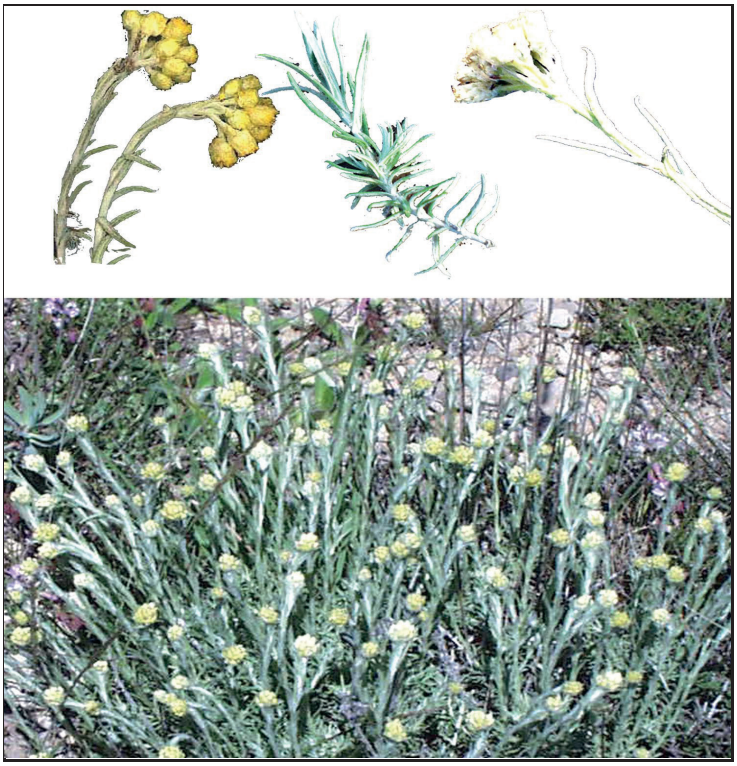
SIEMPREVIVA, PERPETUA (SPANISH) | SEMPREVIVA BORDA (VALENCIAN) | CURRY PLANT (ENGLISH) | IMMORTELLE DES SABLES (FRENCH)

STRUCTURE		
Shape: EXTENDED	Height: 10-80 CM	Diameter:
Texture: FINE	Shade: LIGHT	Root:

DIVISION:	MAGNOLIOPHYTA
SUBDIVISION:	
TYPE:	MAGNOLIOPSIDA
ORDER:	ASTERALES
FAMILY:	ASTERACEAE

VARIETIES

MORPHOLOGY		
Stem	Bark:	Color:
Leaf EVERGREEN; SIZE: 20-30 MM; COLOR: US:GR/GRAY, LS:LIGHT GREEN; TEXTURE: TOMENTOSE	COMPOUND: NO; HARDNESS: SOFT; ARRANGEMENT: ; VENATION: ; SHAPE: LINEAR; MARGIN: ENTIRE; APEX: ACCUMINATE; LEAF BASE: ; PETIOLE: SESSILE	
Flower SIZE:	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
	Flowering: FLORET (0.8-1.2 CM)	Aromatic: YES
Fruit SIZE:	Type: ACHENE	Color: GRAY
	Edible: NO	Fruiting season:
Growth	Rate: FAST	Longevity:



ECOLOGY		
Climate ALTITUDE: 0-1200; IRRIGATION: LOW	Temperature: -12ºC,H3,Z5	Drought resistant: YES
	Sun exposure: FULL SUN	Frost resistant: Up to -5ºC
Soil pH: INDIFFERENT; FERTILITY: MODERATE	Texture: LOAMY	Salt resistant:
	Drainage: HIGH	Lime resistant: YES

USES				
Resistances		Applications		
COASTAL:	MODERATE	SLOPES:	YES	HEDGEROWS: NO
POLLUTION:	__	RIVERBANKS:	NO	BORDERS: YES
WIND:	MODERATE	GROUPS:	YES	ISOLATED: YES

POINTS OF INTEREST

"Helios" (Greek) = sun; "Chrysos" (greek) = golden (alludes to the color of the inflorescence).
Origin/distribution: Southern and western Europe, north to France / on dry, bare ground, sandy areas, coasts, scrublands. **Active substances:** essential oil (variable composition): thujones (toxic), thiol, linalool, absinthol, pinene, flavonoids, tannins,... content: 2% (on dry matter.). **Uses**: officinal (anti-inflammatory, antiseptic, expectorant...)
When the leaves are crushed, it has a strong smell of curry.

SPACING :

PLANTING AND PLANT HEALTH

Propagation: by seed, division of bushes; germination in 14-21 days. **Pests/diseases**: Very sensitive to excess moisture in the soil (radical suffocation and fungal attacks on the stem of the plant).

CHROMATIC CALENDAR

Foliage,Flowering and Fruiting season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Planting Pruning

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Height (cm)	Topiary shapes
13TA (1L)	10-20	NO

HYSSOPUS

Hyssopus officinalis L.

MEDICINAL AND AROMATIC

HISOPO	HISOP	HYSSOP	HYSOPE
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE

Shape	Height	Diameter
IRREGULAR	30-60 CM	60-90 CM
Texture	**Shade**	**Root**
MEDIUM	PARTIAL	TAP ROOT

DIVISION:	MAGNOLIOPHYTA
SUBDIVISION:	
TYPE:	MAGNOLIOPSIDA
ORDER:	LAMIALES
FAMILY:	LAMIACEAE

VARIETIES

ALBUS (WHITE FLOWER)

ROSEUS (RED FLOWER)

ssp. ARISTATUS (SMALLER AND MORE COMPACT INFLORESCENCE)

MORPHOLOGY

Stem	Bark	Color
Leaf	COMPOUND: NO	
	HARDNESS: CORIACEOUS	
EVERGREEN	ARRANGEMENT: OPPOSITE	
SIZE: 10-50 MM	VENATION:	
	SHAPE: ELLIPTICAL	
COLOR: US:MID GREEN	MARGIN: ENTIRE	
LS:MID GREEN	APEX: OBTUSE/ACUMINATE	
TEXTURE: SMOOTH	LEAF BASE: ATTENUATE	
	PETIOLE: SESSILE	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE: 7-12 MM	Flowering: VERTICILLASTER (MIX)	Fragrance: YES
Fruit	Type: TETRA-ACHENES	Color: BLACK
SIZE: Up to 2 MM	Edible: NO	Fruiting season
Growth	Rate	Longevity: 4-5 YEARS



ECOLOGY

Climate	Temperature: -12ºC,H3,Z5	Drought resistant: YES
ALTITUDE: 0-2000	Sun exposure: FULL SUN	Frost resistant: UP TO -15ºC
IRRIGATION: LOW		
Soil	Texture: LOAMY/SANDY	Salt resistant: __
pH: BASIC	Drainage: HIGH	Lime resistant: YES
FERTILITY: MODERATE		

USES

Resistances	Applications	
COASTAL:	SLOPES: NO	HEDGE ROWS: YES
POLLUTION:	RIVERBANKS: NO	BORDERS: YES
WIND:	GROUPS: YES	ISOLATED: YES

POINTS OF INTEREST

"Hyssôpos" (Greek); "Ezob" (Hebrew) = Holy grass

Origin/geographical distribution: Southern Europe, Mediterranean region / Southern and Central Europe, Mediterranean area, Near East, North Africa; on calcareous slopes and hills. Active substances: essential oil: thujone, pinocamphone, flavonic derivatives (diosmin) and bitter substances (marrubiin...); content in essence: 0.3-1% / **Uses:**Medicinal (expectorant, digestive disorders,...), perfumery, cosmetics, seasoning, liquor, honey.

Toxic: excessive consumption can cause epileptic disorders.

SPACING: 30-40 CM

PLANTING AND PLANT HEALTH

Polymorphous plant: pink and even white flowering is possible (all or part of the plant). Wild plants are more fragrant than cultivated ones.

Propagation: by seed, cutting, division of the bush; seeds in 1g: 850-1260; germination in: 15-20 days; germinating power: 3 years. **Pests/diseases**: mites, nematodes, cicada, ant, spider mites.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season)

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
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Sowing Planting Pruning x

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
	NPK										

Fungicides Pesticides Fertilizers Herbicides

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shapes
CT 11 (1)	40-50	NO

LAVANDULA

MEDICINAL AND AROMATIC

Lavandula angustifolia Miller (sin.: *L. officinalis* L., *L. vera* D.C., *L. spica* L.)

LAVANDA, ESPLIEGO SPANISH | ESPÍGOL FEMELLA VALENCIAN | LAVENDER ENGLISH | LAVANDE, LAVANDE VRAIE FRENCH

STRUCTURE		
Shape: ROUND	Height: 20-150 CM	Diameter: 30-120 CM
Texture: MEDIUM	Shade: PARTIAL	Root

DIVISION:	MAGNOLIOPHYTA
SUBDIVISION:	
TYPE:	MAGNOLIOPSIDA
ORDER:	LAMIALES
FAMILY:	LAMIACEAE

VARIETIES

FINA BLANCA
BARREME
MAILLETTE
MATEROONE, FRITZ SAULT, VESUBIE,... ...

MORPHOLOGY		
Stem	Bark	Color
Leaf EVERGREEN; SIZE: 20-40 MM; COLOR: US:GR./GRAY LS:MID GREEN; TEXTURE: TOMENTOSE	COMPOUND: NO; HARDNESS: HARD; ARRANGEMENT: OPPOSITE; VENATION: ; SHAPE: LINEAR-LANCEOLATE; MARGIN: ENTIRE; APEX: ACUTE; LEAF BASE: ATTENUATE; PETIOLE: SESSILE	
Flower SIZE: 10-12 MM	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
	Flowering: VERTICILLASTER (MIX)	Fragrant: YES
Fruit SIZE:	Type: TETRA-ACHENE	Color: GRAY
	Edible: NO	Fruiting season
Growth	Rate: FAST	Longevity: > 20 YEARS

ECOLOGY		
Climate ALTITUDE: 0-2000; IRRIGATION: LOW	Temperature: -12ºC,H3,Z5	Drought resistant: YES
	Sun exposure: FULL SUN	Frost resistant: UP TO -15ºC
Soil pH: 7-8.5; FERTILITY: MODERATE	Texture: LOAMY/SANDY	Salt resistant
	Drainage: MODERATE	Lime resistant: HIGH

USES		
Resistances: COASTAL: YES; POLLUTION: ; WIND:	Applications: SLOPES: YES; RIVERBANKS: NO; GROUPS: YES; HEDGE ROWS: YES; BORDERS: YES; ISOLATED: YES	



POINTS OF ITNEREST

"Lavare" (Latin) = wash, purify; "Anguish", "Folia" (Latin) = narrow leaf.
Origin/distribution: Southern Europe, Mediterranean area, Asia Minor / Mediterranean region; on arid and stony slopes and hills, generally dry and sunny. **Active substances**: essential oil (linalool acetate, limonene, pinene, geraniol,...) rich in esters, unlike lavender and lavandins; content in essence: 0.3-0.7% (on dry matter).
Uses:Medicinal (diuretic, sedative, healing, antiseptic, antispasmodic,...), perfumery, cosmetics, honey,...
It supports high rainfall (up to about 1000 mm per year) nevertheless the soil must have adequate drainage.

SPACING: 50 CM

PLANTING AND PLANT HEALTH

Propagation: by seed, cutting. **Pests/diseases:** *Chrisolina americana* / Rosemary beetle (can be controlled with chlorpyrifos) and *Thomasiniana lavandulae* (gall midge) larvae and butterfly caterpillars / root rot due to excess moisture in the soil (*Septoria lavandulae/Septoria black spot)*, *Phoma lavandulae/Phomopsis lavandulae*, *Armillaria mellea/* Honey fungus) attack the inflorescences; it is controlled by removing the affected plants. **Weeds**: control with dichlobenil, chlorthiamide

CHROMATIC CALENDAR

Foliage,Flowering and Fruiting season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
						x	x	x	x	x	x

Sowing | Planting | Pruning x

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary Shapes
CT11 (1)	15-25	
CT14 (1,5)	20-30	
CT20 (5)	30-40	
CT30 (17)		

LAVANDULA

Lavandula dentata L.

MEDICINAL AND AROMATIC

LAVANDA DENTADA, CANTUESO RIZADO (SPANISH) · GAL.LANDA (VALENCIAN) · DENTATE LAVENDER, FRENCH LAVENDER (ENGLISH) · LAVANDE DENTELÉE (FRENCH)

STRUCTURE		
Shape: ROUND	Height: Up to 100 CM	Diameter: 60-90 CM
Texture: MEDIUM	Shade: PARTIAL	Root: FIBROUS

DIVISION:	MAGNOLIOPHYTA
SUBDIVISION:	
TYPE:	MAGNOLIOPSIDA
ORDER:	LAMIALES
FAMILY:	LAMIACEAE

VARIETIES

var. *CANDICANS*

EDELWEISS (WHITE INFLORESCENCE)

DUSKY MAIDEN

PLOUGHMAN'S BLUE

MORPHOLOGY		
Stem	Bark	Color
Leaf	COMPOUND: NO	
EVERGREEN	HARDNESS: SOFT	
SIZE: 1.5-3.5 CM	ARRANGEMENT: OPPOSITE	
COLOR: US: GR./GRAY	VENATION:	
LS: GR./GRAY	SHAPE: LINEAR	
TEXTURE: TOMENTOSE	MARGIN: DENTATE	
	APEX: ACUTE-ROUNDED	
	LEAF BASE: CUNEATE	
	PETIOLE: SESSILE	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE: 8 MM	Flowering: SPIKE	Fragant: YES
Fruit	Type: TETRA-ACHENE	Color: BLACK
SIZE:	Edible: NO	Fruiting season
Growth	Rate: FAST	Longevity: 5-10 YEARS

ECOLOGY		
Climate	Temperature: -12ºC,H3,Z5	Drought resistant: YES
ALTITUDE:	Sun exposure: FULL SUN	Frost resistant: NO
IRRIGATION: LOW		
Soil	Texture: LOAMY/SANDY	Salt resistant: __
pH: BASIC	Drainage: HIGH	Lime resistant: MODERATE
FERTILITY: MODERATE		

USES			
Resistances		Applications	
COASTAL: YES		SLOPES: YES	HEDGE ROWS: YES
POLLUTION: __		RIVERBANKS: NO	BORDERS: YES
WIND: __		GROUPS: YES	ISOLATED: YES









POINTS OF INTEREST

"Lavare" (lat) = wash, purify; "Dentata" (lat) = toothed or dentate.

Origin/Distribution: Mediterranean / Southern Europe, North Africa; arid, dry, stony, sunny areas. It prefers limestone soils in thinned forests. **Active substances**: essential oil (1-8 cineol,...);content in essence: up to 2% (wet matter). **Uses**: ornamental

SPACING: 60 CM

PLANTING AND PLANT HEALTH

Propagation: by seed, cutting. **Pests/diseases**: *Chrisolina americana* (the Rosemary beetle) can be controlled with chlorpyrifos. *Thomasiniana lavandulae* (gall midge) larvae and butterfly caterpillars / root rot due to excess moisture in the soil *Septoria lavandulae* (Septoria black spot), *Phoma lavandulae* (Phomopsis lavandulae), *Armillaria mellea* (Honey fungus) attack the inflorescences; it is controlled by removing the affected plants. **Weeds**: control with dichlobenil, chlorthiamide.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Planting Pruning x

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shapes
Containers		
CT 8 (0.2)	10-15	1 year
CT 11 (1)	10-20	
SEED TRAYS (0.2L per cell)		

LAVANDULA

MEDICINAL AND AROMATIC

Lavandula x hybrida (sin.: *L. x intermedia*)

LAVANDÍN SPANISH | ESPIGOLINA VALENCIAN | LAVANDIN ENGLISH | LAVANDIN FRENCH

STRUCTURE		
Shape: ROUND	Height: 40-120 CM	Diameter: 40-150 CM
Texture: MEDIUM	Shade: PARTIAL	Foot: FIBROUS

DIVISION:	MAGNOLIOPHYTA
SUBDIVISION:	
TYPE:	MAGNOLIOPSIDA
ORDER:	LAMIALES
FAMILY:	LAMIACEAE

VARIETIES

ABRIAL
GROSSO
SUPER
MAIME, SUMEINS, LADY, HIDCOTE WHITE, PROVANCE, …

MORPHOLOGY		
Stem	Bark	Color
Leaf: EVERGREEN; SIZE: 10-40 MM; COLOR: US:GR. GRAY, LS: GR. GRAY; TEXTURE: TOMENTOSE	COMPOUND: NO; HARDNESS: HARD; ARRANGEMENT: OPPOSITE; VENATION: ; SHAPE: LINEAR; MARGIN: ENTIRE; APEX: ROUNDED; LEAF MARGIN: ATTENUATE; PETIOLE: SESSILE	
Flower: SIZE: 6-8 MM	Type: STERILE	Reproduction: —
	Flowering: VERTICILLASTER (mix) 3-4 CM	Fragrant: YES
Fruit: SIZE:	Type	Color
	Edible	Fruiting Season
Growth	Rate: MODERATE	Longevity: 15 YEARS

ECOLOGY		
Climate: ALTITUDE: 0-1800; IRRIGATION: LOW	Temperature: -12ºC,H3,Z5	Drought resistant: YES
	Sun exposure: FULL SUN	Frost resistant: MODERATE
Soil: pH: 7-8; FERTILITY: LOW	Texture: LOAMY/SANDY	Salt resistant: —
	Drainage: HIGH	Lime resistant: MODERATE

USES		
Resistances	Applications	
COASTAL: —	SLOPES: YES	HEDGE ROWS: NO
POLLUTION: —	RIVERBANKS: NO	BORDERS: YES
WIND: —	GROUPS: YES	ISOLATED: YES



POINTS OF INTEREST

"Lavare" (lat) = wash, purify.
Origin/Distribution: Mediterranean / Southern Europe, North Africa; arid, dry, stony, sunny areas. in general prefers dry and sunny areas. **Active substances**: essential oil (linalool acetate, limonene, eucalyptol, camphor, linalool, geraniol, borneol,…); content in essence: 1-3% (wet matter). **Uses:** Medicinal (diuretic, sedative, healing, antiseptic, germicide,...), perfumery, cosmetics, honey, veterinary. It can support high rainfall (up to about 1000 mm per year) if the soil has adequate drainage.

SPACING: 60 CM

PLANTING AND PLANT HEALTH

Hybrids between *L. angustifolia* and L. *latifolia*.
Propagation: cutting. **Pests/diseases**: Chrisolina americana (the Rosemary beetle) can be controlled with chlorpyrifos. *Thomasiniana lavandulae* (gall midge) larvae and butterfly caterpillars / root rot due to excess moisture in the soil *Septoria lavandulae* (Septoria black spot), *Phoma lavandulae* (Phomopsis lavandulae), *Armillaria mellea* (Honey fungus) attack the inflorescences; it is controlled by removing the affected plants. **Weeds**: control with dichlobenil, chlorthiamide.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing ☐ Planting ☐ Pruning ☒ ☐

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides ☐ Pesticides ☐ Fertilizers ☐ ☐

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary forms
CT 11 (1)		No
C18 (2.5)		
C22 (5)		
C32 (11.5)		
C40 (25)		

LAVANDULA

MEDICINAL AND AROMATIC

Lavandula latifolia Medicus (sin.: *L. spica* D.C.)

ESPLIEGO, ALHUCEMA (SPANISH) | ESPÍGOL MASCLE (VALENCIAN) | SPIKE LAVENDER (ENGLISH) | ASPIC, LAVANDE MÂLE (FRENCH)

STRUCTURE		
Shape: IRREGULAR	Height: Up to 100 CM	Diameter: Up to 100 CM
Texture: MEDIUM	Shade: PARTIAL	Root: TAPROOT

DIVISION:	MAGNOLIOPHYTA
SUBDIVISION:	
TYPE:	MAGNOLIOPSIDA
ORDER:	LAMIALES
FAMILY:	LAMIACEAE

VARIETIES

MORPHOLOGY		
Stem	Bark	Color: LIGHT GREEN
Leaf: EVERGREEN; SIZE: 30-60 MM; COLOR: US: GR. GRAY, LS: GR. GRAY; TEXTURE: TOMENTOSE	COMPOUND: NO; HARDNESS: CORIACEOUS; ARRANGEMENT: OPPOSITE; VENATION:; SHAPE: OBLONG-SPATULATE; MARGIN: ENTIRE; APEX: ACUTE; LEAF BASE: ATTENUATE; PETIOLE: SESSILE	
Flower: SIZE: 8-10 MM	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
	Flowering: VERTICILLASTER (MIX)	Fragrant: YES
Fruit: SIZE: 2 MM	Type: ACHENE	Color: GRAY
	Edible: NO	Fruiting season
Growth	Rate: MEDIUM	Longevity: > 10 YEARS

ECOLOGY		
Climate: ALTITUDE: 0-1700; IRRIGATION: LOW	Temperature: -12ºC,H3,Z5	Drought resistant: YES
	Sun exposure: FULL SUN	Frost resistant: YES
Soil: pH: 7-8.5; FERTILITY: MODERATE	Texture: LOAMY/SANDY	Salt resistant: —
	Drainage: HIGH	Lime resistant: MODERATE

USES		
Resistances: COASTAL: YES; POLLUTION: MODERATE; WIND: MODERATE	Applications: SLOPES: YES; RIVERBANKS: NO; GROUPS: YES; HEDGE ROWS: NO; BORDERS: YES; ISOLATED: YES	



POINTS OF INTEREST

"Lavare" (lat) = wash, purify; "Lato", "Folia" = broad leaf

Origin/Distribution: Mediterranean / Southern Europe, North Africa; arid, dry, stony, sunny area. It prefers limestone soils; in cleared forests. **Active substances**: essential oil (monoterpene hydrocarbons, camphene, borneol, geraniol, p-cymene, cineole, camphor,…); content in essence: up to 2% (wet matter). **Uses**:Medicinal (stimulant, antiseptic, bactericide, healing, antitussive,…), perfumery, cosmetics, honey, veterinary...

Colonizing plant in mountainous areas.

SPACING: 50 CM

PLANTING AND PLANT HEALTH

Propagation: by seed, cutting or division of plant; 1 g = 800-1300 seeds; germination in 40 days. Plagues/diseases: *Chrisolina americana* (the Rosemary beetle) can be controlled with chlorpyrifos. *Thomasiniana lavandulae* (gall midge) larvae and butterfly caterpillars / root rot due to excess moisture in the soil *Septoria lavandulae* (Septoria black spot), *Phoma lavandulae* (Phomopsis lavandulae), *Armillaria mellea* (Honey fungus) attack the inflorescences; it is controlled by removing the affected plants. **Weeds**: control with dichlobenil, chlorthiamide.

CHROMATIC CALENDAR

Foliage,Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing | Planting | Pruning (x)

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation (L)	Height(cm)	Topiary shapes
Containers		
CT8 (0.2)	10-15	1 year
9 (036)	20-30	
CT10 (0.45)		
CT13	10-20	
CT12 (1.1)		
CT14 (1.6)		
Seed trays (0.2 L per cell)		2 years

LAVANDULA

MEDICINAL AND AROMATIC

Lavandula stoechas L.

CANTUESO (SPANISH) | TOMANÍ, CAPS D'ASE (VALENCIAN) | SPANISH LAVENDER (ENGLISH) | LAVANDE STÉCHADE (FRENCH)

STRUCTURE		
Shape: IRREGULAR	Height: Up to 100 CM	Diameter: 30-90 CM
Texture: MEDIUM	Shade: PARTIAL	Root: FIBROUS

DIVISION:	MAGNOLIOPHYTA
SUBDIVISION:	
TYPE:	MAGNOLIOPSIDA
ORDER:	LAMIALES
FAMILY:	LAMIACEAE

VARIETIES

ssp. *PEDUNCULATA*
LEUCANTHA SHAPE (WHITE FLOWER)
KEW RED
DEVONSHIRE, SNOWMAN, MADRID PINK, MADRID PURPLE ,...

MORPHOLOGY		
Stem	Bark	Color
Leaf	COMPOUND: NO	
	HARDNESS: SOFT	
EVERGREEN	ARRANGEMENT: OPPOSITE	
SIZE: 10-40 MM	VENATION: PINNATE	
	SHAPE: LINEAR	
COLOR: US: LIGHT GRN	MARGIN: ENTIRE	
LS: LIGHT GRN	APEX: ROUNDED	
TEXTURE: TOMENTOSE	LEAF BASE: ATTENUATE	
	PETIOLE: SESSILE	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE: 6-8 MM	Flowering: VERTICILLASTER	Fragrant: YES
Fruit	Type: TETRA-ACHENE	Color: BLACK
SIZE:	Edible: NO	Fruiting season
Growth	Rate: MODERATE	Longevity: 5-10 YEARS







ECOLOGY		
Climate	Temperature: -12ºC,H3,Z5	Drought resistant: YES
ALTITUDE: 0-500 M	Sun exposure: FULL SUN	Frost resistant: Up to -5ºC
IRRIGATION: LOW		
Soil	Texture: LOAMY/SANDY	Salt resistant
pH: ACIDIC	Drainage: HIGH	Lime resistant: LOW
FERTILITY:		

USES				
Resistances	Applications			
COASTAL: YES	SLOPES: YES	HEDGE ROWS: NO		
POLLUTION:	RIVERBANKS: NO	BORDERS: YES		
WIND:	GROUPS: YES	ISOLATED: YES		

POINTS OF INTEREST

Floral spikes topped by very showy purple ovoid bracts. **Origin/distribution**: Mediterranean region / Mediterranean scrubland, non-calcareous soils. **Active substances**: essential oil (camphor, fenchone, borneol, terpineol,...), tannins,...; content in essence: 0.5-0.7% (dry mattter). **Uses**:Medicinal (stimulant, antiseptic, antirheumatic,...),liquor, insect repellent,...

SPACING: 60 CM

PLANTING AND PLANT HEALTH

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
							x	x	x	x	x

Sowing Planting Pruning x

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shapes
Containers		No
CT13 (1)	10-20	
CT (1.5)	20-30	
CT20 (5)		
CT30 (17)		

Seed tray (0.2 L per cell)

LIPPIA

Lippia triphylla (L'Hér.) O.Kuntze (sin. *L. citriodora* L.)

MEDICINAL AND AROMATIC

HIERBA LUISA, VERBENA OLOROSA (SPANISH) · MARIALLUÏSA (VALENCIAN) · HERB LOUISE (ENGLISH) · VERVEINE ODORANTE (FRENCH)

STRUCTURE		
Shape: IRREGULAR	Height: 50-200 CM	Diameter:
Texture: MEDIUM	Shape: LIGHT	Root:

DIVISION:	MAGNOLIOPHYTA
SUBDIVISION:	
TYPE:	MAGNOLIOPSIDA
ORDER:	LAMIALES
FAMILY:	VERBENACEAE

VARIETIES

MORPHOLOGY		
Stem	Bark:	Color: LIGHT BROWN
Leaf	COMPOUND: NO	
DECIDUOUS	HARDNESS: —	
SIZE: 10 CM X 1 CM	ARRANGEMENT: VERTICULATED	
COLOR: US: MID GREEN	VENATION: PINNATE	
LS: MID GREEN	SHAPE: LANCEOLATE	
TEXTURE: US: SMOOTH	MARGIN: ENTIRE	
LS: SMOOTH	APEX: ACUTE	
	LEAF BASE: CUNEATE	
	PETIOLE: SHORT	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE:	Flowering: SPIKE	Fragrant: YES
Fruit	Type: DRUPE	Color: BLACK
SIZE:	Edible: NO	Fruiting season:
Growth	Rate: FAST	Longevity: > 15 YEARS







ECOLOGY		
Climate	Temperature: -6ºC,H4,Z6	Drought resistant: NO
ALTITUDE: 0-800 M	Sun exposure: FULL SUN	Frost resistant: Up to -7 ºC
IRRIGATION: MODERATE		
Soil	Texture: LOAMY/SANDY	Salt resistant:
pH: 6.5-7.2	Drainage: HIGH	Lime resistant: MODERATE
FERTILITY: FERTILE		

USES		
Resistances	Applications	
—	SLOPES: NO	HEDGE ROWS: NO
POLLUTION: —	RIVERBANKS: NO	BORDERS: NO
WIND: —	GROUPS: YES	ISOLATED: YES

POINTS OF INTEREST

The generic name alludes to the botanist A. Lippi (French); "triphylla" = three leaves, refers to the ternary grouping by node of the leaves.
Origin/distribution: South America (Chile), cultivated as an ornamental shrub. Active substances: essential oil (citral, limonene, geraniol, verbenalin,...); content in essence: 0.20-0.25% (wet matter). **Uses:** Medicinal (tonic, stomach, spasms,...), flavoring (pastry,...), liquor store,... / Citrus aroma.

SPACING: 60-80 CM

PLANTING AND PLANT HEALTH

Propagation: by cutting, bush division, layering. **Pests/diseases**: aphids / root suffocation due to excessive moisture in the soil, rust in autumn (control with maneb) **Weeds**: no known selective herbicides.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
						x	x	x	x	x	x

Sowing ■ Planting ■ Pruning x

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
	NPK				number in cows / KSH						

Fungicides ☐ Pesticides ☐ Fertilizers ■

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shapes
C21 (4)		

MELISSA

Melissa officinalis L.

MEDICINAL AND AROMATIC

MELISA, TORONJIL	MELISSA, TARONGINA	BALMMINT, LEMON BALM	MÉLISSE, CIDRONELLE
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE

Shape	Height	Diameter
EXTENDED	Up to 100 CM	30-80 CM
Texture	**Shade**	**Root**
MEDIUM	DENSE	

DIVISION:	MAGNOLIOPHYTA
SUBDIVISION:	
TYPE:	MAGNOLIOPSIDA
ORDER:	LAMIALES
FAMILY:	LAMIACEAE

VARIETIES

AUREA

ALL GOLD

MORPHOLOGY

Stem	Bark	Color: GREEN
Leaf	COMPOUND: NO	
EVERGREEN	HARDNESS: CORIACEOUS	
SIZE: 20-90 MM	ARRANGEMENT: OPPOSITE	
COLOR: US:DK. GREEN LS:MID GREEN	VENATION: PINNATE	
TEXTURE: US: ROUGH LS:TOMENTOSE	SHAPE: OVAL	
	MARGIN: CRENATE	
	APEX: ACUTE	
	LEAF BASE: ROUNDED	
	PETIOLE: SHORT	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE: 8-15 MM	Flowering: VERTICILLASTER	Fragrant: YES
Fruit	Type: TETRA-ACHENE	Color
	Edible: NO	Fruiting season
SIZE: 1.5-2 MM		
Growth	Rate: FAST	Longevity: 5-10 YEARS







ECOLOGY

Climate	Temperature: --	Drought resistant: NO
ALTITUDE: 0-1200	Sun exposure: SUN/PARTIALSHADE	Frost resistant: UP TO -15ºC
IRRIGATION: HIGH		
Soil	Texture: LOAMY	Salt resistant: NO
pH: 6.6-7.5	Drainage: HIGH	Lime resistant: YES
FERTILITY: HIGH		

USES

Resistances	Applications	
COASTAL:	SLOPES: NO	HEDGE ROWS: NO
POLLUTION:	RIVERBANKS: YES	BORDERS: YES
WIND: NO	GROUPS: YES	ISOLATED: YES

POINTS OF INTEREST

"Melissa" (Greek) = bee, alludes to its honey nature

Origin/distribution: Near Eastern, Southern Europe and Mediterranean Basin / Central Europe, North America, North Africa; temperate climatic zones; in cool and shady places, banks, orchards, streams,... / Active substances: essential oil (pinene, limonene, geraniol, linalool, citral, citronellal, rosmarinic acid, bitter substances,...); content in essence: 0.05-0.25% (wet matter). **Uses**: Medicinal ("Carmen water") (antispasm, choleretic, treatment of digestive disorders,...), condiment, liquor store, aromas, herbalism, confectionery, perfumery, honey / Citrus aroma.

SPACING: 35-40 CM

PLANTING AND PLANT HEALTH

Propagation: by seed, cutting, division of the bush; 1 g = 1950-2000 seeds, germination in 15-35 days, germination power 4-7 years. **Pests/diseases**: snails and slugs, powdery mildew, *Septoria melissae (l*eaf spot*)*, *Chrysolina americana* (Rosemary beetle), *Cryptocephalus ocellatus* (Leaf beetle), *Ocenthus pellucens* (Italian tree cricket). **Weeds**: control with diuron, terbacillus.

CHROMATIC CALENDAR

Foliage,Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
						X	X	X	X		

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers Herbicides

COMMERCIALIZATION

Presentation(L)	Height (cm)	Topiary shapes
Container		
13CT (1L)	20-40	
Seed trays (0.2L per cell)		

MENTHA

Mentha x piperita L.

MEDICINAL AND AROMATIC

MENTA PIPERITA	MENTA PEBRERA	PEPPERMINT	MENTHE POIVRÉE
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Shade: EXTENDED	Height: 30-90 CM	Diameter: UNDEFINED
Texture: FINE	Shade: DENSE	Root: FIBROUS

DIVISION:	MAGNOLIOPHYTA
SUBDIVISION:	
TYPE:	MAGNOLIOPSIDA
ORDER:	LAMIALES
FAMILY:	LAMIACEAE

VARIETIES

var. *OFFICINALIS* or *PALLESCENES* (WHITE PEPPERMINT)
var. *VULGARIS* or *RUBESCNCE* (BLACK PEPPERMINT)
var. *CITRATA* (LEMON or ORANGE PEPPERMINT)
MITCHAM , *MAINE ET LOIRE* ,...

MORPHOLOGY		
Stem	Bark	Color: REDDISH
Leaf: EVERGREEN; SIZE: 40-90 MM; COLOR: US: DK.GREEN, LS:MID GREEN; TEXTURE: ROUGH	COMPOUND: NO; HARDNESS: CORIACEOUS; ARRANGEMENT: OPPOSITE; VENATION: PINNATE; SHAPE: LANCEOLATE; MARGIN: SERRATE; APEX: ACUTE; LEAF BASE: ROUNDED; PETIOLE: SHORT	
Flower: SIZE: 3.5-6 MM	Type: STERILE	Reproduction: STERILE
	Flowering: VERTICILLASTER	Fragrant: YES
Fruit: SIZE:	Type	Color
	Edible	Fruiting season
Growth	Rate: FAST	Longevity

ECOLOGY		
Climate: ALTITUDE: 0-2100 M; IRRIGATION: HIGH	Temperature: -6ºC,H4,Z6	Drought resistant: NO
	Sun exposure: SUN/PARTIAL SHADE	Frost resistant: Up to -15 ºC
Soil: pH: 6-7.5; FERTILITY: HIGH	Texture: LOAMY	Salt resistant: NO
	Drainage: HIGH	Lime resistant: YES

USES		
Resistances: COASTAL: ; POLLUTION : ; WIND: NO	Applications: SLOPES: NO; HEDGE ROWS: NO; RIVERBANKS: YES; BORDERS: YES; GROUPS: YES; ISOLATED: YES	







POINTS OF INTEREST

"Mintha" Greek nymph transformed into a plant by the goddess Persephone; "piper" (Latin) = pepper, alludes to the strong and spicy smell and taste
Origin/distribution: Southern Europe and North Africa / cultivated in Southwestern Europe, the United States and Asia; in temperate zones, cosmopolitan; in cool, moist areas. **Active substances**: essential oil (45-86% menthol, menthone, pinene, cineole, rosmarinic acid, caffeic acid, flavonoids,...); content in essence: 0.8-3% (dry matter) **Uses**: Phytotherapy (antispasmodic, antiseptic, antigastric, antifungal,...), condiment, liquors, aromas, herbalism, confectionery, perfumery. The essence can cause **allergic reactions.**

PLANTING AND PLANT HEALTH

Hybrid of *M. aquatica* L. (water sandalwood or curly mint) and *M. spicata L* . (spearmint)
Propagation: by cutting, stolon, division of the bush. **Pests/diseases**: *Spodoptera littoralis* (African cotton leafworm), aphids, cicada, nematodes, *Puccinia menthae* causes rust spot or blight on the leaves, *Phyllosticta menthae* (a type of fungi), *Chrysolina americana* (Rosemary Beetle). **Weeds:** control with terbacillus. It forms showy stolons runners.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
						x	x	x	x		

Sowing Planting Pruning x

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers Herbicides

COMMERCIALIZATION

Presentations (L)	Height (cm)	Topiary shapes
13CT (1)	10-20	No

MENTHA

MEDICINAL AND AROMATIC

Mentha pulegium L.

POLEO (SPANISH) | POLIOL (VALENCIAN) | PENNY-ROYAL (ENGLISH) | POULIOT (FRENCH)

STRUCTURE		
Shape: EXTENDED	Height: 10-60 CM	Diameter: UNDEFINED
Texture: FINE	Shade: LIGHT	Root

DIVISION:	MAGNOLIOPHYTA
SUBDIVISION:	
TYPE:	MAGNOLIOPSIDA
ORDER:	LAMIALES
FAMILY:	LAMIACEAE

VARIETIES

CUNNINGHAM MINT

MORPHOLOGY		
Stem	Bark	Color: GREEN
Leaf	COMPOUND: NO	
EVERGREEN	HARDNESS: SOFT	
SIZE: 8-30 MM	ARRANGEMENT: OPPOSITE	
COLOR: US: MID GREEN	VENATION: PINNATE	
LS: MID GREEN	SHAPE: OVAL-OBLONG	
TEXTURE: US: SMOOTH	MARGIN: ENTIRE	
LS: TOMENTOSE	APEX: ROUNDED	
	LEAF BASE: ATTENUATE	
	PETIOLE: SHORT	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE: 4.5-6 MM	Flowering: VERTICILLASTER	Fragrant: YES
Fruit	Type: TETRA-ACHENE	Color: BROWN
	Edible: NO	Fruiting season
SIZE: 0.75 MM		
Growth	Rate: FAST	Longevity: 1-3 YEARS



ECOLOGY		
Climate	Temperature: -6ºC,H4,Z6	Drought resistant: NO
ALTITUDE: 0-1500	Sun exposure: SUN	Frost resistant: UP TO -15ºC
IRRIGATION: HIGH		
Soil	Texture: LOAMY	Salt resistant
pH:	Drainage: MODERATE	Lime resistant: YES
FERTILITY: HIGH		

USES		
Resistances	Applications	
COASTAL:	SLOPES: NO	HEDGE ROWS: NO
POLLUTION:	RIVERBANKS: YES	BORDERS: YES
WIND: NO	GROUPS: YES	ISOLATED: YES

POINTS OF INTEREST

"Mintha" - Greek nymph transformed into a plant by the goddess Persephone; "Pulex" (Latin) = flea (repels fleas)
Origin/distribution: Native to Spain, Central and Southern Europe, the Middle East, North Africa, the Americas / cosmopolitan; in humid areas, even waterlogged. Ideal for cool somewhat shady areas. It prefers acidic soils. **Active substances**: essential oil (82-90% mixture of pulegone and piperitone (very toxic), menthone, menthol, thymol, carvacrol, tannins,...); content in essence: 1.5-1.75% (dry matter). **Uses**:Medicinal (treatment of gastric disorders, digestive, spasms, antiseptic,...), insect repellent, refreshing, seasoning, liquor store, aromas, herbalism. Very polymorphous plant. (**toxic** essential oil).

PLANTING AND PLANT HEALTH

Propagation: by seed, cutting, stolon, division of the bush. 19,000 seeds per g; germination at 15-30 days. **Pests/diseases**: aphids, field flea, mealybug, nematodes. *Puccinia menthae* causes rust or blight on the leaves. **Weeds**: control with terbacillus, diuron, metribuzin.
The plant will root through the nodes of the creeping stems.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
						x	x	x	x		

Sowing | Planting | Pruning x

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers | Herbicides

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shapes
Pot		No
CT 13 (1)		
Seed tray (0.2L per cell)		

MENTHA

MEDICINAL AND AROMATIC

Mentha spicata L. (sin.: *M. viridis* L.)

HIERBABUENA (SPANISH) | HERBA SANA (VALENCIAN) | SPEARMINT (ENGLISH) | MENTHE VERTE (FRENCH)

STRUCTURE		
Shape: EXTENDED	Height: 30-100 CM	Diameter: UNDEFINED
Texture: FINE	Shade: DENSE	Root

DIVISION:	MAGNOLIOPHYTA
SUBDIVISION:	
TYPE:	MAGNOLIOPSIDA
ORDER:	LAMIALES
FAMILY:	LAMIACEAE

VARIETIES

var. *CRISPA*

MORPHOLOGY		
Stem	Bark	Color: GREEN
Leaf	COMPOUND: NO HARDNESS: SOFT ARRANGEMENT: OPPOSITE VENATION: PINNATE SHAPE: LANCEOLATE MARGIN: SERRATE APEX: ACUTE LEAF BASE: ROUNDED PETIOLE: SHORT	
EVERGREEN SIZE: 30-90 MM COLOR: US:MID GREEN, LS:MID GREEN TEXTURE: SMOOTHROUGH		
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE: 3.5-6 MM	Flowering: VERTICILLASTER	Fragrant: YES
Fruit	Type: TETRA-ACHENE	Color
SIZE:	Edible: NO	Fruiting season
Growth	Rate: FAST	Longevity



ECOLOGY		
Climate	Temperature	Drought resistant: NO
ALTITUDE: 0-2100	Sun exposure: FULL SUN	Frost resistant: UP TO -15ºC
IRRIGATION: HIGH		
Soil	Texture: LOAMY	Salt resistant: NO
pH: 6.6-7.5	Drainage: HIGH	Lime resistant: YES
FERTILITY: HIGH		

USES	
Resistances	Applications
COASTAL:	SLOPES: NO — HEDGE ROWS: NO
POLLUTION:	RIVERBANKS: YES — BORDERS: YES
WIND: NO	GROUPS: YES — ISOLATED: YES

POINTS OF INTEREST

Origin/distribution: Southern and Eastern Europe / in humid places, naturalized from cultivation in large parts of Europe. **Active substances**: essential oil (carvone, limonene, rosmarinic acid,...),... **Uses**: Medicinal (estringent, carminative (digestion), calming, febrifuge, stomach,...), seasoning, liquor store, aromas, herbalism, confectionery, perfumery.

PLANTING AND PLANT HEALTH

Propagation: by cutting, stolon, division of the bush. **Pests/diseases:** Spodoptera littoralis (African cotton leafworm), aphids, cicada, nematodes, *Puccinia menthae* causes rust spot or blight on the leaves, Phyllosticta menthae (a type of fungi) *Chrysolina americana (*Rosemary Beetle*)*.

CHROMATIC CALENDAR

Foliage,Flowering and Fruiting season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing | Planting | Pruning

Treatments Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary Shape
CT13 (1)		No

MICROMERIA

MEDICINAL AND AROMATIC

Micromeria fruticosa (L.) Druce

POLEO BLANCO (SPANISH) · POLIOL MENTA (VALENCIAN) · HYSSOP TEA (ENGLISH) · THYM DU LIBAN (FRENCH)

STRUCTURE		
Shape: IRREGULAR	Height: 10-50 CM	Diameter:
Texture: FINE	Shade: PARTIAL	Root:

DIVISION:	MAGNOLIOPHYTA
SUBDIVISIN:	
TYPE:	MAGNOLIOPSIDA
ORDER:	LAMIALES
FAMILY:	LAMIACEAE

VARIETIES

MORPHOLOGY		
Stem	Bark	Color: LIGHT GREEN
Leaf	COMPOUND: NO	
EVERGREEN	HARDNESS: CORIACEOUS	
SIZE: UP TO 20MM	ARRANGEMENT: OPPOSITE	
	VENATION:	
	SHAPE: OVAL-LANCEOLATE	
COLOR: US:GR. GRAY	MARGIN: ENTIRE	
LS: GR. GRAY	APEX: ROUNDED	
TEXTURE: TOMENTOSE	LEAF BASE:	
	PETIOLE: SHORT	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE: 5-10 MM	Flowering: RACEMES	Fragrant: YES
Fruit	Type: TETRA-ACHENE	Color: BLACK
	Edible: NO	Fruiting season:
SIZE:		
Growth	Rate: FAST	Longevity:



ECOLOGY		
Climate	Temperature	Drought resistant: YES
ALTITUDE: 0-1200	Sun exposure: FULL SUN	Frost resistant:
IRRIGATION: LOW		
Soil	Texture: LOAMY	Salt resistant:
pH:	Drainage: HIGH	Lime resistant: YES
FERTILITY: LOW		

USES		
Resistances	Applications	
COASTAL:	SLOPES: YES	HEDGE ROWS: NO
POLLUTION:	RIVERBANKS: NO	BORDERS: YES
WIND:	GROUP: YES	ISOLATED: YES

POINTS OF INTEREST

Active substances: essential oil (pulegone, rosmarinic acid, caffeic acid,...). **Uses**:Medicinal (digestive tonic, carminative, stomach, antiseptic, expectorant,...),refreshing,...

SPACING: 50 CM

PLANTING AND PLANT HEALTH

Propagation: by seed, cutting

CHROMATIC CALENDAR

Foliage, Flowering at Fruiting season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
						X X X X			X X X X X X		

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shapes
CT13(1)	10-20	NO

NEPETA

MEDICINAL AND AROMATIC

Nepeta cataria L.

HIERBA GATERA, NÉBEDA (SPANISH) | NEPTA (VALENCIAN) | CATNIP, CATMINT (ENGLISH) | HERBE AUX CHATS, CATAIRE (FRENCH)

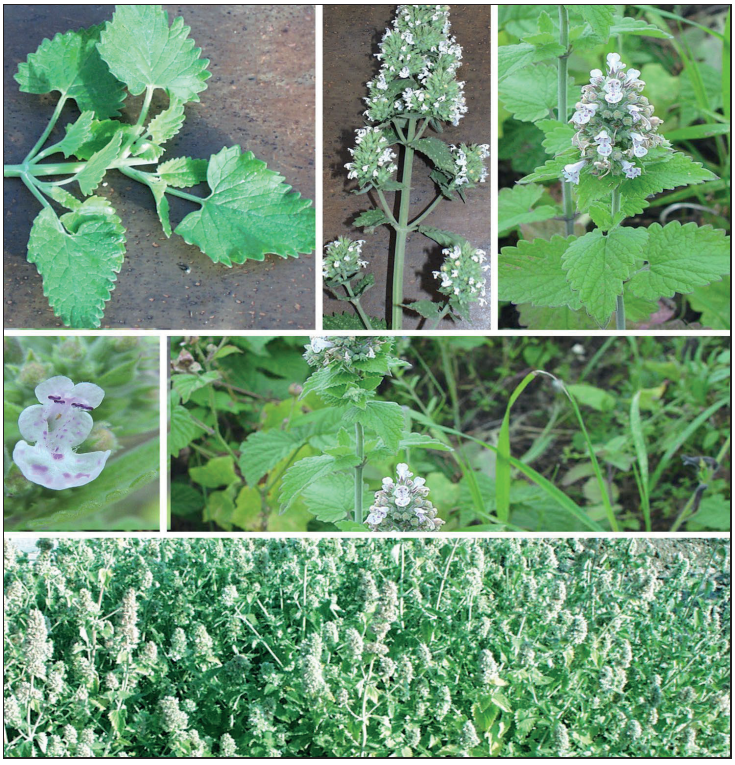
STRUCTURE		
Shape: IRREGULAR	Height: 30-100 CM	Diameter: 20-60 CM
Texture: FINE	Shade: PARTIAL	Root

DIVISION:	MAGNOLIOPHYTA
SUBDIVISION:	
TYPE:	MAGNOLIOPSIDA
ORDER:	LAMIALES
FAMILY:	LAMIACEAE

VARIETIES

ssp. *CITRIODORA*

MORPHOLOGY		
Stem	Bark	Color: GREEN/GRAY
Leaf: EVERGREEN; SIZE:; COLOR: US: GR.GRAY, LS: GR. GRAY; TEXTURE: TOMENTOSE	COMPOUND: NO; HARDNESS: SOFT; ARRANGEMENT: OPPOSITE; VENATION: PINNATE; SHAPE: OVAL; MARGIN: DENTATE; APEX: ACUTE; LEAF BASE: CORDATE; PETIOLE: SHORT	
Flower: SIZE:	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
	Flowering: VERTICILLASTER	Fragrant: YES
Fruit: SIZE:	Type: TETRA-ACHENE	Color: BLACK
	Edible: NO	Fruiting season
Growth	Rate: FAST	Longevity



ECOLOGY		
Climate: ALTITUDE: 0-1200; IRRIGATION: LOW	Temperature: -6ºC,H4,Z6	Drought resistant: YES
	Sun exposure: SUN/PARTIAL SHADE	Frost resistant: Up to -15ºC
Soil: pH: BASIC; FERTILITY: LOW	Texture: LOAMY	Salt resistant
	Drainage: HIGH	Lime resistant: YES

USES		
Resistances: COASTAL: __; POLLUTION: __; WIND: __	Applications: SLOPES: NO; HEDGE ROWS: NO; RIVERBANKS: NO; BORDERS: YES; GROUPS: YES; ISOLATED: YES	

POINTS OF INTEREST

"Catus" (Latin) = cat

Origin/Distribution: Eastern Mediterranean / Europe; dump sites, roadsides. **Active substances**: fatty acids, essential oil (carvacrol, thymol, lactones, nepetalactone,...), phenolic acids (rosmarinic acid, caffeic acid,...), content in essence: 0.3-1% (dry matter of inflorescences). **Uses**: Medicinal (calming, digestive, treatment of gastric and respiratory problems,...), seasoning, insecticide, insect repellent,...

SPACING: 30 CM

PLANTING AND PLANT HEALTH

Propagation: by seed, cutting; germination in 7-21 days.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
						x	x	x			

Sowing | Planting | Pruning x

Treatment calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shapes
CT13 (1)	10-20	No

ORIGANUM

Origanum majorana L. (sin.: *Majorana hortensis* Moench.)

MEDICINAL AND AROMATIC

MEJORANA (SPANISH) · MARDUIX (VALENCIAN) · SWEET MARJORAM (ENGLISH) · MARJOLAINE (FRENCH)

STRUCTURE		
Shape: ROUND	Height: 60 CM	Diameter: 45 CM
Texture: FINE	Shade: PARTIAL	Root

DIVISION:	MAGNOLIOPHYTA
SUBDIVISION:	
TYPE:	MAGNOLIOPSIDA
ORDER:	LAMIALES
FAMILY:	LAMIACEAE

VARIETIES: *VARIEGATA*

MORFOLOGY		
Stem	Bark	Color: LIGHT BROWN
Leaf: EVERGREEN; SIZE: 10-30 MM; COLOR: US:GR. GRAY, LS:GR. GRAY; TEXTURE: US: TOMENTOSE	COMPOUND: NO; HARDNESS: SOFT; ARRANGEMENT: OPPOSITE; VENATION: PINNATE; SHAPE: OVAL; MARGIN: ENTIRE; APEX: ACUTE; LEAF BASE: ATTENUATE; PETIOLE: SHORT	
Flower: SIZE: 4-7 MM	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
	Flowering: SPIKE	Fragrant: YES
Fruit: SIZE:	Type: ACHENE	Color: DARK BROWN
	Edible: NO	Fruiting season
Growth	Rate: FAST	Longevity: 8-10 YEARS

ECOLOGY		
Climate: ALTITUDE: 0-1200; IRRIGATION: MODERATE	Temperature: -15,H2,Z5	Drought resistant: YES
	Sun exposure: FULL SUN	Frost resistant: UP TO -5ºC
Soil: pH: NEUTRAL; FERTILITY: FERTILE	Texture: LOAMY	Salt resistant
	Drainage: HIGH	Lime resistant: YES

USES		
Resistances: COASTAL:; POLLUTION:; WIND:	Applications: SLOPES: NO; HEDGE ROWS: NO; RIVERBANKS: NO; BORDERS: YES; GROUPS: YES; ISOLATED: NO	



POINTS OF INTEREST

"Oros" = mountain; "Ganos" = ornament; alludes to its decorative character in mountainous areas; Also. "Origanon" (Greek) = bitter herb; "Amaraco" (Greek) = bitter, alludes to the taste of the leaves. **Origin/distribution**: Middle East and Arabia / Mediterranean area, North Africa and America; also cultivated, feral. **Active substances**: essential oil (carvacrol, thymol, linalool, terpinene, rosmarinic acid, caffeic acid, flavonoids,...); content in essence: 0.7-3%. **Uses:** Medicinal (antispasmodic, antiseptic, stomach, antioxidant, diuretic,...), condiment, preservative, liquors, herbalism, perfumery, confectionery (seeds). Toxic (essential oil).

SPACING: 20 CM

PLANTING AND PLANT HEALTH

Propagation: by seed, cutting, division of the bush; 1 g = 4000-4500 seeds; germination in 10-15 days; Germinating power: 3-7 years. **Pests/diseases**: cicadas, mites, aphids and *Puccinia origani* (fungus/white rust) **Weeds**: control with Lenacil.

CHROMATIC CALENDAR

Foliage,Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
		1	2	1		x x x x		2	x x x x		

Sowing Planting Pruning x

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shapes
Pot		No
CT13 (1)	20-30	
Seed tray (0.2L per cell)		

ORIGANUM

Origanum vulgare L.

MEDICINAL AND AROMATIC

ORÉGANO	ORENGA	WILD MARJORAM	MARJOLAINE SAUVAGE
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE

Shape	Height	Diameter
ROUND	20-80 CM	20-60 CM
Texture	**Shade**	**Root**
FINE	PARTIAL	

MORFOLOGY

Stem	Bark	Color
		BROWN
Leaf	COMPOUND:	NO
	HARDNESS:	SOFT
EVERGREEN	ARRANGEMENT:	OPPOSITE
SIZE: 10-40 MM	VENATION:	PINNATE
	SHAPE:	OVAL
COLOR. US:DK. GREEN	MARGIN:	ENTIRE
LS: MID GREEN	APEX:	ACUTE
TEXTURE: US:TOMENTOSE	LEAF BASE:	ROUNDED
	PETIOLE:	SHORT
Flower	Type	Reproduction
	HERMAPHRODITE	HERMAPHRODITE
SIZE: 4-7 MM	Flowering	Fragrant
	SPIKE	YES
Fruit	Type	Color
	ACHENE	
SIZE:	Edible	Fruiting season
	NO	
Growth	Rate	Longevity
	FAST	8-10 YEARS

ECOLOGY

Climate	Temperature	Drought resistant
	-15ºC,H2,Z5	YES
ALTITUDE: 0-3000	Sun exposure	Frost resistant
IRRIGATION: MODERATE	FULL SUN	Up to -15ºC
Soil	Texture	Salt resistant
	LOAMY	
pH: 7-8.5	Drainage	Lime resistant
FERTILITY: MODERATE	HIGH	YES

USES

Resistances	Applications			
COASTAL:	SLOPES:	NO	HEDGE ROWS:	NO
POLLUTION:	RIVERBANKS:	NO	BORDERS:	YES
WIND:	GROUPS:	YES	ISOLATED:	NO

DIVISION:	MAGNOLIOPHYTA	**VARIETIES**
SUBDIVISION:		ssp. *VIRENS* (GREEN OREGANO, WHITE FLOWER)
TYPE:	MAGNOLIOPSIDA	ssp. *VULGARE* (RED OREGANO, RED FLOWER)
ORDER:	LAMIALES	*AUREUM CRISPUM*
FAMILY:	LAMIACEAE	*COMPACTUM, AUREUM, HEIDEROS, THUMBLE'S VARIETY,…*



POINTS OF INTEREST

"Oros" = mountain; "Ganos" = ornament; alludes to its decorative character in mountainous areas; also "origanon" (Greek) = bitter herb

Origin/distribution: Mediterranean area and in a large part of Europe, reaching Asia / very adaptable to different habitats. Active substances: essential oil (carvacrol, thymol, linalool, terpinene, rosmarinic acid, caffeic acid, flavonoids,...). Content in essence: 0.4%. **Uses**: Medicinal (antispasmodic, antiseptic, stomach, antiasthmatic, healing,...), condiment, preservative, liquors, herbalism, perfumery, cosmetics, honey.

Very variable in terms of color and size of the inflorescences. Polymorphous plant. The stems root at their base.

SPACING: 35 CM

PLANTING AND PLANT HEALTH

Propagation: by seed, cutting, division of the bush; 1 g = 20,000-30,000 seeds; germination in 25 days; germinating power: 5 years. **Pests/diseases**: cicadas, aphids, *Puccinia origani* (fungis/white rust). **Weeds**: control with Lenacil, Terbacil.

CHROMATIC CALENDAR

Foliage,Flowering and Fruiting season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
					x	x	x	x	x	x	

Sowing Planting Pruning x

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shapes
Pot		No
CT13(1)	20-30	
Seed tray (0.2L per cell)		

RICINUS *Ricinus communis* L.

MEDICINAL AND AROMATIC

RICINO	RICÍ, FIGUERA BORDA	CASTOR BEAN, CASTOR OIL PLANT	RICIN
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE

Shape	Height	Diameter
IRREGULAR	2-4 M	1-4 M
Texture	**Shade**	**Root**
COARSE	PARTIAL	

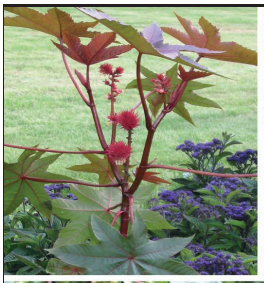
DIVISION:	MAGNOLIOPHYTA
SUBDIVISION:	
TYPE:	MAGNOLIOPSIDA
ORDER:	EUPHORBIALES
FAMILY:	EUPHORBIACEAE

VARIETIES

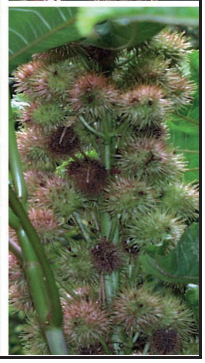
NIGRA
CARMENCICK
IMPALA

MORPHOLOGY

Trunk	Bark: SMOOTH	Color: DARK RED
Leaf	COMPOUND: PALMATE	
	HARDNESS: —	
ANUAL-EVERGREEN	ARRANGEMENT: ALTERNATE	
SIZE: 30-60 CM	VENATION: PALMATE	
	SHAPE: PALMATE 5-11 LOBES	
COLOR: US:DK. GREEN	MARGIN: DENTATE	
LS:DK. GREEN	APEX: ACCUMINATE	
TEXTURE: US: SMOOTH	LEAF BASE:	
—	PETIOLE: LONG (10-20 CM)	
Flower	Type: UNISEXUAL	Reproduction: MONOECIOUS
SIZE: ♂/F 15-30MM ♀/M	Flowering: PANICLE	Fragrant: NO
Fruit	Type: CAPSULE	Color: RED
	Edible: NO	Fruiting season: SUMMER/AUTUMN
SIZE: 15-20 MM		
Growth	Rate: FAST	Longevity: >= 1 YEAR







ECOLOGY

Climate	Temperature: -1ºC,H5,Z6	Drought resistant: MODERATE
ALTITUDE: 0-500	Sun exposure: SUN	Frost resistant: NO
IRRIGATION: LOW		
Soil	Texture: LOAMY/SANDY	Salt resistant: NO
pH: 4.5-8	Drainage: HIGH	Lime resistant: NO
FERTILITY: HIGH		

USES

Resistances	Applications			
COASTAL:	SLOPES: NO	HEDGE ROWS: NO		
POLLUTION:	RIVERBANKS: NO	BORDERS: NO		
WIND: NO	GROUPS: YES	ISOLATED: YES		

POINTS OF INTEREST

"Ricinus" (Latin) = tick, alludes to the resemblance of the seeds to ticks (Pliny).
Origin/distribution: Tropical Africa / in the Mediterranean area; in vacant lots, adapted to many types of soil. It has been cultivated and naturalized. **Active substances**: Oil (ricinoleic acid, alkaloids, ricin (toxic), stearin, toxystearic acid,...),... **Uses**: Medicinal (purgative "castor or castor oil" nowadays in disuse, anthelmintic,... .), industrial (as a high-grade lubricant). Monoecious plant. Its characteristic seeds (1.5 x 1 cm) are shiny, ellipsoid, smooth and marbled.Toxic (ricin albumin).

SPACING: 1-1.5M

PLANTING AND PLANT HEALTH

Propagation: by seed; 1 g = 2.5 seeds; germination in 15 days (t>12ºC); Germinating power: 2-3 years. **Pests/diseases**: Gray mold (*Botrytis* sp.), leaf spots (*Cercosporina* sp.), castor bean caterpillar (*Achoeta* sp., attacks young plants).
Disinfect seeds before sowing.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Planting Pruning x

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shapes
CT17 (2.8)	60-80	No

ROSMARINUS *Rosmarinus officinalis* L.

MEDICINAL AND AROMATIC

ROMERO	ROMANÍ	ROSEMARY, ROSMARINE	ROMARIN
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Shape	Height	Diameter
IRREGULAR	50-150 CM	50-100 CM
Texture	Shade	Root
MEDIUM	PARTIAL	

DIVISION:	MAGNOLIOPHYTA
SUBDIVISION:	
TYPE:	MAGNOLIOPSIDA
ORDER:	LAMIALES
FAMILY:	LAMIACEAE

VARIETIES

BARBACUE
HOJA FINA
MOZART, ALBU'S, ARP, BENENDEN BLUE, CORSICAN BLUE ,...
PROSTRATUS (Creeper group)

MORPHOLOGY		
Stem	Bark	Color
		GRAY
Leaf	COMPOUND:	NO
	HARDNESS:	CORIACEOUS
EVERGREEN	ARRANGEMENT:	OPPOSITE
SIZE: 15-35 MM	VENATION:	
	SHAPE:	LINEAR
COLOR: US:DK. GREEN	MARGIN:	ENTIRE
LS:GR./GRAY	APEX:	ROUNDED
TEXTURE: US:GLOSSY	LEAF BASE:	ATTENUATE
LS: TOMENTOSE	PETIOLE:	SESSILE
Flower	Type	Reproduction
SIZE: 10-12 MM	HERMAPHRODITE	HERMAPHRODITE
	Flowering	Fragrant
	RACEMES	YES
Fruit	Type	Color
	TERTA-ACHENE	BLACK
SIZE:	Edible	Fruiting season
	NO	
Growth	Rate	Longevity
	MODERATE	10-12 YEARS



ECOLOGY		
Climate	Temperature	Drought resistant
	-18,H2,Z5	YES
ALTITUDE: 0-1400	Sun exposure	Frost resistant
IRRIGATION: LOW	FULL SUN	Up to -5ºC
Soil	Texture	Salt resistant
	LOAMY/SANDY	
pH: BASIC	Drainage	Lime resistant
FERTILITY: MODERATE	HIGH	YES

USES			
Resistances		Applications	
COASTAL:	YES	SLOPES: YES	HEDGE ROWS: YES
POLLUTION:		RIVERBANKS: NO	BORDERS: YES
WIND:	NO	GROUPS: YES	ISOLATED: YES

POINTS OF INTEREST

"Ros" (Latin) = dew, bush, rosy; "marinus" (Latin) = maritime, alludes to its aroma and habitat close to the coast / "Rhos" (Greek) = shrub; "myrinos" (Greek) = aromatic.
Origin/distribution: Southern Europe, the Mediterranean basin and Southwest Asia. Found in most places in Spain but scarce/disappearing in the north-northwest. This shrub prefers low altitudes. Common on limestone substrates. **Active substances**: Essential oil (camphor, cineol, pinene, camphene, rosmarinic acid, flavonoids, phenolic acids,...); content in essence: 0.5% (dry matter.) **Uses**: Medicinal (analgesic, anti-asthmatic, anti-flu, cardiotonic, digestive, febrifuge, sedative, scalp stimulant,...), gastronomy (leaves, pungent flavor), honey, liquor, herbalism, aromatherapy,... Colonizing plant.

SPACING: 50 CM

PLANTING AND PLANT HEALTH

Propagation: by seed, cutting, division of the bush; 1 g = 950-1000 seeds; slow and poor germination (50%); germinating power: 4 years. **Pests/diseases**: *Chrisolina americana*, attacks stems and leaves (effectively combated with chlorpyrifos), fungal attack problems (soil fungi) in case of excess soil moisture. **Weeds**: control with Linuron,Terbacillus.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
								X	X	X	X

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shapes
Pots		
CT9 (0.33)	10-20/20-30	1-2 years
CT10(0.45)		
CT13 (1)	10-20/20-30	normal/creeping
CT12 (1.1)		
15TC (1.3)	30-40	
CT17 (2.8)		
CT20 (5)		normal/creeping
CT (7.5)		creeping/piramidal
CT25 (10)		ball
CT40 (25)		
Seed tray (0.35L per cell)		

RUTA

Ruta graveolens L.

MEDICINAL AND AROMATIC

RUDA SPANISH	RUDA VALENCIAN	HERB OF GRACE ENGLISH	RUE FÉTIDE FRENCH

STRUCTURE		
Shape: IRREGULAR	Height: Up to 150 CM	Diameter: 45 CM
Texture: MEDIUM	Shade: PARTIAL	Root

DIVISION:	MAGNOLIOPHYTA
SUBDIVISION:	
TYPE:	MAGNOLIOPSIDA
ORDER:	SAPINDALES
FAMILY:	RUTACEAE

VARIETIES

JACKMAN'S BLUE

VARIEGATA

MORPHOLOGY		
Stem	Bark	Color
Leaf EVERGREEN SIZE: LEAF: 7-12CM, LEAFLET: 8-12 MM COLOR: US:BLUE/GREEN, LS:BLUE/GREEN TEXTURE: SMOOTH	COMPOUND: IMPARIPINNATE HARDNESS: CORIACEOUS ARRANGEMENT: ALTERNATE VENATION: PINNATE SHAPE: OVAL LEAFLET MARGIN: ENTIRE APEX: ACUTE LEAF BASE: ATTENUATE PETIOLE: LONG	
Flower SIZE: 1.5-2 CM	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
	Flowering: CORYMB	Fragrant: UNPLEASANT
Fruit SIZE:	Type: CAPSULE	Color: BLACK
	Edible: NO	Fruiting season
Growth	Rate: SLOW	Longevity: >10 YEARS

ECOLOGY		
Climate ALTITUDE: 0-1200, IRRIGATION: LOW	Temperature: -12ºC; H4; Z6	Drought resistant: YES
	Sun exposure: FULL SUN	Frost resistant: Up to -15ºC
Soil pH: BASIC, FERTILITY: MODERATE	Texture: LOAMY/SANDY	Salt resistant
	Drainage: HIGH	Lime resistant: YES

USES		
Resistances: COASTAL, POLLUTION, WIND	Applications: SLOPES: NO, RIVERBANKS: NO, GROUPS: YES, HEDGE ROW: NO, BORDERS: YES, ISOLATED: NO	



POINTS OF INTEREST

"Rhutos" (Greek) = shielded, alludes to its long history as an antidote. **Origin/distribution**: Southern Europe, Mediterranean area, Balkans. Cosmopolitan in the Mediterranean area, on sunny plains in coastal areas, wastelands and arid. **Active substances**: Essential oil (methyl salicylate, limonene, pinene, furocumanine, tannins,...). **Uses**: Medicinal (antiepileptic, ophthalmic, vermifuge, carminative, anthelmintic,...). Gastronomy (flavoring), liquors (flavoring).Toxic if swallowed. May cause allergic reactions upon contact with the plant. Pungent aroma, sometimes unpleasant. Ornamental plant from the Middle Ages.

SPACING: 45 CM

PLANTING AND PLANT HEALTH

Propagation: by seed, cutting; 1g = 250-440 seeds; germinates in 10-15 days; Germinating power: 2-5 years.

CHROMATIC CALENDAR

Foliage,Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
		x	x	x	x	x	x				

Sowing Planting Pruning x

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shapes
CT13 (1)		No

SALVIA

Salvia microphylla Kunth .

MEDICINAL AND AROMATIC

SALVIA ROSA, SALVIA GRANADINA (SPANISH) | BLACKCURRANT SAGE, BABY SAGE (ENGLISH) | SAUGE GRAHAMII (FRENCH) | VALENCIAN

STRUCTURE		
Shape: IRREGULAR	Height: Up to 120 CM	Diameter:
Texture: MEDIUM	Shade: PARTIAL	Root:

DIVISION:	MAGNOLIOPHYTA
SUBDIVISION:	
TYPE:	MAGNOLIOPSIDA
ORDER:	LAMIALES
FAMILY:	LAMIACEAE

VARIETIES

NEWBY HALL
KEW RED
TREBAH
TRELISSICK, NEUPETIA, PINK

MORPHOLOGY		
Stem	Bark	Color: DARK GRAY
Leaf: EVERGREEN; SIZE:; COLOR: US:MID GREEN, LS: GR.GRAY; TEXTURE: US:TOMENTOSE, LS: ROUGH	COMPOUND: NO; HARDNESS: CORIACEOUS; ARRANGEMENT: OPPOSITE; VENATION: PINNATE; SHAPE: OVAL; MARGIN: CRENATE; APEX: ACUTE; LEAF BASE: ROUNDED; PETIOLE: LONG	
Flower: SIZE:	Type: HERMAPHRODITE; Flowering: ISOLATED	Reproduction: HERMAPHRODITE; Fragrant: YES
Fruit: SIZE:	Type: TETRA-ACHENE; Edible: NO	Color: BLACK; Fruiting season
Growth	Rate: FAST	Longevity

ECOLOGY		
Climate: ALTITUDE: 300-1500; IRRIGATION: HIGH	Temperature: -12ºC,H3,Z6; Sun exposure: FULL SUN	Drought resistant: YES; Frost resistant: UP TO -10ºC
Soil: pH: 6.5-8.5; FERTILITY: HIGH	Texture: LOAMY/SANDY; Drainage: HIGH	Salt resistant; Lime resistant: YES

USES		
Resistances: COASTAL:; POLLUTION:; WIND:	Applications: SLOPES: YES; RIVERBANKS: NO; GROUPS: YES	HEDGE ROWS: YES; BORDERS: YES; ISOLATED: YES









POINTS OF INTEREST

Origin: Mexico. **Uses**: Medicinal (febrifuge,...),in confectionery, seasoning and honey.

PLANTING AND PLANT HEALTH

PROPAGATION: by seed, cutting. Germination in 14 days. **Pest and diseases**: fleas and gastropods.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
		X	X	X		X	X	X			

Sowing | Planting | Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shapes
CT13(1)		No

SALVIA

Salvia officinalis L.

MEDICINAL AND AROMATIC

SALVIA COMÚN	SÀLVIA, SÀUVIA	SAGE	SAUGE OFFICINALE
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE

Shape	Height	Diameter
IRREGULAR	60-80 CM	Up to 100 CM
Texture	**Shade**	**Root**
MEDIUM	PARTIAL	FUSIFORM

DIVISION:	MAGNOLIOPHYTA
SUBDIVISION:	
TYPE:	MAGNOLIOPSIDA
ORDER:	LAMIALES
FAMILY:	LAMIACEAE

VARIETIES

ALBA or *ALBIFLORA* (WHITE FLOWER)
ICTERINA
BERGGARTEN (DWARF PLANT)
PURPURESCENS GROUP

MORPHOLOGY

Stem	Bark	Color
		LIGHT GREEN
Leaf	COMPOUND:	NO
	HARDNESS:	SOFT
EVERGREEN	ARRANGEMENT:	OPPOSITE
SIZE: Up to 5 CM	VENATION:	
	SHAPE:	OVAL/LANCEOLATE
COLOR: US:GR. GRAY	MARGIN:	CRENATE
LS:GR. GRAY	APEX:	ACUTE
TEXTURE: TOMENTOSE	LEAF BASE:	ROUNDED
	PETIOLE:	LONG
Flower	Type	Reproduction
SIZE: <35 MM	HERMAPHRODITE	HERMAPHRODITE
	Flowering	Fragrant
	VERTCILLASTER	YES
Fruit	Type	Color
	TETRA-ACHENE	BROWN/BLACK
SIZE:	Edible	Fruiting season
	NO	JUL-AUG
Growth	Rate	Longevity
	FAST	4-5 YEARS



ECOLOGY

Climate	Temperature	Drought resistant
	-12ºC,H3,Z6	YES
ALTITUDE: 0-1800	Sun exposure	Frost resistant
IRRIGATION: LOW	FULL SUN	Up to -15ºC
Soil	Texture	Salt resistant
	LOAMY/SANDY	
pH: 5-9	Drainage	Lime resistant
FERTILITY: POOR	HIGH	YES

USES

Resistances	Applications			
COASTAL:	SLOPES:	YES	HEDGE ROWS:	YES
POLLUTION: YES	RIVERBANKS:	NO	BORDERS:	YES
WIND:	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

"Salvare" (lat) = to save, alludes to its healing properties
Origin/distribution: Southern Europe (Spain, France and the Balkan Peninsula). It has been naturalized in much of Europe, Russia and the United States; in dry and arid areas, very rustic, it prefers limestone soils. **Active substances**: Essential oil (pinene, salviene, thujone, cineol, borneol, camphene,...), mucilage, tannins, resins,...; content in essence: 1-2.5% (dry matter.)
Uses: Medicinal (digestive, antiperspirant, cholagogue, antiasthmatic, carminative, antiseptic, antioxidant, antibacterial, ...), liquor, cosmetics, perfumery, seasoning, flavoring. Its essential oil is toxic.

SPACING: 20-40 CM

PLANTING AND PLANT HEALTH

Propagation: by seed, bush division, cutting; seeds in 1g: 160-250, germination in 14-21 days, germination power: 3-7 years. **Trimming/pruning**: as soon as flowering stems are distinguished. This will stimulate foliage. **Pests/diseases:** various insects (*Chrisolina sp.*) (control with chlorpyrifos); different fungi (*Cercospora salviicola* (a type of fungi) , *Puccinia sp* . (rust), *Erysiphe* sp (fungi), *Sclerotinia* (fungi/white mold) *Peronospora* (mildew disease), *Fusarium* (fungi) *Rhizoctonia* (fungi) *Armillaria mellea* (honey fungus). **Weeds**: control with Linuron (before sprouting), norflurazon, bentazon, dicamba. Simazine is phytotoxic for Salvia.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
						X	X	X	X		

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
			P-K			N			N		

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation (L)	Height(cm)	Topiary shapes
Pots		No
CT11 (0.6)	10-20	
CT13 (1)	20-30	
Seed tray (0.02L per cell)		
Seed tray (0.35L per cell)	2 Years	

SALVIA

Salvia sclarea L.

MEDICINAL AND AROMATIC

SALVIA ROMANA, AMARO (SPANISH) · SÀLVIA ROMANA (VALENCIAN) · CLARY, CLARY SAGE (ENGLISH) · SCLARÉE, SAUGE SCLARÉE (FRENCH)

STRUCTURE		
Shape: IRREGULAR	Height: 40-150 CM	Diameter: 60 CM
Texture: COARSE	Shade: PARTIAL	Root

DIVISION:	MAGNOLIOPHYTA
SUBDIVISION:	
TYPE:	MAGNOLIOPSIDA
ORDER:	LAMIALES
FAMILY:	LAMIACEAE

VARIETIES

var. *TURKESTANCIA*

ARGENTEA

MORPHOLOGY		
Stem	Bark	Color: MID GREEN
Leaf	COMPOUND: NO	
	HARDNESS: SOFT	
BIENNAL - EVERGREEN	ARRANGEMENT: OPPOSITE	
SIZE: 70-180 MM	VENATION: PINNATE	
	SHAPE: CORDATE	
COLOR: US:DK. GREEN	MARGIN: CRENATE	
LS:GR.GRAY	APEX: ACUTE	
TEXTURE: US:TOMENTOSE	LEAF BASE: ROUNDED	
LS: ROUGH	PETIOLE: LONG	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE: 20-30 MM	Flowering: PANICLE	Fragrant: YES
Fruit	Type: TETRA-ACHENE	Color: BROWN
SIZE:	Edible: NO	Fruiting season
Growth	Rate: MODERATE	Longevity: 5 YEARS



ECOLOGY		
Climate	Temperature: -12ºC,H3,Z6	Drought resistant: NO
ALTITUDE: 0-1200	Sun exposure: FULL SUN	Frost resistant: UP TO -15ºc
IRRIGATION: HIGH		
Soil	Texture: LOAMY/SANDY	Salt resistant
pH: 6.5-8.5	Drainage: HIGH	Lime resistant: YES
FERTILITY: MODERATE		

USES	
Resistances	Applications
COASTAL.	SLOPES: NO — HEDGE ROWS: NO
POLLUTION:	RIVERBANKS: NO — BORDERS: YES
WIND:	GROUP: YES — ISOLATED: YES

POINTS OF INTEREST

"Salvare" (Latin) = to save, alludes to its healing properties.

Origin/distribution: Southern Europe, Central Asia, Near East and in America. Dry and sunny areas but also on humid slopes, understory of poplars and elm groves. It prefers somewhat humid and nitrified environments and limestone and stony soils. **Active substances:** Essential oil (sclareol, linalool, linalyl acetate, bitter substances, tannins,...),...; content in essence: 0.1-0.4% (dry matter). **Uses:** Medicinal (antispasmodic, sedative, relief of digestive disorders, antiseptic,...), perfumery, herbalism, cosmetics, soap.

SPACING: 50 CM

PLANTING AND PLANT HEALTH

Propagation: by seed, division of bushes; 1 g = 260-350 seeds; germination in 7-21 days. **Weeds**: control with Linuron, Lenacil, Methobromuron

It is demanding in fertilization.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing ■ Planting ■ Pruning x

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides ☐ Pesticides ☐ Fertilizers ■

COMMERCIALIZATION

Presentation	Height (cm)	Topiary shapes
		No

SAMBUCUS *Sambucus nigra* L.

MEDICINAL AND AROMATIC

SAÚCO	SAÚC, SAÚQUER	ELDER, BOURTREE	SUREAU
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Shape: OVIOD	Height: 4-5 (10) M	Diameter: 2-3 M
Texture: MEDIUM	Shade: PARTIAL	Root: FASCICULATE

DIVISION:	MAGNOLIOPHYTA
SUBDIVISION:	
TYPE:	MAGNOLIOPSIDA
ORDER:	DIPSACALES
FAMILY:	CAPRIFOLIACEAE

VARIETIES

PURPUREA
BLACK BEAUTY
MADONNA
AUREA ,GUINCHO PURPLE, MARGINATA, LACINIATA FORM…

MORPHOLOGY		
Stem	Bark: FURROWED	Color: LIGHT/DARK GRAY
Leaf	COMPOUND: IMPARIPINNATE	
DECIDUOUS	HARDNESS: CORIACEOUS	
SIZE: Leaf: 15 CM	ARRANGEMENT: OPPOSITE	
Leaflet. 3-8 CM	VENATION: PINNATE	
COLOR: US: MID GREEN	SHAPE: LANCEOLATE	
LS: MID GREEN	MARGIN: DENTATE	
TEXTURE: SMOOTH	APEX: ACCUMINATE	
	LEAF BASE: ROUNDED	
	PETIOLE: LONG	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE: 4-5 MM	Flowering: CORYMB (10-20 CM)	Fragrant: UNPLEASANT
Fruit	Type: BERRY	Color: BLACK
SIZE: 6-8 MM	Edible	Fruiting Season: END OF SUMMER
Growth	Rate: FAST	Longevity

ECOLOGY		
Climate	Temperature	Drought resistant: NO
ALTITUDE: 0-1600	Sun exposure: SUN/PARTIAL SHADE	Frost resistant: YES
IRRIGATION: HIGH		
Soil	Texture: LOAMY/CLAYEY	Salt resistant: NO
pH: 5.5-8.5	Drainage: INDIFFERENT	Lime resistant: MODERATE
FERTILITY: FERTILE		

USES				
Resistances		Applications		
COASTAL:	1ST LINE	SLOPES:	NO	HEDGE ROWS: NO
POLLUTION:	YES	RIVERBANKS:	Yes	BORDERS: NO
WIND:	YES	GROUPS:	Yes	ISOLATED: YES



POINTS OF INTEREST

"Sambuke" (Greek) = musical flute that was made with elder shoots; "Nigra" (Latin) = black, refers to the color of its ripe fruit.
Origin/Distribution: Europe, North Africa, North Asia. In any humid and fertile soil. Can be found in valleys, stream banks, clear forests, slopes. Active substances: Essential oil (flavonoids, phenolic acids (chlorogenic and caffeic), triterpenes, urosolic acid, sambunigroside,...), sugars, tannins, mucilages, potassium salts. **Uses**:Medicinal (anti-inflammatory, diuretic, laxative, contributes in slimming regimens,...), veterinary (laxative), liquor, cosmetics ("elderwater"), flavoring food, insecticide, dye wool and fabrics, fruits are used in jams, juices, wood as fuel. **Toxic** (fresh fruits, roots, stems); the leaves and berries can cause dermatitis.

SPACING: 1-1.5M

PLANTING AND PLANT HEALTH

Propagation: by seed (somewhat complicated), stake or regrowth with root; 1 g = 245 seeds, germination in 5-7 months. **Pests/diseases**: attacks by aphids, moderate resistance to *Armillaria mellea* (honey fungus).
Complicated planting (necessary stratification is necessary). Plantation of cuttings: tender (summer), withered (autumn), hard (winter). Rooted renewals in March.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
X	X	X	X	X	X					X	X

Sowing Planting Pruning X Division of bush

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Height (cm)	Topiary shapes
Pots		No
	30-40	
	40-50	
	50-60	
	60-80	

SANTOLINA

Santolina chamaecyparissus ssp.chamaecyparissus L.

MEDICINAL AND AROMATIC

MANZANILLA AMARGA, ABRÓTANO HEMBRA (SPANISH) | CAMAMILLA DE MUNTANYA (VALENCIAN) | LAVENDER COTTON (ENGLISH) | SANTOLINE,LAVANDE Coton (FRENCH)

STRUCTURE		
Shape: ROUND	Height: 20-70 CM	Diameter: 60 CM
Texture: MEDIUM	Shade: PARTIAL	Root

DIVISION:	MAGNOLIOPHYTA
SUBDIVISION:	
TYPE:	MAGNOLIOPSIDA
ORDER:	ASTERALES
FAMILY:	ASTERACEAE

VARIETIES

LEMON QUEEN (DWARF CREAM-COLORED FLOWER)
PRETTY CAROL (COMPACT)
NANA (H and Ø 15 CM)
PRETTY PINK

MORPHOLOGY		
Stem	Bark	Color: GRAY
Leaf: EVERGREEN; SIZE:; COLOR: US: GRAY, LS: GRAY; TEXTURE: US: TOMENTOSE, LS: VISCOSE	COMPOUND: PINNATE; HARDNESS: SOFT; ARRANGEMENT: ALTERNATE; VENATION: —; SHAPE: LINEAR; MARGIN: SERRATE; APEX: —; LEAF BASE: —; PETIOLE: SESSILE	
Flower: SIZE:	Type: HERMAPHRODITE; Flowering: FLORET (6-15 MM)	Reproduction: HERMAPHRODITE; Fragrant: YES
Fruit: SIZE:	Type: ACHENE; Edible: NO	Color; Fruiting season
Growth	Rate: MODERATE	Longevity: 5-10 YEARS

ECOLOGY		
Climate: ALTITUDE: 0-2000; IRRIGATION: LOW	Temperature: -12ºC,H3,Z4; Sun exposure: FULL SUN; Texture: LOAMY/SANDY; Drainage: HIGH	Drought resistant: YES; Frost resistant: UPTO -15ºC; Salt resistant; Lime resistant: YES
Soil: pH: BASIC; FERTILITY: POOR		

USES				
Resistances: COASTAL: YES; POLLUTION:; WIND:	SLOPES: YES	HEDGE ROWS: YES		
	RIVERBANKS: NO	BORDERS: YES		
	GROUPS: YES	ISOLATED: YES		



POINTS OF INTEREST

"Xanthos" (Greek) = yellow; "sanctum linum" (Latin) = sacred linen

Origin/distribution: Western Mediterranean / warm European regions, especially in the Mediterranean area. **Active substances**: Essential oil (azulene, flavonoids, phenolic acids,...), resins, tannins,...; content in essence: 0.7-1% (dry matter). **Uses**: Medicinal (anti-inflammatory, antiseptic, antispasmodic, vermifuge, vulnerary, healing,...), perfumery, insecticide.

Colonizing plant.

SPACING: 50 CM

PLANTING AND PLANT HEALTH

Pruning: deadhead after flowering. Thorough pruning is recommended every 2-3 years in April. Propagation can take place in the summer by means of 8 cm cuttings in a seed box.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
						x	x	x			

Sowing | Planting | Pruning x

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shapes
Pots		
8C (0.2)	10-15	1 year
CT9 (0.33)	10-20	
CT10 (0.45)		round
CT13 (1)	10-20/15-25	round
CT12 (1.1)		round
CT14 (1.6)		round
CT17 (2-8)		round
CT20 (5)		round
CT22 (6)		round
C32 (11-5)		round
Seed tray (0.35L per cell)		

SATUREJA

Satureja montana L.

MEDICINAL AND AROMATIC

AJEDREA, MORQUERA	SABORIJA, HERBA D'OLIVES	WINTER SAVORY	SARRIETTE VIVACE
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Shape: EXTENDED	Height: 10-40 CM	Diameter: 20-60 CM
Texture: FINE	Shade	Root: TAP ROOT

DIVISION:	MAGNOLIOPHYTA
SUBDIVISION:	
TYPE:	MAGNOLIOPSIDA
ORDER:	LAMIALES
FAMILY:	LAMIACEAE

VARIETIES: *NANA*

MORPHOLOGY		
Stem	Bark	Color: REDDISH
Leaf: EVERGREEN; SIZE: 5-30 MM; COLOR: US:MID GREEN LS:MID GREEN; TEXTURE: GLOSSY	COMPOUND: NO; HARDNESS: CORIACEOUS; ARRANGEMENT: OPPOSITE; VENATION:; SHAPE: LINEAR-LANCEOLATE; MARGIN: CILIATE; APEX: ACUTE; LEAF BASE: CUNEATE; PETIOLE: SESSILE	
Flower: SIZE: 6-12 MM	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
	Flowering: VERTICILLASTER	Fragrant: YES
Fruit: SIZE:	Type: TETRA-ACHENE	Color: BLACK
	Edible: NO	Fruiting season
Growth	Rate: FAST	Longevity: 5-10 YEARS

ECOLOGY		
Climate: ALTITUDE: 0-1800 M; IRRIGATION: LOW	Temperature: -6ºC,H4,Z6	Drought resistant: YES
	Sun exposure: FULL SUN	Frost resistant: Up to -15ºC
Soil: Ph: 7-8.5; FERTILITY: MODERATE	Texture: LOAMY/SANDY	Salt resistant
	Drainage: HIGH	Lime resistant: YES

USES		
Resistances: COASTAL:; POLLUTION:; WIND:	Applications: SLOPES: YES; HEDGE ROWS: NO; RIVERBANKS: NO; BORDERS: YES; GROUPS: YES; ISOLATED: YES	



POINTS OF INTEREST

"Satura" (Latin) = stew, alludes to its application as a seasoning.

Origin/distribution: Southern Europe and Northern Africa, Mediterranean, Southern Asia. It tolerates limestone, wasteland, stony, poor soils of much of the Iberian Peninsula. **Active substances**: Essential oil (carvacrol, linalool, thymol, terpineol, cymene, rosmarinic acid,...); content in essence: approx. 1.7% (up to 3% dry matter). **Uses**: Medicinal (digestive, carminative, tonic, antispasmodic, germicidal, antioxidant,...), seasoning and food preservative (germicidal, fungicidal), herbalism, liquor, melliferous,... The peripheral branches take root easily.

SPACING: 30-35 CM

PLANTING AND PLANT HEALTH

Propagation: by seed, cutting, division of the bush; 1 g = 1300-1500 seeds, germination in 20-25 days, germination power: 2-7 years. **Pests/diseases**: This species of plant is prone to fungal attacks from the soil in situations of excess humidity, but, in general, there are few conditions due to the high content of carvacrol. **Weeds**: It presents allelopathies against weeds; control with terbacil (controls a wider range of weeds and with greater persistence), lenacil. Complicated direct sowing (March-April). Nursery plant planting (with a minimum height of 10 cm) in May, approx. The bush can be divided towards March.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing | Planting | Pruning (x) | Dividing of bush

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation(L)	Height (cm)	Topiary shapes
Pots		No
CT13 (1)		
Seed tray (0.2L per cell)		

SIDERITIS

Sideritis angustifolia L.

MEDICINAL AND AROMATIC

RABO DE GATO (SPANISH) · CUA DE GAT (VALENCIAN) · IRONWORT, MOUNTAIN TEA (ENGLISH) · HERBE DE REFLUX (FRENCH)

STRUCTURE		
Shape: IRREGULAR	Height: 30-60 CM	Diameter:
Texture: MEDIUM	Shade: LIGHT	Root: TAP ROOT

DIVISION:	MAGNOLIOPHYTA
SUBDIVISION:	
TYPE:	MAGNOLIOPSIDA
ORDER:	LAMIALES
FAMILY:	LAMIACEAE

VARIETIES

MORPHOLOGY		
Stem	Bark:	Color: GREEN
Leaf	COMPOUND: NO	
EVERGREEN	HARDNESS: CORIACEOUS	
SIZE: 7-8 MM	ARRANGEMENT: OPPOSITE	
COLOR: US: MID GREEN	VENATION:	
LS: MID GREEN	SHAPE: LINEAR	
TEXTURE: TOMENTOSE	MARGIN: ENTIRE	
	APEX: OBTUSE/ACUMINATE	
	LEAF BASE: ATTENUATE	
	PETIOLE: SESSILE	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE: 7-12 MM	Flowering: VERTICILLASTER	Fragrant: YES
Fruit	Type: TETRA-ACHENE	Color: BLACK
SIZE: Up to 2 MM	Edible: NO	Fruiting season
Growth	Rate: MODERATE	Longevity: 4-5 YEARS







ECOLOGY		
Climate	Temperature: __	Drought resistant: YES
ALTITUDE: 0-1000 M	Sun exposure: FULL SUN	Frost resistant
IRRIGATION: LOW		
Soil	Texture: LOAMY/SANDY	Salt resistant
pH : BASIC	Drainage: HIGH	Lime resistant: YES
FERTILITY : POOR		

USES		
Resistances	Applications	
COASTAL:	SLOPES: NO	HEDGE ROWS: YES
POLLUTION:	RIVERBANKS: NO	BORDERS: YES
WIND:	GROUPS: YES	ISOLATED: NO

POINTS OF INTEREST

Origin/geographical distribution: Southern and Central Europe, Mediterranean region, Near East, North Africa. Shrub found on slopes and calcareous hills. **Active substances**: Essential oil (pinene, sabinene, cineole, fenchone, bisalobol,...). **Uses**: Medicinal (vulnerary, digestive, antirheumatic,...). This shrub is also used by herbolists.

SPACING: 20CMS

PLANTING AND PLANT HEALTH

It stands out among the other species of its family (*Lamiaceae*) for its yellow inflorescences.
Propagation: by seed,cutting.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
						x	x	x	x	x	x

Sowing Planting Pruning x

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Topiary shapes
CT13 (1)		No

THYMUS *Thymus vulgaris* L.

MEDICINAL AND AROMATIC

TOMILLO, TOMILLO COMÚN	TIMÓ, TOMELLO	THYME	THYM
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Shape: IRREGULAR	Height: 20-40 CM	Diameter: 30-60 CM
Texture: FINE	Shade: LIGHT	Root: TAP ROOT

DIVISION:	MAGNOLIOPHYTA
SUBDIVISION:	
TYPE:	MAGNOLIOPSIDA
ORDER:	LAMIALES
FAMILY:	LAMIACEAE

VARIETIES

ERECTUS (WHITE FLOWER)
SILVER POSIE
AUREUS
ORANGE BLOSSOM

MORPHOLOGY		
Stem	Bark	Color: BROWN
Leaf: EVERGREEN; SIZE: 3.5-8 MM; COLOR: US: MID GREEN, LS:GRAY/GREEN; TEXTURE: SMOOTH	COMPOUND: NO; HARDNESS:; ARRANGEMENT: OPPOSITE; VENATION:; SHAPE: LANCEOLATE; MARGIN: ENTIRE; APEX: ACUTE-OBTUSE; LEAF BASE:; PETIOLE: SHORT	
Flower: SIZE: 5-6 MM	Type: HERMAPHRODITE / Flowering	Reproduction: HERMAPHRODITE / Fragrant: YES
Fruit: SIZE:	Type: TETRA-ACHENE / Edible: NO	Color: BLACK / Fruiting season
Growth	Rate: MODERATE	Longevity: 5-10 YEARS



ECOLOGY		
Climate: ALTITUDE: 0-1800; IRRIGATION: LOW	Temperature: -12ºC,H3,Z5 / Sun exposure: FULL SUN	Drought resistant: YES / Frost resistant: YES
Soil: pH: NEUTRAL; FERTILITY: POOR	Texture: LOAMY/SANDY / Drainage: HIGH	Salt resistant / Lime resistant: YES

USES		
Resistances: COASTAL:; POLLUTION:; WIND:	Applications: SLOPES: YES; RIVERBANKS: NO; GROUPS: YES; HEDGE ROWS: NO; BORDERS: YES; ISOLATED: YES	

POINTS OF INTEREST

"Thyo" (Greek) = fragrance; "Thymos" (Greek) = strength

Origin/distribution: Native to Western Mediterranean region. In dry and arid areas, scrub in stony and sunny spaces; prefers calcareous soils. **Active substances**: Essential oil (thymol, carvacrol, cineol, camphor, borneol, bitter substances, flavonoids,...); content in essence: up to 3%. **Uses**: Medicinal (antiseptic, stimulant, antitussive, vermifuge, balsamic,...), honey, seasoning, herbalism, cosmetics, perfumery. It is considered a colonizing plant. Very polymorphous plant. **Toxic** (essential oil).

SPACING: 25-30 CM

PLANTING AND PLANT HEALTH

Propagation: By seed, cutting, division of the bush; 1g = 3500-6000 seeds; germination in 15-20 days; Germinating power: 3-7 years. **Pests/diseases**: This species is prone to *Meloidogyne hapla* (nematodes) **Weeds**: Control with monolinuron, simazine, lenacil, terbacil.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
						X	X	X			

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation (L)	Height (cm)	Years
Pots		
CT8(0.2)	10-15	1/2 years
CT9(0.33)	10-20	
CT11 (0.6)		
CT13 (1)	10-20/15-25	
CT12 (1.1)	20-30	
15TC (1.3)	20-30	
CT14 (1.6)		
CT20 (5)		
Seed tray (0.2L per cell)		
Seed tray (0.35L per cell)		2 years

Subchapter 8.3 Commercialization, use and planting

THE SECTOR OF MEDICINAL AND AROMATIC PLANTS IN VALENCIA

The garden sector in Valencia is in continuous expansion. Although producers and crops undergo periodic changes, they adapt both to the growing demands of the local and international markets. Spain and, more specifically, the Valencian Region, have the adequate starting material and environmental conditions to produce medicinal and aromatic plants.

In addition, plant producers (nurseries) have been diversifying the supply of plants, considering both the needs of aromatic plants for landscape revegetation or regeneration, as well as those necessary for public and private gardens and parks. It is not surprising therefore the considerable interest on the part of the consumer (administrations, companies, and individuals) in these plants, which necessarily must obtain a response from nurseries, "garden centers", florists, events (contests, fairs...).

COMMERCIALIZATION

There is no national or international standard regarding marketing regulations for medicinal and aromatic plants. Some regions in Spain and other organizations are working on the development of minimum guidelines that set the quality standards and regulate the marketing for these species. It should be noted that the Technological Standards for Gardening and Landscaping, prepared by the Official Chamber of Agricultural Technical Engineers and Agricultural Experts of Catalonia, are currently disseminated but not mandatory. A homogenization of present and future regulations would be desirable, based on valid criteria on both a national and international level.

In order to elaborate this chapter on medicinal and aromatic plant species the following frameworks have been considered: Technological Standards for Gardening and Landscaping (NTJ 07) and the Quality Regulations for Ornamental Plants for their distinction with the "CV" 8 (Community of Valencia) quality mark published by the Ministry of Agriculture, Fisheries and Food of the Valencian Community (DOGV 4782, 2004) on June 24, 2004.

The technical regulations applicable to medicinal and aromatic plants is divided between NTJ 07F (shrubs), NTJ 07G (bushes and sub-shrubs) and NTJ 07J (ground cover plants).

Shrubs (NTJ 07F)

Shrubs are classified according to their structure as indicated in the following Figure 8.3.1.

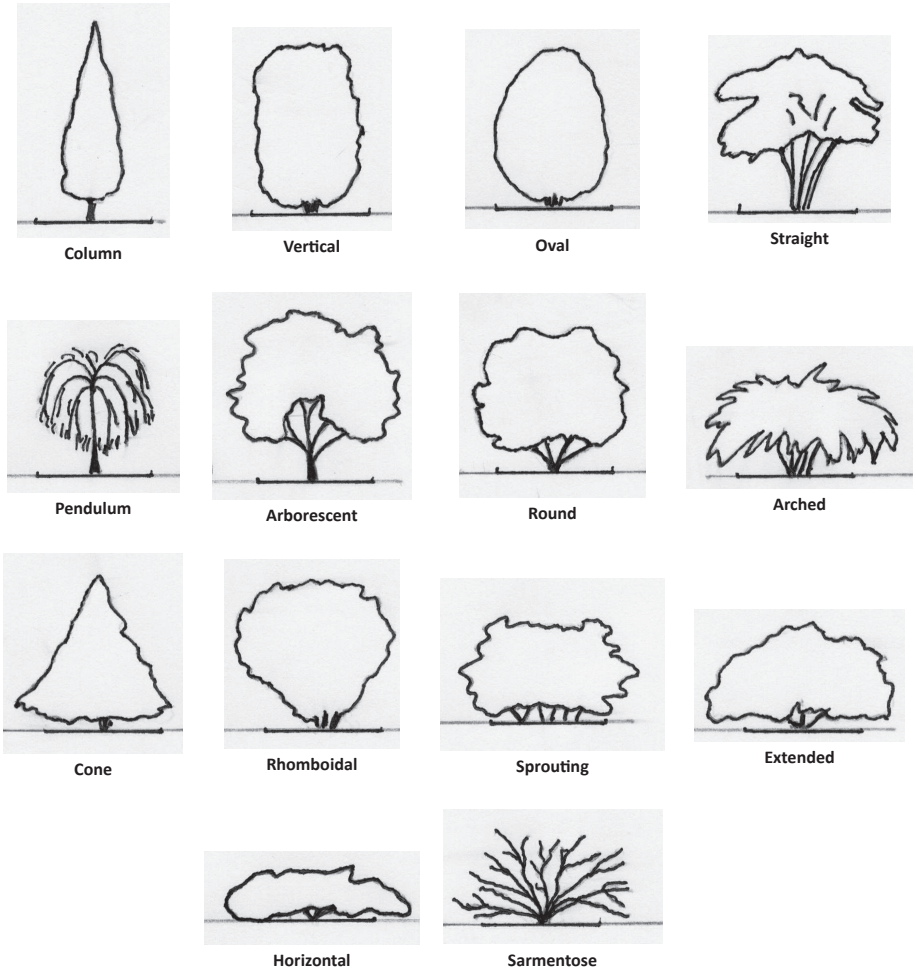


Figure 8.3.1. Shrub structure (NTJ 07F)

Quality Specifications
Shrubs must be supplied with identification and proof of purity level in relation to the genus, the species and where applicable, the cultivar.

They may be grown on field conditions or in containers, considering the specific needs of the species-cultivar, age, and location.

They will be subjected to pruning and/or formative pruning if necessary.

Open Field cultivation
They will be supplied in bare root or root ball form. Likewise, they can be cultivated in the field to later be potted in a container or vice versa; in the latter case, they must remain in the container for a minimum period of one cycle to form a suitable root ball system.

The planting framework (spacing) in the field will be determined by the needs derived from the species-cultivar, mechanization system, soil texture, irrigation system and age of the plant when it is uprooted.

If the plant is supplied with a root ball, it will be formed exclusively with the soil adhered to the roots after extraction, without adding any other soil or substrate.

Container cultivation
When cultivating plants in containers, th e spiraling of ro ots sh ould be carefully avoided. Therefore, depending on the growth rate of the plant, it should be repotted to progressively larger containers every two or three years, except in the case of very slow-growing shrubs.

The substrate used must be of a quality adapted to the characteristics of the species-cultivar, destination of the plant, type of crop, climate of the area, etc., allowing the development of the root system in all its volume. Undesirable residues should be removed in the final plantation.

Dimensions and sizes
The number of branches or main stems influences the quality of the bush. These must sprout from the lower third of the plant, be regularly distributed and present a thickness and length in accordance with the proportions of the rest of the plant.

Shrub aerial dimensions will be based on height (ground level to top) and average crown diameter. The minimum dimension of the root system will be determined by the height of the shrub (in the case of supplying bare root plants). The measurements used for the classification will be those indicated in Tables 8.3.1. and 8.3.2.

Height in cm	Width of root system In cm (minimum)*
10-20	
20-40	20
40-60	20/25
60-80	25
80-100	30
100-125	35
125-150	40
150-175	45
175-200	50
200-225	
225-250	

* Refers to bareroot plants

Table 8.3.1: Minimum size of the root system in relation to shrub height (NTJ07F)

Average crown diameter in cm
10-20
20-40
40-60
60-80
80-100

Table 8.3.2: Size categories of shrubs according to the diameter of their crown (NTJ07F)

For medicinal and aromatic plants supplied in root ball or container formats, the following dimensions will apply:

Root ball plant				Container plant		
Height(cm)	**Minimum diameter of root ball (cm)**	**Minimum depth of root ball (cm)**		**Height (cm)**	**Minimum volume of container (L)**	**Upper and lower minimum diameter of container (cm)**
20-40	20	15		20-40	1.5-2	15-16
40-60	20-25	15-20		40-60	2	16
60-80	25	20		60-80	3	18
80-100	25-30	20-25		80-100	3-5	18-22
100-125	30-35	25-30		100-125	5	22
125-150	35-40	30		125-150	7.5	24
150-175	40-45	30		150-175	10	26
175-200	45-50	35				
200-225	50-55	35				
225-250	55-60	40				

Table 8.3.3: Minimum Root ball and Container dimensions (NTJ07F)

Bushes and subshrubs (NTJ 07G)

Bushes and subshrubs can be classified according to:

- Size of the plant
- Degree of lignification
- Location of resistance shoots and buds
- Persistence of foliage

Therefore, the following groups in table 8.3.4. are considered

Group		**Size (cm)**
Bushes (small shrubs)	Woody plants	50-100
Soft wood shrubs	Plants whose stems are not completely lignified	> 50
Large sub shrubs	Plants that are only woody at their base	> 50
Chamaephyte	Small bushes and subshrubs	< 50

Table 8.3.4: Classification of bushes and subshrubs

Quality Specifications

Bushes and subshrubs must be supplied with identification and level of purity in relation to the genus, the species and where applicable, the cultivar.

They are usually grown in containers, considering the specific needs of the species-cultivar, age and location. In some cases, they are first grown under field conditions and later potted. Some large plants are marketed in bare-rooted or in root ball form.

They will be subjected to pruning and/or staking if necessary.

Plants cultivated in containers

Containers that prevent a root spiraling must be used. In relation to the growth of the plant, they should be repotted to bigger containers.

Types of containers:

- Container
- Truncate cone pot
- Truncated pyramid pot
- Seed plug tray (for seedlings and rooted cuttings)

A containerized medicinal or aromatic plant should have been transplanted and grown long enough for new roots to develop in such a way that the root ball will hold its shape inside the container and remain compact when the container is removed.

Roots should not show symptoms of spiraling and should not protrude significantly through drainage holes.

The substrate must be of a quality adapted to the characteristics of the species-cultivar, destination of the plant, type of crop, climate of the area, etc., allowing the development of the root system in its entire volume. Undesirable residues in the final plantation should be avoided.

In the nursery, the containers must be sufficiently separated to ensure that all the plants receive enough light and avoid signs of etiolation.

The dimensions of bushes and subshrubs cultivated in containers must be related to the size of the container used. A guideline is outlined in Table 8.3.5.

Volume of recipient (liters)	Diameter of recipient (cm)	Minimum width of plant (cm)
0.5	10-11	10
0.5-1	11-13	12
1-1.5 or 2	13-15	14

Table 8.3.5: Relation between container size and width of plants

For the classification of bushes and subshrubs, the scale of plant height or width is usually followed using these three ranges: 5/10, 10/20 and 20/30 cm.

There must be an appropriate balance between the aerial part of the plant and its underground part (roots and root ball). The aerial part must cover, as a minimum, the surface of the container.

Groundcover plants (NTJ 07J)

Ground cover plants can be classified according to:

- Bearing or shape of the plant
- Extension system or floor covering
- Persistence of foliage

Quality Specifications

Groundcover plants must be supplied with identification and level of purity in relation to the genus, the species and where applicable, the cultivar.

They can be grown in the field or in a container, considering the needs of the species-cultivar, age and location. In some cases, they are first grown under field conditions and later potted.

They will be pruned, trimmed, grafted and or repotted if necessary.

Cultivation in containers

Containers that prevent root spiraling must be used. As plants grow, they should be repotted to bigger containers.

Types of containers:

- Container
- Truncate cone pot
- Truncated pyramid pot
- Seed plug tray (for seedlings and rooted cuttings)

A containerized plant should have been grown long enough for new roots to develop in such a way that the root ball will hold its shape inside the container and remain compact when the container is removed.

Roots should not show symptoms of spiraling and should not protrude significantly through drainage holes.

The substrate must be of a quality adapted to the characteristics of the species-cultivar, destination of the plant, type of crop, climate of the area, etc., allowing the development of the root system in its entire volume. It must not leave undesirable residues in the final plantation.

Size and proportions

The dimensions of the aerial part of the ground cover plants are based on the width of the plant and, additionally where appropriate, on the length of the stems and their number. These all depending on the species, the volume of the root ball or the recipient/container.

Plant width (cm)		Number of stems
5-10 10-20 20-30 30-40 40-60 60-80 80-100		1 2 3-4 5-7 8-12

Table 8.3.6: Measurements to classify ground cover plants (aerial part)

The root ball of the underground part of groundcover plants must be proportional to the type of growth of the species or the cultivar, the development of the plant, and the soil conditions. Therefore, for

containerized plants, the relationship between the width of the plant and the volume of the container should be considered, as shown in the following Table 8.3.7.

Plant width (cm)	Min. volume of container (liters)
5-10	0.5
10-20	0.5-1
20-30	1-1.5
30-40	1.5-2
40-60	2-2.5
60-80	3-5
80-100	5-7.5

Table 8.3.7: Minimum volume of container in relation to plant width

General considerations

Supply

The plants considered in this chapter may only be supplied by authorized suppliers and following quality criteria that will refer to both the aerial and underground parts. They must be healthy, well-formed, and sufficiently hardened off to ensure their survival in their final placement.

Where appropriate, plants must be marketed with a label, clearly indicating the cultivar (following international naming standards), as well as the description of the cultivar, its most important distinguishing characteristics, the propagation technique that was carried out, and the main indications for plant conservation.

In the case of a plant with a single stem supplied in a container, the stem must be centered.

Plants supplied in containers must have a volume of substrate and roots equivalent to 90-95% of the total volume of the container. They must not show cut roots with a diameter greater than 2 cm.

Plants supplied bare root must come from areas with environmental conditions (especially regarding temperature regime) similar to the final planting area.

Plant Health

Plants must not show any signs of disease or be affected by pests or diseases in their leaves, stems and trunks. The branches and foliage should be turgid, as well as the roots. They must not show deterioration or dryness and the roots cannot present symptoms of rot.

The substrate must be in all cases (plants supplied in plugs and containers) free of weeds, mosses, and lichens.

There should be no harmful organisms as a result of quarantine.

Species	Foliage	Basic shape	Plant height (cm)	Plant width (cm)	Min. stems	Container volume (L)	Interest	Presentation	Observations
SHRUBS (NTJ 07F)									
Lavandula dentata L.	Evergreen	Round	20 min.		3	1.5	Flower/leaf	Container	Aromatic/hedge
Ricinus communis L.	Evergreen	Round/bush	40 min.		1+	5	Flower/leaf	Container	
Rosmarinus officinalis L.	Evergreen	Round	20 min.		3	1.5	Flower/leaf	Container	Aromatic/hedge
Salvia microphylla Kunth.	Evergreen	Round	30 min.		3	1.5	Flower	Container	
Sambucus nigra L.	Deciduous	Round/bush	50 min.		3	3	Flower/fruit	Container /bare root.	Hedge
BUSHES AND SUB SHRUBS (NTJ 07G)									
Artemisia absinthium L.	Semi-dec.	Subshrub	30-90	30-60			Leaf		Aromatic
Helichrysum stoechas (L.) Moench.	Evergreen	Chamaephyte	40-50	60-90			Flower/leaf		Aromatic
Hyssopus officinalis L.	Semi-dec	Chamaephyte	20-60	60-100			Flower		Aromatic
Lavandula angustifolia Miller	Evergreen	Bush	50-100				Flower/leaf		Aromatic
L. dentata L.	Evergreen	Bush	60-100				Flower/leaf		Aromatic
L. latifolia Medicus	Evergreen	Chamaephyte	30-80				Flower/leaf		Aromatic
L. stoechas L.	Evergreen	Bush	30-100				Flower/leaf		Aromatic
Micromeria fruticosa (L.) Druce	Evergreen	Chamaephyte	20-60				Flower/leaf		Aromatic
Origanum majorana L.	Evergreen	Subshrub	60-80	30-45			Leaf		Aromatic
Ruta graveolens L.	Evergreen	Subshrub	60-100	50-75			Leaf		Aromatic.
Salvia officinalis L.	Evergreen	Bush	50-80	60-90			Flower		Aromatic
Santolina chamaecyparissus L.	Evergreen	Chamaephyte	40-60	60-100			Flower/leaf		Aromatic
Satureja montana L.	Evergreen	Chamaephyte	10-40	10-20			Flower		Aromatic
Thymus vulgaris L.	Evergreen	Chamaephyte	10-30	40-60			Flower		Aromatic
GROUNDCOVER PLANTS (NTJ 07J)									
Helichrysum stoechas (L.) Moench.	Evergreen	Subshrub	40-50	60-90			Flower/leaf	Container	Aromatic
Mentha x piperita L.		Vigorous	30-50	70-100			Leaf	Container	Arom./Rhizome plant
M. pulegium L.		Vigorous	2-10	50-90			Flower	Container	Arom./ not walkable
Rosmarinus officinalis L. 'Prostratus'	Evergreen	Shrub creeper	10-15	100-150			Flower/leaf	Container	Aromatic
Santolina chamaecyparissus L.	Evergreen	Bush	40-60	60-100			Flower/leaf	Container	Aromatic
Thymus vulgaris L.	Evergreen	Subshrub	25-30	40-60			Flower	Container	Aromatic

semi-dec = semi deciduous; arom. = aromatic

Table 8.3.8: Measurements to classify ground cover plants (aerial part)

Regulation of Quality of Ornamental Plants for its distinction with the quality mark "CV"

The commercialization o f ornamental plants u nder t he "CV" quality m ark must f ulfill th e following requirements:

- Origin of the plants from an authorized nursery, which meets the legal requirements, especially the provisions of the regulation.
- Compliance with the characteristics listed in Table 8.3.9.

- Presentation of optimal phytosanitary conditions and absence of pests and diseases showing the plants typical development of the variety, healthy and clean appearance, absence of dry flowers, absence of wounds other than those of the crop, absence of chlorosis symptoms, well developed root system and balanced with the aerial part.
- A minimum tolerance is admitted when batches of plants destined for commercialization are evaluated.

The Regulation also refers to the minimum conditions that farms must meet:

- The cultivation techniques and the management of the facilities must meet minimum criteria in terms of environmental respect: maximum energy savings, rational use of resources (water, nutrients, phytosanitary products, recyclable materials, proper waste management), and monitoring of standards of recognized environmental management.
- If plant material from other farms is used, they must be duly authorized and registered, where appropriate, in the Register of Nursery Plant Producers, accompanied by the material with its corresponding phytosanitary certificate.
- The farm staff must be properly trained, especially in technical management and the application of phytosanitary products.
- A register must be kept and the control of other records (maintenance of facilities and equipment, inputs, and outputs of phytosanitary products…).

Regarding the marketing conditions, the following must be considered:

- Presentation, considering the general aspects indicated above.
- Labeling of each unit of sale to the public (name of the plant, trademarks, in addition to what has been established by current legislation).
- Transport that guarantees adequate conditions for its subsequent planting and that preserves the integrity of the plant during the journey and handling process.

Species				Plant height (cm)	Plant width (cm)	Diameter of container (cm)
Rosmarinus officinalis	*R. officinalis* 'Prostrata'/ *Lavandula officinalis*	*Santolina chamaecyparissus*	*Thymus vulgaris* 'Compacta' *and* 'Aureus'			
x				15-25	15-20	12-14
x				20-35	20-30	18
x				30-45	25-35	23
	x			15-25	15-20	12-14
	x			25-35	20-30	18
	x			20-30	25-40	23
		x	x	15-20	15-20	12-14
		x		20-30	20-30	18
		x		30-40	30-40	23
			x	15-30	20-30	18
			x	25-40	30-40	23

Table 8.3.9: Dimensions of commercialized plants (DOGV, 2004)

Subchapter 8.4 Maintenance

Medicinal and aromatic plants, especially Mediterranean varieties adapted to harsh environmental conditions (poor soils, low water supply, extreme temperatures...), require low maintenance. On many occasions, plant replacement is low as many species can be maintained for several years in their location.

For maintenance purposes ,medicinal and aromatic plants can be grouped according to their water needs:

- medicinal plants for “non arable land” (rainfed)
- medicinal plants for “arable land”

The first group of medicinal plants for non-arable land (rainfed) include:

- *Artemisia absinthium* L. (Grand wormwood)
- *Helichrysum stoechas* (L.) Moench.(Mediterranean strawflower)
- *Artemisia absinthium* L. (Grand wormwood)
- *Lavandula angustifolia* Miller (True lavender/English Lavender)
- *Lavandula dentata* L. (Fringed lavender/French lavendar)
- *Lavandula dentata* (Fringed lavender/French lavendar)
- *Lavandula latifolia* Medicus (Broadleaved lavender/Spiked Lavender)
- *Lavandula stoechas* L. (Spanish lavender/topped lavender)
- *Micromeria fruticosa* (L.) Druce (whiteleaved savory)
- *Nepeta cataria* L. (Catnip)
- *Origanum majorana* L. (Marjoram)
- *Origanum vulgare* L. (Oregano)
- *Rosmarinus officinalis* L. (Rosemary)
- *Ruta graveolens* L. (Rue/Common rue/ Herb-of-grace)
- *Salvia microphylla* Kunth. (Baby sage/blackcurrant sage)
- *Salvia officinalis* L. (Common sage)
- *Salvia sclarea* L. (Clary sage)
- *Santolinachamaecyparissus* ssp. *chamaecyparissus* L. (Cotton lavender)
- *Satureja montana* L. (Winter Savory/mountain Savory)
- *Sideritis angustifolia* L. (Ironwort/Mountain tea)
- *Thymus vulgaris* L. (Thyme)

The second group of medicinal plants for arable land include:

- *Acanthus mollis* L. (Bear’s breeches/sea dock/sea holly/oyster plant)
- *Chamomilla recutita* (L.) Rauschert sweet chamomile)
- *Lippia triphylla* (L’Hér.) O.Kuntze (Lippia)
- *Melissa officinalis* L. (Lemon balm)
- *Mentha x piperita* L. (Peppermint)
- *Mentha pulegium* L. (Pennyroyal/ Pennyrile/mosquito plant)
- *Mentha spicata* L. (Spearmint)
- *Ricinus communis* L. (Castor oil plant)
- *Sambucus nigra* L. (Elder/elderberry/European black elderberry)

It is essential to consider these two groups when deciding on irrigation needs, nutritional needs (fertilization), pruning, mowing, cutting and phytosanitary protection, etc.

MEDICINAL PLANTS FOR IRRIGATED LAND

The plants considered for arable land have similar needs to other ornamental plants with high water demands: higher nutrient supply (fertilization) due, logically, to their higher growth rate; greater control of pests and diseases (more intensive control, for example by using phytosanitary products); and greater control of aerial development through pruning or cutting back, due to the more intense rate of leaf development.

Pruning or mowing

Special care must be taken with the group of plants belonging to the genus *Mentha*. Due to their creeping growth habit (main – pennyroyal- or secondary – mint and spearmint) their extension must be limited in the garden area. Otherwise, they compete with other ornamental plants or become "weeds" due to their ease for forming rhizomes and stolons and, therefore, of vegetative propagation. The pruning of these plants can be severe (mowing). This implies cutting a few centimeters from the ground and repeat several times a year if necessary. In addition, mowing after the end of the flowering period is always recommended.

As for the *Lippia* genus, it is important to observe the dimensions of the bush it forms. Its long shoots can give the plant an ungainly appearance. It is easy to prune and allows, in ornamentally appropriate cases, the formation of small trees.

Fertilizing

Very little information is available regarding specific fertilization guidelines for medicinal and aromatic plants when they are used for ornamental purposes. However, the recommendations that are available when these plants are cultivated for agricultural purposes (for instance to produce leaves, flowers or essential oils) can be somehow of interest also in the garden. In any case, medicinal and aromatic plants adapt well to what is already established for other ornamental plants that can be found in the garden, logically depending on the environmental characteristics (soil, water, climate).

Irrigation

The species of plants outlined in this section need a regular supply of water. They adapt well to any irrigation system; however, drip irrigation is preferred as it saves water. It also deters weed development, reduces the appearance of spots on the leaves (caused by a sprinkler irrigation system) and the settling of dust (quite common to the area) or pollution in urban areas (with the subsequent damage on the leaves and the whole appearance of the garden). However, if used correctly, a sprinkler irrigation system for this group of plants is acceptable but paying special attention to the flowering period. If care is not taken possible rotting of inflorescences, higher incidence of phytosanitary problems due to the humidity-heat combination can occur.

Likewise, and as a general rule (already established for other plants), it is interesting to avoid sprinkler irrigation when the sun is at its highest point (it may cause burns on the leaves). Watering in strong winds should also be avoided (less irrigation effectiveness). Poor quality water for irrigation is not recommended, especially in situations of handling water with a high salt content.

Phytosanitary protection

These plants do not present excessive phytosanitary problems. As ornamental plants, they present us with even greater ease in their handling. However, its application (used to obtain better quality leaves or essences) is limited due to possible repercussions in human health and residues.

A substrate that does not provide good drainage can provoke soil fungi. To avoid this pathology, the soil must not get waterlogged. The use of fungicides is acceptable as long as it is viable (technically and economically).

Since these plants for considered for irrigated land (greater leaf volume, tender leaves, intense sprouting…) they are more prone to attacks by aphids and beetles (*Chrisolina sp.*) among other pests. They can be controlled with well-known and widely used phytosanitary products, both in garden and crop conditions. This is also supported by information provided in the first paragraph regarding their limitations due to possible residues.

PLANTS FOR NON-ARABLE LAND (RAINFED PLANTS)

Rainfed medicinal and aromatic plants require less maintenance than those described in the previous section:

- Lower contribution of nutrients (fertilization) due, logically, to its lower rate of growth.
- Less control of pests and diseases.
- Less need for pruning or mowing, due to their low rate of leaf development.

Pruning or mowing

The pruning of these plants can be severe (mowing). This implies cutting a few centimeters from the ground as long as the main wood is not too old (the plants can be kept for several years in the garden) and the basal buds show signs of sprouting. Mowing that is carried out on ornamental plants prevents the appearance of a woody bush with excessively dry and lignified areas. Care must be taken with those species that allow the formation of roundish aerial part (*Origanum sp., Santolina sp.; Thymus sp*...). Mowing at the end of the flowering period is always recommended.

In the case of wormwood, mowing or pruning can impede it from invading nearby areas of the garden due to its exuberant development under suitable conditions. The fringed lavender and the *Lavandula semidentata* (semi-fringed lavender) have similar characteristics as the wormwood, pruning being especially important in the latter case because the stem becomes lignified rather quickly and the vegetative buds lose vigor. Mowing or pruning should also be carried out with the rosemary of the *Prostrata* group, which stands out for its ability to create a creeping carpet effect.

Fertilizing

As mentioned above, very little information is available regarding fertilization for medicinal and aromatic plants when they are used for ornamental purposes. However, information from their agricultural use can be of partial interest when they are planted in a garden.

In any case, they are relatively undemanding plants in terms of nutrients, which, in most cases adapt well to what is established for the maintenance of other ornamental plants. However, if there is an excess of

fertilization, a reinforcement of the vegetative activity can occur to the detriment of the flowering patterns. The influence of the richness of the soil in certain elements (fundamentally trace elements) on the coloration of the flowers is also well known since they participate in the composition of the pigments.

Irrigation

Plants in this group do not need a regular supply of water. However, they adapt well to sprinkler or drip irrigation, as long as proper drainage is ensured to avoid waterlogging in the soil. Great care must be taken as these plants are sensitive to fungal attacks from the soil, especially in conditions of high humidity. The fungi that affect the stems of the plant are very aggressive.

Regarding special recommendations for these irrigation systems, it is advisable to refer to previous paragraphs.

In the revegetation and restoration of slopes, it is interesting to provide the plants used (generally rainfed species) with a support irrigation (e.g., drip) to facilitate their initial establishment and maintenance. The special characteristics of slopes (gradient, poor soil, etc.) make it difficult for these plants to survive and therefore, it is recommended to fix or stabilize the soil (for instance with biodegradable meshes) and to keep the humidity of the soil (for instance by adding a mulch).

These plants are also ideal for the composition of non-irrigated gardens (dry gardening), combined with other herbaceous and/or woody species.

Phytosanitary protection

In addition to what has been established for arable plants, it should be mentioned that medicinal and aromatic plants in general (some more than others) are capable of limiting the development of some pests and diseases by storing certain active substances in their roots and aerial parts. In some cases, the insecticidal, anti-mite, fungicidal or anti-nematodes properties, of some species (wormwood, rosemary, sage...) is known. Some even limit the development of weeds due to allelopathic effects (wormwood); an interesting factor when designing and considering the maintenance of a garden.

The appearance of symptoms due to fungal attack (sudden deaths or drying of plants) that affect the stems of plants, or the root system are quite prominent. The most practical way to combat these problems is to eliminate the affected plant and the neighboring ones, disinfect the soil and replant with other species (varying the family and growth habit, if possible).

Care must be taken when planting on land where woody species affected by fungi have grown (e.g., *Armillaria*), as medicinal and aromatic may be affected.

9

HEDGES AND TOPIARY

Chapter 9 HEDGES AND TOPIARY

Subchapter 9.1 Introduction and choosing hedges
Subchapter 9.2 Species
Subchapter 9.3 Commercialization, use, planting and maintenance

Subchapter 9.1 Introduction and choosing hedges

INTRODUCTION

Hedges are linear formations of plants with straight or curved shapes. They can be dense and compact or sparse, evergreen or deciduous, austere and/or flowery.

Hedges and topiary are a decorative element of the garden. Some hedges are used as functional elements to separate spaces and to reduce views and noise. Others are used exclusively for their ornamental role and to delimit small spaces in the garden.

Normally the plants used to form hedges are plants that admit intense trimming/pruning and produce dense and compact growth.

The most common practice is to use compact growth species, with a good number of latent buds and small leaf.

Plantings are usually very dense in order to form the hedge as soon as possible and, at the same time, make it as compact as the project requires. Due to the narrow planting frames (with the subsequent concentration of roots in a small space) and successive annual pruning, the plants that form the hedge must be fertilized frequently since the stress they suffer is very high.

Shrubs are more commonly used for topiary and pruning hedges, however other tree species, perennials, bamboos, or even palms can be considered.

Planting frames (spacing) for hedge plants range from 15 cm to 100 cm and can be planted in a row or staggered.

To achieve the best possible hedge, it is very important to do a proper maintenance during the first 2-3 years of its life, since during that period plants should not grow too fast or too slow, neither too high nor too low.





Figure 9.1.1: Planting of strawberry tree (*Arbutus unedo*) for hedges. The use of a young plant favors the shaping of the hedge
Figure 9.1.2: Park of the Labyrinth of Horta, Barcelona- Hedge of *Cupressus sempervirens*. Hedge trimmed on a right angle

Considerations for the Topiary of hedges

- If we prune too intensively the shrubs or trees as shrubs, flowering is unlikely. However, in some species the hedge can flower if we control the height and time of the pruning operation.

- Shrubs normally have many dormant buds at their base and along their branches.

- Pruning tends to wear down plants by removing their reservoirs of nutrients and by forcing them to consume a lot of energy in healing. Therefore, plants must be adequately cultivated to minimize the stress for them.

- The new buds that come out of the base or the lower parts of the shrubs will be the ones that replace the weak and dead branches.

- The fundamental characteristic of old or poorly maintained shrubs is that they have few buds at their base (the sun does not reach them). If we prune the upper part of the shrub and allow the sun to penetrate, new buds will grow and therefore shaping becomes possible.

- The specialist must be familiar with the species used to make the hedge or topiary, whether or not it is slow or fast growing and as a result, act accordingly.

- The apical bud of each plant must be recognized. Trees more than shrubs have apical dominance and therefore will tend to vertical growth. Dominance disappears or is greatly weakened in old plants. The apical bud controls the growth of the lateral twigs, being that it grows longitudinally to the detriment of the widening of the plant. In the case of monopodic species, the control of the apical bud is so intense that it prevents the growth of the lateral ones. The pruning of the apical bud usually causes the activation of the lower twigs and their growth.

- When pruning the apical bud, to prevent vertical growth, it is the twigs or upper buds that take over from the vertical growth, so if we do not want to repeat the same situation, the bush will have to be pruned again, in this way, eliminating the dominant apical buds, we keep the form compact and shrubs can be shaped or trimmed.

- The more severe the pruning (short pruning, in which we barely leave a few buds), the stronger the growth of the terminal buds that are left.

- The longer we do the pruning (removing a few buds), the less development of the remaining branch will be.

- Since variegations tend to disappear, all the green branches that emerge from the shrub should be pruned quickly as they are more vigorous and weaken the shrub.

CHARACTERISTICS TO CONSIDER IN HEDGEROWS

Deciduous: Adequate when we are interested in the leaf fall, the view of the stems, the structure, the autumnal color of the leaf. *Acer campestre, Carpinus betulus, Crataegus monogyna, Forsythia Spp*.

Evergreen: Adequate when the function of the hedge is to be homogeneous over time, throughout the year, and the appearance of the hedge must keep the same aesthetic characteristics. *Viburnum tinus, Laurus nobilis, Ilex aquifolium, Cupressus sempervirens, Arbutus unedo*.

Foliation: The leaf is the main focus. Whether deciduous or evergreen. The color, texture and fragrance are also of interest. *Prunus laurocerassus, Pittosporum tobira, Lavandula spp., Cotinus coggygria.*

Flowering: The flowers, their colors, their fragrances or even the time in which they bloom are of interest. *Myrtus communis, Viburnum tinus, Forsythia Spp, Crataegus monogyna, Chaenomeles speciosa, Fuchsia magellanica, Hydrangea macrophylla.*



Figure 9.1.3: *Hibiscus syriacus*, shrub as a formal hedgerow with flowers

Decorative fruits: Adequate when we look for a hedge that displays its fruits throughout the year or in autumn - winter, whether the hedge is with leaves or without. *Ilex aquifolium, Gleditsia triacanthos, Arbutus unedo.*

Defensive: Appropriate when we want to use plants that define a natural barrier that can deter entry to some areas. *Pyracantha Spp., Gleditsia triacanthos, Quercus ilex, Ilex aquifolium, Rosa rugosa*.

Low: Suitable when what is being cultivated behind the hedge must be clearly visible, and the hedge must frame another well-defined space (for instance, around parterres). The species used must be slow growing to require little maintenance. *Buxus sempervirens, Lavandula spp. Lonicera nitida, Rosmarinus officinalis*.

High: Adequate when what is cultivated behind the hedge must not visible or lacks any interest. If it must be year-round, an evergreen species is most suitable and if it is only during the spring and summer months, a deciduous species will be ideal. The species used are usually fast growing and can adapt well. *Prunus laurocerassus, Acer campestre, Laurus nobilis, Cupressus sempervirens*.

TYPOLOGY

Regular or formal hedges

Regular or formal hedges require more maintenance and dedication during the first few years of their development.

Regular hedges should have a trapezoidal shape, with the base of the bush being wider than the crown. In this way, the base of the bush receives more solar radiation and does not run out of leaves or twigs. This shape is very important in evergreen hedges, which require light throughout the year.

Regular hedges can be divided into three groups according to the type of species that we are going to use:

(a) Sprouting species
(b) Non-Sprouting species
(c) Evergreen and conifer species

(a) Sprouting species

These species are planted while the plants are in a dormant stage. Plants must be shortened to 15-20 cm from the ground in its first year of life in order to produce new vegetation and expand the bush by emitting new root shoots.

During the summer all the branches are cut off and shortened to reduce the size of the plant. For the next two years and with a few a more pruning operations the desired shape can be achieved.

From May to September and every month or two months after that, the regular hedge is reviewed with sharp and disinfected tools.

Species in this group: *Crataegus, Ligustrum, Tamarix, Laurus, Ilex.*



Figura 9.1.4: Monforte Gardens. Topiary with different species. *Ligustrum ovalifolium, Ligustrum japonicum* and *Bougainvillea spectabilis*

(b) Non-sprouting species

These plants do not produce new branches from the roots, although they are capable of forming compact vegetation from the buds of stems and twigs.

During the first year and during the dormant periods, the terminal guide should be shortened by a third and the lateral branches should be shortened in proportion, this formative pruning lasts three years until the hedge has the desired shape.

In the third year the final shape of the hedge is formed. If the hedge belongs to a species that flowers on one-year-old wood, severe pruning is done after flowering and then light pruning in the month of August.

Species in this group: *Carpinus betulus, Forsythia Spp., Corylus Spp; Teucrium fruticans*.

(c) Evergreen and conifer species

During the first and second year of planting, the central leader is not touched and the lateral branches are pruned so that the bush takes on a compact form. It is when the desired height is reached that the central leader can be pruned.

The following years, the end of branches are cut off in summer.

Species in this group: *Cupressus Spp., Pyracantha Spp., Cotoneaster Spp., Taxus baccata, Ilex aquifolium, Quercus ilex, x Cupressocyparis leylandii, Buxus sempervirens, Myrtus comunis*.



Figure 9.1.5: Formal hedge of the species *Pittosporum tobira*.

Informal hedges

Flower shrubs are often used for this type of hedge. The plants are allowed to grow freely without pruning (other than flowering, maintenance, and rejuvenation). Planting frames are somewhat narrower than for regular shrub cultivation but not as narrow as for formal hedges.



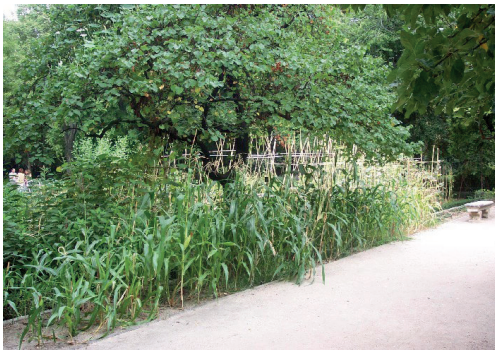


Figure 9.1.6: *Lantana camara*, flowering shrubs displayed as informal flowering hedge.
Figure 9.1.7: informal hedge *Zhea mays*. Annual plant

TABLES FOR HEDGES

In the following tables we can find some classifications of hedges, according to different criteria.

In Table 9.1.1 we can see the classification of hedge species according to whether the leaf is deciduous or evergreen. In Table 9.1.2 according to their height, and in Table 9.1.3 according to their main characteristics for landscape design.

Spieces	Leaf type
Acer campestre	Deciduous
Acer monspessulanum	Deciduous
Arbutus unedo	Evergreen
Ardisia japonica	Evergreen
Bougainvillea spectabilis	Evergreen
Brunfelsia pauciflora	Evergreen
Carpinus betulus	Deciduous
Chamaerops excelsa	Evergreen
Coriaria myrtifolia	Deciduous
Crataegus monogyna	Deciduous
Elaeagnus macrophylla	Deciduous
Erica arborea	Evergreen
Escallonia macrantha	Evergreen
Euonymus japonicus	Evergreen
Fagus sylvatica	Deciduous

Spieces	Leaf type
Griselinia littoralis	Evergreen
Ilex aquifolium	Evergreen
Laurus nobilis	Evergreen
Melaleuca leucodendra	Evergreen
Myrtus communis	Evergreen
Nandina domestica	Evergreen
Nerium oleander	Evergreen
Opuntia Spp.	Evergreen
Photinia x fraseri	Evergreen
Quercus ilex `Rotundifolia´	Evergreen
Rosa rugosa	Deciduous
Rosmarinus officinalis	Evergreen
Sambucus nigra	Deciduous
Tamarix gallica	Deciduous
Tamarix ramosissima	Deciduous

Table 9.1.1: Classification of species (evergreen or deciduous)

Type	Plant height	normal height of hedge	Planting frame
BUXUS SEMPERVIRENS	1-3-5 m	30-40 cm	According to hedge height 25-30 cm
CARPINUS BETULUS	15-20 m	60-80 cm	According to hedge height 60-80 cm
COTONEASTER FRANCHETII	3 m	50-60 cm	60-80 cm
ESCALLONIA RUBRA	3-4 m	50-70 cm	50-60 cm
EUONYMUS JAPONICUS	5-7m	60-70 cm	40-50 cm
ILEX AQUIFOLIUM	5-15 m	60-80 cm	According to hedge height 60-80 cm and up to 3-4 m
LAURUS NOBILIS	3-15 m	60-80 cm	According to hedge height 60-80 cm and up to 2-3 m
LAVANDULA SPICA	1-2 m	50-70 cm	40-50 cm
LIGUSTRUM OVALIFOLIUM	3-4 m	60-80 cm	According to hedge height 50-60 cm
MAHONIA AQUIFOLIUM	1-2 m	80-100 cm	50-70 cm
MYOPORUM LAETUM	7-10 m	80-100 cm	According to hedge height 60-80 cm
MYRTUS COMMUNIS	3-5 m	60-80 cm	According to hedge height 60-80 cm
PRUNUS LAUROCERASSUS	2-3 m	80-100 cm	According to hedge height 60-80 cm
TEUCRIUM FRUTICANS	1,5 -2,5 m	50-70 cm	50-70 cm
VIBURNUM TINUS	2,5-3,5 m	60-80 cm	According to hedge height 60-80 cm

Table 9.1.2: Hedge species according to height and planting frame (spacing)

Species	Observations
Acer campestre	Hardy-formal
Acer monspessulanum	Formal-delicate
Arbutus unedo	Fruit
Ardisia japonica	Warm climate
Arundinaria-Phyllostachys Sp.	Invasive
Berberis julianae	Thorny, Spiked
Bougainvillea spectabilis	Flowering-invasive
Brunfelsia pauciflora	Warm climate
Ceanothus	Flowering
Cereus Spp.	Warm climate
Chamaerops excelsa	Warm climate
Choysia ternata	Flowering -fragrant
Coriaria myrtifolia	Medicinal
Crataegus monogyna	Flowering-spiked (defensive)
Elaeagnus macrophylla	Colored leaves-spiked (defensive)
Erica arborea	Flowering-ground
Escallonia macrantha	Warm climate -Coastal conditions
Fagus sylvatica	Delicate-humid-shade
Forsythia x intermedia	Flowering-informal
Frangula alnus	Medicinal
Genista hispanica	Informal-flowering
Gleditsia triacanthos	Fruit-Thorny, spiked (defensive)
Griselinia littoralis	Flowering
Ilex aquifolium	Thorny, Spiked leaves
Lantana camara	Flowering –Thorny, spiked (defensive)

Species	Observations
Lonicera nitida	Formal
Melaleuca Spp.	Warm climate
Nandina domestica	Warm climate
Nerium oleander	Flowering- informal
Opuntia Spp.	Warm climate. Thorny/spiked (defensive)
Philadelohus x Virginalis	Flowering - informal
Photinia x Fraseri	Flowering – colored leaves
Pittosporum tenuifolium	Flowering-fragrant
Pittosporum tobira	Flowering-fragrant
Portulacaria afra	Succulent-hardy
Prunus laurocerasus	Toxic fruit
Pyracantha angustifolia	Flowering -fruit. Thorny, spiked (Defensive)
Quercus ilex `Rotundifolia´	Spiked (defensive)
Rosa rugosa	Spiked (defensive)
Rosmarinus officinalis	Medicinal-aromatic- flower
Ruscus aculeatus	Defensive-informal-leaves
Sambucus nigra	Medicinal-Informal
Santolina chamaecyparissus	Flowering- fragrant- formal-hardy
Spartium junceum	Flowering-hardy
Spiraea x Vanhouttei	Flowering - informal
Tamarix gallica	Flowering -sea
Tamarix ramosissima	Flowering - sea
Ulex europaeus	Flowering – Thorny, spiked-hardy
Viburnum lucidum	Flowering - informal

Table 9.1.3: Hedges classified according to their main characteristics for landscape design

Subchapter 9.2 Species

This subchapter describes **11 species of plants suitable for hedges or topiary** used in garden and landscape design They have been chosen based on their ornamental use, botanical interest, and other characteristics which make them of special interest.

Firstly, a table of parameters and values has been developed to explain each characteristic or factor presented in each botanic datasheet

Then, each botanic datasheet describes each species with regards to its botanical and ecological characteristics, cultivation, and uses, along with other interesting features such as their commercialization. This information is accompanied by different photographs in which the general appearance and morphological details of each species can be appreciated.

PARAMETERS AND VALUES USED IN THE BOTANIC DATASHEET	
TAXONOMY	
TAXONOMIC RANKS	DIVISION, SUBDIVISION, TYPE, ORDER, FAMILY
VARIETIES	OTHER VARIETIES OF INTEREST
STRUCTURE	
SHAPE	GLOBE-SHAPED, ROUNDED, OVAL, COLUMNAR, CONE, EXTENDED, IRREGULAR, PARASOL, FAN-SHAPED, HORIZONTAL, PALMIFORM, PENDULAR, WEEPING
HEIGHT	AS APPROPRIATE- IN METERS OR CENTIMETERS
DIAMETER	AS APPROPRIATE -IN METERS OR CENTIMETERS
TEXTURE	TEXTURE: LEAVES>10CM= COARSE. LEAVES OR LEAFLETS BETWEEN 2-10CM= MEDIUM. LEAVES OR LEAFLETS <2CM= FINE
SHADE	LIGHT, FULL, DENSE
ROOT	TAPROOT, FASCICULATE , OBLIQUE, HORIZONTAL, AERIAL, ADVENTITIOUS
MORPHOLOGY	
TRUNK	
BARK	SMOOTH, VERTICAL FISSURES, LONGITUDINAL FISSURES, DIAGONAL FISSURES; ROUGH, SCALY, CORKY WITH PLATES
COLOR OF BARK	GREYS, GREEN/GREY OR BLUE/GREY. SILVER, LIGHT GREEN, YELLOW, LIGHT BROWN, DARK, GREEN, RED, PURPLE; YELLOW, BLACK, MARBLED, TWO-TONED, THREE-TONED, LIGHT GREY, DARK GREY
LEAF	
TYPE	EVERGREEN, SEMI-EVERGREEN DECIDUOUS, SEMI-DECIDUOUS
SIZE OF LEAF	LENGTH OF LEAF (cm)
SIZE OF LEAFLET	LENGTH OF LEAFLET (cm)
COLOR OF UPPER SIDE (US)	PALE GREEN, LIGHT GREEN, DARK GREEN , BLUE/GREEN, GREY, PURPLE, PALE, YELLOW, VARIEGATED
COLOR OF LOWER SIDE (LS)	GREEN, LIGHT GREEN, DARK GREEN, BLUE/GREEN, GREY PURPLE, PALE, YELLOW, VARIEGATED, RUST COLORED, SILVER
TEXTURE OF UPPER SIDE (US)	SHINY, ROUGH, GLABROUS, TOMENTOSE, HAIRY, ROUGH, SCALY, VISCOSE
TEXTURE OF LOWER SIDE (LS)	SHINY, ROUGH, GLABROUS, TOMENTOSE, HAIRY, ROUGH, SCALY, VISCOSE
COMPOUND LEAVES	NO COMPOUND LEAVES YES. COMPOUNDS: IMPARIPINNATE, PARIPINNATE, TRIFOLIATE, PALMATE, PALMIFORM, PALM, PINNATE, BIPINNATE
HARDNESS	CORIACEOUS, SOFT, SUCCULENT, HARD
ARRANGEMENT	OPPOSITE, ALTERNATE, WHORLED, VERTICAL
VENATION	PINNATE, PALMATE, PARALLEL, RETICULATE, ARCUATE, A3 MAIN VEINS
SHAPE	ROUNDED, LINEAR, LANCEOLATE, FALCATE, OVAL, OBLONG, ELLIPTIC, DELTOID, RHOMBOID, SPATULATE, ACICULAR GROUPS 2, ACICULAR GROUPS 3, ACICULAR GROUPS 5, ACICULAR GROUPS, ACICULAR IN 1 PLANE, ACICULAR IN SPIRAL, SCALY, PALM 7 LOBES, PALM 5 LOBES- PALM 3 LOBES, POLYMORPHIC; PANDURIFORM; PINNATIFID, SAGITATE, RENIFORM, CORDATE, ORBICULAR, OBOVATE, OBLANCEOLATE, LIRATE, HASTATE, RUNCINATE
LEAF MARGIN	WHOLE, CILIATE, DENTATE, CRENATE, SERRATED, DOUBLE SERRATED, LOBED, DOUBLE LOBED
APEX	ACUTE, CUSPIDATE, OBTUSE, RETUSE, MUCRONATE
LEAF BASE	ATTENUATE, CORDATE, ROUNDED, ASYMMETRIC, CUNEATE, OBLIQUE, SAGITATE, HASTATE
PETIOLE	LONG, SHORT, SESSILE, WIDE

FLOWER	
SIZE	HERMAPHRODITE (MALE/FEMALE FLOWERS): (CM OR MM)
TYPE	UNISEX, HERMAPHRODITE
REPRODUCTION	MONOECIOUS, DIOECIOUS, HERMAPHRODITE, POLYGAMY, SYNOICOUS, STERILE
FLOWERING	SINGLE; INFLORESCENCE IN CORYMB, CYMOSE, RACEME, SPIKE, UMBEL, CATKIN, SPADIX, FLORET OR CAPITULUM, PANICLE (+ INFLORESCENCE SIZE (IN CM OR MM))
FRAGRANCE	YES, NO, UNPLEASANT
FRUIT	
SIZE	IN CM OR MM
TYPE	FOLLICLE, PLURIFOLLICLE, LEGUME, LOMENT, SAMARA, DOUBLE SAMARA, PLURISAMARA , CAPSULE, POLYATHENE, TETRACHENE, NUT, ACHENE; SYCONIUM, HESPERIDIUM, PLURISAMARA, ACORN, COMPOUND FRUIT, PLURIFOLLICLE, BERRY, RACEME, POME, BALAUSTA, DRUPE, CONIFER CONE, PSEUDO CONIFER, CONE, PINE
EDIBLE FRUIT	YES, NO
COLOR OF FRUIT	RED, GREEN, YELLOW, BROWN, BLACK, PALE, WHITE, PURPLE
FRUITING SEASON	INTERVAL OF MONTHS: JAN, FEB, MAR, APR, MAY, JUN, JUL, AGO, SEP, OCT, NOV, DEC
DEVELOPMENT	
GROWTH	SLOW, VERY SLOW, MEDIUM, FAST, VERY FAST
LONGEVITY	<25 YEARS, 25 YEARS, 50 YEAR, 75 YEARS, 100 YEARS, 150 YEARS, 200 YEARS, 250 YEARS, 300 YEARS, >300 YEARS
ECOLOGY	
CLIMATE	
ALTITUDE	NATURAL HEIGHT OF THE PLANT: interval of sea level altimetry
IRRIGATION	++HIGH, MODERATE, LOW, ++LOW (very low/low < 350 mm; Very high/high > 750 mm)
MINIMUM TEMPERATURE AND INTERNATIONAL CLASSIFICATION	MINIMUM TEMPERATURES: DEGREES CELSIUS **CLASSIFICATION ACCORDING TO EUROPEAN REGULATION**: (SEE MAP) G2____ HOT GREENHOUSES IN SOUTHERN EUROPE G1____ COLD GREENHOUSES IN SOTHERN EUROPE H5____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM OºC TO -5ºC H4____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM -5ºC TO -10ºC H3____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM -10ºC TO -15ºC H2____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM -15ºC TO -20ºC H1____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM -20. **CLASSIFICATION INTERNATIONAL REGULATIONS.** ACCORDING TO MINIMUM TEMPERATURE RANGES Z1____SUPPORT MINIMUM TEMPERATURES OF -50ºC Z2____ SUPPORT MINIMUM TEMPERATURES OF -50ºC TO -40ºC Z3____ SUPPORT MINIMUM TEMPERATURES OF -40ºC TO -30ºC Z4____ SUPPORT MINIMUM TEMPERATURES OF -30ºC TO -20ºC Z5____ SUPPORT MINIMUM TEMPERATURES OF -20ºC TO -10ºC Z6____ SUPPORT MINIMUM TEMPERATURES OF -10ºC TO -0ºC Z7____ SUPPORT MINIMUM TEMPERATURES OF -0ºC TO 10ºC Z8____ SUPPORT MINIMUM TEMPERATURES OF 10ºC TO 20ºC Z9____ SUPPORT MINIMUM TEMPERATURES OF 20ºC TO 30ºC Z10___ SUPPORT MINIMUM TEMPERATURES OF 30ºC TO 40ºC Z11___ SUPPORT MINIMUM TEMPERATURES OF MORE THAN 40ºC
EXPOSURE TO SUNLIGHT	FULL SUN, FULL SHADE, SHADE, PART SHADE

DROUGHT RESISTANCE	YES, NO; MODERATE
FROST RESISTANCE	YES, NO; MODERATE
SOIL	
PH OPTIMUM	PH: ALL TYPES; NEUTRAL, ACID, BASIC (OR INTERVAL OF PH)
LEVEL OF FERTILITY	FERTILE, AVERAGE, POOR
TEXTURE OF SOIL	SANDY, SLIT OR LOAMY, CLAYEY, SANDY/LOAMY, CLAYEY/LOAMY - ALL TYPES
DRAINAGE	HIGH, MODERATE, LOW
RESISTANCE TO SEA	YES, NO, MODERATE
RESISTANCE TO LIME	YES, NO, MODERATE
USES	
RESISTANCES	
COASTAL	1ST LINE, 2ND LINE, NO.
RESISTANCE TO POLLUTION	HIGH, MODERATE, LOW
RESISTANCE TO WIND	HIGH, MODERATE, LOW
APPLICATIONS	
IN SLOPES **IN LINES** **ON RIVERBANKS** **AS WINDBREAKERS** **IN HEDGES** **IN FIELD BORDERS** **IN GROUPS** **ISOLATED**	YES, NO
SPACING	MINIMUM RECOMMENDED DISTANCE BETWEEN PLANT: M, CM
PLANTING AND PLANT HEALTH	
PLANTING AND PLANT HEALTH	
CALENDARS	
CHROMATIC CALENDAR	FOLIAGE, FLOWERING, FRUITING SEASON: the color white represented with grey or black cell
CULTIVATION CALENDAR	SOWING, PLANTING, PRUNING
TREATMENTS CALENDAR	FUNGICIDES, PESTICIDES, FERTILIZERS, HERBICIDES
COMMERCIALIZATION	
PRESENTATION	BR (BARE ROOT), CT (CONTAINER or POT (LITERS), CE (ROOT BALL); CEY (ROOT BALL IN GYPSUM), ROOT BALL IN MESH
STEM GIRTH(TREE)	GIRTH (perimeter): CM or years, or SAMPLE, or shrubs (in tree species)
HEIGHT (SHRUBS, CONIFERS AND PALMS)	HEIGHT: CM, M

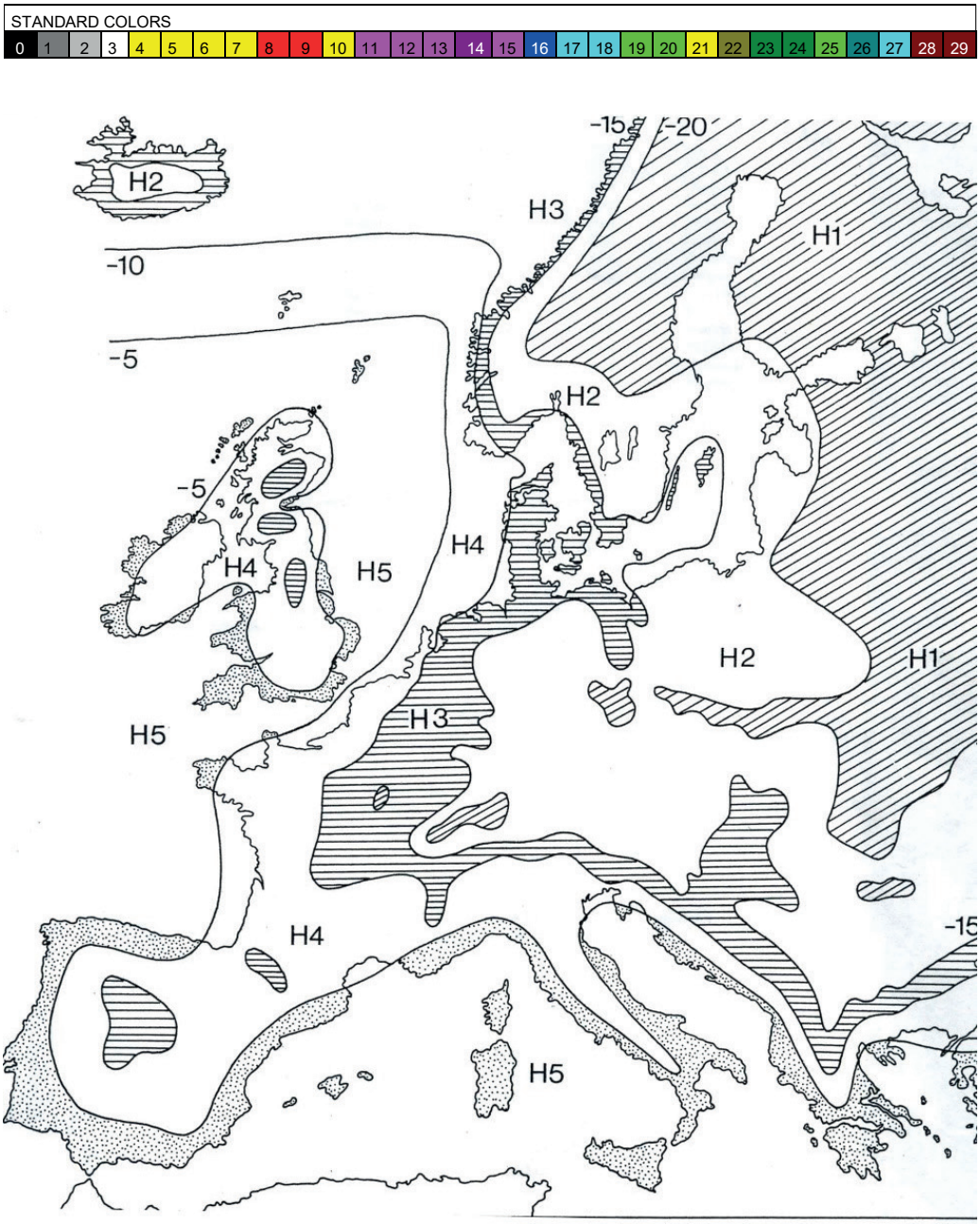


Figure 9.2.1: Thermal classification map according to European regulations

LIST OF HEDGES AND TOPIARY SPECIES DESCRIBED

1. *Buxus sempervirens*
2. *Carpinus betulus*
3. *Cotoneaster franchetti*
4. *Escallonia rubra*
5. *Lingustrum ovalifolium*
6. *Mahonia aquifolium*
7. *Myoporum laetum*
8. *Myrtus comunis*
9. *Prunus laurocerasus*
10. *Teucrium fruticans*
11. *Viburnum tinus*

BUXUS

HEDGE AND TOPIARY

Buxus sempervirens

BOJ	BOIX	BOXWOOD	BUIS
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Shape: OVOID	Height: 3-5M	Diameter: 3-4M
Texture: FINE	Shade: LIGHT	Root: HORIZTONAL

DIVISION:	SPERMATOPHYTE
SUBDIVISION:	ANGIOSPERM
TYPE:	DICOTYLODON
ORDER:	EUPHORBIALES
FAMILY:	BUXACEAE

VARIETIES

ARGENTEOVARIEGATA
AUREOVARIEGATA , BLAUER HEINZ
ELEGANTISSIMA , LATIOLA MACULATA
LINERAIIFOLIA , RAKET , ROTUNDIFOLIA

MORPHOLOGY

Trunk	Bark: SMOOTH	Color: GREENISH/GRAY
Leaf	COMPOUND: NO	
EVERGREEN	HARDNESS: CORIACEOUS	
SIZE: 2-3CM	ARRANGEMENT: OPPOSITE	
COLOR: US:DARK GREEN	VENATION: PINNATE	
LS: YELLOW/GR.	SHAPE: OVAL	
TEXTURE: US:GLOSSY	MARGIN: ENTIRE	
LS: ROUGH	APEX: EMARGINATE	
	LEAF BASE: ROUNDED	
	PETIOLE: SHORT	
Flower	Type: UNISEXUAL	Reproduction: MONOECIOUS
SIZE AND TYPE: ♂/M 1 MM, ♀/F 1 MM	Flowering: RACEME	Fragrant: YES
Fruit	Type: CAPSULE	Color: DARK BROWN
SIZE: 0.8-10 MM	Edible: NO	Fruiting season: SEPT-NOV
Growth	Rate: SLOW	Longevity: > 200 YEARS





ECOLOGY

Climate	Temperature: -23ºC; H1; Z4	Drought resistant: MODERATE
ALTITUDE: 400-2000	Sun exposure: SHADE/PARTIAL SHADE	Frost resistant: YES
IRRIGATION: HIGH		
Soil	Texture: LOAMY	Salt resistant: MODERATE-LOW
pH: 5.5-7.5	Drainage: HIGH	Lime resistant: MODERATE
FERTILITY: HIGH		

USES

Resistances		Applications			
COASTAL:	MODERATE	SLOPES:	NO	CARPET:	NO
POLLUTION:	MODERATE	RIVERBANKS:	NO	WINDBREAKER:	NO
WIND:	MODERATE	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

This species can be found in the Mediterranean region, and northeast of the Peninsula: Catalonia, Pyrenees, Navarra, Maestrazgo, reaching the Valencian Community. It is located in calcareous mountainous zones with a cold climate. It tolerates shade and shallow soils well. It is a protected plant in many Autonomous Communities of Spain. Although this species can provoke allergies, it is used mainly for hedges and topiary. Since it does not flower, it reduces the problems it may cause to people.

TYPICAL SPACING FOR HEDGES: 0.3-1 M

PLANTING AND PLANT HEALTH

It tolerates transplanting if it is carried out in its dormant stage and with a root ball. Drought is the worst abiotic disease for this plant. It is resistant to pests and diseases. The machinery and tools used in pruning must be disinfected and especially if the same tools are used on other species of plants (this reduces the risk of passing on plagues and diseases to other plants). Boxwood plants intended as low hedges are often sold bare root.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
	X	X	X	X	X	X	X	X	X	X	X

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Height (cm)	Topiary shapes
BR	10-15	No
BR	15-20	No
BR	20-25	No
CT2	10-15	No
CT3	15-20	No
CT9	20-25	No
CT15	25-30	Yes
CT25	30-35	Yes
CT30	35-40	Yes
CT50	40-50	Yes
CT60	50-60	Yes
CT60	60-80	Yes

CARPINUS

Carpinus betulus

HEDGE AND TOPIARY

CARPE	CARPÍ	HORNBEAM	CHARME COMMUN
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Shape: PYRAMID	Height: 20M	Diameter: 6-8M
Texture: MEDIUM	Shade: PARTIAL	Root: HORIZONTAL

DIVISION:	SPERMATOPHYTE
SUBDIVISION:	ANGIOSPERM
TYPE:	DICOTYLEDON
ORDER:	FAGALES
FAMILY:	BETULACEAE

VARIETIES

FASTIGIATA
FRANS FONTAINE
PURPUREA

MORPHOLOGY		
Trunk	Bark: GROOVED	Color: GRAY
Leaf	COMPOUND: NO	
DECIDUOUS-MARCESCENCE	HARDNESS: CORIACEOUS	
SIZE: LEAF:6-12CM	ARRANGEMENT: ALTERNATE	
	VENATION: PINNATE	
	SHAPE: OVAL	
COLOR: US: DARK GREEN	MARGIN: DENTATE	
LS: DARK GREEN	APEX: ACUTE	
TEXTURE: US: ROUGH	LEAF BASE: ROUNDED	
LS: ROUGH	PETIOLE: LONG	
Flower	Type: UNISEXUAL	Reproduction: UNISEXUAL
SIZE AND TYPE: 3-5 CM	Type: CATKIN	Fragrant: NO
Fruit	Type: NUT	Color: BROWN
SIZE: 4 CM	Edible: NO	Fruiting season: SEPT-NOV
Growth	Rate: MODERATE	Longevity: 100-200 YEARS

ECOLOGY		
Climate	Temperature: -29ºC; H1; Z4	Drought resistant: MODERATE-LOW
ALTITUDE: 400-2000	Sun exposure: SHADE/PARTIAL SHADE	Frost resistant: YES
IRRIGATION: HIGH		
Soil	Texture: LOAMY/SANDY	Salt resistant: NO
pH: 5-7.5	Drainage: MODERATE	Lime resistant: YES
FERTILITY: MODERATE		

USES			
Resistances		Applications	
COASTAL: 2ND LINE		SLOPES: NO	CARPET: NO
POLLUTION: YES		RIVERBANKS: NO	WINDBREAKERS: Yes
WIND: YES		GROUPS: YES	ISOLATED: Yes



POINTS OF INTEREST

This species can be found in Europe and Near Asia, the Iberian Peninsula is the southwestern limit (Navarra), although in the past it reached as far as Andalusia. Lives in fresh deciduous forests in rich (not very acidic) soils. The fruits remain during the winter, giving it an interesting appearance. This species is used for hedges and since it is deciduous, it sprouts in both spring and autumn offering an interesting foliar coloration. The autumn leaves remain entangled in the mesh of branches and twigs of the shrubs that form it. The wood was widely used, it is a dye plant (yellow) and provides coal. It is known to provoke allergies however, if it is pruned and does not flower, there is minimal risk to people. The leaves are marcescent and remain on the twigs without falling.

PLANTING AND PLANT HEALTH

Resistant to pests and diseases. Lack of humidity and salt burns (if placed near the sea) can affect this species.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
							X	X	X	X	

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Height (cm)	Topiary shapes
CT3	20-30	No
CT7	30-40	No
CE	60-80	No
CE	80-100	Yes
CE	100-125	Yes
CE	125-150	Yes
CE	150-175	Yes
CE	175-200	Yes
CE	200-250	Yes
CE	250-300	Yes
CE	400-450	Yes
CE	450-500	Yes

COTONEASTER

HEDGE AND TOPIARY

Cotoneaster franchetii

GRIÑOLERA (SPANISH) · CORNERA DE FRANCHET (VALENCIAN) · COTONEASTER (ENGLISH) · COTONEASTER (FRENCH)

STRUCTURE		
Shape: OVAL	Height: 1-4M	Diameter: 1-3 M
Texture: MEDIUM	Shade: LIGHT	Root: HORIZONTAL

DIVISION:	SPERMATOPHYTE
SUBDIVISION:	ANGIOSPERM
TYPE:	DICOTYLEDON
ORDER:	ROSALES
FAMILY:	ROSACEAE

VARIETIES

MORPHOLOGY		
Trunk	Bark: SMOOTH	Color: BROWN
Leaf	COMPOUND: NO	
SEMI-EVERGREEN	HARDNESS: CORIACEOUS	
SIZE: 2-3CM	ARRANGEMENT: ALTERNATE	
	VENATION: PINNATE	
	SHAPE: OVAL	
COLOR: US: GREEN	MARGIN: ENTIRE	
LS: LIGHT GREEN	APEX: MUCRONATE	
TEXTURE: US:SMOOTH	LEAF BASE: ROUNDED	
LS:TOMENTOSE	PETIOLE: SHORT	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE AND TYPE: 0.8-1 CM	Flowering: CORYMB	Fragrant: YES
Fruit	Type: POME	Color: ORANGE
	Comestible: NO	Fruiting Season: SEPT-OCT
SIZE: 0.8-1 CM		
Growth	Rate: MODERATE	Longevity: 10-25 YEARS

ECOLOGY		
Climate	Temperature: -23ºC; H1; Z4	Drought resistant: YES
ALTITUDE: 0-1200	Sun exposure: SUN/PARTIAL SHADE	Frost resistant: YES
IRRIGATION: MODERATE		
Soil	Texture: LOAMY	Salt resistant: MODERATE
pH: 5-8.5	Drainage: LOW	Lime resistant: YES
FERTILITY: MODERTATE		

USES					
Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	YES	CARPET:	YES
POLLUTION:	YES	RIVERBANKS:	NO	WINDBREAKER:	YES
WIND:	YES	GROUPS:	YES	ISOLATED:	YES



POINTS OF INTEREST

Native to Western China and Tibet. This species can be found in mountainous areas with limestone soils. Its fruit is slightly toxic. Widely used as bushes and hedges due to their impenetrability. Its planting has been mishandled due to its ease of cultivation and its hardiness, but nevertheless, it remains one of the most economical hedges. When carrying out a maintainence pruning, avoid trimming the lower branches so that the lower part of the bushes can be cleaned (this is where most dirt accumulates). If those branches are pruned in their adult state, it is very difficult to clean and therefore recovering its lower foliage is complicated. For many months the fruits remain on the bush offering an interesting and visible color.

TYPICAL SPACING FOR HEDGES: 0.5 -1 M

PLANTING AND PLANT HEALTH

This species belongs to the rosacea family and therefore is widely cultivated throughout Spain (especially the genus *Cotoneaster* and *Pyracantha*). As a result, there is a danger that fire blight (a common plague in this species) may be introduced and generalized, therefore, it is essential that the plant is purchased with a sanitary guarantee.Planting and caring for this species does not present any specific challenges.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
				X	X	X	X	X	X		

Sowing · Planting · Pruning (X)

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides · Pesticides · Fertilizers

COMMERCIALIZATION

Presentation	Height (cm)	Topiary shape
CT2	25-30	No
CT3	30-35	No
CT7	35-40	No
CT9	40-50	No
CT30	50-60	No
CT50	60-80	Yes

ESCALLONIA

HEDGE AND TOPIARY

Escallonia rubra

ESCALLONIA SPANISH | ESCALLONIA VALENCIAN | ESCALLONIA ENGLISH | ESCALLONIA FRENCH

STRUCTURE		
Shape: OVAL	Height: 1-2 M	Diameter: 2-5 M
Texture: MEDIUM	Shade: PARTIAL	Root: HORIZONTAL

DIVISION:	SPERMATOPHYTE
SUBDIVISION:	ANGIOSPERM
TYPE:	DICOTYLEDON
ORDER:	ROSALES
FAMILY:	ESCALLONIACEAE

VARIETIES

CRIMSON SPIRE
INGRAMII, VERYI
MACRANTHA
WILLIAM WATSON

MORPHOLOGY		
Trunk	Bark: SMOOTH	Color: GREEN/RED
Leaf: EVERGREEN; SIZE: 2-5 CM; COLOR: US: LIGHT GREEN, LS: LIGHT GREEN; TEXTURE: US: ROUGH, LS: ROUGH	COMPOUND: NO; HARDNESS: CORIACEOUS; ARRANGEMENT: ALTERNATE; VENATION: PINNATE; SHAPE: OVAL; MARGIN: SERRATE; APEX: ACUTE; LEAF BASE: ATTENUATE; PETIOLE: SHORT	
Flower; SIZE AND TYPE: 1-2 CM	Type: RACEME 5-10CM	Reproduction: HERMAPHRODITE; Fragrant: NO
Fruit; SIZE: 0.8-1.5 CM	Type: CAPSULE; Edible: NO	Color: PURPLE; Fruiting season: SEPT-NOV
Growth	Rate: MODERATE	Longevity: 25-50 YEARS

ECOLOGY		
Climate; ALTITUDE: 100-1200; IRRIGATION: LOW	Temperature: -12ºC; H3; Z5; Sun exposure: SUN/PARTIAL SHADE	Drought resistant: MODERATE; Frost resistant: YES
Soil; pH: 5.5-8; FERTILITY: MODERATE	Texture: LOAMY/SANDY; Drainage: MODERATE	Salt resistant: YES; Lime resistant: MODERATE

USES		
Resistances	Applications	
COASTAL: 1ST LINE	SLOPES: NO	CARPET: MOD
POLLUTION: YES	RIVERBANKS: YES	WINDBREAKER: YES
WIND: YES	GROUPS: YES	ISOLATED: YES



POINTS OF INTEREST

Native to Chile and Southern Argentina, in cool and humid forests and scrub, near flows of water. It can become wild. It requires a fertile and well-drained soil. The *Macrantha* variety is more suited to coastal areas. It works well as a flowering hedge plant. Prune once flowering has finished to ensure abundancy in subsequent years. The substrate must be rich to guarantee good flowering.

TYPICAL SPACES FOR HEDGES: 0.7-1.5M

PLANTING AND PLANT HEALTH

Planting can take place at the end of winter and spring. Avoid planting late in the season, even in a container. It has good resistance to pests and diseases.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
					X	X	X	X	X	X	X

Sowing | Planting | Pruning (X)

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation	Height (cm)	Topiary Shape
CT2	20-25	No
CT3	25-30	No
CT7	30-35	No
CT9	35-40	No
CT15	35-40	No
CT50	40-50	Yes

LIGUSTRUM

HEDGE AND TOPIARY

Ligustrum ovalifolium

ALIGUSTRE DE HOJA OVAL	TROANELLA	CALIFORNIA PRIVET	TROÈNE DE CALIFORNIE
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Shape: OVAL	Height: 1-4 M	Diameter: 2-3 M
Texture: MEDIUM	Shape: PARTIAL	Root: HORIZONTAL

DIVISION:	SPERMATOPHYTE
SUBDIVISION:	ANGIOSPERM
TYPE:	DICOTYLEDON
ORDER:	GENTIANALES
FAMILY:	OLEAECEAE

VARIETIES

AUREUM
ALBOMARGINATUM
ARGENTEUM
COMPACTUM , NANUM, GLOBOSUM

MORPHOLOGY

Trunk	Bark: SMOOTH	Color: GRAY
Leaf: EVERGREEN; SIZE: 5-7 CM; COLOR: US: DARK GREEN, LS: GR./YELLOW; TEXTURE: US: SMOOTH, LS: SMOOTH	COMPOUND: NO; HARDNESS: MEDIUM; ARRANGEMENT: OPPOSITE; VENATION: PINNATE; SHAPE: ELLIPTICAL; MARGIN: ENTIRE; APEX: ACUTE; LEAF BASE: ROUNDED; PETIOLE: MEDIUM	
Flower; SIZE AND TYPE: 0.8-1 CM	Type: HERMAPHRODITE	Reproduction: HERMAPHRPDITE
	Flowering: PANCILE -10 CM	Fragrant: YES
Fruit; SIZE: 0.6-0.8 CM	Type: BERRY	Color: BLACK
	Edible: NO	Fruiting season: SEP-OCT
Growth	Rate: HIGH	Longevity: 25-50 YEARS



ECOLOGY

Climate	Temperature: - 29ºC; H1; Z4	Drought resistant: MODERATE
ALTITUDE: 200-1200; IRRIGATION: MODERATE	Sun exposure: SUN/PARTIAL SHADE	Frost resistant: MODERATE
Soil	Texture: LOAMY/SANDY	Salt resistant: NO
pH: 5-8.5; FERTILITY: MODERATE	Drainage: MODERATE	Lime resistant: YES

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	YES	CARPET:	NO
POLLUTION:	YES	RIVERBANKS:	YES	WINDBREAKER:	YES
WIND:	YES	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Native to Japan, from the middle riverside areas. Widely used as a formal hedge through pruning or as an informal hedge. The flowers have an unpleasant fragrance and so if pruned as a formal hedge it will not flower. If used to form hedges, they require plenty of water, sun, and fertilizer.

TYPICAL SPACING FOR HEDGES: 0.7-0.3 M

PLANTING AND PLANT HEALTH

Planting should be done at the end of winter and beginning of spring, although it can withstand other periods of planting. Transplanting and rooting are easy. Due to its rapid growth rate, it requires up to three prunings per year (two in April and May and one in September).

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
			X	X	X	X	X	X	X	X	X

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Height (cm)	Topiary shapes
BR	60-80	No
BR	80-100	No
BR	100-125	No
CT2	20-40	No
CT3	40-60	No
CT7	80-100	No
CT9	125-150	Yes
CT50	200-250	Yes
CE	60-80	Yes
CE	80-100	Yes
CE	100-125	Yes
CE	125-150	Yes

MAHONIA

Mahonia aquifolium

HEDGES AND TOPIARY

MAHONIA SPANISH	MAHÒNIA VALENCIAN	OREGON GRAPE ENGLISH	MAHONIA FRENCH

STRUCTURE		
Shape: OVAL	Height: 1-2 M	Diameter: 1-2 M
Texture: 1-2M	Shade: LIGHT	Root: HORIZONTAL

DIVISION:	SPERMATOPHYTA
SUBDIVISION:	ANGIOSPERMAE
TYPE:	DICOTYLEDONEAE
ORDER:	ROSALES
FAMILY:	BERBERIDACEAE

VARIETIES

APOLLO, ORANGE FLAME
ATROPURPUREA
GREEN RIPPLE
SMARAGAGE, FASCICULATA

MORPHOLOGY		
Trunk	Bark: VERTICALLY FISSURED	Color: GREEN
Leaf: EVERGREEN; SIZE: LEAF:10-25CM, LEAFLET:4-6CM; COLOR: US:DARK GREEN, LS: GREEN; TEXTURE: US:GLOSSY, LS: GLOSSY	COMPOUND: IMPARIPINNATE; HARDNESS: CORIACEOUS; ARRANGEMENT: OPPOSITE; VENATION: PINNATE; SHAPE: OVATE; MARGIN: ONDULATE-SPINE; APEX: ACUTE; LEAF BASE: ATTENUATE; PETIOLE: SESSILE	
Flower: SIZE AND TYPE: 0.6-0.8 CM	Type: HERMAPHRODITE; Flowering: PANICLE 8-10CM	Reproduction: HERMAPHRODITE; Fragrant: YES
Fruit: SIZE: 0.8-1 CM	Type: BERRY; Edible: YES	Color: BLACK; Fruiting Season: JUNE-AUG
Growth	Rate: MODERATE	Longevity: 15-25 YEARS

ECOLOGY		
Climate: ALTITUDE: 0-1200M; IRRIGATION: LOW	Temperature: -29ºC; H1; Z4; Sun exposure: SUN/PARTIAL SHADE	Drought resistant: MODERATE; Frost resistant: YES
Soil: pH: 5-8; FERTILITY: MODERATE	Texture: LOAMY; Drainage: LOW	Salt resistant: MODERATE; Lime resistant: MODERATE

USES			
Resistances		Applications	
COASTAL: 2ND LINE		SLOPES: YES	CARPET: YES
POLLUTION: YES		RIVERBANKS: YES	WINDBREAKER: NO
WIND: YES		GROUPS: YES	ISOLATED: YES



POINTS OF INTEREST

Native to North America (California and Oregon). It can be found on riverbanks, underbrush and prefers cool, shady places. It is very common in gardening. It is a stoloniferous plant, which means that over the years, stems will emerge from the roots and invade new spaces (delimited by a wall, sidewalk, geotextile surfaces). Over time, maintenance will not increase, but if it is necessary, plants that are in unwanted places must be removed. In case of open spaces, it should not be used as a formal hedge. This species is more suitable as an informal hedge, without formative pruning. As a species it offers the reddish coloration of autumn and spring, the yellow flowering and the black fruiting during the winter. The leaf has thorns and therefore can be considered a defensive species and, of course, its use, both as a hedge or as a bush should be kept away from children's play areas.

TYPICAL SPACING FOR HEDGES 0.7-1.5 M

PLANTING AND PLANT HEALTH

Planting should take place in the winter months and early spring. Transplanting is easy. Pruning should be carried out on the stems that are directed away from the center of the plant or from the planting site. Rejuvenation pruning must be done to remove old and dry stems making way for a new root and only after flowering and on old branches.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
			X	X	X	X	X	X	X		

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Height (cm)	Topiary shapes
CT3	30-40	No
CT7	40-50	No
CT9	40-50	No
CT30	50-60	No
CT50	50-60	No

MYOPORUM

Myoporum laetum

HEDGES AND TOPIARY

MIOPORO, TRASPARENTE SPANISH	MIOPORO VALENCIAN	MYOPORUM ENGLISH	MYOPORUM FRENCH

STRUCTURE

Shape	Height	Diameter
ROUND	4-8 M	4-6 M
Texture	**Shade**	**Root**
COARSE	PARTIAL	HORIZONTAL

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	SCROPHULARIALE
FAMILY:	MYOPORACEAE

VARIETIES

MORPHOLOGY

Trunk	Bark: SCALY	Color: GRAY
Leaf	COMPOUND: NO	
EVERGREEN	HARDNESS: SOFT	
SIZE: Leaf: 4-14 CM	ARRANGEMENT: ALTERNATE	
	VENATION: PINNATE	
	SHAPE: OBOVATE	
COLOR: US: GR./YELLOW	MARGIN: SERRATE	
LS: GR./ YELLOW	APEX: ACUTE	
TEXTURE: US: VISCOSE	LEAF BASE: CUNEATE	
LS: VISCOSE	PETIOLE: SHORT	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE AND TYPE: 1-1.5 CM	Flowering: SOLITARY	Fragrant: NO
Fruit	Type: DRUPE	Color: BLACK
SIZE: 0.5-1 CM	Edible: NO	Fruiting season: SEPT-OCT
Growth	Rate: FAST	Longevity: 50-100 YEARS










ECOLOGY

Climate	Temperature: -7ºC;H4; Z6	Drought resistant: MODERATE
ALTITUDE: 0-1000	Sun exposure: SUN	Frost resistant: LOW
IRRIGATION: LOW		
Soil	Texture: SANDY	Salt resistant: YES
pH: 5-8	Drainage: MODERATE	Lime resistant: YES
FERTILITY: MODERATE		

USES

Resistances		Applications			
COASTAL:	1ST LINE	SLOPES:	YES	CARPET:	NO
POLLUTION:	YES	RIVERBANKS:	YES	WINDBREAKER:	YES
WIND:	YES	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Native to New Zealand. It can be cultivated in the coastal areas of the Mediterranean region and regions with a warm climate. It is also a naturalized species. It has good resistance to sea but has low resistant to frost especially when young. For hedges, *Myoporum insulare* is widely used. (*Myoporum tenuifolium* is a synonym of *M. laetum)* . Widely used for medium-height hedges. Flowers are white.

TYPICAL SPACING FOR HEDGES: 1.5-0.7 M

PLANTING AND PLANT HEALTH

Planting should be carried out late spring and summer (when possible frosts have passed). Pruning at the end of winter, shortening 1/3 all the twigs.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
	X	X	X	X	X						

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Height (cms)	Topiary shapes
CT2	30-40	No
CT3	40-50	No
CT7	50-60	No
CT30	80-100	Yes
CT50	125-150	Yes
CT70	150-175	Yes
CT85	175-200	Yes

MYRTUS

HEDGES AND TOPIARY

Myrtus communis

MIRTO, ARRAYÁN	MURTA	MYRTLE	MYRTE
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Shape: OVAL	Height: 2-5 M	Diameter: 2-4 M
Texture: MEDIUM	Shade: PARTIAL	Root: HORIZONTAL

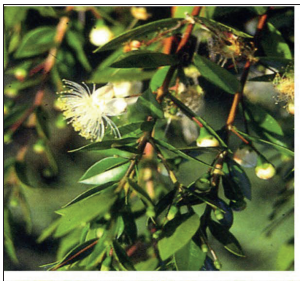
DIVISION:	SPERMATOPHYTE
SUBDIVISION:	ANGIOSPERM
TYPE:	DICOTYLEDON
ORDER:	MYRTALES
FAMILY:	MYRTACEAE

VARIETIES

TARENTINA, ITALICA, ROMANA
TARENTINA MICROPHYLL A
TARENTINA VARIEGATA
VARIEGATA

MORPHOLOGY

Trunk	Bark: SCALY	Color: BROWN/RED
Leaf: EVERGREEN; SIZE: 2-4 CM; COLOR: US: DARK GREEN, LS: GREEN; TEXTURE: US: GLOSSY, LS: GLOSSY	COMPOUND: NO; HARDNESS: SOFT; ARRANGEMENT: OPPOSITE; VENATION: PINNATE; SHAPE: LANCEOLATE; MARGIN: ENTIRE; APEX: ACUTE; LEAF BASE: CUNEATE; PETIOLE: SHORT	
Flower; SIZE AND TYPE: 2-3 CM	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
	Flowering: SOLITARY	Fragrant: YES
Fruit; SIZE: 0.6-0.8 CM	Type: BERRY	Color: BLACK
	Edible: YES	Fruiting season: OCT-NOV
Growth	Rate: MEDIUM	Longevity: 50-100 YEARS











ECOLOGY

Climate; ALTITUDE: 0-1000 M; IRRIGATION: MODERATE	Temperature: -12ºC; H3; Z5	Drought resistant: MODERATE
	Sun expiosure: SUN	Frost resistant: NOT EXTREME
Soil; pH: 5.5-8; FERTILITY: MODERATE	Texture: LOAMY/SANDY	Salt resistant: MODERATE
	Drainage: MODERATE	Lime resistant: MODERATE

USES

Resistances		Applications			
COASTAL:	MODERATE	SLOPES:	MOD	CARPET:	YES
POLLUTION:	YES	RIVERBANKS:	YES	WINDBREAKER:	YES
WIND:	YES	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Native to the Mediterranean region in the Balearic Islands and on the Iberian Peninsula in Extremadura, Andalusia, Levante and Catalonia. It has low resistance to strong frosts and does well in humid and well-drained substrate. The flower is yellowish white. Both its leaves and flowers are scented. It has important medicinal properties. The fruits have been used in confectionery, for the elaboration of wines and as condiment. The myrtle is protected in the Balearic Islands (Decree 24/1992, of March 12, B.O.C.A.I.B. of 2-4-1992). It has been cultivated as an ornamental plant since ancient times.

TYPICAL SPACING FOR HEDGES: 0.3-0.5

PLANTING AND PLANT HEALTH

Plant and transplant in late winter. Lack of light will leave the branches with very little vitality. Pruning is done in spring. If the aim is develop a flowering hedge, pruning must be carried out in the summer, once flowering has finished.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
						X	X	X	X	X	X

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Height (cm)	Topiary shapes
CT2	15-20	No
CT3	20-25	No
CT7	25-30	Yes
CT9	30-40	Yes
CT30	60-80	Yes
CT50	80-100	Yes

PRUNUS *Prunus laurocerasus*

HEDGE AND TOPIARY

LAUREL CEREZO, LAUROCERASO (SPANISH) | LLORER-CIRER (VALENCIAN) | CHERRY LAUREL (ENGLISH) | LAURIER-CERISE (FRENCH)

STRUCTURE		
Shape: OVAL	Height: 4-6 M	Diameter: 2-4 M
Texture: COARSE	Shade: PARTIAL	Root: FASICULATE

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	ROSALES
FAMILY:	ROSACEAE

VARIETIES

CAUCASICA, ROTUNDIFOLI
HERBERGII, VARIEGATUM
ZEBELIANA, OTTO LUYKEN

MORPHOLOGY		
Trunk	Bark: ROUGH	Color: DARK BROWN
Leaf: EVERGREEN; SIZE: 8-15 CM; COLOR: US: DARK GREEN, LS: GREEN; TEXTURE: US: SMOOTH, LS: SMOOTH	COMPOUND: NO; HARDNESS: CORIACEOUS; ARRANGEMENT: ALTERNATE; VENATION: PINNATE; SHAPE: ELIPTICAL; MARGIN: ENTIRE; APEX: OBTUSE; LEAF BASE: CUNEATE; PETIOLE: SHORT	
Flower; SIZE AND TYPE: 0.8-1 CM	Type: HERMAPHRODITE; Flowering: RACEME 8-10CM	Reproduction: HERMAPHRODITE; Fragrant: YES
Fruit; SIZE: 1-1.2 CM	Type: DRUPE; Edible: NO	Color: BLACK; Fruiting season: SEPT-OCT
Growth	Rate: MEDIUM	Longevity: 25-50 YEARS

ECOLOGY		
Climate; ALTITUDE: 100-1000; IRRIGATION: HIGH	Temperature: -17ºC; Z5; H2; Sun exposure: SUN/PARTIAL	Drought resistant: MODERATE; Frost resistant: YES
Soil; pH: 5-8; FERTILITY: MODERATE	Texture: SANDY; Drainage: MODERATE	Salt resistant: NO; Lime resistant: YES

USES				
Resistances		Applications		
COASTAL:	2ND LINE	SLOPES:	NO	CARPET: NO
POLLUTION:	YES	RIVERBANKS:	MOD	WINDBREAKER: Yes
WIND:	YES	GROUPS:	YES	ISOLATED: Yes





POINTS OF INTEREST

Native to Eastern Europe, the Balkan Peninsula, Turkey and Iran. Found in slightly humid mid-mountain areas. The flower is a whitish cream color. The leaves and fruit have medicinal properties that must be handled with care. These plants should never be placed near children's areas, nurseries and schools. It is used for informal hedging and of a certain width and height.

TYPICAL SPACING FOR HEDGES: 1.5-0.7 M

PLANTING AND PLANT HEALTH

Planting is easy and should be done at the end of winter - beginning of spring. It is frequently attacked by mealybug, therefore the bushes must be treated with the appropriate phytosanitary treatments. Pruning should be done before bud break (around April-end of March) and when not used as a formal hedge. Rejuvenation pruning can be carried out if the plant is losing vitality. If it is used as a formal hedge, during the months of August-September a second pruning must be done.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
			X	X	X	X	X	X	X	X	X

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Height (cm)	Topiary shapes
CT3	40-60	Yes
CT3	60-80	Yes
CT3	80-100	Yes
CT7	100-125	Yes
CT9	125-150	Yes
CT50	170-200	Yes

TEUCRIUM

HEDGE AND TOPIARY

Teucrium fruticans

OLIVILLA BLANCA	TEUCRÍ FRUTICÓS	TREE GERMANDER	ARBRISSEAU
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE

Shape	Height	Diameter
OVAL	1-2 M	0.5-1 M
Texture	**Shade**	**Root**
MEDIUM	LIGHT	SCATTERED

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	LAMIALES
FAMILY:	LABIATAE

VARIETIES

AZUREUM

PYRAMIDALIS

MORPHOLOGY

Trunk	Bark: SCALY	Color: GRAY
Leaf	COMPOUND: NO	
	HARDNESS: SOFT	
EVERGREEN	ARRANGEMENT: OPPOSITE	
SIZE: 2-2.5 CM	VENATION: PINNATE	
	SHAPE: OVAL	
COLOR: US: GREEN	MARGIN: ENTIRE	
LS: TOMENTOSE	APEX: ACUTE	
TEXTURE: US: SMOOTH	LEAF BASE: DECURRENT	
LS: TOMENTOSE	PETIOLE: SHORT	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE AND TYPE: 1-2 CM	Flowering: RACEME 5-7CM	Fragrant: YES
Fruit	Type: NUT	Color: DULL BROWN
SIZE: 0.4-0.6 CM	Edible: NO	Fruiting season: SEPT-OCT
Growth	Rate: MEDIUM	Longevity: 15-25 YEARS








ECOLOGY

Climate	Temperature: -12ºC; H3; Z5	Drought resistant: YES
ALTITUDE: 0-1300	Sun exposure: SUN	Frost resistant: YES
IRRIGATION: MODERATE		
Soil	Texture: LOAMY	Salt resistant: YES
pH: 5-8.5	Drainage: MODERATE	Lime resistant: YES
FERTILITY: LOW		

USES

Resistances		Applications			
COASTAL:	YES	SLOPES:	YES	CARPET:	YES
POLLUTION:	YES	RIVERBANKS:	MOD	WINDBREAKER:	YES
WIND:	YES	GROUPS:	YES	ISOLATED:	YES

POINTS OF INTEREST

Native to the Mediterranean region and reaching as far as the Balkans. In the Iberian peninsula it extends through Extremadura, Castilla la Mancha, Andalusia and Portugal. It is not found in the Balearic Islands. It is naturalized on the Mediterranean coast. It grows in low mountain areas, especially in places where species of evergreen holm oak, mastic, Mediterranean dwarf palm and wild olive trees can be found. It is resistant to most types of soil. Its flowers are bluish white and it is a honey plant.

TYPICAL SPACING FOR HEDGES: 0.3 m

PLANTING AND PLANT HEALTH

Propagation is easy by seed, bush division and by herbaceous cutting under cover. Admits pruning very well both to shape the plant and to stimulate growth.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Height (cm)	Topiary shapes
CT2	10-15	No
CT3	15-20	No
CT7	20-25	Yes
CT9	25-30	Yes
CT10	30-40	Yes

VIBURNUM

Viburnum tinus

HEDGE AND TOPIARY

DURILLO	MARFULL	LAURUSTINUS	LAURIER - TIN
SPANISH	VALENCIAN	ENGLISH	FRENCH

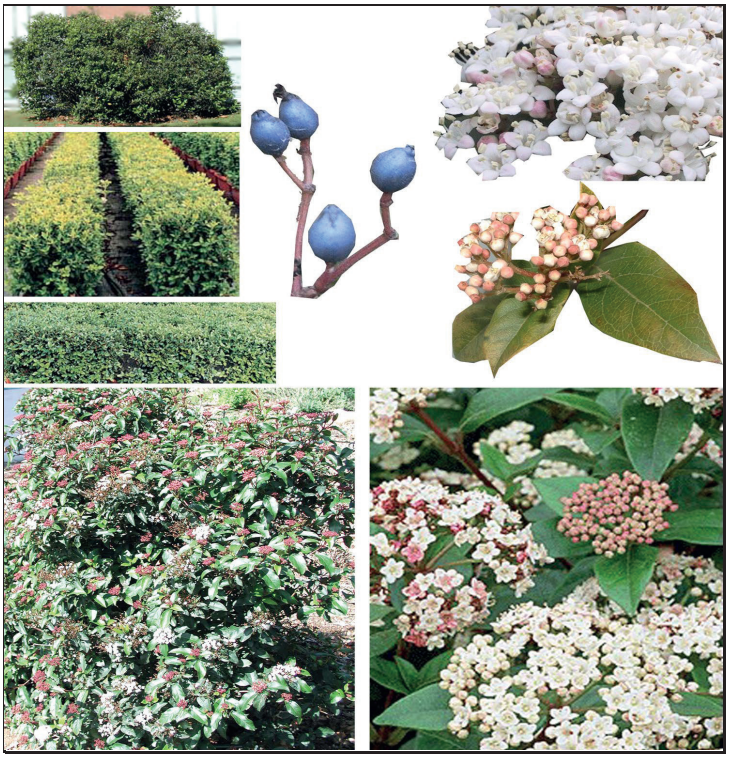
STRUCTURE		
Shape: OVAL	Height: 2-4 M	Diameter: 2-4 M
Texture: COARSE	Shade: PARTIAL	Root: HORIZONTAL

DIVISION:	SPERMATOPHYTE
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	DIPSACALES
FAMILY:	CAPRIFOLIACEAE

VARIETIES

COMPACTUM, PURPUREUM
EVE PRICE, VARIEGATUM
LUCIDUM
MACROPHYLLUM

MORPHOLOGY		
Trunk	Bark: SMOOTH	Color: RED
Leaf	COMPOUND: NO	
EVERGREEN	HARDNESS: CORIACEOUS	
SIZE: 3-10 CM	ARRANGEMENT: OPPOSITE	
	VENATION: PINNATE	
	SHAPE: OVAL-LANCEOLATE	
COLOR: US: DARK GREEN	MARGIN: ENTIRE	
LS: GREEN	APEX: ACCUMINATE	
TEXTURE: US: ROUGH	LEAF BASE: ROUNDED	
LS: ROUGH	PETIOLE: SHORT	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE AND TYPE: 0.8-1 CM	Flowering: CYMOSE 8-10 CM	Fragrant: YES
Fruit	Type: DRUPE	Color: BLACK
SIZE: 0.6-0.8 CM	Edible: NO	Fruiting season: SEP-NOV
Growth	Rate: MEDIUM	Longevity: 50-100 YEARS



ECOLOGY		
Climate	Temperature: -17ºC; H2; Z5	Drought resistant: MODERATE
ALTITUDE: 0-1200	Sun exposure: SUN	Frost resistant: YES
IRRIGATION: MODERATE		
Soil	Texture: LOAMY/SANDY	Salt resistant: MODERATE
pH: 5-8	Drainage: MODERATE	Lime resistant: MODERATE
FERTILITY: MODERATE		

USES			
Resistances		Applications	
COASTAL: 2ND LINE		SLOPES: YES	CARPET: YES
POLLUTION: YES		RIVERBANKS: YES	WINDBREAKER: YES
WIND: YES		GROUPS: YES	ISOLATED: YES

POINTS OF INTEREST

Although native to the Mediterranean region, it is not prominent in the central part of the Iberian Peninsula. It can be found in shady areas together with holm oaks, strawberry trees and other thick bushes grow. The inflorescence is flat and has a very decorative purplish white color. It is one of the most floriferous and decorative evergreen hedges. It can be used as a formal hedge through pruning and as an informal hedge. In this second case, it may need quite large space. The fruits and leaves have medicinal properties. It is protected in the Balearic Islands (Decree 24/1992, of March 12, B.O.C.A.I.B. of 2-4-1992).

TYPICAL SPACING FOR HEDGES: 1-1.5 m

PLANTING AND PLANT HEALTH

Planting can take place in its dormant stage and when it is not flowering. Pruning must be done after flowering. Transplanting is not complicated. This species is not prone to serious pests and diseases.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Height (cm)	Topiary shapes
CT3	25-40	Yes
CT6	50-60	Yes
CT10	80-100	Yes
CT40	80-100	Yes

Subchapter 9.3 Commercialization, Use and Planting

The general conditions of commercialization and use of hedge species are similar to those in chapters of this book since we can form hedges with trees (deciduous or evergreen leaves), shrubs, medicinal and aromatic plants... Therefore, depending on the type of plant used to form a hedge, we must refer to the corresponding chapter.

PLANTING

The place where a hedge is going to be planted must be well studied including the appropriate choice of species. When a hedge extends for a long distance, it might find shady and sunny areas and therefore the species cannot be sensitive to either condition. Otherwise, the part of the hedge located in an inadequate place with have a deficient growth and will look unsightly.

Planting must be done in the best conditions, both at the right time (usually with the cold temperatures of late winter) and in early spring.

If small plants are used, they can be supplied in a bare root or container format.

The soil must be adequate for the species and the place where they will be planted should not be waterlogged or have poor drainage. A hedge must be correctly zoned and provided with the best growing conditions: good substrate, adequate irrigation (drip system), periodic fertilization, drainage, without competition in its root system.



Figure 9.3.1: Plants in containers for hedges. *Laurus nobilis*

MAINTENANCE: PRUNING

Ornamental shrubs require pruning to achieve either many flowers or a compact shape. To alleviate the effects of pruning, shrubs must be well cared for (free of pests and diseases). This implies that they are well aerated, well-watered and well fertilized.

The purpose of pruning

- The aim of formative pruning is to give the bush the desired shape for the purpose we intend whether it is a free-growing shrub or a regular form (low, tall hedge, topiary).

- In adult plants pruning is done to obtain a greater number of flowers, fruits, compactness or if it is a formal hedge, to maintain the shape established in its youthful state.

- Pruning will keep the plant clean of dry branches and rejuvenated through the continuous production of foliage.

- Through the removal of infected branches, pruning can also serve to maintain the health of a diseased plant.



Figure 9.3.2: Cutting mechanically an informal hedge of *Buxus sempervirens*

Times for pruning

There are two typical pruning times: in winter and autumn when plants are dormant or at the beginning of spring to avoid complications due to frost. Summer pruning or green pruning is also possible, which is carried out when the plant is in its vegetative growth from spring to late summer.

In the case of flowery hedges, we must know on what type of wood the flowers grow and the time of flowering. This is important since pruning can impede the flowering process. Those that flower on young wood from that year, are pruned in late winter. Those that flower on old wood from the previous year are pruned after flowering.

Types of pruning

Formative pruning: This will produce the desired shape and is carried out during the first periods of the plant´s life.

Maintenance pruning (or regular/selective pruning): This is the next step once formative pruning has been completed. This will ensure that the hedge keeps the shape required for the project. It must be maintained as set out in the project report: compact green, with flowers or with fruits.

Green pruning: This is done while the plant is growing. It is carried out on the growing young parts, either shortening the twigs or trimming them in order to produce secondary branches and thus achieve a compact shape of the bush.

Rejuvenation pruning: This can take place when the plant is very old and the aim is to achieve new vegetation. This type of pruning is usually traumatic, and the bush become quite disfigured.

Pruning cuts

- The tools use to prune must be sharp and disinfected.

- The cut is made in a bevel a few millimeters from the bud or twig and with an opposite inclination to the bud.

- The cut must be made at the height of a bud or twig that goes outwards or in the direction desired by the professional.

- The cut will be made up to a bud or twig.

- When the buds are opposite, the cut is made up to the height of the two, if we are interested in a particular direction, we would eliminate the bud or twig in the unwanted direction.

- In the case of dry branches, it is necessary to cut up to the height of the first branch or where the first green bud appears.



Figure 9.3.3: Using a scaffold to prune a hedge

CRITERIA FOR PRUNING ACCORDING TO FLOWERING

Group 1: Shrubs with flowers in apical buds formed during the same growing period (flowering by the end of spring or summer)

These shrubs flower in spring or summer at the ends of the shoots or wood of that same year. Since the buds that have flowered will no longer do so, they must be removed so that new ones emerge. Depending on the desired number and size of the flower, it will be pruned in winter at different heights: leaving 2 to 5 buds on the branches of the previous season counted from their base for normal flowering or, if you prefer fewer but larger flowers, leave 2 or 3 buds. These are the buds that will contain the flowers that will sprout in spring.

This group includes species suitable to form flowering hedges or borders such as:

- Adelfa (*Nerium oleander*)
- Hibisco (*Hibiscus rosa-sinensis*)
- Lantana (*Lantana camara*)
- Rosemary (*Rosmarinus officinalis*)
- Veronica (*Hebe sp*.)

Cleaning: Eliminate undesirable parts of the plant, preferably in winter however, it can be carried out at any time of the year.

Pruning for flowering: Should take place in the winter months, when the intense cold has passed, around mid-February in the Northern Hemisphere. If the climate is warm as in the Mediterranean, it can be done anytime during the winter.

Pruning to promote the yearly growth of flowers can be done together with the cleaning

Group 2: Shrubs with flowers in lateral or axillar twigs formed during the same growing period (flowering by the end of spring or summer)

Species in this group that are suitable to form hedges and borders are included below:

- Durillo (*Viburnum tinus*)
- Hydrangea (*Hydrangea macrophylla*)
- Rhododendrun (*Rhododendron sp*.)
- Viburnum (*Viburnum opulus*)

Cleaning: Eliminate undesirable parts of the plant, preferably in winter however, it can be carried out at any time of the year.

Pruning for flowering: This group of hedges flower very early. The buds at the ends of the previous year's branches are the ones that produce flowers and the rest provide buds or leaves. They should not be pruned in winter, but rather when flowering has finished, since cutting the branches before flowering would eliminate the flower buds. All the branches of the year must be cut just above the second or third bud counted from its base. It is these buds that in the following year will produce a flower at the tip. Pruning to clean can be combined with pruning for flowering. Although it is preferable to do the former in winter (in dormant stage).

Group 3: Shrubs with flowers in apical buds formed during the previous growing season (flowering in early spring, and some, in early summer)

Species in this group that are suitable to form hedges and borders are included below:

- Forsythia (*Forsythia sp*.)
- Tamarix tetandra (*Tamarix tetandra*)
- Thymus (*Thymus sp*.)

Cleaning: Eliminate undesirable parts of the plant, preferably in winter however, it can be carried out at any time of the year.

Pruning for flowering: Plants in this group flower in early spring and flowers sprout from lateral buds of the previous year's branches. Once the flowering is over, the branches must be cut at ground level so that it regrows strongly. Alternatively, the plant can also be lowered to 30 or 40 centimeters from the ground, which also eliminates all the old wood.

Group 4: Shrubs with flowers in small twigs and branches from the previous growing season (flowering in spring)

Species from this group that are suitable to form hedges and borders are included below:

- Hawthorn (*Crataegus sp.*)
- Prunus (*Prunus sp*.)

Cleaning : Eliminate undesirable parts of the plant, preferably in winter however, it can be carried out at any time of the year.

Pruning for flowering: In these species flowering is prior to foliation, the first occurring at the end of winter or at the beginning of spring, in buds on branches that usually are more than 2 years old. It is therefore necessary to maintain these old branches by lightly pruning the terminal branches of the year, which facilitates the appearance of new flower buds. Pruning will be done at the end of winter and before sprouting.

Pruning hedges that produce fruit

- English holly (*Ilex aquifolium*)
- Cotoneaster (C*otoneaster spp.*)
- Scarlet firethorn (*Pyracantha coccinea*)
- Japanese Skimmia (*Skimmia japonica*)
- Strawberry tree (*Arbutus unedo*)
- Blackberry (*Rubus spp.*)

The greatest ornamental value of this group lies in its fruits. They require very little pruning and should be carried out in winter. Additionally, every 3 or 4 years a rejuvenation pruning is recommended to reduce intensively the size of the bush.

10
CITRUS PLANTS

Chapter 10 CITRUS PLANTS

Subchapter 10.1 Introduction
Subchapter 10.2 Species
Subchapter 10.3 Commercialization, use and planting
Subchapter 10.4 Maintenance

Subchapter 10.1 Introduction

Citrus is usually understood as the species of the *Citrus* genus, which are the most popular, but this term also includes plants of the *Fortunella, Poncirus, Eremocitrus,* and *Microcitrus* genus, as well as hybrids between these genera and their species.

The *Citrus* genus originates from the S.E. Himalayas, Assam, and Northern Burma. Its wild plants were used long before they were cultivated, attributed with medicinal and even miraculous virtues since time immemorial. Following the routes of the merchants, they came to be cultivated in Mesopotamia more than 2,600 years ago. Thus, during their captivity in Babylon, the Jews substituted the "cone" of the cedar for the fruit of the current "citron" as an offering in the ceremony of tabernacles. Possibly bitter orange, lemon, sweet lime and *zamboa* also referred to as the *azamboa* or *azimboa* has a yellowish gold color fruit similar to an apple or pear were also used, with various applications. During the Roman Empire, these citrus fruits were not of interest for food and their cultivation was restricted to growing only a few trees in small orchards and gardens.

The citron (*Citrus medica*) is the first citrus known in Europe, where it arrived through the Middle East through Iran from its native India. It did not spread to the Iberian Peninsula, perhaps because of its great sensitivity to cold. Currently, it does not have many uses in the commercial sector. Something similar must have happened with the *azamboa* and sweet lime, although traces of these species remained in some areas of Murcia.

Bitter orange (*Citrus aurantium*) also seems to be native to Southeast Asia and quite possibly to India, from where it spread to China. It seems that Arab traders based in India brought bitter orange with them to Oman (Arabia) in the 10th century, from where it spread to Iraq, Syria, Palestine, and Egypt and later through North Africa to Spain, where it was introduced in the eleventh century.

The origin of the lemon tree (*Citrus limon*) is ambiguous. It is thought that it could have originated from Southeast Asia or northern Burma. Everything suggests that this fruit is a mutation or a hybridization from other citrus fruits, among which the citron would be found. The Arabs already knew about it in the 10th century, and it was they who spread it. From India it would probably follow the same paths as the bitter orange tree and it is supposed to have arrived in Spain around the year 1150.

The arrival of the sweet orange tree (*Citrus sinensis*) to the Mediterranean is still a mystery for which there are many answers but, although none of them is completely satisfactory, the one that claims to have been brought by the Portuguese from the Far East is plausible (oranges from China, sweet, as opposed to the "normal" orange tree then, bitter). References to the sweet orange tree in the 15th century are scarce, but in those years, it spread in Spain. However, it is from the sixteenth century onwards that numerous citations and data begin to be documented that do not name it as a new plant, which suggests that it had been known for a long time.

The citron, bitter orange, and lemon plants were known and cultivated for their ornamental value, medicinal and aromatic properties, and thus we have descriptions, treatises and Islamic poems that speak of the beauty of their fruits, trees, and flowers, of their different uses, and of its cultivation.

Taking into consideration all of the above, it can be deduced that the presence of orange trees in Spain is mainly due to the Arabs and especially to the caliphs of Córdoba. These trees were primarily used for their ornamental value, being planted in streets, gardens, and courtyards of mosques, specially and more extensively in the Levantine regions of Spain and in Andalusia.

The mandarin (*Citrus reticulata*) arrived in Spain at the beginning of the 19th century and the grapefruit (*Citrus paradisii*) came to Europe at the beginning of the 20th century.

The interesting features that citrus fruits can offer through their genera, species and varieties means that this group has a specific place within garden ornamentation. The diversity of sizes makes it easy to choose a species for each case and so we find from small shrubs such as *Triphasia trifolia* to the impressive specimens of sweet lime (*Citrus limettioides*) and lemon trees, passing through intermediate sizes such as kumquats. (*Fortunella margarita, Fortunella japonica*), calamondins (*Citrus madurensis*), mandarins, etc.

The intense color of their leaves is striking in these trees but with some exceptions, such as *Poncirus trifoliata*, a deciduous species. The contrast offered by the deep, glossy green of the foliage with the bright orange or yellow of its fruits is one of the many reasons why these specimens can occupy prominent places in gardens. Another circumstance that makes citrus very usable in ornamentation is the flowering and its aroma. Many varieties produce profuse white blooms that stand out against the green background of the foliage. Some varieties such as citrons and lemon trees can flower several times a year as long as the weather conditions are adequate.

The fruits of the citrus species offer a great diversity in sizes, flavors, and colorations. Regarding size, we can choose from the small fruits of the *Severina buxifolia* to the large pummelos (*Citrus grandis*). Concerning shape some are spherical like oranges, ovoid like kumquats, and strange looking like *Citrus medica* var. *sarcodactylis*. As for flavor, some are acidic like Mexican limes (*Citrus aurantifolia*), sweet like clementines (*Citrus clementium*). Some species are inedible like *Poncirus trifoliata* although other species, like the kumquats can be eaten even with their skin. Their colors vary from reddish orange to yellow, always in warm tones that contrast with the bright green of the foliage.

In addition to the purely ornamental use, the leaves and flowers were used for many years for medicinal purposes, and even today, orange blossom water and essences for perfumery are still obtained from bergamot orange tree (*Citrus bergamia*), and the wood of the lemon tree for inlays in joinery. When it comes to the ornamental use of citrus as garden plants, we should consider that these trees and shrubs can be used for many purposes in landscape design, as long as the climate is not excessively cold. In the case of somewhat low temperatures, some of the most resistant citrus trees are *Citrange Troyer, Poncirus trifoliata* or the bitter orange (*Citrus aurantium*).

Subchapter 10.2 Species

This subchapter describes **15 ornamental citrus species** used in garden and landscape design They have been chosen based on their ornamental use, botanical interest, and other characteristics which make them of special interest in this chapter.

A table of parameters and values has been developed to explain each characteristic or factor presented in each botanic datasheet.

Each datasheet describes each species containing with regards to its botanical and ecological characteristics, cultivation, and uses, along with other interesting features such as their commercialization. This information is accompanied by photographs in which the general appearance and morphological details of each species can be appreciated.

PARAMETERS AND VALUES USED IN THE BOTANIC DATASHEET	
TAXONOMY	
TAXONOMIC RANKS	DIVISION, SUBDIVISION, TYPE, ORDER, FAMILY
VARIETIES	OTHER VARIETIES OF INTEREST
STRUCTURE	
SHAPE	GLOBE-SHAPED, ROUNDED, OVAL, COLUMNAR, CONE, EXTENDED, IRREGULAR, PARASOL, FAN-SHAPED, HORIZONTAL, PALMIFORM, PENDULAR, WEEPING
HEIGHT	AS APPROPRIATE- IN METERS OR CENTIMETERS
DIAMETER	AS APPROPRIATE -IN METERS OR CENTIMETERS
TEXTURE	TEXTURE: LEAVES>10CM= COARSE. LEAVES OR LEAFLETS BETWEEN 2-10CM= MEDIUM. LEAVES OR LEAFLETS <2CM= FINE
SHADE	LIGHT, FULL, DENSE
ROOT	TAPROOT, FASCICULATE, OBLIQUE, HORIZONTAL, AERIAL, ADVENTITIOUS
MORPHOLOGY	
TRUNK	
BARK	SMOOTH, VERTICAL FISSURES, LONGITUDINAL FISSURES, DIAGONAL FISSURES; ROUGH, SCALY, CORKY WITH PLATES
COLOR OF BARK	GREYS; GREEN/GREY OR BLUE/GREY. SILVER; LIGHT GREEN, YELLOW, LIGHT BROWN, DARK, GREEN, RED; RED. PURPLE; YELLOW; BLACK; MARBLED; TWO-TONED; THREE-TONED; LIGHT GREY, DARK GREY
LEAF	
TYPE	EVERGREEN, SEMI-EVERGREEN DECIDUOUS, SEMI-DECIDUOUS
SIZE OF LEAF	LENGTH OF LEAF (cm)
SIZE OF LEAFLET	LENGTH OF LEAFLET (cm)
COLOR OF UPPER SIDE (US)	PALE GREEN, LIGHT GREEN, DARK GREEN, BLUE/GREEN, GREY, PURPLE; PALE; YELLOW; VARIEGATED
COLOR OF LOWER SIDE (LS)	GREEN, LIGHT GREEN, DARK GREEN, BLUE/GREEN, GREY PURPLE; PALE; YELLOW; VARIEGATED; RUST COLORED; SILVER
TEXTURE OF UPPER SIDE (US)	SHINY, ROUGH, GLABROUS, TOMENTOSE, HAIRY, ROUGH, SCALY, VISCOSE
TEXTURE OF LOWER SIDE (LS)	SHINY, ROUGH, GLABROUS, TOMENTOSE, HAIRY, ROUGH, SCALY, VISCOSE
COMPOUND LEAVES	NO COMPOUND LEAVES YES. COMPOUNDS: IMPARIPINNATE, PARIPINNATE, TRIFOLIATE, PALMATE, PALMIFORM, PALM, PINNATE, BIPINNATE
HARDNESS	CORIACEOUS, SOFT, SUCCULENT, HARD
ARRANGEMENT	OPPOSITE, ALTERNATE, WHORLED, VERTICAL
VENATION	PINNATE, PALMATE, PARALLEL, RETICULATE, ARCUATE, A3 MAIN VEINS
SHAPE	ROUNDED, LINEAR, LANCEOLATE, FALCATE, OVAL, OBLONG, ELLIPTIC, DELTOID, RHOMBOID, SPATULATE, ACICULAR GROUPS 2, ACICULAR GROUPS 3, ACICULAR GROUPS 5, ACICULAR GROUPS, ACICULAR IN 1 PLANE, ACICULAR IN SPIRAL, SCALY, PALM 7 LOBES, PALM 5 LOBES- PALM 3 LOBES, POLYMORPHIC; PANDURIFORM; PINNATIFID, SAGITATE, RENIFORM, CORDATE, ORBICULAR, OBOVATE, OBLANCEOLATE, LIRATE, HASTATE, RUNCINATE
LEAF MARGIN	WHOLE, CILIATE, DENTATE, CRENATE, SERRATED, DOUBLE SERRATED, LOBED, DOUBLE LOBED
APEX	ACUTE, CUSPIDATE, OBTUSE, RETUSE, MUCRONATE
LEAF BASE	ATTENUATE, CORDATE, ROUNDED, ASYMMETRIC, CUNEATE, OBLIQUE, SAGITATE, HASTATE

PETIOLE	LONG, SHORT, SESSILE, WIDE
FLOWER	
SIZE	HERMAPHRODITE (MALE/FEMALE FLOWERS): (CM OR MM)
TYPE	UNISEX, HERMAPHRODITE
REPRODUCTION	MONOECIOUS, DIOECIOUS, HERMAPHRODITE, POLYGAMY, SYNOICOUS, STERILE
FLOWERING	ISOLATED, INFLORESCENCE IN CORYMB, CYMOSE, RACEME, SPIKE, UMBEL, CATKIN, SPADIX, FLORET OR CAPITULUM, PANICLE (+ INFLORESCENCE SIZE (IN CM OR MM))
FRAGRANCE	YES, NO, UNPLEASANT
FRUIT	
SIZE	IN CM OR MM
TYPE	FOLLICLE, PLURIFOLLICLE, LEGUME, LOMENT, SAMARA, DOUBLE SAMARA, PLURISAMARA, CAPSULE, POLYATHENE, TETRACHENE, NUT, ACHENE; SYCONIUM, HESPERIDIUM, PLURISAMARA, ACORN, COMPOUND FRUIT, PLURIFOLLICLE, BERRY, RACEME, POME, BALAUSTA, DRUPE, CONIFER CONE, PSEUDO CONIFER, CONE, PINE
EDIBLE FRUIT	YES, NO
COLOR OF FRUIT	RED, GREEN, YELLOW, BROWN, BLACK, PALE, WHITE, PURPLE
FRUITING SEASON	INTERVAL OF MONTHS: JAN, FEB, MAR, APR, MAY, JUN, JUL, AGO, SEP, OCT, NOV, DEC
DEVELOPMENT	
GROWTH	SLOW, VERY SLOW, MODERATE, FAST, VERY FAST
LONGEVITY	<25 YEARS, 25 YEARS, 50 YEAR, 75 YEARS, 100 YEARS, 150 YEARS, 200 YEARS, 250 YEARS, 300 YEARS, >300 YEARS
ECOLOGY	
CLIMATE	
ALTITUDE	NATURAL HEIGHT OF THE PLANT: interval of sea level altimetry
IRRIGATION	++HIGH, MODERATE, LOW, ++LOW (very low/low < 350 mm; Very high/high > 750 mm)
MINIMUM TEMPERATURE AND INTERNATIONAL CLASSIFICATION	MINIMUM TEMPERATURES: DEGREES CELSIUS **CLASSIFICATION ACCORDING TO EUROPEAN REGULATION**: (SEE MAP) G2____ HOT GREENHOUSES IN SOUTHERN EUROPE G1____ COLD GREENHOUSES IN SOUTHERN EUROPE H5____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM OºC TO -5ºC H4____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM -5ºC TO -10ºC H3____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM -10ºC TO -15ºC H2____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM -15ºC TO -20ºC H1____ THE PLANT SUPPORTS MINIMUM TEMPERATURES FROM -20. **CLASSIFICATION INTERNATIONAL REGULATIONS.** ACCORDING TO MINIMUM TEMPERATURE RANGES Z1____SUPPORT MINIMUM TEMPERATURES OF -50ºC Z2____ SUPPORT MINIMUM TEMPERATURES OF -50ºC TO -40ºC Z3____ SUPPORT MINIMUM TEMPERATURES OF -40ºC TO -30ºC Z4____ SUPPORT MINIMUM TEMPERATURES OF -30ºC TO -20ºC Z5____ SUPPORT MINIMUM TEMPERATURES OF -20ºC TO -10ºC Z6____ SUPPORT MINIMUM TEMPERATURES OF -10ºC TO -0ºC Z7____ SUPPORT MINIMUM TEMPERATURES OF -0ºC TO 10ºC Z8____ SUPPORT MINIMUM TEMPERATURES OF 10ºC TO 20ºC Z9____ SUPPORT MINIMUM TEMPERATURES OF 20ºC TO 30ºC Z10___ SUPPORT MINIMUM TEMPERATURES OF 30ºC TO 40ºC Z11___ SUPPORT MINIMUM TEMPERATURES OF MORE THAN 40ºC

EXPOSURE TO SUNLIGHT	FULL SUN, FULL SHADE, SHADE, PART SHADE
DROUGHT RESISTANCE	YES, NO, MODERATE
FROST RESISTANCE	YES, NO, MODERATE
SOIL	
PH OPTIMUM	PH: ALL TYPES- NEUTRAL, ACID, BASIC (OR INTERVAL OF PH)
LEVEL OF FERTILITY	FERTILE, AVERAGE, POOR
TEXTURE OF SOIL	SANDY, SLIT OR LOAMY, CLAY, SANDY LOAM, CLAY LOAM - ALL TYPES
DRAINAGE	HIGH, MODERATE, LOW
RESISTANCE TO SEA	YES, NO, MODERATE
RESISTANCE TO LIME	YES, NO, MODERATE
USES	
RESISTANCES	
COASTAL	1ST LINE, 2ND LINE, NO
RESISTANCE TO POLLUTION	HIGH, MODERATE, LOW
RESISTANCE TO WIND	HIGH, MODERATE, LOW
APPLICATIONS	
IN SLOPES **IN LINES** **ON RIVERBANKS** **AS WINDBREAKERS** **IN HEDGES** **IN FIELD BORDERS** **IN GROUPS** **ISOLATED**	YES, NO
SPACING	MINIMUM RECOMMENDED DISTANCE BETWEEN PLANT: M, CM
PLANTING AND PLANT HEALTH	
PLANTING AND PLANT HEALTH	
CALENDARS	
CHROMATIC CALENDAR	FOLIAGE, FLOWERING, FRUITING SEASON: the color white represented with grey or black cell
CULTIVATION CALENDAR	SOWING, PLANTING, PRUNING
TREATMENTS CALENDAR	FUNGICIDES, PESTICIDES, FERTILIZERS, HERBICIDES
COMMERCIALIZATION	
PRESENTATION	BR (BARE ROOT), CT (CONTAINER or POT (LITERS), CE (ROOT BALL), CEY (ROOT BALL IN GYPSUM), ROOT BALL IN MESH
TRUNK GIRTH(TREE)	GIRTH (perimeter): CM or years, or SAMPLE, or shrubs (in tree species)
HEIGHT	CM, M

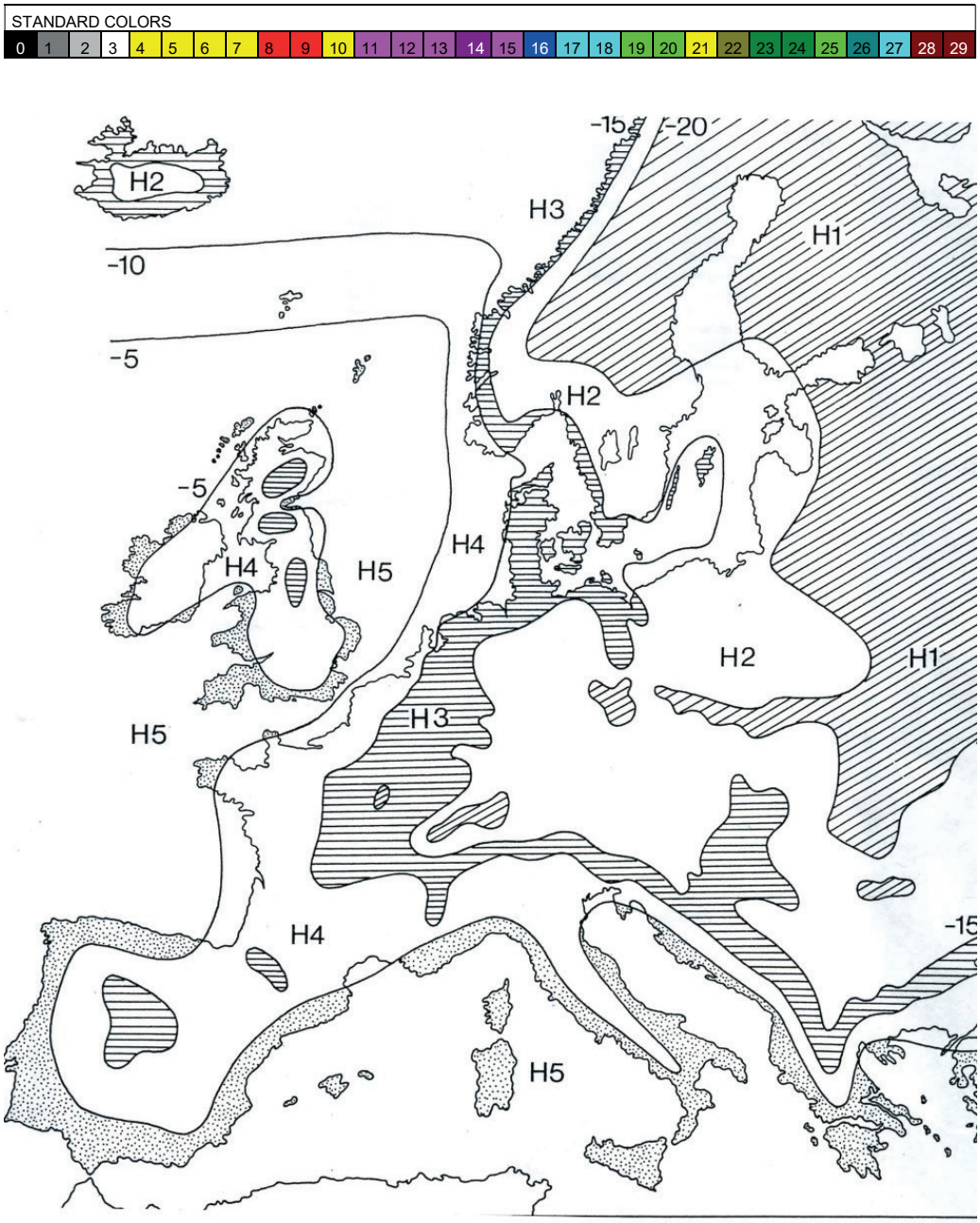


Figure 10.2.1: Thermal classification map according to European regulations

LIST OF ORNAMENTAL CITRUS SPECIES DESCRIBED

1. *Citrus aurantifolia*
2. *Citrus aurantium*
3. *Citrus deliciosa*
4. *Citrus limos*
5. *Citrus madurensis*
6. *Citrus medica*
7. *Citrus reshni*
8. *Citrus sinensis*
9. *Eremocitrus glauca*
10. *Fortunella japonica*
11. *Fortunella margarita*
12. *Fortunilla sp (Citrus sinensis x Poncirus trifoliata)*
13. *Murraya paniculata*
14. *Poncirus trifoliata*
15. *Triphasia trifolia*

CITRUS

ORNAMENTAL CITRUS

Citrus aurantifolia

LIMA MEXICANA (SPANISH) | VALENCIAN | KEY LIME (ENGLISH) | LIMETTIER MEXICAIN (FRENCH)

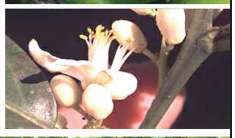
STRUCTURE		
Shape: ROUND	Height: 6 M	Diameter: 6 M
Texture: COARSE	Shade: DENSE	Root: TAPROOT

DIVISION:	PHANEROGAMS
SUBDIVISON:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	SAPINDALES
FAMILY:	RUTACEAE

VARIETIES

MORPHOLOGY		
Trunk	Bark: SMOOTH	Color: GRAY/BROWN
Leaf	COMPOUND: NO	
	HARDNESS: CORIACEOUS	
EVERGREEN	ARRANGEMENT: ALTERNATE	
SIZE: 4-6 CM	VENATION: PINNATE	
	SHAPE: ELLIPTIC	
COLOR: US: GREEN	MARGIN: SMOOTH	
LS: LIGHT GREEN	APEX: OBTUSE	
TEXTURE: US: SMOOTH	LEAF BASE: ATTENUATE	
LS: SMOOTH	PETIOLE: SHORT AND WINGED	
Flower	TYPE: HERMAPHRODITE	REPRODUCTION: HERMAPHRODITE
SIZE AND TYPE: 2 CM RACEME	Flowering	Fragrant: YES
Fruit	Type: HESPERIDIUM	Color: YELLOW
SIZE: 3-4 CM	Edible: YES	Fruiting season: SEPT-FEB
Growth	Rate: MEDIUM	Longevity: <10 YEARS




ECOLOGY		
Climate	Temperature: -2ºC,H5,Z6	Drought resistant: LOW
ALTITUDE: 0-300	Sun exposure: SUN	Frost resistant: MODERATE
IRRIGATION: MODERATE		
Soil	Texture: LOAMY	Salt resistant: LOW
pH: 6.5-7.5	Drainage: MODERATE	Lime resistant: MODERATE
FERTILITY: MODERATE		

USES			
Resistances		Applications	
COASTAL:	2ND LINE	SLOPES: NO	HEDGEROWS: NO
POLLUTION:	MODERATE	RIVERBANKS: NO	BORDERS: NO
WIND:	MODERATE	GROUPS: NO	ISOLATED: YES

POINTS OF INTEREST

Valued for its evergreen foliage, this species of citrus is edible in addition to having an ornamental value. It is also known for its exquisite fragrance. It produces more juice than the lemon. It is much more fragrant and has softer pulp. The fruit is medium in size, similar to that of a tangerine. The lime is native to Southeast Asia. Its cultivation is widespread throughout Asia, India, the Caribbean, Mexico, Brazil and South Africa. In addition to being a source of vitamin C, popular medicine attributes curative properties to the lime. It is believed to be a natural antibiotic and to regulate cholesterol levels.

SPACING: 4-6 M

PLANTING AND PLANT HEALTH

They need deep, mulched soil in warm, well-watered locations. It propagates by polyembryonic seeds or grafts that cause the trees to bear early fruit. Unlike the lemon (subtropical) the lime requires a tropical climate. It is more sensitive to cold than other varieties and has low resistance to frost. Trees must be kept well drained as waterlogged soil can kill them. Some heat is required if quality fruits are to be produced 5-6 months after flowering.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
		X	X	X	X	X	X	X			

Sowing | Planting | Pruning (x)

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
RB in gypsum/CT	8-10	250-300
RB in gypsum/CT	10-12	250-300
RB in gypsum/CT	12-14	250-300
RB in gypsum/CT	14-16	250-300
RB in gypsum/CT	16-18	250-300
RB in gypsum/CT	18-20	250-300
RB in gypsum/CT	20-25	250-300
RB in gypsum/CT	25-30	300-400
CT(1500L)	Specimen	400-500

CITRUS

Citrus aurantium

ORNAMENTAL CITRUS

NARANJO AMARGO (SPANISH) | TARONGER BORD (VALENCIAN) | BITTER ORANGE (ENGLISH) | BIGARADIER (FRENCH)

STRUCTURE		
Shape	Height	Diameter
ROUND	6-10 M	6-10 M
Texture	Shade	Root
COARSE	DENSE	TAPROOT

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	SAPINDALES
FAMILY:	RUTACEAE

VARIETIES

MORPHOLOGY		
Trunk	Bark: SMOOTH	Color: GRAY/BROWN
Leaf	COMPOUND: NO	
EVERGREEN	HARDNESS: CORIACEOUS	
SIZE: 7-10 CM	ARRANGEMENT: ALTERNATE	
	VENATION: PINNATE	
COLOR: US: GREEN	SHAPE: OVAL	
LS: GREEN	MARGIN: CRENATE	
TEXTURE: US: SMOOTH	APEX: ACUTE	
LS: SMOOTH	LEAF BASE: ATTENUATE	
	PETIOLE: SHORT AND WINGED	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE AND TYPE: 2 CM	Flowering: SINGLE OR IN RACEMES	Fragrant: YES
Fruit	Type: HESPERIDIUM	Color: ORANGE
SIZE: 7-8 CM	Edible: YES	Fruiting Season: NOV-JUNE
Growth	Rate: MEDIUM	Longevity: <100 YEARS











ECOLOGY		
Climate	Temperature: -3ºC,H5,Z6	Drought resistant: LOW
ALTITUDE: 0-300	Sun exposure: SUN	Frost resistant: MODERATE
IRRIGATION: MODERATE		
Soil	Texture: LOAMY	Salt resistant: LOW
pH: 6.5-7.5	Drainage: MODERATE	Lime resistant: MODERATE
FERTILITY: MODERATE		

USES			
Resistances	Applications		
COASTAL: 2ND LINE	SLOPES: NO	HEDGE ROWS: NO	
POLLUTION: MODERATE	RIVERBANKS: NO	BORDERS: NO	
WIND: MODERATE	GROUPS: NO	ISOLATED: YES	

POINTS OF INTEREST

Native to Southeast Asia. The bitter orange tree can reach heights of 8m, with a fairly straight trunk and a regular round crown. Bitter oranges, highly variable in size and less in shape, are rich in vitamin C, as well as mineral salts and sugar. They are used for the preparation of jams, pharmacopoeia, perfumery and the liquor industry. It has long, curved spines (not sharp). It is used to align narrow streets. It is found in historical gardens typical of Arab or Mozarabic cultures. The water of the same name is extracted from the orange blossom flowers, with antispasmodic and slightly sedative properties. Lemon rootstocks.

SPACING: 4-6 M

PLANTING AND PLANT HEALTH

It requires medium compact, deep and fresh soils, regardless of its nature, although it prefers ones that are humus-rich without salt. It has a deep and moderately branched root system, which makes it drought tolerate (irrigation between light humidity and light drought). This is an ideal species for topiary shapes. Pruning allows light to penetrate the interior and should be done after harvesting. Seed propagation in spring.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
		X	X	X	X	X	X	X	X		

Sowing | Planting | Pruning (X)

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
RB in gypsum/CT	8-10	250-300
RB in gypsum/CT	10-12	250-300
RB in gypsum/CT	12-14	250-300
RB in gypsum/CT	14-16	250-300
RB in gypsum/CT	16-18	250-300
RB in gypsum/CT	18-20	250-300
RB in gypsum/CT	20-25	250-300
RB in gypsum/CT	25-30	300-400
CT(1500L)	Specimen	400-500

CITRUS

Citrus deliciosa

ORNAMENTAL CITRUS

MANDARINA SPANISH	MANDARÍ VALENCIAN	MANDARINER ENGLISH	MANDARINIER FRENCH

STRUCTURE		
Shape	Height	Diameter
SPHERICAL	4-6 M	4-6 M
Texture	Shade	Root
COARSE	DENSE	TAP ROOT

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	SAPINDALES
FAMILY:	RUTACEAE

VARIETIES

CLAUSELLINA

SATSUMA, ...

MORPHOLOGY			
Trunk		Bark: SMOOTH	Color: GRAY/BROWN
Leaf	EVERGREEN	COMPOUND: NO HARDNESS: CORIACEOUS ARRANGEMENT: ALTERNATE VENATION: PINNATE SHAPE: LANCEOLATE MARGIN: SMOOTH APEX: ACUTE LEAF BASE: ATTENUATE PETIOLE: SHORT	
	SIZE: 5-7.5 CM		
	COLOR: US: GREEN LS: LIGHT GREEN		
	TEXTURE: US: SMOOTH LS: SMOOTH		
Flower		Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
	SIZE AND TYPE: 1.5-2 CM SINGLE	Flowering	Fragrant: YES
Fruit		Type: HESPERIDIUM	Color: ORANGE
	SIZE: 5-7.5	Edible: YES	Fruiting season: SEPT-FEB
Growth		Rate: MEDIUM	Longevity: <100 YEARS

ECOLOGY			
Climate		Temperature: -2ºC,H5,Z6	Drought resistant: LOW
	ALTITUDE: 0-300	Sun exposure: SUN	Frost resistant: MODERATE
	IRRIGATION: MODERATE		
Soil		Texture: LOAMY	Salt resistant: LOW
	pH: 6.5-7.5	Drainage: MODERATE	Lime resistant: MODERATE
	FERTILITY: MODERATE		

USES			
Resistances		Applications	
COASTAL: 2ND LINE		SLOPES: NO	HEDGE ROWS: NO
POLLUTION: MODERATE		RIVERBANKS: NO	BORDERS: NO
WIND: MODERATE		GROUPS: NO	ISOLATED: YES



POINTS OF INTEREST

Native to China and Vietnam, from where it was brought to Europe at the beginning of the 19th century. The specific name *deliciosa* alludes to the exquisiteness of its fruit, with an acidic but pleasant flavor and is edible. The so-called mandarin essential oil is obtained from the rind of the fruit, which, in addition to being used in perfumery, is used to flavor liqueurs, sweets and medicines. Potted mandarin is also cultivated as an ornamental plant. This plant is quite common in orchards or gardens throughout the Mediterranean area. The Valencian Community produces 90% of the Spanish mandarin.

SPACING: 4-6 M

PLANTING AND PLANT HEALTH

It is more resistant to cold than the orange tree but its fruits are sensitive. It prefers temperate climates. The optimum temperature for root growth is 26ºC. It is more drought resistant than the orange tree but the soil requirements are similar. It is not suitable for soils that are too clayey or calcareous, while it grows perfectly on those of medium consistency (sandy or sandy/loamy), permeable, deep and cool. It prefers fertile and well-drained soils. A certain amount of humidity must be maintained in the soil and waterlogging must be avoided. It admits pruning, which allows light to penerate the interior and to improve harvesting potential.

CHROMATIC CALENDAR

Foliage , Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
		X	X	X	X	X	X				

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
RB in Gypsum/CT	8-10	250-300
RB in Gypsum/CT	10-12	250-300
RB in Gypsum/CT	12-14	250-300
RB in Gypsum/CT	14-16	250-300
RB in Gypsum/CT	16-18	250-300
RB in Gypsum/CT	18-20	250-300
RB in Gypsum/CT	20-25	250-300
RB in Gypsum/CT	25-30	300-400
CT(1500L)	Specimen	400-500

CITRUS

Citrus limon

ORNAMENTAL CITRUS

LIMON	LLIMER	LEMON TREE	CITRONNIER
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE

Shape	Height	Diameter
ROUND	3-7 M	3-7 M
Texture	**Shade**	**Root**
COARSE	DENSE	TAP ROOT

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	SAPINDALES
FAMILY:	RUTACEAE

VARIETIES

FINO

VERNA

MORPHOLOGY

Trunk	Bark: SMOOTH	Color: GRAY/BROWN
Leaf	COMPOUND: NO	
	HARDNESS: CORIACEOUS	
EVERGREEN	ARRANGEMENT: ALTERNATE	
SIZE: 5-10 CM	VENATION: PINNATE	
	SHAPE: OBLONG/LANCEOLATE	
COLOR: US: PALE YELLOW	MARGIN: CRENATE	
LS: PALE YELLOW	APEX: ACUTE	
TEXTURE: US: SMOOTH	LEAF BASE: ATTENUATE	
LS: SMOOTH	PETIOLE: SHORT	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE AND TYPE: 3.5 CM	Flowering: RACEMES	Fragrant: YES
Fruit	Type: HESPERIDIUM	Color: YELLOW
SIZE: 5-7 CM	Edible: YES	Fruiting season: SEPT-MAR
Growth	Rate: MEDIUM	Longevity: 75 YEARS











ECOLOGY

Climate	Temperature: -2ºC,H5,Z6	Drought resistant: LOW
ALTITUDE: 0-300	Sun exposure: SUN	Frost resistant: MODERATE
IRRIGATION: MODERATE		
Soil	Texture: LOAMY	Salt resistant: LOW
pH: 6.5-7.5	Drainage: MODERATE	Lime resistant: MODERATE
FERTILITY: MODERATE		

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	NO	HEDGE ROWS:	NO
POLLUTION:	MODERATE	RIVERBANKS:	NO	BORDERS:	NO
WIND:	MODERATE	GROUPS:	NO	ISOLATED:	YES

POINTS OF INTEREST

Native to Asia Minor and brought to Spain by the Arabs. Its cultivation extends mainly through the Levante and Southern provinces, with an annual lemon production of about 500,000 tons. The flowers are dark pink before opening and white when in full bloom, giving off a very pleasant fragrance. Most lemon trees bloom several times a year so that flowers and the green and ripe fruits coincide at the same time on the same tree. It is used to prepare drinks and as a dressing for various foods, as well as in pharmacopoeia, cosmetics and perfumery. They have low resistance to many pests, viruses and diseases (especially fungal).

SPACING: 4-6 M

PLANTING AND PLANT HEALTH

The lemon tree needs warm climates temperatures which should not drop below 0º C. It also needs a certain amount of humidity, so it is important to protect it from the wind. It is not very demanding on soils, but the highest productions are achieved in fertile, medium-consistency and deep soils. They are formed with two or three main branches. During the first years it is advisable to reduce pruning to the maximum, by just removing suckers or any overlapping branches. Once they have produced fruit, some branches are lightly pruned to allow light to penetrate to the interior. They are grafted on bitter orange or on ungrafted lemon trees. It is advisable to transplant the seedlings with a root ball.

CHROMATIC CALENDAR

Foliage, Floration and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
			o	o	o	o	o	o			

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
		X	X	X	X	X	X	X			

Sowing Planting Pruning x

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
RB in gypsum /CT	8-10	250-300
RB in gypsum/CT	10-12	250-300
RB in gypsum/CT	12-14	250-300
RB in gypsum/CT	14-16	250-300
RB in gypsum/CT	16-18	250-300
RB in gypsum/CT	18-20	250-300
RB in gypsum/CT	20-25	250-300
RB in gypsum/CT	25-30	300-400
CT(1500L)	Specimen	400-500

CITRUS

Citrus madurensis

ORNAMENTAL CITRUS

CALAMONDIN SPANISH	VALENCIAN	CALAMONDIN TREE ENGLISH	CALAMONDIN FRENCH

STRUCTURE		
Shape	Height	Diameter
ROUND	4 M	4 M
Texture	Shade	Root
COARSE	DENSE	TAP ROOT

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	SAPINDALES
FAMILY:	RUTACEAE

VARIETIES

MORPHOLOGY			
Trunk		Bark: SMOOTH	Color: GRAY/BROWN
Leaf	EVERGREEN	COMPOUND: NO	
	SIZE:	HARDNESS: CORIACEOUS	
		ARRANGEMENT: ALTERNATE	
		VENATION: PINNATE	
		SHAPE: OVAL/LANCEOLATE	
	COLOR: US: DK. GREEN	MARGIN: DOUBLY SERRATE	
	LS: GREEN	APEX: EMARGINATE	
	TEXTURE. US: SMOOTH	LEAF BASE: ATTENUATE	
	LS: SMOOTH	PETIOLE: SHORT	
Flower		Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
	SIZE AND TYPE: 1.5-2 CM	Flowering: RACEME	Fragrant: YES
Fruit		Type: HESPERIDIUM	Color: ORANGE
	SIZE: 1-1.5 CM	Edible: NO	Fruiting season: NOV-JUNE
Growth		Rate: MEDIUM	Longevity: 0-50 YEARS

ECOLOGY			
Climate		Temperature: -2ºC	Drought resistant: LOW
	ALTITUDE: 0-300	Sun exposure: SUN	Frost resistant: HIGH
	IRRIGATION: MODERATE		
Soil		Texture: LOAMY	Salt resistant: LOW
	pH: 6.5-7.5	Drainage: MODERATE	Lime resistant: MODERATE
	FERTILITY: MODERATE		

USES			
Resistances		Applications	
COASTAL:	2ND LINE	SLOPES: NO	HEDGE ROWS: NO
POLLUTION:	MODERATE	RIVERBANKS: NO	BORDERS: NO
WIND:	MODERATE	GROUPS: NO	ISOLATED: YES









POINTS OF INTEREST

Native to China and brought to Indonesia and the Philippines in ancient times. This species of citrus is appreciated more for its ornamental value than for its fruits. Commonly known as calamondin, China orange, Panama orange, etc. It became the most important source of citrus juice in the Philippine Islands and has been extensively planted in India and throughout South Asia and Malaysia. It is a common doorway ornamental in Hawaii, the Bahamas, some of the islands in the West Indies, and parts of Central America.

SPACING: 3-4 M

PLANTING AND PLANT HEALTH

The calamondin is very resistant to frost and drought (like the Satsuma). It seems capable of tolerating a wide range of soils, from clayey to sandy. Plants grow from cuttings during the rooting period. Transplanted into large containers and if well cared for, they will grow at a rate of 30 cm per year and produce abundant fruit at the age of 2 years. Potted plants can be stored in the dark for 2 weeks. A commercial fertilizer with a 1:1 nitrogen to potassium ratio has been found to encourage the best growth.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
		X	X	X	X	X	X	X	X		

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
RB in Gypsum/CT	8-10	250-300
RB in Gypsum/CT	10-12	250-300
RB in Gypsum/CT	12-14	250-300
RB in Gypsum/CT	14-16	250-300
RB in Gypsum/CT	16-18	250-300
RB in Gypsum/CT	18-20	250-300
RB in Gypsum/CT	20-25	250-300
RB in Gypsum/CT	25-30	300-400
CT(1500L)	Specimen	400-500

CITRUS

Citrus medica

ORNAMENTAL CITRUS

CIDRO	PONCILER	CITRON	CEDRATIER
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Shape	Height	Diameter
ROUND	3-5 M	3-5 M
Texture	Shade	Root
COARSE	DENSE	TAP ROOT

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	SAPINDALES
FAMILY:	RUTACEAE

VARIETIES

Sacrodactylis - SWINGLE

MORPHOLOGY

Trunk	Bark: SMOOTH	Color: GRAY/BROWN
Leaf	COMPOUND: NO	
	HARDNESS: CORIACEOUS	
EVERGREEN	ARRANGEMENT: ALTERNATE	
SIZE: 8-20 CM	VENATION: PINNATE	
	SHAPE: OVAL/OBLONG	
COLOR: US: GREEN	MARGIN: CRENATE	
LS: GREEN	APEX: EMARGINATE	
TEXTURE: US: SMOOTH	LEAF BASE: ATTENUATE	
LS: PUBESCENT	PETIOLE: SHORT	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE AND TYPE: 1.5-2.5 CM RACEME	Flowering	Fragrant: YES
Fruit	Type: HESPERIDIUM	Color: WHITE
SIZE: 8-15 CM	Edible: YES	Fruiting season: NOV-JUNE
Growth	Rate: MEDIUM	Longevity: 75 YEARS











ECOLOGY

Climate	Temperature: -2ºC,H5,Z6	Drought resistant: LOW
ALTITUDE: 0-300	Sun exposure: SUN	Frost resistant: LIGHT
IRRIGATION: MODERATE		
Soil	Texture: LOAMY	Salt resistant: LOW
pH: 6.5-7.5	Drainage: MODERATE	Lime resistant: MODERATE
FERTILITY: MODERATE		

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	NO	HEDGE ROWS:	NO
POLLUTION:	MODERATE	RIVERBANKS:	NO	BORDERS:	NO
WIND:	MODERATE	GROUPS:	NO	ISOLATED:	YES

POINTS OF INTEREST

Native to Southeast Asia. The fruit rind of this species is used to make soft drinks, sweets, preserves and liqueurs. It does well as a potted plant. The ***sacrodactylis*** Swingle (also known as "Buddha's fingers") is a singular variety due to the shape of its fruits and was appreciated many years ago by the Chinese for its ornamental and medicinal value.

SPACING: 4-6 M

PLANTING AND PLANT HEALTH

This species has a very low resistant to cold and to excessively high temperatures. It requires normal garden soil, preferably rich, well-drained and porous. Depending on the rootstock, it tolerates lime. A normal irrigation programme is needed. Drought and excess water-logging must be avoided. Pruning is required to allow light to penetrate the interior. It is propagated by cutting or grafted on "Cleopatra" mandarin.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
			o	o	o	o	o	o	o		

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
		X	X	X	X	X	X	X	X		

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
RB in gypsum/CT	8-10	250-300
RB in gypsum/CT	10-12	250-300
RB in gypsum/CT	12-14	250-300
RB in gypsum/CT	14-16	250-300
RB in gypsum/CT	16-18	250-300
RB in gypsum/CT	18-20	250-300
RB in gypsum/CT	20-25	250-300
RB in gypsum/CT	25-30	300-400
CT(1500L)	Specimen	400-500

CITRUS

Citrus reshni

ORNAMENTAL CITRUS

SPANISH	VALENCIAN	ENGLISH	FRENCH
MANDARINO CLEOPATRA		CLEOPATRA MANDARIN	MANDARINIER CLEOPATRE

STRUCTURE		
Shape: ROUND	Height: 3-4 M	Diameter: 3-4 M
Texture: COARSE	Shape: DENSE	Root: TAP ROOT

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	SAPINDALES
FAMILY:	RUTACEAE

VARIETIES

MORPHOLOGY		
Trunk	Bark: SMOOTH	Color: GRAY/BROWN
Leaf: EVERGREEN; SIZE: 4-7 CM; COLOR: US: DK. GREEN, LS: GREEN; TEXTURE: US: SMOOTH, LS: SMOOTH	COMPOUND: NO; HARDNESS: CORIACEOUS; ARRANGEMENT: ALTERNATE; VENATION: PINNATE; SHAPE: OVAL/LANCEOLATE; MARGIN: DOUBLY SERRATE; APEX: ACUTE; LEAF BASE: ATTENUATE; PETIOLE: SHORT	
Flower: SIZE AND TYPE: 1.5-2.5 CM	Type: HERMAPHRODITE; Flowering: RACEME	Reproduction: HERMAPHRODITE; Fragrant: YES
Fruit: SIZE: 3-5 CM	Type: HESPERIDIUM; Edible: YES	Color: ORANGE; Fruiting season: NOV-FEB
Growth	Rate: MEDIUM	Longevity: 0-50 YEARS







ECOLOGY		
Climate: ALTITUDE: 0-300; IRRIGATION: MODERATE	Temperature: -3ºC,H5,Z6; Sun exposure: SUN	Drought resistant: LOW; Frost resistant: LIGHT
Soil: pH: 6.5-7.5; FERTILITY: MODERATE	Texture: LOAMY; Drainage: MODERATE	Salt resistant: LOW; Lime resistant: MODERATE

USES			
Resistances		Applications	
COASTAL: 2ND LINE		SLOPES: NO	HEDGE ROWS: NO
POLLUTION: MODERATE		RIVERBANKS: NO	BORDERS: NO
WIND: MODERATE		GROUPS: NO	ISOLATED: YES

POINTS OF INTEREST

Native to India, The Cleopatra mandrain (due to the long persistence of its pleasant-tasting fruit) is used as an ornamental plant in both orchards and gardens. They have reached their maximum development in subtropical areas (30-40º N and S latitude). In these areas, production is seasonal and the quality of the fruit for fresh consumption is excellent. The production of mandarins has a greater yield than that of oranges.

SPACING: 3-4 M

PLANTING AND PLANT HEALTH

This species had good resistance to cold and more tolerant to drought than the orange tree, which is why it is used as rootstock in citrus production, but the fruits are more sensitive to low temperatures. The limiting factor is the minimum temperature, since it does not tolerate temperatures below 3º (temperature determines the vegetative development, flowering, fruit set and quality of the fruits). Constant high temperatures maintain high levels of chlorophylls and its color is persistently green. They do well in porous, fresh and well-drained soils, without excessive lime. They are demanding in fertilizer. Long periods of drought are not recommended but waterlogging must be avoided. Light pruning is required to allow light to penetrate the interior.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
		o	o	o	o	o	o				

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
		X	X	X	X	X	X				

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Height (cm)	Topiary shapes
RB in gypsum/CT	8-10	250-300
RB in gypsum/CT	10-12	250-300
RB in gypsum/CT	12-14	250-300
RB in gypsum/CT	14-16	250-300
RB in gypsum/CT	16-18	250-300
RB in gypsum/CT	18-20	250-300
RB in gypsum/CT	20-25	250-300
RB in gypsum/CT	25-30	300-400
CT(1500L)	Specimen	400-500

CITRUS

ORNAMENTAL CITRUS

Citrus sinensis

NARANJO	TARONGER	SWEET ORANGE TREE	ORANGER
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE

Shape	Height	Diameter
ROUND	4-6 M	4-6 M
Texture	**Shade**	**Root**
COARSE	DENSE	TAP ROOT

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYILEDONS
ORDER:	SAPINDALES
FAMILY	RUTACEAE

VARIETIES

NAVEL LANE LATE , NAVELATE, NAVELINA
NEWHALL
SALUSTIANA
SANGUINELLI

MORPHOLOGY

Trunk	Bark: SMOOTH	Color: GRAY/BROWN
Leaf	COMPOUND: NO	
EVERGREEN	HARDNESS: CORIACEOUS	
SIZE: 6-15 CM	ARRANGEMENT: ALTERNATE	
	VENATION: PINNATE	
	SHAPE: LANCEOLATE	
COLOR: US: DK. GREEN	MARGIN: SMOOTH	
LS: GREEN	APEX: ACUTE	
TEXTURE: US: SMOOTH	LEAF BASE: ATTENUATE	
LS:SMOOTH	PETIOLE: SHORT	
Flower	TYPE: HERMAPHRODITE	REPRODUCTION: HERMAPHRODITE
SIZE AND TYPE: 1.5-2 CM	Flowering: SINGLE	Fragrant: YES
Fruit	Type: HESPERIDIUM	Color: ORANGE
SIZE: 6.5-9 CM	Edible: YES	Fruiting season: OCT-MAY(depending on var.)
Growth	Rate: MEDIUM	Longevity: 0-100 YEARS



ECOLOGY

Climate	Temperature: -2ºC,H5,Z6	Drought resistant: LOW
ALTITUDE: 0-300	Sun Exposure: SUN	Frost resistant: LIGHT
IRRIGATION: MODERATE	Texture: LOAMY	Salt resistant: LOW
Soil	Drainage: MODERATE	Lime resistant: MODERATE
pH: 6.5-7.5		
FERTILITY: MODERATE		

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	NO	HEDGE ROWS:	NO
POLLUTION:	MODERATE	RIVERBANKS:	NO	BORDERS:	NO
WIND:	MODERATE	GROUPS:	NO	ISOLATED:	YES

POINTS OF INTEREST

With its many cultivated varieties, the orange is one of the most popular and recognizable fruits. They are considered important sources of vitamin C (ascorbic acid) and other fruit acids. The origins of citrus are difficult to trace because of the immense variety of natural hybrids and cultivated varieties, including spontaneous mutants. They originated from the region comprising Southeast Asia and India. They arrived from India to the Italian peninsula and during the fall of the Roman Empire they had already spread. The navel variety is the most important.

SPACING: 4-6 M

PLANTING AND PLANT HEALTH

This particular species prefer porous, fresh and well-drained soils, without excessive lime. They are demanding in fertilizer. They have good resistance to salt. Long periods of drought are not recommended but waterlogging must be avoided. Pruning (done in spring after the harvest - avoid the coldest months) allows light to penetrate the interior and to encourage the production of fruits. It propagates by grafting on rootstocks tolerant to the *Citrus tristeza* virus (CV).

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
		o	o	o	o	o	o	o	o	o	o

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
		X	X	X	X	X	X	X	X	X	X

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
RB in gypsum/CT	8-10	250-300
RB in gypsum/CT	10-12	250-300
RB in gypsum/CT	12-14	250-300
RB in gypsum/CT	14-16	250-300
RB in gypsum/CT	16-18	250-300
RB in gypsum/CT	18-20	250-300
RB in gypsum/CT	20-25	250-300
RB in gypsum/CT	25-30	300-400
CT(1500L)	Specimen	400-500

EREMOCITRUS

ORNAMENTAL CITRUS

Eremocitrus glauca

LIMA DEL DESIERTO		AUSTRALIAN DESERT LIME	EMEROCITRUS
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Shape	Height	Diameter
ROUND	2-3 M	2-3 M
Texture	Shade	Root
COARSE	DENSE	TAP ROOT

DIVISION:	PHANEROGAMS
SUBDIVISON:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	SAPINDALES
FAMILY:	RUTACEAE

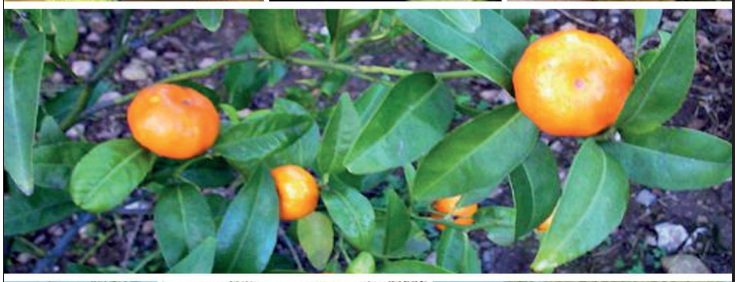
VARIETIES

MORPHOLOGY		
Trunk	Bark: SMOOTH	Color: GRAY/BROWN
Leaf	COMPOUIND: NO	
EVERGREEN	HARDNESS: CORIACEOUS	
SIZE: 2-3.5 CM	ARRANGEMENT: ALTERNATE	
	VENATION: PINNATE	
	SHAPE: OVAL	
COLOR: LS: GREEN	MARGIN: SMOOTH	
US: GREEN	APEX: OBTUSE	
TEXTURE: LS: SMOOTH	LEAF BASE: ROUNDED	
US:SMOOTH	PETIOLE: SHORT	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE AND TYPE: 1.5 CM	Flowering: SINGLE OR IN RACEMES	Fragrant: YES
Fruit	Type: ROUND/BERRY-LIKE	Color: ORANGE/RED
SIZE: 1-1.5 CM	Edible: YES	Fruiting season: DEPENDS ON VAR.
Growth	Rate: MEDIUM	Longevity: 50 years

ECOLOGY		
Climate	Temperature: -2ºC,H5,Z6	Drought resistant: LOW
ALTITUDE: 0-300	Sun exposure: SUN	Frost resistant: LIGHT
IRRIGATION: MODERATE		
Soil	Texture: LOAMY	Salt resistant: LOW
pH: 5.5-6.5	Drainage: MODERATE	Lime resistant: LOW
FERTILITY: MODERATE		

USES			
Resistances		Applications	
COASTAL: 2ND LINE	SLOPES: NO	HEDGE ROWS: YES	
POLLUTION: MODERATE	RIVERBANKS: NO	BORDERS NO	
WIND: MODERATE	GROUPS: NO	ISOLATED YES	






POINTS OF INTEREST

Native to Australia, its common name is desert lime and its scientific name comes from *eremos* (desert) and *citron* (citrus), since it grows in desert areas. *Glauca*, from Latin, means bluish-green, due to the color of its leaves. The pulp of its fruits (similar to small tangerines) is edible. This species is used for indoor areas. Due to its habitat, this species is grafted to increase resistance to frost and drought. It has a tendancy to produce suckers that may need to be controlled in cultivation.

SPACING: 2-3 M

PLANTING AND PLANT HEALTH

It propagates by seed or by cuttings (the latter being very slow). This plant is drought resistant and undemanding in soils, although it prefers clayey ones. It is not widely cultivated because it is not adapted to humid climates. However, it can survive in arid, near-desert conditions. Produces hybrids with some ease when planted near other citrus.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
			o	o	o						

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
X	X	X	X	X	X	X	X				

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
RB in gypsum/CT	8-10	250-300
RB in gypsum/CT	10-12	250-300
RB in gypsum/CT	12-14	250-300
RB in gypsum/CT	14-16	250-300
RB in gypsum/CT	16-18	250-300
RB in gypsum/CT	18-20	250-300
RB in gypsum/CT	20-25	250-300
RB in gypsum/CT	25-30	300-400
CT(1500L)	Specimen	400-500

FORTUNELLA

Fortunella japonica

ORNAMENTAL CITRUS

KUMQUAT DE FRUTO GLOBOSO		ROUND KUMQUAT	KUMQUAT
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE

Shape	Height	Diameter
ROUND	3-4 M	3-4 M
Texture	**Shade**	**Root**
COARSE	DENSE	TAP ROOT

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	SAPINDALES
FAMILY:	RUTACEAE

VARIETIES

MEIWA

MERUMI

MORPHOLOGY

Trunk		Bark: SMOOTH	Color: GRAY/BROWN
Leaf		COMPOUND: NO	
EVERGREEN		HARDNESS: CORIAECOUS	
SIZE: Leaf: 4-7 CM		ARRANGEMENT: ALTERNATE	
		VENATION: PINNATE	
		SHAPE: OVAL/LANCEOLATE	
COLOR: US: DK. GREEN		MARGIN: SMOOTH	
LS: GREEN		APEX: ACUTE	
TEXTURE: US: SMOOTH		LEAF BASE: ATTENUATE	
LS: SMOOTH		PETIOLE: SHORT	
Flower		Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE AND TYPE:	1.5-2.5 CM	Flowering: SINGLE OR IN AXILLARY RACEMES	Fragrant: YES
Fruit		Type: HESPERIDIUM	Color: ORANGE
SIZE: 2-3 CM		Edible: YES	Fruiting season: DEC-MAR
Growth		Rate: MEDIUM	Longevity: 0-50 YEARS

ECOLOGY

Climate		Temperature: -2ºC,H5,Z6	Drought resistant: LOW
ALTITUDE:	0-300	Sun exposure: SUN	Frost resistant: LIGHT
IRRIGATION:	MODERATE		
Soil		Texture: LOAMY	Salt resistant: LOW
pH:	6-7	Drainage: MODERATE	Lime resistant: LOW
FERTILITY:	MODERATE		

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	NO	HEDGE ROWS:	NO
POLLUTION:	MODERATE	RIVERBANKS:	NO	BORDERS:	NO
WIND:	MODERATE	GROUPS:	NO	ISOLATED:	NO









POINTS OF INTEREST

Native to East Asia. Its scientific name *Fortunella* is dedicated to Robert Fortune (1812-1880), a Scottish horticulturist who collected plants in China. Small tree with an abundance of dark orange fruits, which can be eaten directly from the tree as both the thick rind and the fleshy interior are very sweet. Delicious both fresh and in jams and preserves. As a potted species, it can give an ornamental value to interior spaces.

SPACING : 3-4 M

PLANTING AND PLANT HEALTH

The transplant season is from April to June in summer (when the leaves have fallen) with a substrate consisting of a mixture of 60% akadama and 40% sand. Ripe pinching from June to August by removing shoots that are too long when the leaves are ripe. Prune from February to June. Severe pruning is not recommended as it will turn the leaves yellow. It is vulnerable to the white fly, red spider, Chlorosis. It undergoes a loss of foliage from June to August.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
				o	o	o	o	o	o	o	o

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
		X	X	X	X	X	X				

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
RB in Gypsum/CT	8-10	250-300
RB in Gypsum/CT	10-12	250-300
RB in Gypsum/CT	12-14	250-300
RB in Gypsum/CT	14-16	250-300
RB in Gypsum/CT	16-18	250-300
RB in Gypsum/CT	18-20	250-300
RB in Gypsum/CT	20-25	250-300
RB in Gypsum/CT	25-30	300-400
CT(1500L)	Specimen	400-500

FORTUNELLA

ORNAMENTAL CITRUS

Fortunella margarita

KUMQUAT DE FRUTO ALARGADO (SPANISH) | VALENCIAN | OVAL KUMQUAT (ENGLISH) | KUMQUAT A FRUITS OVALES (FRENCH)

STRUCTURE		
Shape: ROUND	Height: 3-4 M	Diameter: 3-4 M
Texture: COARSE	Shade: DENSE	Root: TAP ROOT

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	SAPINDALES
FAMILY:	RUTACEAE

VARIETIES

NAGAMI

MORPHOLOGY			
Trunk		Bark: SMOOTH	Color: GRAY/BROWN
Leaf	EVERGREEN SIZE: 4-8 CM COLOR: US: DK. GREEN LS: GREEN TEXTURE: US: SMOOTH LS:SMOOTH	COMPOUND: NO HARDNESS: CORIACEOUS ARRANGEMENT: ALTERNATE VENATION: PINNATE SHAPE: OVAL/LANCEOLATE MARGIN: SMOOTH APEX: ACUTE LEAF BASE: ATTENUATE PETIOLE: SHORT	
Flower	SIZE AND TYPE: 1.5-2.5 CM SINGLE OR IN AXILLARY RACEMES	Type: HERMAPHRODITE Flowering	Reproduction: HERMAPHRODITE Fragrant: Yes
Fruit	SIZE: 2.5-3.5	Type: HESPERIDIUM Edible: YES	Color: ORANGE Fruiting season: DEC-MAR
Growth		Rate: MEDIUM	Longevity: 0-50 YEARS

ECOLOGY			
Climate	ALTITUDE: 0-300 IRRIGATION: MODERATE	Temperature: -2ºC,H5,Z6 Sun exposure: SUN	Drought resistant: LOW Frost resistant: LIGHT
Soil	pH: 6-7 FERTILITY: MODERATE	Texture: LOAMY Rate: MODERATE	Lime resistant: LOW Salt resistant: LOW

USES			
Resistances		Applications	
COASTAL: 2ND LINE		SLOPES: NO	HEDGE ROWS: NO
POLLUTION: MODERATE		RIVERBANKS: NO	BORDERS: NO
WIND: MODERATE		GROUPS: NO	ISOLATED: YES



POINTS OF INTEREST

Native to East Asia. Its scientific name *Fortunella* species is dedicated to Robert Fortune (1812-1880), a Scottish horticulturist who collected plants in China. Margarita comes from the Latin *margaritus*, which means pearl, alluding to its small, shiny fruits. Commonly known as the Kumquat. It can be used as a fruit or ornamental tree in orchards or gardens.

SPACING: 3-4 M

PLANTING AND PLANT HEALTH

More resistant to cold than other citrus commercial species. Cold temperatures cause a severe winter dormancy. It requires medium-compact, deep, fresh soils, regardless of its nature, although it prefers soils that are free of salt, excessive in lime and humus-rich. A certain humidity must be maintained in the soil and waterlogging must be avoided. A light/moderate pruning is recommended to allow light to penetrate the interior and encourage harvesting. Propagation is by seed or grafting.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
				X	X						

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
		X	X	X	X	X	X				

Sowing | Planting | Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
RB in gypsum/CT	8-10	250-300
RB in gypsum/CT	10-12	250-300
RB in gypsum/CT	12-14	250-300
RB in gypsum/CT	14-16	250-300
RB in gypsum/CT	16-18	250-300
RB in gypsum/CT	18-20	250-300
RB in gypsum/CT	20-25	250-300
RB in gypsum/CT	25-30	300-400
CT(1500L)	Specimen	400-500

CITRANGEQUAT

Fortunella sp. x (Citrus sinensis x Poncirus trifoliata)

ORNAMENTAL CITRUS

CITRANGEQUAT SPANISH | VALENCIAN | CITRANGEQUAT ENGLISH | CITRANGEQUAT FRENCH

STRUCTURE		
Shape: ROUND	Height: 2-4 M	Diameter: 2-4 M
Texture: COARSE	Shape: DENSE	Root: TAPROOT

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOYILEDONS
ORDER:	SAPINDALES
FAMILY:	RUTACEAE

VARIETIES

MORPHOLOGY		
Trunk	Bark: SMOOTH	Color: GRAY/BROWN
Leaf	COMPOUND: NO	
EVERGREEN	HARDNESS: CORIACEOUS	
SIZE: 3.5-5.5 CM	ARRANGEMENT: ALTERNATE	
	VENATION: PINNATE	
	SHAPE: OVAL	
COLOR: US: GREEN	MARGIN: SMOOTH	
LS: GREEN	APEX: ACUTE	
TEXTURE: US: SMOOTH	LEAF BASE: ROUND	
LS: SMOOTH	PETIOLE: SHORT	
Flower	Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE AND TYPE: 1 CM	Flowering: SINGLE OR IN AXILLARY RACEMES	Fragrant: YES
Fruit	Type: HESPERIDIUM	Color: ORANGE
SIZE: 2-2.5 CM	Edible: NO	Fruiting Season
Growth	Rate: MEDIUM	Longevity: 50 YEARS

ECOLOGY		
Climate	Temperature: -2ºC,H5,Z6	Drought resistant: LOW
ALTITUDE: 0-300	Sun exposure: SUN	Frost resistant: LIGHT
IRRIGATION: MODERATE		
Soil	Texture: LOAMY	Salt resistant: LOW
pH: 5.5-6.5	Drainage: MODERATE	Lime resistant: LIGHT
FERTILITY: MODERATE		

USES				
Resistances		Applications		
COASTAL: 2ND LINE		SLOPES: NO	HEDGE ROWS: NO	
POLLUTION: MODERATE		RIVERBANKS: NO	BORDERS: NO	
WIND: MODERATE		GROUPS: NO	ISOLATED: YES	









POINTS OF INTEREST

It is the first trigeneric hybrid to be artificially produced from known ancestors. The cross is produced by means of *Poncirus trifoliata* x *Citrus sinensis* pollen that is placed on suitably protected *Fortunella Margarita* flowers. The objective was to improve resistance to cold while maintaining the sweetness of the orange fruits. They can vary considerably in size, color, flavor, etc. Species exist that display unknown characteristics in any of the ascendants, such as the shape of the fruit.

SPACING: 2-3 M

PLANTING AND PLANT HEALTH

This species of ornamental citrus is much more resistant to cold that other species. Despite the damage that late frosts at the beginning of the year can cause, they can usually recover by flowering again.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
	X	X	X	X	X	X					

Sowing Planting Pruning X

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Height(cm)	Topiary shapes
RB in gypsum/CT	8-10	250-300
RB in gypsum/CT	10-12	250-300
RB in gypsum/CT	12-14	250-300
RB in gypsum/CT	14-16	250-300
RB in gypsum/CT	16-18	250-300
RB in gypsum/CT	18-20	250-300
RB in gypsum/CT	20-25	250-300
RB in gypsum/CT	25-30	300-400
CT(1500L)	Specimen	400-500

MURRAYA

Murraya paniculata

ORNAMENTAL CITRUS

MURRAYA		ORANGE JASMINE	BUIS DE CHINE
SPANISH	VALENCIAN	ENGLISH	FRENCH

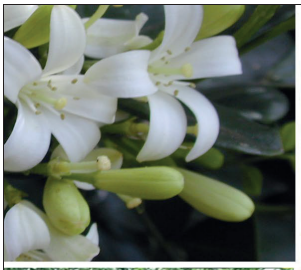
STRUCTURE		
Shape	Height	Diameter
ROUND	Up to 6 M	Up to 6 M
Texture	Shade	Root
COARSE	DENSE	TAP ROOT

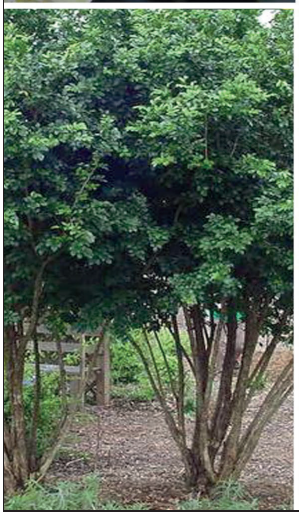
DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	SAPINDALES
FAMILY:	RUTACEAE

VARIETIES

MORPHOLOGY

Trunk		Bark: SMOOTH	Color: GRAY/BROWN
Leaf	EVERGREEN	COMPOUND: PARIPINNATE HARDNESS: CORIACEOUS ARRANGEMENT: ALTERNATE VENATION: PINNATE SHAPE: OVATE MARGIN: SMOOTH OR CRENATE APEX: ACUTE LEAF BASE: ATTENUATE PETIOLE: SHORT	
SIZE:	Leaf: 2.5-5CM Leaflets: 2-8		
COLOR:	US: DK. GREEN LS: GREEN		
TEXTURE:	US: SMOOTH LS: SMOOTH		
Flower		Type: HERMAPHRODITE	Reproduction: HERMAPHRODITE
SIZE AND TYPE:	1-2.5CM SINGLE OR IN AXILLARY RACEMES	Flowering	Fragrant: YES
Fruit		Type: HESPERIDIUM/OBLONG	Color: ORANGE OR RED
SIZE:	1 CM	Edible: NO	Fruiting season: NOV-JUNE
Growth		Rate: MEDIUM	Longevity: 0-50 YEARS




ECOLOGY

Climate		Temperature: -2ºC,H5,Z6	Drought resistant: LOW
ALTITUDE:	0-300	Sun exposure: SUN	Frost resistant: LOW
IRRIGATION:	MODERATE		
Soil		Texture: LOAMY	Salt resistant: LOW
pH:	6.5-7.5	Drainage: MODERATE	Lime resistant: MODERATE
FERTILITY:	MODERATE		

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	NO	HEDGE ROWS:	NO
POLLUTION:	MODERATE	RIVERBANKS:	NO	BORDERS:	NO
WIND:	MODERATE	GROUPS:	NO	ISOLATED:	YES

POINTS OF INTEREST

Native to Southeast Asia, from China to Japan and Malaysia. Commonly known as orange jasmine. The species is dedicated to the scientist Johann Andreas Murray (1740-1791), a Swedish professor of medicine and botany and a disciple of Linnaeus. *Paniculata* comes from the Latin *paniculatus* (with flowers arranged in panicles). It is a tropical species that can used indoors. It is commonly used in bonsai.

SPACING: 3-4 M

PLANTING AND PLANT HEALTH

Irrigation must take place when the soil begins to dry out. It is fertilized with a solid, slow-release organic fertilizer once a month. It can be fertilized throughout the year. If severe pruning is to be carried out, it should be done in winter. In spring the finer twigs are removed. It sprouts without problems from the old wood. It can be obtained very easily by cuttings. High resistant to pests however it is prone to red spider, aphid and scale insect.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
X	X	X	X	X	X	X	X				

Sowing Planting Pruning x

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides Pesticides Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (Cm)
RB in gypsum/CT	8-10	250-300
RB in gypsum/CT	10-12	250-300
RB in gypsum/CT	12-14	250-300
RB in gypsum/CT	14-16	250-300
RB in gypsum/CT	16-18	250-300
RB in gypsum/CT	18-20	250-300
RB in gypsum/CT	20-25	250-300
RB in gypsum/CT	25-30	300-400
CT(1500L)	Specimen	400-500

PONCIRUS

CitrusTrifoliata-Deciduous

ORNAMENTAL CITRUS

NARANJO TRIFOLIADO (SPANISH) | VALENCIAN | TRIFOLIATE ORANGE (ENGLISH) | CITRONNIER EPINEUX (FRENCH)

STRUCTURE		
Shape: ROUND	Height: 2-3 M	Diameter: 2-3 M
Texture: COARSE	Shade: DENSE	Root: TAP ROOT

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	SAPINDALES
FAMILY:	RUTACEAE

VARIETIES

MORPHOLOGY

Trunk	Bark: SMOOTH	Color: GRAY/BROWN
Leaf: DECIDUOUS; SIZE: Leaf: 4-6CM, Leaflets: 3; COLOR US: GREEN, LS: LIGHT GREEN; TEXTURE: US: SMOOTH, LS: SMOOTH	COMPOUND: TRIFOLIATE; HARDNESS: CORIACEOUS; ARRANGEMENT: ALTERNATE; VENATION: PINNATE; SHAPE: OVOID; MARGIN: SMOOTH; APEX: OBTUSE; LEAF BASE: ATTENUATE; PETIOLE: SHORT AND WINGED	
Flower; SIZE AND TYPE: 2-3CM, SINGLE OR IN AXILLARY RACEMES	Type: HERMAPHRODITE; Flowering:	Reproduction: HERMAPHRODITE; Fragant: YES
Fruit; SIZE: 5 CM	Type: HESPERIDIUM; Edible: NO	Color: YELLOW; Fruiting season: SEPT-NOV
Growth	Rate: MEDIUM	Longevity: 50 YEARS







ECOLOGY

Climate; ALTITUDE: 0-300; IRRIGATION: MODERATE	Temperature: -2ºC,H5,Z6; Sun exposure: SUN	Drought resistant: LOW; Frost resistant: LIGHT
Soil; pH: 5.5-6.5; FERTILITY: MODERATE	Texture: LOAMY; Drainage: MODERATE	Salt resistant: LOW; Lime resistant: LOW

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	NO	HEDGE ROWS:	NO
POLLUTION:	MODERATE	RIVERBANKS:	NO	BORDERS:	NO
WIND:	MODERATE	GROUPS:	NO	ISOLATED:	YES

POINTS OF INTEREST

Native to Northern and Central China. Commonly known as Japanese bitter orange or trifoliate orange. It propagates by seeds, being used as a rootstock to graft other citrus fruits and to be more resistant to cold. It is well known for being the most cold-hardy rootstock for citrus, although it has also been hybridized with sweet orange, to produce a large number of varieties known colloquially as citranges, also used as ornamental plants. Its leaves are deciduous. Crossed with sweet orange, it has given rise to "Citranges" with acid fruits.

SPACING: 2-3 M

PLANTING AND PLANT HEALTH

This tree tolerates very fertile and well-drained acidic soils but that maintain humidity. The pH should normally be between 5 to 6. These plants need a moderate irrigation programme and cold temperatures will stagnate growth. It requires sunny exposure and watering in dry seasons. The fruit ripens between 16 and 18ºC but if the fruit is to last for several months, the temperature should not exceed 25ºC. Very hot environments with dry air will cause the fruit to fall. During the period of greatest growth liquid fertilizer should be applied at a rate of 150 ppm of 2:1:2 ratio.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
		n	n	n							

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
	X	X	X	X							

Sowing | Planting | Pruning (X)

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
RB in gypsum/CT	8-10	250-300
RB in gypsum/CT	10-12	250-300
RB in gypsum/CT	12-14	250-300
RB in gypsum/CT	14-16	250-300
RB in gypsum/CT	16-18	250-300
RB in gypsum/CT	18-20	250-300
RB in gypsum/CT	20-25	250-300
RB in gypsum/CT	25-30	300-400
CT(1500L)	Specimen	400-500

TRIPHASIA *Triphasia trifolia*

ORNAMENTAL CITRUS

LIMONCILLO (SPANISH) | VALENCIAN | LIME BERRY (ENGLISH) | ORANGINE (FRENCH)

STRUCTURE		
Shape: ROUND	Height: 2-3 M	Diameter: 2-3 M
Texture: COARSE	Shade: DENSE	Root: TAP ROOT

DIVISION:	PHANEROGAMS
SUBDIVISION:	ANGIOSPERMS
TYPE:	DICOTYLEDONS
ORDER:	SAPINDALES
FAMILY:	RUTACEAE

VARIETIES

MORPHOLOGY

Trunk	Bark: SMOOTH	Color: GRAY/BROWN
Leaf: EVERGREEN; SIZE: Leaf:2-3.5CM, Leaflets: 3; COLOR: US: GREEN, LS: GREEN; TEXTURE: US: SMOOTH, LS:SMOOTH	COMPOUND: TRIFOLIATE; HARDNESS: CORIACEOUS; ARRANGEMENT: ALTERNATE; VENATION: PINNATE; SHAPE: OVAL; MARGIN: SMOOTH; APEX: OBTUSE; LEAF BASE: ROUND; PETIOLE: SHORT	
Flower; SIZE AND TYPE: 1.5 CM, SINGLE OR IN AXILLARY RACEMES	Type: HERMAPHRODITE; Flowering	Reproduction: HERMAPHRODITE; Fragrant: YES
Fruit; SIZE: 1-1.5 CM	Type: ROUND/BERRY-LIKE; Edible: YES	Color: ORANGE/RED; Fruiting season
Growth	Rate: MEDIUM	Longevity: 50 YEARS



ECOLOGY

Climate; ALTITUDE: 0-300; IRRIGATION: MODERATE	Temperature: -2ºC,H5,Z6; Sun exposure: SUN	Drought resistant: LOW; Frost resistant: LIGHT
Soil; pH: 5.5-6.5; FERTILITY: MODERATE	Texture: LOAMY; Drainage: MODERATE	Salt resistant: LOW; Lime resistant: LOW

USES

Resistances		Applications			
COASTAL:	2ND LINE	SLOPES:	NO	HEDGE ROWS:	YES
POLLUTION:	MODERATE	RIVERBANKS:	NO	BORDERS:	NO
WIND:	MODERATE	GROUPS:	NO	ISOLATED:	YES

POINTS OF INTEREST

Its fruit is edible and can be used to prepare drinks. When cooked; to prepare jams, cosmetics or aromatic baths. They are shaped like red berries whose flesh has an acidic taste similar to that of lime. It is native to Java, in Indonesia. One of its most common uses in landscaping is as a hedge. They can also be used as bonsai.

SPACING: 2-3 M

PLANTING AND PLANT HEALTH

It is a small tree or shrub that is quite resistant. Although they can survive temperatures below zero, low temperatures in general are not recommended. It propagates by seeds that must be planted in early spring. It should be kept in a greenhouse during its first two winters in cold climates. This species tolerates moist soils with a pH between 5 and 6.

CHROMATIC CALENDAR

Foliage, Flowering and Fruiting Season

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Cultivation Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
	X	X	X	X	X	X					

Sowing | Planting | Pruning (X)

Treatment Calendar

JAN	FEB	MAR	ABR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC

Fungicides | Pesticides | Fertilizers

COMMERCIALIZATION

Presentation	Girth (cm)	Height (cm)
RB in gypsum/CT	8-10	250-300
RB in gypsum/CT	10-12	250-300
RB in gypsum/CT	12-14	250-300
RB in gypsum/CT	14-16	250-300
RB in gypsum/CT	16-18	250-300
RB in gypsum/CT	18-20	250-300
RB in gypsum/CT	20-25	250-300
RB in gypsum/CT	25-30	300-400
CT(1500L)	Specimen	400-500

Subchapter 10.3 Commercialization, Use and Planting

COMMERCIALIZATION

Throughout the complete cultivation process or in the last phases, the citrus plant should be grown in a mesh container, since large citrus plants cannot tolerate bare root transplants.

The most common presentation for Citrus species is a straight stem or trunk with a diameter of at least 2-3 cm, devoid of leaves and branches up to a height of 1.80-2 meters. The crown is given a rounded shape, although without much retouching.

The Technological Standards for Gardening and Landscaping state:

1. The trees are measured according to the girth of the trunk, 1 m above the level of the root neck.

2. For trees with multiple trunks, the total girth is the sum of the individual perimeters.

3. In all plants there must be a proportion between the total height and the diameter of the trunk, which depends on the species or variety, and which may vary according to the growing conditions in different climatic zones.

4. The height, width of the crown, the length of the branches, the branching out, and foliage must correspond to the age of the individual according to the species or variety in well-balanced proportions. Where appropriate, this should also be applied to the ratio between rootstocks and grafts in terms of trunk and crown.

5. The crown must be proportionate to the thickness of the trunk and present a minimum of three structural branches, balanced among them.

6. Citrus plants can be supplied with a root ball or in a container, as long as good root development is possible.

7. The root system must be well developed and correspond, both in shape and size, to the characteristics of the species or variety, to the age of the tree, as well as to the characteristics of the soil or substrate where it has been cultivated. The root system will be balanced and its size proportional to the size of the root ball or container. In the case of root systems with taproot, it must have sufficient functional secondary roots and must maintain a length of at least 20 cm.

8. The trees must be correctly formed and structured, having adequate branching. They must be supplied with a proportionate volume of healthy foliage.

9. In grafted trees, the grafts should be satisfactorily attached to the rootstocks.

10. Trees, especially those intended for alignments must not present codominant branches (with forks) in their main axis, nor anomalous ramifications.

11. Trees for roadsides require a minimal crown height, normally high or medium crown, and care must be taken that the main branches do not branch out excessively.

Classification of citrus trees according to trunk girth	
6-8 cm	20-25 cm
8-10 cm	25-30 cm
10-12 cm	30-35 cm
12-14 cm	35-40 cm
14-16 cm	40-45 cm
16-18 cm	45-50 cm
18-20 cm	50-55 cm

Table 10.3.1. Classification of citrus trees according to trunk girth

Crown height	
Crown height	Free trunk of lateral branches (cm)
Tall	>250
Medium	225-250
Low	<225

Table 10.3.2. Crown height of Citrus trees

The volume of the root ball must be proportional to the size of the aerial part of the plant, its vigor, and the soil conditions of the garden where it has grown. The following table outlines the guidelines.

- Diameter of root ball (cm) = Girth of trunk x 2
- Height of root ball (cm) = Diameter of root ball x 1'2

Minimum recommended volume for root ball	
Trunk girth	**Root ball volume (liters)**
6-10	10
8-10	10
10-12	15
12-14	15
14-16	25
16-18	35
18-20	50
20-25	80

Table 10.3.3. Minimum volume of root ball in citrus

PLANTING

Citrus plants are identified with a color code. Plants produced in the field are commonly individually packed or in groups of five, at the buyer's discretion, with the root ball covered with a 60 x 70 cm black plastic sheet, or with sackcloth.

The root ball of a plant used in agriculture should have dimensions of 20 cm in diameter and 25 cm in height, with a weight of 5-6 kg.

The plants produced in a mesh or in a greenhouse are cultivated in black plastic foil bags or in a plastic container of variable dimensions depending on the size of the plant.

When the plants arrive in the garden (its time in the nursery after the uprooting should be as short as possible), they must be planted in their final placed sheltered from the sun and maintaining a high relative humidity by lightly spraying with water. The conditions for planting evergreen broadleaf trees presented in Chapter 1 of this book should also be observed. To begin the with the planting process, the plant should be removed from the bag or container and the substrate should be shaken slightly, the last two centimeters of the main root must be eliminated (including those that have spiraled) and pruning should be carried out.

USES

The use of citrus as garden and street trees is based on different criteria than those that are followed for agricultural citrus trees. Thus, citrus trees for gardening should preferably come from seed and without grafting since this allows obtaining specimens with greater vigor and in which it is easier to form a trunk without branches in the lower part. On the contrary, if grafted trees are used in gardens, streets and avenues, multiple branches are obtained in the lower part, which must be eliminated, causing scars that give rise to multiple bulges or wounds on the trunks. At the same time, the crowns do not reach the volume or area capable of generating shade of sufficient width or to offer a desired shape in a citrus tree.

The use of citrus trees in ornamentation has niched the bitter orange tree as a street tree and therefore numerous other applications in gardening have been ignored, except for its use in Moorish gardens.

New applications for the use of citrus trees in gardens are the result of the existence of recent mutations with variegated leaves or leaves that are different from the typical ones. For example, the variety of bitter orange *Bouquet de fleurs* are trees of great ornamental value and with ruffled leaves. In addition, *Poncirus trifoliata* and *Citrange Troyer* offer new possibilities for the use of citrus trees in gardens since they can be planted in regions where the climate is not as mild as in the typical citrus-growing regions). Similarly, *Citrus reshni* can be placed in any type of soil, provided it has good drainage and there is no danger of waterlogging.

The aromatic effect of citrus has historically been of great interest. To this end, it is necessary to plant these trees in groups, so that the fragrance of their blossom becomes more intense.

Another interesting application for these species is hedges in gardening. However, we should bear in mind that although these plants tolerate pruning well, most of them grow better if the trimming is done according to their needs. Consequently, these species can be used as informal hedges and although they are shrubby or arboreal species with very dense foliage and therefore suitable for forming a hedge, it will not be possible to obtain an effect like the one achieved in common topiary art. However, citrus hedges, in addition to providing originality, offer profuse spring flowering and decorative fruits adding to the primary delimiting function of the hedge.

If species such as *Citrus aurantium* var. *myrtifolia, Severinia buxifolia, Microcitrus australasica* and *Triphasia trifolia* are used for hedges they can reach heights of between 1 and 2 meters.

To obtain acceptable hedges with *Citrus* species, the plants should begin to branch from a fairly low point and, since these plants derive from cultivars generated by mutation or hybridization, they must be grafted plants in which the graft must be made in the rootstock a few centimeters from the ground. Another option would be to choose a species suitable for hedges but without grafting.

If tall hedges are desired, these same species can be used, allowing them to reach a development and size appropriate to the needs. More vigorous species such as calamondin, kumquat and other vigorous citrus can also be used, the choice of which will be made based on their foliage density, tolerance to pruning, existence of short internodes and abundant branching out.

Trellises can also be covered by citrus. As early as the 15th century, the Valencian *lligadors d'orts* (professional lattice workers) distinguished themselves for their ability to intertwine citrus branches to form tunnels and trellises. In this case, the most vigorous species must be chosen, capable of quickly reaching the desired height so that later, by directing their branches and buds, they can populate the space that needs to be covered. In this case, moderate pruning is recommended in order to preserve the good vigor of the plant and ensure that the trellis is progressively covered. Suitable species for this purpose are lemon trees, the *Salustiana* variety of orange tree or the *Chandler pummelo*.

LEGISLATION

Citrus trees are, rather than ornamental plants, a crop of enormous social and economic importance, not only in Spain but also in other countries of the European Union. Therefore, every state takes steps to protect this resource. Among these measures is the prevention of pests and diseases that may compromise the profitability or even the survival of this crop. For this reason, citrus plants intended for ornamental use must be produced in such a way that they do not spread of diseases and pests to commercial plantations. The European Union establishes some rules in this regard. These rules are transferred to Spanish law by the following provisions:

- Royal Decree 2071/1993 of November 26, regarding protection measures against the introduction and dissemination in the national territory and the European Union of organisms harmful to plants or plant products, as well as for export and transit to countries third parties.

- Decree 200/2000 approving the Technical Regulation for the Control of Production and Marketing of reproductive materials for ornamental plants and ornamental plants themselves.

Subchapter 10.4 Maintenance

FERTILIZING

Base-dressing with mineral and organic fertilizers

Base dressing consists of the incorporation of fertilizers or manure into the soil before the planting takes place.

The equipment usually used includes: Truck or van with a trailer to carry bags of organic and mineral fertilizer, hoes, rakes, shovels, brushes and brooms.

A typical example of organic fertilizer in gardening would include well fermented solid waste from the city free of glass, metal, plastic, etc. It should contain 60% refined city compost, 20% pomace and 20% cow dung. In the case of meadows and lawns, sand is added to the mixture in a proportion of 1/3, and it is fermented much more. The dose used is 5 kg/m^2.

The mineral fertilizer is used with the complex fertilizer 15-15-15 at a dose of 30 gr/ m^2.

Maintenance fertilizing

Programme:

November.....	Organic Matter: 150 Kg/area
March.....	Ammonium nitrate: 3 Kg/area Superphosphate of lime: 2.5 Kg/area Potassium sulfate: 1.5 Kg/area
May.....	Ammonium nitrate: 1.5 Kg/area
July.....	Superphosphate of lime: 2.5 Kg/area Potassium sulfate: 1.5 Kg/area
August.....	Ammonium nitrate: 1.5 Kg/area

A suitable nutrient solution (mg/l final solution) could be:

N 100-150
P2O5 50-80
K2O 75-125
MO 20-30
CaO 50-150

Depending on the characteristics of the area to be fertilized, the operation is carried out in different ways. In the case of planting beds and tree pits, the expert will provide the appropriate amount of fertilizer according to the species planted. When possible, a rake is used to spread the fertilizer. Finally, abundant water is added and the paths or walkways are cleaned.

FERTILIZING OUTPUTS	
MAINTENANCE OPERATION	**Output**
Supply and manual spread of mineral fertilizer on lawns, with a dose of 800 Kg/ha	600 m^2/hour
Supply and mechanical spread of mineral fertilizer on lawns, with a dose of 800 kg/ha.	6800 m^2/hour
Supply and spread of organic fertilizer on groups of trees and shrubs, contributing a dose of 6 Kg/ m^2	90 m^2/hour
Organic fertilizer by manual digging	19 m^2/hour
Supply and spread of mineral fertilizer on groups of trees and shrubs, contributing a dose of 70 g/ m^2	350 m^2/hour
Application of foliar fertilizer by means of a wheelbarrow-type sprayer (100 l capacity)	800 m^2/hour

Table 10.4.1.: Outputs in the supply of fertilizers

IRRIGATION

The soil must be at field capacity in order to ensure that the plant is in good condition and an adequate level of cohesion of the walkways and paths in the gardens. Irrigation will take place through sprinklers, diffusers and dripping nozzles and programmed by means of an electronic timing device. Quick irrigation heads or hydrants will be installed so that they can be used in the event the automated network breaks down.

Below is a guideline to the monthly irrigation operations, which may vary depending on the type of soil.

Irrigation	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Bush/shrub		1	1	1	2	3	3	2	1			
Trees		1	1	1	1	1	2	1	1			

Table 10.4.2.: Number of monthly per plant (in Valencia)

When planting new specimens or restocking, they must be watered immediately.

Dose:

Shrubs: Average: 5 L per foot of watering/irrigation
Maximum: 10 L per foot of watering/irrigation

Trees: Average: 30 L per foot of watering/irrigation
Maximum: 50 L per foot of watering/irrigation

REPLACING

When replacing a specimen, the tree and its stump must be removed. To do this, the tree is sawn at a height between 0.5 m and 1 m, depending on the diameter of the tree (the larger the diameter, the higher the cutting height). Its purpose is to facilitate subsequent stump removal, which is carried out in two different ways depending on the size or state of the stump:

- Stump with a diameter < 30 cm: the stump is removed with the root cutter (an ax and a hoe in the same tool) and axes (either one-handed or two-handed). Both pieces are used to cut roots and for this a ditch is made around the tree, approximately one meter deep. If necessary, a crane is used to pull up the stump and as it comes out the roots are cut. The crane then transports it to a platform or trailer for delivery to the landfill.

- Stump with a diameter > 30 cm: The stump is removed with the help of a crane and the tools mentioned above.

After removing the tree (an operation that is usually carried out the day before) the specimens to be planted are collected from the nursery and brought to the site. During the transportation phase, care must be taken so that the plant does not undergo any stress or receive air at the roots.

In the case of replacement trees, the hole resulting from the stump removal is deepened. The opening of new planting pit can be done by hand (hoes, picks) or with a mechanical auger. A pit up to one meter deep and approximately one meter in diameter is made (less in small trees).

Once the pit is made, the extracted soil is fertilized. In some cases, mulch with sand can be added instead of manure. With the earth prepared, part of it is put back into the pit, and then the tree is prepared: if it is container tree, the container is given a few taps on the side or at the base to loosen it (this makes it easy to remove the tree and root ball). If it is wrapped in burlap, cut it with scissors. In the case of plastic or plaster, the wrapping can be broken with a pair of scissors (plastic) or with some light taps (plaster).

Once the root system of the tree is placed inside the pit (if the specimen is being used in a line of trees, care must be taken that it is well positioned with respect to the others), the pit is then filled with the soil that has been previously prepared. Approximately halfway through the filling, both a tube which will allow the water to get to roots and the stake are placed. The rest of soil will be added and the surface padded down to make it more compact.

To carry out the staking operation, refer to the steps outlined in other chapters. Tie the tree with a cable and elastic protection so that it does not damage the tree by preventing its swaying in the wind. The stake should be higher than the cross crown so that it does not cause chafing to the bark. If this is not possible, it can be placed lower, but its end would finish in a flute beak cut with its highest part being on the side opposite the tree, avoiding damage to the bark.

PRUNING AND FORMATIVE PRUNING

Trees do not need severe pruning, but rather light touch-ups, unless dead or broken branches are present, elimination of suckers, adjustment of structural branches that are poorly arranged, and certain thinning that allow the passage of air and light to the center of the plant. The maximum percentage of living tissue that it is advisable to prune in a tree is 25% and in the case of citrus fruits it is considered 20% for normal pruning and 10% for light pruning. The goal is to keep the treetop balanced, and a light branch cleaning should be done every year. Pruning work will always be carried out by qualified personnel and care will be taken to ensure that the cuts are clean and that there are no tears, to ensure the health of the tree and avoid risks to passersby.

If the specimen has dead or diseased branches, pruning can be done at any time. However, if branches are in good health, pruning should be carried out only during the dormant stage. In recent years, various studies have appeared that show that pruning done in the dormant stage reduces the incidence of cankers

on branches, since a good part of wood-degenerating fungi produce their fruit bodies in the winter period.

Action will be taken every year on the specimens that need it, according to a program that will be presented by the maintenance company. Pruning should not be carried out in frosty weather, on rainy days or days with very high temperatures.

Pruning tools must be kept in good condition, sharp and disinfected. If the branch is relatively large and heavy, the rule of three cuts is used, which consists of making two relief cuts before making the final cut: the first cut is made at 30-45 cm. from the neck of the branch, the second cut is made further outwards (at this point the branch breaks and falls). The third cut removes what remains of the stump. In the case of pruning large branches, the branch can be eliminated by cutting it successively into smaller sections.

There is no pre-established pruning angle since it depends on each particular case. When making the cut, the neck of the branch and the bark ridge will be respected so that healing happens quickly, and internal rotting does not set in.

Material used: chainsaws, handsaw with its sheath, one-handed scissors with its sheath, two-handed scissors, telescopic scissors with saw, dynamic climbing rope, aluminum ladder with 3 extensible sections, aluminum stepladder with steel saw, rakes, brushes and brooms, wheelbarrow and carts, healing products such as Lac-Balsam or similar.

Formative pruning

Among formative pruning types the following are highlighted:

- Formative pruning of the stem: Consists of maintaining the dominant stem, while the secondary branches are eliminated or reduced, so that they do not compete with the central leader. A few well-formed and shortened side branches can be left to protect the trunk from sun and traumatic injury.

- Formative pruning of the structure: It is done when the tree is young. This will provide the tree with a strong structure so that it becomes resistant and has fewer pruning needs in the future. When pruning, an adequate distance is maintained between consecutive branches. The natural forms towards which the growth of the tree is oriented are: ovoid, extended, columnar, tapered, conical and rounded.

- Thinning out/lifting the crown: This consists in the progressive elimination of the lower branches of the trees (with central leader and lateral branches). Only small diameter branches should be removed, also considering that the part removed does not exceed one third of the total crown height. The free height of the trunk will ultimately depend on its location: on public roads or streets it will be 4.5 m and in pedestrian areas 2.5-3 m.

- Formative pruning for the safety of aerial service networks: If there are aerial low voltage electricity or telephone networks with untwisted cables, a formative pruning of the structure is carried out, in order to keep a clear area between the top of the tree and the aerial network.

Pruning to clean and plant health

The tree is cleaned by selectively eliminating dead branches, cracked or broken branches, diseased branches, weak branches, badly oriented branches, branches that cross or rub against each other, branches loosely attached to the trunk, excess suckers, shoots of root. The tools used for this type of pruning must

be disinfected before moving onto a new tree. This will reduce the transmission of diseases from one tree to another.

Pruning for pedestrian security

This type of pruning is carried out in order to prevent the following risks: detachment and fall of branches; friction of branches with buildings, facilities, services...; low branches that might interfere with the crossing of pedestrians and circulation in general; branches that might affect urban furniture; tree falls or breaks.

Elimination of branches attached to the main trunk

The cuts must be made in the section of the resulting plane between the branch bark ridge and the upper end of its neck, which positively promotes healing.

If the branches to be removed are excessively heavy and there is a danger of causing damage due to tears when making the cuts, the rule of three cuts is applied.

If the branches are horizontal and not inclined as in the previous case, the cuts will be made parallel to the trunk, respecting the neck of the branch.

Pruning to reduce the crown

Through this type of pruning, branches and parts of branches are selectively removed from a tree to reduce its height and width. The aim is to create sufficient space to not to interfere with aerial service networks and buildings, to ensure the stability of some branches, and to allow sunlight to reach homes.

There are several methods to reduce the crown: the English method consists of eliminating the terminal branches, leaving a lateral branch in each cut so that it becomes the central leader, thus ensuring the shape and structural integrity of the tree. Another method is crown rebalancing pruning, which aims to ensure the tree's stability and improve its aesthetics (according to the English method this would be considered topping).

The removal of an unfavorable branch must be carried out at the level of another lateral branch, leaving the latter acting as a sap strip and never leaving stumps. The cuts will be made in a plane parallel to the ridge of the bark.

Unless otherwise stated (due to the specific type of pruning used), the suppression of any branch will try to give to the tree its most natural appearance, and must respect the following rules:

- Keep proportion between the diameters of the respective orders of branching.
- The side branches should generally grow outwards.
- Avoid twisted shapes

If there are no lateral branches, the cuts will be made at the height of a lateral bud, making the cut in a bevel shape, parallel to the plane of the future bark ridge.

The branches that were dead at the time of pruning will be removed by making the cuts at the height of the new healing callus that would have formed, taking great care not to damage this callus

Eliminating hooked branches

The cuts must be made so that only unfavorable branches are eliminated. The cut must be made in bevel allowing the sap to flow to the healing area. It is important that no part of the plant is left without sap circulation and the section of the wound must be as small as possible.

Thinning

This operation will be carried out when it is necessary or convenient to maintain the volume of the tree. It consists in eliminating part of the branches in order to facilitate greater aeration, penetration of light and revitalization of the tree. The removal of the branches must be carried out evenly, distributing the loads and making the branches lighter at their terminal ends. This will prevent breakage due to excess weight. In this type of pruning, 25-30% of the branches will be suppressed, never more than 50%. Thinning should start first at the highest part of the crown and then continue in the lower parts. This type of pruning should be done when the tree has foliage.

Pruning to Restore and re-shaping.

This type of pruning is only carried out in special cases and by qualified professionals. Restoration pruning aims to improve the structure, shape and appearance of a tree that has been neglected and is only applied to large specimens of high heritage value. Re-shaping pruning aims to re-shape a tree that has been subjected to vandalism, to inclement weather, or that it is simply poorly shaped.

Rejuvenation pruning

This pruning process aims to revitalize the trees when all other methods have not given results or circumstances advise it. Most of the branches are eliminated, thus causing the sprouting of the emergency adventitious buds. This pruning will only be applied in exceptional cases.

Treatment of wounds

Any wound produced in a tree can be a future source of infection, thus endangering its health. The cuts should be made correctly, always following the guidelines indicated in the previous sections. This will ensure the tree can activate its natural defense against this type of damages and wounds.

When pruning the tree, we will try to make as few cuts as possible, favoring small ones. All cuts whose wounds are greater than 5 cm in diameter will be treated with protective products.

The cuts must be clean and without burrs and therefore the tools used must be perfectly sharp. If the cut cannot be done properly in the first attempt, successive cutting operations will be carried out until a perfectly clean wound edge is achieved, which will favor the development of a healing callus.

Wounds caused accidently will also be treated. To carry out this treatment, all dead tissues must be cleaned, while facilitating the non-accumulation of water in the wound. Subsequently and after carrying out these operations, a waterproofing product will be applied.

Special treatment of cavities

It includes the elimination of dead tissues, making sure the edges are smooth and uniform, creation of drains to avoid the accumulation of water, waterproofing treatments. The construction of a structure may be necessary to avoid possible loss of resistance in the tree.

MAINTENANCE OF TREE PITS

The aim here is to provide the tree with the necessary elements for its correct development in a tree pit (normally in a paved area). For this, various tasks are carried out such as: digging, fertilizing, and weeding, as well as cleaning and watering.

Digging: It is carried out throughout the year, especially in spring and summer, with the same frequency that the rest of the plantations are dug, resulting in 3-4 per year. It is convenient to check the state of the pit after heavy rains in case it is necessary to dig.

Fertilizer: Generally, 1-2 times a year.

Weeding: In spring-summer every 20-30 days, in autumn-winter approximately every 45-60 days

PHYTOSANITARY TREATMENTS

Treatments are carried out at the times indicated below, always by mutual agreement with the owners or managers of the garden or green area, in terms of species, products and methods. (c.p. = commercial product).

March: Treatment against insects, mites and cryptogamic diseases.
- Abamectin: 0.35 cc/l c.p.
- Fosetil Al: 2.5 g/l p.c.

May: Treatment against wax scales, other insects and cryptogamic diseases.
- Metilpirimifos: 1.75 g/l c.p.
- Fosetil Al. 2.5 g/l c.p.

July: Treatment against sucking insects, chewing insects and mites.
- Fenvalerate: 0.75 cc/l c.p
- Dienochlor: 0.9 g/l c.p

September: Treatment against sucking insects, chewing insects and mites.
- Abamectina: 0.35 cc/l c.p
- Fosetil Al: 2.5 g/l c.p

December: Treatment against cryptogamic diseases.
- Fosetil Al: 2.5 g/l c.p

February: Treatment against cryptogamic diseases.
- Fosetil Al: 2.5 g/l c.p

Signs of specific pests and diseases in some plants should be monitored throughout the year:

- **Aphids/mites:** Treat with Abamectin at 0.75 cc/l p.c. or with Ethiofencarb at 1 cc/l c.p.
- **Powdery mildew:** White spots on the leaves. Treat with Benomyl at 0.6 g/l as soon as it appears
- **Snails and slugs:** Treat late in the day and water with Metaldehyde at a rate of 10-15 granules/m^2.
- **Chlorosis (iron deficiency):** Sequestrene 138 F at 3 g/m^2.

The following equipment and materials will be normally used:

- Low toxicity phytosanitary products
- Wetting
- Small tank
- Vehicle for displacement
- Masks, aprons, forearm gloves, boots.

The treatment requires only one specialist or technician , who prepares the mixture in the tank or backpack and sprays the indicated species.

Phytosanitary treatments are preferably carried out during hours of minimal inconvenience, prior to notifying the owners or managers of the garden or green area.

REMOVAL OF WASTE TO LANDFILL

Throughout the year and whenever waste is produced by gardening and cleaning work, it should be removed within 24 hours. The following materials are usually needed: van, rakes, brooms, carts, shovel, and wheelbarrow.

The waste should have been previously accumulated in piles, bags or containers, depending on their origin. The driver of the van where the remains are stored will be helped by a laborer in collecting and loading them into the van. Once the collection is finished, the area is cleaned with a rake or broom, (depending on whether it is a garden or a walkway). The waste will be transported to the landfill for their appropriate disposal.

Calendar of operations

MONTH	Trees and bushes
MARCH	Transplanting of bareroot plants Formative training/pruning
APRIL	Transplanting of evergreen trees Fertilizing
MAY	Maintenance pruning
OCTOBER **NOVEMBER**	Deep substrate, maintenance pruning Transplanting of evergreen species
DECEMBER **JANUARY**	Transplants and pruning weather permitting
FEBRUARY	Formative pruning and transplanting of deciduous species.

Table 10.4.3.: Calendar of operations for evergreen and deciduous specimens

Frequency in maintenance operations

OPERATION	FREQUENCY		
Irrigation		**1 Mar / 31 Oct**	**1 Nov / 28 Feb**
	Bushes with or without trees	3 times a week	once a week
	Trees	2 time a week	once a week
	Pots	3 time a week	once a week
	Street trees	2 time a week	once every 2 months
Subsoiling and Deep digging	Trees or bushes	3 times a year /as indicated by D.T.	
Base dressing	Prior to any planting		
Renewal of substrates or amelioration	As indicated by D. T.		
Weeding or light digging	Once a month		
Surface Fertilizing (top dressing)	**Spring and Autumn**	**Winter**	
	5-8 mineral fertilizer	1 organic fertilizer	
Replacements	Trees with root ball	All year	
Phytosanitary treatments	From April to Nov OR as indicated by D.T.		
Maintenance of tree base or tree pit	Once a month		
Pruning and tree sanitation	Formative pruning	Winter	
	Maintenance pruning	As indicated by D.T.	
	Green pruning	Every month	
Applications of herbicides	Monthly		

Table 10.4.4.: Calendar and frequency in maintenance operations (D.T.: Technical Director)

LIST OF PLANT SPECIES

BROADLEAF EVERGREEN TREES

Acacia dealbata 25
Acacia saligna (Acacia cyanophylla) 26
Brachychiton acerifolius 27
Brachychiton populneus 28
Casuarina equisetifolia 29
Cinnamomum camphora 30
Coccoloba uvifera 31
Cocculus laurifolius 32
Eucalyptus camaldulensis 33
Eucalyptus ficifolia 34
Eucalyptus globulus 35
Ficus elastica 36
Ficus lyrata 37
Ficus macrophylla 38
Ficus microcarpa (Ficus nitida) 39
Ficus rubiginosa 40
Grevillea robusta 41
Lagunaria patersonii 42
Ligustrum lucidum 43
Magnolia grandiflora 44
Phytolacca dioica 45
Quercus ilex subsp. ilex 46
Quercus ilex subsp. ballota 47
Quercus suber 48
Schinus molle 49
Schinus terebinthifolius 50
Spathodea campanulata 51

DECIDUOUS TREES

Acer campestre 89
Aesculus hippocastanum 90
Ailanthus altissima 91
Albizia julibrissin 92
Bauhinia variegata 93
Catalpa bignonioides 94
Celtis australis 95
Cercis siliquastrum 96
Chorisia speciosa 97
Crataegus monogyma 98
Eleagnus angustifolia 99
Erythrina crista-galli 100
Fraxinus ornus 101
Gingko biloba 102
Gleditsia triacanthos 103
Jacaranda mimosifolia 104
Koelreuteria paniculata 105
Lagerstroemia indica 106

Malus floribunda 107
Melia azedarach 108
Morus alba 109
Paulownia tomentosa 110
Plananus hispanica 111
Populus alba 112
Prunus cerasifera pisardii 113
Pterocarya fraxinifolia 114
Robinia pseudoacacia 115
Sophora japonica 116
Tamarix ramosissima 117
Tipuana tipu 118
Ulmus pumila 119

CONIFERS

Abies pinsapo 146
Araucaria araucana 147
Araucaria heterophylla 148
Calocedrus decurrens 149
Cedrus atlantica 150
Cedrus deodara 151
Cephalotaxus harringtonia 152
Chamaecyparis lawsoniana 153
Cryptomeria japonica 154
Cupressus arizonica 155
Cupressus macrocarpa 156
Cupressus sempervirens 157
Juniperus communis 158
Juniperus horizontalis 159
Juniperus oxycedrus 160
Juniperus thurifera 161
Larix decidua 162
Picea abies 163
Picea pungens 164
Pinus brutia 165
Pinus canariensis 166
Pinus halepensis 167
Pinus nigra 168
Pinus pinaster 169
Pinus pínea 170
Pinus sylvestris 171
Pinus wallichiana 172
Platycladus orientalis 173
Podocarpus macrophylla 174
Pseudotsuga menziesii 175
Sequoiadendron giganteum 176
Taxodium distichum 177
Taxus baccata 178
Tetraclinis articulata 179
X Cupressocyparis leilandii 180

PALM TREES, ZAMIACEAE AND CYCADCEA

Brahea armata 220
Butia capitata 221
Chamaerops humilis 222
Copernicea alba 223
Cyca revoluta (cycadácea) 224
Diion spinulosum (zamiácea) 225
Howea fosteriana 226
Jubaea chilensis 227
Livistona australis 228
Livistona chinensis 229
Livistona decipiens 230
Phoenix canariensis 231
Phoenix dactylifera 232
Phoenix reclinata 233
Phoenix roebelinii 234
Sabal palmeto 235
Sygarus ramanzoffianum 236
Trachycarpus fortunei 237
Washingtonia filifera 238
Washingtonia robusta 239

SHRUBS

Abelia floribunda 264
Arbutus unedo 265
Atriplex halimus 266
Buddleia davidii 267
Buxus sempervirens 268
Callistemon citrinus 269
Callistemon speciosus 270
Capparis spinosa 271
Carissa macrocarpa 272
Cassia corymbosa 273
Cassia didymobotrya 274
Cestrum nocturnum 275
Chrysantemum frutescens 276
Cistus albidus 277
Coronilla valentina 278
Cotoneaster horizontalis 279
Cotoneaster pannosus 280
Cotoneaster salicifolius 281
Cytisus scoparius 282
Datura arborea 283
Datura sanguinea 284
Deutzia scabra 285
Echium fastuosum 286
Eleagnus pungens 287
Escallonia rubra 288

Euonymus japonicus 289
Genista monosperma 290
Hibiscus rosa-sinensis 291
Hibiscus syriacus 292
Jasminum officinale 293
Lantana camara 294
Laurus nobilis 295
Myoporum tenuifolium 296
Myrtus communis 297
Nerium oleander 298
Philadelphus coronarius 299
Photiniax fraseri 300
Pistacia lentiscus 301
Pittosporum tobira 302
Polygala Myrtifolia 303
Pyracantha coccinea 304
Rhamnus alaternus 305
Senecio petasitis 306
Senecio maritima 307
Solanum rantonnetti 308
Spartium junceum 309
Spirea x arguta 310
Syringa vulgaris 311
Teucrium fruticans 312
Viburnum tinus 313
Vitex agnus-castus 314

GROUNDCOVERS

Aptenia cordifolia 344
Asparagus densiflorus 345
Carpobrotus acinaciformis 346
Carpobrotus edulis 347
Cerastium tomentosum 348
Drosanthemum floribundum 349
Felicia amelloides 350
Festuca cinerea 351
Gazania x hybrida 352
Hedera helix 353
Hypericum calycinum 354
Lampranthus aureus 355
Lampranthus spectabilis 356
Lantana montevidensis 357
Lobularia maritima 358
Ophiopogon japonicus 359
Verbena x hybrida 360
Vinca Major 361

CLIMBERS

Bougainvillea glabra 382
Campsis x hybrida 383
Ficus repens 384
Hedera helix 385
Jasminum mesnyi 386
Jasminum officinale 387
Lonicera japonica 388
Macfadyena ungis-cati 389
Parthenocissus tricuspidata 390
Plumbago auriculata 391
Solandra maxima 392
Solanum jasminoides 393
Tecomaria capensis 394
Vitis vinifera 395
Wisteria sinensis 396

MEDICINAL AND AROMATIC PLANTS

Acanthus mollis 423
Artemisia absinthium 424
Chamomilla recutita 425
Helichrysum stoechas 426
Hyssopus officinalis 427
Lavandula angustifolia 428
Lavandula dentata 429
Lavandula hybrida 430
Lavandula latifolia 431
Lavandula stoechas 432
Lippia thriphylla 433
Melissa officinalis 434
Mentha piperita 435
Mentha pulegium 436
Mentha spicata 437
Micromeria fruticosa 438
Nepeta cataria 439
Origanum majorana 440
Origanum vulgare 441
Ricinus communis 442
Rosmarinus officinalis 443
Ruta graveolens 444
Salvia microphylla 445
Salvia officinalis 446
Salvia sclarea 447
Sambucus nigra 448
Santolina chamaecyparissus 449
Satureja montana 450
Sideritis angustifolia 451
Thymus vulgaris 452

HEDGES AND TOPIARY

Buxus 482
Carpinus betulus 483
Cotoneaster franchetti 484
Escallonia rubra 485
Lingustrum ovalifolium 486
Mahonia aquifolium 487
Myoporum laetum 488
Myrtus comunis 489
Prunus laurocerasus 490
Teucrium fruticans 491
Viburnum tinus 492

CITRUS PLANTS

Citrus aurantifolia 509
Citrus aurantium 510
Citrus deliciosa 511
Citrus limos 512
Citrus madurensis 513
Citrus medica 514
Citrus reshni 515
Citrus sinensis 516
Eremocitrus glauca 517
Fortunella japonica 518
Fortunella margarita 519
Fortunilla sp (Citrus sinensis x Poncirus trifoliata) 520
Murraya paniculata 521
Poncirus trifoliata 522
Triphasia trifolia 523