PLANTS AND PLANTING IN MEDITERRANEAN LANDSCAPES
(VOLUME 1)

Editors
Juan José Galán Vivas
Vicente Caballer Mellado

http://tiny.cc/edUPV_rea

Original Title: *Material vegetal en paisajismo mediterrráneo (Volumen 1)*

Collection Académica http://tiny.cc/edUPV_aca

To cite this publication please use the following reference:
Galán Vivas, Juan José and Caballer Mellado, Vicente. (2024). *Plants and Planting in Mediterranean Landscapes (Volume 1).* Valencia: edUPV. DOI: https://doi.org/10.4995/REA.2024.677001

Editors
Juan José Galán Vivas
Vicente Caballer Mellado

Layout designers
Antonio Fresneda Colomer
Juan José Galán Vivas
Júlia Martínez Villaronga (transfer to the English version)

Collaborators (in the preparation of the botanic datasheets)
Rafael Barrera Valero
David Sanz Sánchez
César Martinez Graullera
Raquel Katz Perales

Translated by
Jacinta Mary Harrington-Flynn
Translation funded by the NO BORDERS Program of the UPV

Edited by: edUPV, 2024
Ref.: 6770_01_01_01

ISBN: 978-84-1396-250-4 (printed version) ISBN: 978-84-1396-109-5 (electronic version)
DOI: https://doi.org/10.4995/REA.2024.677001

If the reader detects a mistake in the book or wishes to contact the authors, he can send an email to edicion@editorial.upv.es

TABLE OF CONTENTS

3
CONIFERS

Chapter 3 CONIFERS

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.

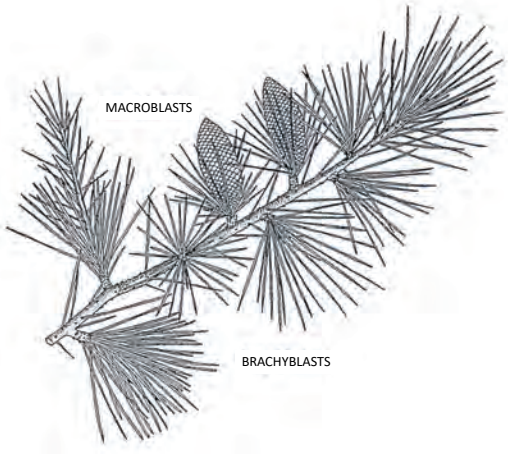


Figure 3.1.1: Macroblasts and brachyblasts in *Cedrus*. According to F.J. Esteras

- **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.

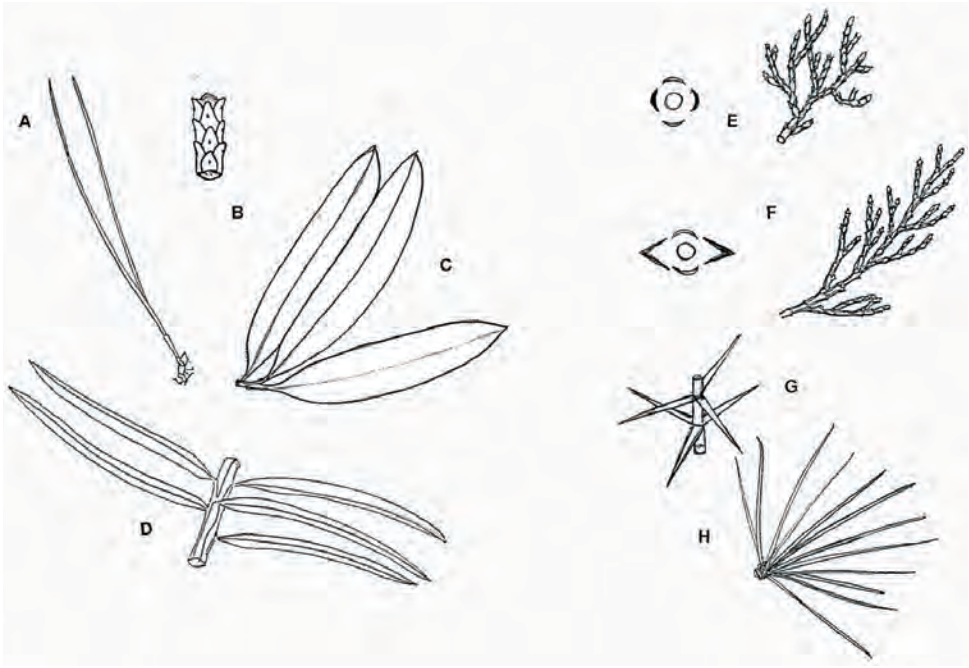


Figure 3.1.2: Shape and position of conifer leaves A) acicular (*Pinus*); B) scale -like (*Cupressus*); C) flat (*Podocarpus*); D) flat (*Cephalotaxus*); E) "cupressoid" position in *Cupressus*; F) "thuja" position in *Calocedrus*; G) whorled position, "juniperoid" leaf, in *Juniperus*; H) fasciculate 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.

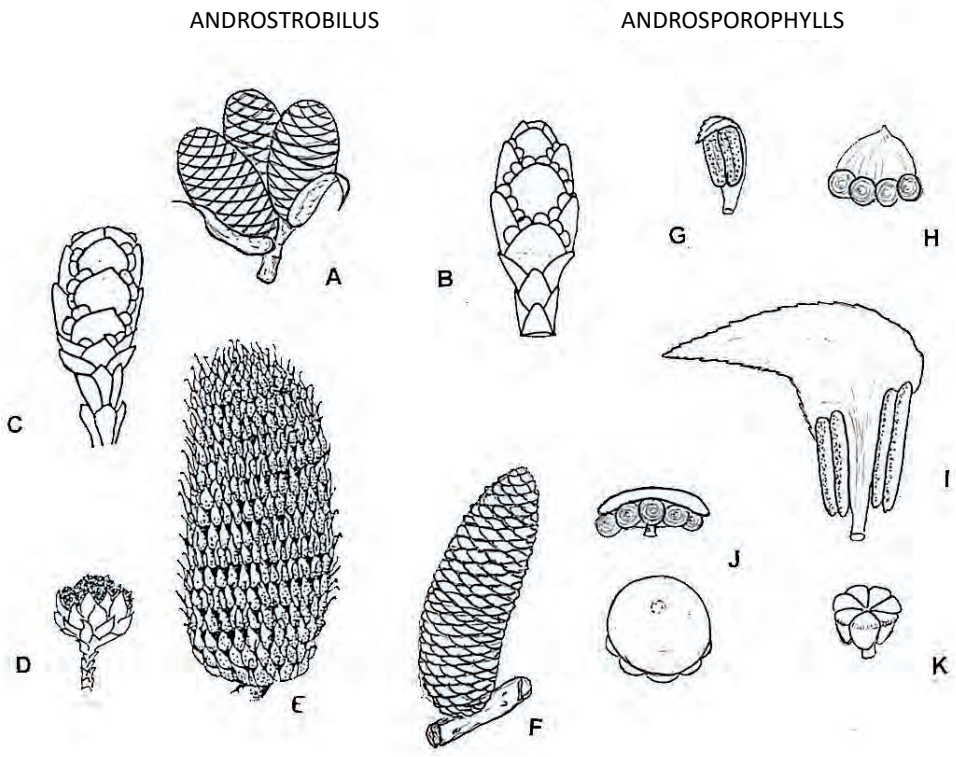


Figure 3.1.3: Androstrobilus and androsporophylls in conifers. A) *Pinus*; B) *Cupressus*; C) *Calocedrus*; D) *Cephalotaxus*; E) *Araucaria*; F) *Cedrus*; G) *Pinus*; H) *Junipers*; I) *Araucaria*; J) *Cupressus*; K) *Taxus*. E taken from Scagel. Those remaining are according to F.J. Esteras.

- 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'.

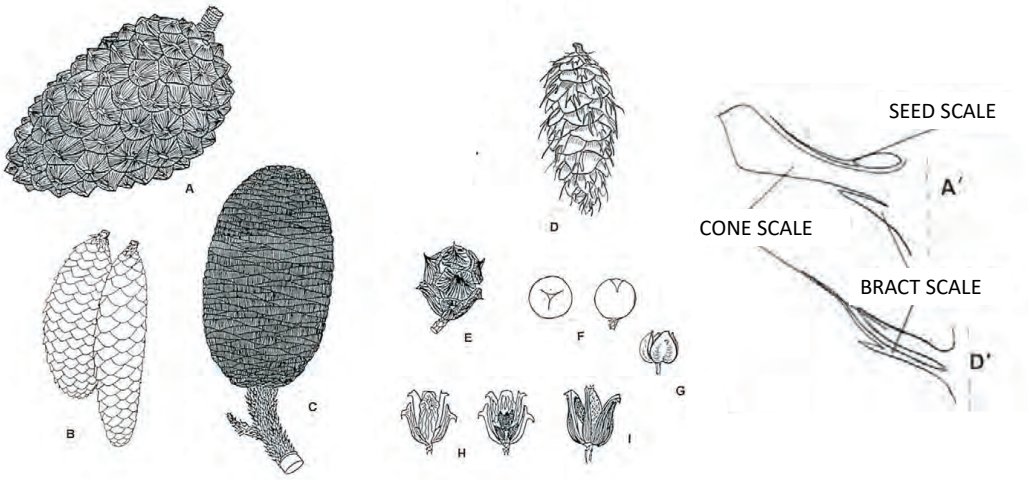


Figure 3.1.4: Gynostrobili in conifers: A) *Pinus pinea*; A') Detail of the cone in *Pinus*; B) *Spruce abies*; C) *Cedrus deodara*; D) *Pseudotsuga menziessii*; D) Detail of the cone in *Pseudotsuga*; E) *Cupressus arizonica*; F) *Juniperus oxycedrus* subsp. *macrocarp*; G) *Tetraclinis articulata*; 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

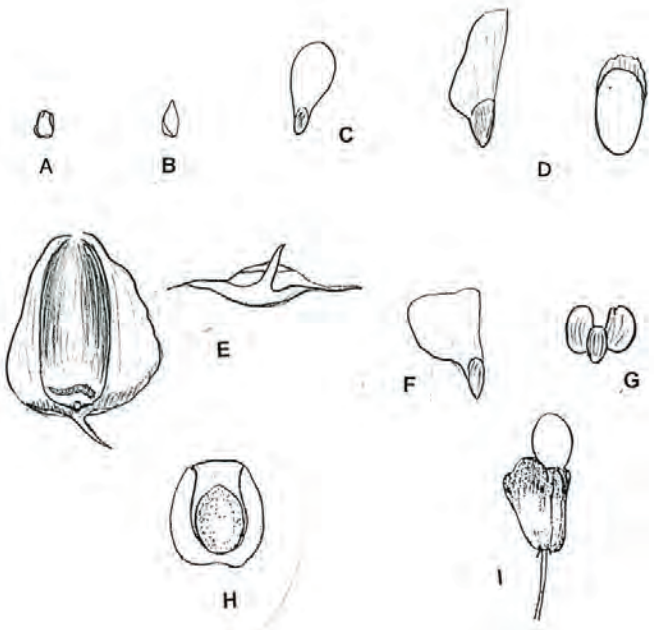


Figure 3.1.5: Coniferous seeds: A) *Cupressus*; B) *Platyclades*; C) *Spruce*; D) *Pinus*; E) *Araucaria*; F) *Cedrus*; G) *Tetraclinis*; H) *Taxus;* I) *Podocarpus*. According to F.J. Esteras.

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

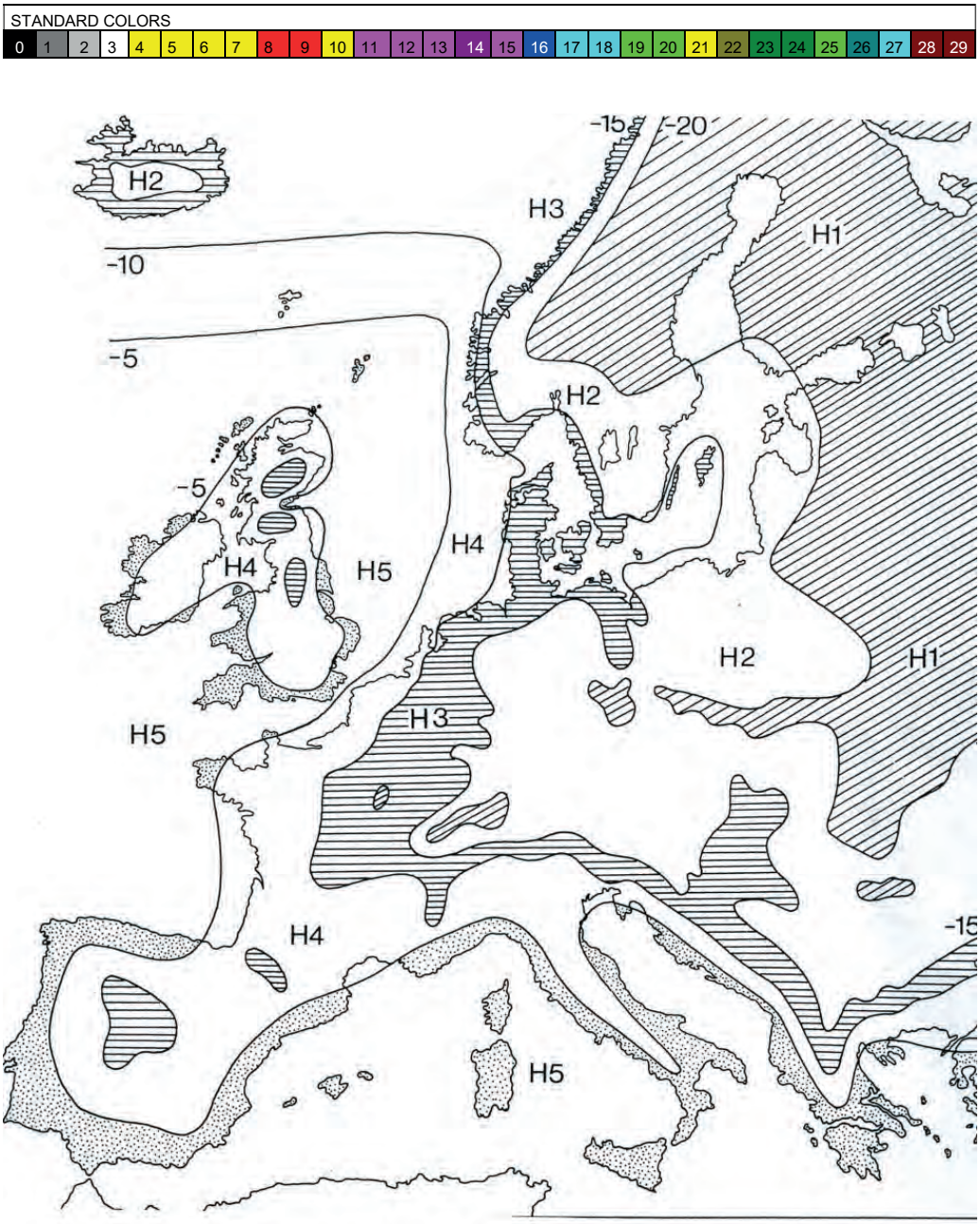


Figure 3.2.1: Thermal classification map according to European regulations

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: EVERGREEN; SIZE: 30-50x15 MM; LEAFLETS: YES; COLOR: US:DARK GREEN, LS:DARK GREEN; TEXTURE: US: GLOSSY, LS: GLOSSY	COMPOUND: NO; HARDNESS: CORIACEOUS; ARRANGEMENT: ALTERNATE(SPIRAL); VENATION: ACICULAR; SHAPE: OVAL/LACEOLATE; MARGIN: ENTIRE; APEX: CUSPIDATE; LEAF BASE: ACUMINATE; PETIOLE: SHORT	
Strobilus: SIZE AND TYPE: ♂/M 6-10 CM YELLOW-SOLITARY; ♀/F 8-10 CM GREEN-SOLITARY	Sex: UNISEXUAL	Distribution: DIOECIOUS; Fragrant: NO
Fruit: SIZE: 8-12 x 10 CM	Type: CONE (2 YEARS); Edible: YES (THE SEED)	Color: BROWN-GRAY; Fruiting season: OCT-DEC
Growth	Rate: SLOW	Longevity: >400 YEARS

ECOLOGY

Climate: ALTITUDE: 500-1500; IRRIGATION: HIGH	Temperature: 10 to 15º C; Sun exposure: SUN/PARTIAL SHADE	Drought resistant: NO; Frost resistant: YES
Soil: pH: 6 - 7.5; FERTILITY: MODERATE	Texture: LOAMY; Drainage: MODERATE	Frost resistant: NO; Lime resistant: NO

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	COMPOUND: NO	
SIZE: LEAF: 1.2-1.6 CM; LEAFLETS: YES	HARDNESS: CORIACEOUS	
COLOR: US: MEDIUM GREEN; LS: MEDIUM GREEN	ARRANGEMENT: ALTERNATE(SPIRAL)	
TEXTURE: US: GLOSSY; LS: GLOSSY	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	Temperature: 0 to -5ºC	Drought resistant: MODERATE
ALTITUDE: 0-300	Sun exposure: SUN/PARTIAL SHADE	Frost resistant: NO
IRRIGATION: MODERATE		
Soil	Texture: LOAMY	Salt resistant: NO
pH: 6.5-7.5	Drainage: HIGH	Lime resistant: NO
FERTILITY: MOD/POOR		

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

ISOLATED. THIS WILL HIGHLIGHT THE SYMMETRY OF ITS CROWN

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.

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 SPANISH | CALOCEDRE VALENCIAN | INCENSE CEDAR ENGLISH | LIBOCEDRE FRENCH

STRUCTURE		
Shape: COLUMNAR	Height: 15-20M	Diameter: 2-4M
Texture: FINE	Shade: FULL/PARTIAL	Root: 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: PERSISTENT; SIZE: 3.5 *2MM; LEAFLETS: YES; COLOR: US: DARK GREEN; LS: DARK GREEN; TEXTURE: US: GLOSSY; LS: GLOSSY	COMPOUND: NO; HARDNESS: ; ARRANGEMENT: OPPOSITE(TUYOIDE); VENATION: ; SHAPE: SCALE; MARGIN: DENTATE; APEX: ACUTE; LEAF BASE: DECURRENT; PETIOLE: SESSILE	
Strobilus	Sex: UNISEXUAL	Distribution: MONOECIOUS
SIZE AND TYPE: ♂/M 6-7 MM YW/GREEN - SOLITARY; ♀/F GREEN/SOLITARY		Fragrant: NO
Fruit: SIZE: 2-3 x 0.6	Type: CONE (1 YEAR); Edible: NO	Color: LIGHT BROWN; Fruiting season: SEPT-OCT
Growth	Rate: MEDIUM	Longevity: > 150 YEARS

ECOLOGY

Climate: ALTITUDE: 300-2500; IRRIGATION: MODERATE	Temperature: -20ºC A9; Sun exposure: SUN/PARTIAL SHADE	Drought resistant: YES; Frost resistant: YES
Soil: pH: 6.5-8.5; FERTILITY: MODERATE	Texture: ALL TYPES; Drainage: MODERATE/HIGH	Frost resistant: NO; 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

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	CEDRE DE L'ATLAS	ATLAS CEDER	CEDRE DE L'ATLAS
SPANISH	VALENCIAN	ENGLISH	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	
EVERGREEN (3 YEARS)		HARDNESS: CORIACEOUS	
SIZE: 15-25x1 MM		ARRANGEMENT: ALTERNATE/FASCICULATE	
LEAFLET: NO		VENATION: ACICULAR	
COLOR: US: DARK GREEN		SHAPE: ACICULAR	
LS: DARK GREEN		MARGIN: ENTIRE	
TEXTURE: US: GLOSSY		APEX: ACUMINATE	
LS: GLOSSY		LEAF BASE: ACUMINATE	
		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 (SPANISH) · CEDRE DE L'HIMALAIA (VALENCIAN) · DEODAR (ENGLISH) · CEDRE DE L'HIMMALAYA (FRENCH)

STRUCTURE		
Shape: EXTENDED/CONCIAL	Height: 15-25M	Diameter: 6-10M
Texture: MEDIUM	Shade: 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	COMPOUND: NO	
EVERGREEN (2)	HARDNESS: CORIACEOUS	
SIZE: > 40x1 MM	ARRANGEMENT: ALTERNATE/FACICULATE	
LEAFLET: NO	VENATION: ACICULAR	
COLOR: US: LIGHT GREEN	SHAPE: ACICULAR	
LS: LIGHT GREEN	MARGIN: ENTIRE	
TEXTURE: US: GLOSSY	APEX: ACUMINATE	
LS: GLOSSY	LEAF BASE: ACUMINATE	
	PETIOLE: SESSILE	
Strobilus	Sex: UNISEXUAL	Distribution: MONOCEIOUS
SIZE AND TYPE: ♂/M 40MM YELLOW -SOLITARY; ♀/F 10MM BLUE/GREEN SOLITARY		Fragrant: NO
Fruit	Type: CONE (2 YEARS)	Color: BROWN/RED
SIZE: 7-11 x 5-6 CM	Comestible: NO	Fruiting season: OCT-DEC
Growth	Rate: MEDIUM/FAST	Longevity: > 150 YEARS

ECOLOGY

Climate	Temperature: H-3	Drought resistant: MODERATE/HIGH
ALTITUDE: 1000-3000M	Sun exposure: SUN/PARTIAL	Frost resistant: MODERATE/HIGH
IRRIGATION: HIGH		
Soil	Texture: ALL TYPES	Salt resistant: NO
pH: 6 - 8.5	Drainage: HIGH	Lime resistant: YES
FERTILITY: MOD/POOR		

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	COMPOUND: NO	
EVERGREEN	HARDNESS: SOFT	
SIZE: 20-50 x 4MM	ARRANGEMENT: ALTERNATE-SUBDISTICHUOUS	
LEAFLET: NO	VENTATION: 1 CENTRAL VEIN-NEARLY INVISIBLE	
COLOR: US: DARK GREEN	SHAPE: LINEAR-FALCATE	
LS: GRAY/GREEN	MARGIN: ENTIRE	
TEXTURE: US: GLOSSY	APEX: ACUTE/ACUMINATE	
LS: OFF-WHITE	LEAF BASE: EXTENDED/DECURRENT	
	PETIOLE: SHORT	
Strobilus	Sex: UNISEXUAL	Distribution: DIOECIOUS (GEN.)
SIZE AND TYPE: ♂/M 6-8 MM	CREAM-SOLITARY	Fragrant: NO
♀/F	CREAM-PAIRS (X2)	
Fruit	Type: DRUPE (2 YEARS)	Color: BROWN
SIZE: 2-3x1.5CM	Edible: NO	Fruiting season: SEPT-NOV
Growth	Rate: SLOW	Longevity: > 150 YEARS

ECOLOGY		
Climate	Temperature: -20ºC	Drought resistant: NO
ALTITUDE: 300-900M	Sun exposure: PARTIALSUN/SHADE	Frost resistant: MODERATE
IRRIGATION: HIGH		
Soil	Texture: ALL TYPES	Salt resistant: NO
pH: 6.5-8.5	Drainage: MODERATE/HIGH	Lime resistant: YES
FERTILITY: MODERATE		

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		Applications	
COASTAL: NO		SLOPES: NO	LINE: YES
POLLUTION: YES(URBAN)		RIVERBANKS: NO	WINDBREAKER: YES
WIND: 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 º 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

Cryptomeria japonica (L.f.) D. Don.

CONIFER

CRIPTOMERIA DEL JAPON (SPANISH) | CRIPTOMERIA DEL JAPO (VALENCIAN) | JAPANESE CEDAR (ENGLISH) | CRYPTOMERIE DU JAPON (FRENCH)

STRUCTURE		
Shape: CONICAL/COLUMNAR	Height: 8-12 M	Diameter: 3-4 M
Texture: FINE	Shade: 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: EVERGREEN(4-5 YEARS); SIZE: 10-20x2 MM; LEAFLET:NO; COLOR: US:LIGHT GREEN, LS:LIGHT GREEN; TEXTURE: US: SMOOTH, LS: SMOOTH	COMPOUND: NO; HARDNESS: SOFT(FLEXIBLE); ARRANGEMENT: ALTERNATE; VENATION: ACICULAR; SHAPE: POINTED; MARGIN: ENTIRE; APEX: ACUTE; LEAF BASE: DECURRENT; PETIOLE: SESSILE	
Strobilus; SIZE AND TYPE: ♂/M 7.5 MM, ♀/F	Sex: UNISEXUAL; YELLOW/CLUSTERED; GREEN/RED-SOLITARY	Distribution: MONOECIOUS; Fragrant: NO
Fruit; SIZE: 1.5-2.5x2.5 CM	Type: CONE; Comestible: NO	Color: BROWN/RED; Fruiting season: OCT-NOV
Growth	Rate: MEDIUM/SLOW	Longevity: >150 YEARS

ECOLOGY		
Climate; ALTITUDE: 200-2000; IRRIGATION: HIGH	Temperature: H-2; Sun exposure: SUN/PARTIAL SHADE	Drought resistant: NO; Frost resistant: NO
Soil; pH: 6-7.5; FERTILITY: HIGH	Texture: LOAMY/CLAYEY; Drainage: MODERATE/HIGH	Salt resistant: NO; Lime resistant: NO

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: SUN/PARTIAL SHADE	Frost resistant: YES
IRRIGATION: MODERATE		
Soil	Texture: CLAYEY	Salt resistant: NO
pH: 6-8.5	Drainage: MODERATE/HIGH	Lime resistant: YES
FERTILITY: POOR		

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	XIPRER DE LAMBERT	MONTERREY CYPRESS	CYPRÈS DE MONTERREY
SPANISH	VALENCIAN	ENGLISH	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

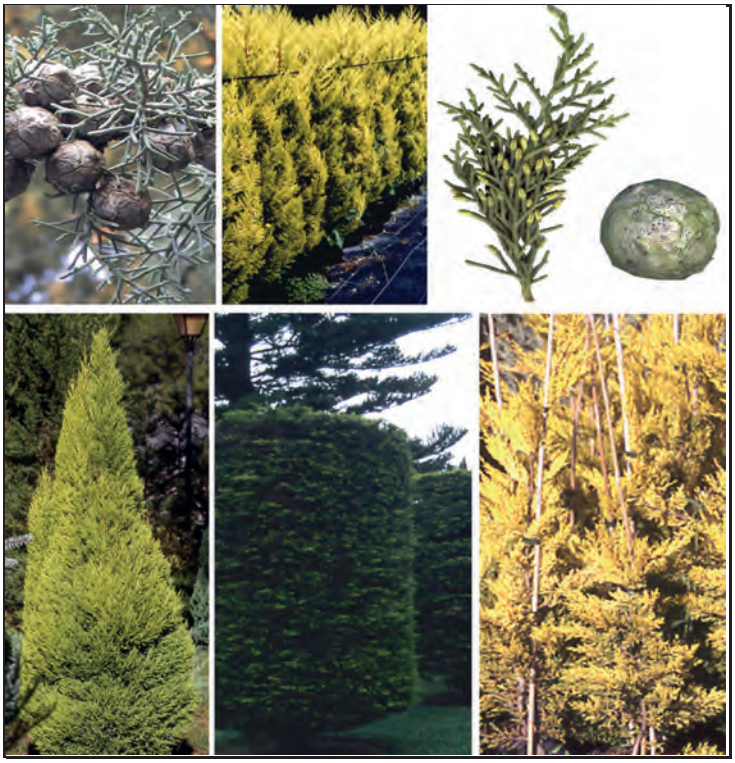
GOLDCREST , *GOLDEN CONE* , *GOLDEN PILLAR* - YELLOW FOLIAGE

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

Cupressus sempervirens L.

CONIFER

CIPRÉS COMUN	XIPRER	ITALIAN CYPRESS	CYPRÉS COMMUM
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Shape: CONICAL/EXTENDED	Height: 15-25 M	Diameter: 2-4 M
Texture: FINE	Shape: FULL	Root: 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: EVERGREEN (4 YEARS); SIZE: 1.2 x 1.2 MM; LEAFLET: NO; COLOR: US: DARK GRAY, LS: DARK GRAY; TEXTURE: US: SMOOTH, LS: SMOOTH

COMPOUND: NO
HARDNESS:
ARRANGEMENT: OPPOSITE (CUPRESSOIDE)
VENATION:
SHAPE: SCALE
MARGIN: SERRATE
APEX: ACUTE/OBTUSE
LEAF BASE: DECURRENT
PETIOLE: SESSILE

Strobilus: Sex: Unisexual; Distribution: MONOECIOUS

SIZE AND TYPE: ♂/M 4-6 MM YELLOW/SOLITARY; ♀/F 4-5 MM GRAY/SOLITARY

Fragrant: NO

Fruit: SIZE: 2.5-4x2-3 CM

Type: CONE (2YEARS); Color: DARK RED; Edible: NO; Fruiting season: SEPT-NOV

Growth: Rate: MEDIUM; Longevity: > 300 YEARS

ECOLOGY

Climate: ALTITUDE: 0-1000 M; IRRIGATION: MOD/LOW

Temperature: -5 to -10ºC; Drought resistant: MODERATE/LOW; Sun exposure: SUN/PARTIAL SUN; Frost resistant: MODERATE

Soil: pH: 6-8.5; FERTILITY: LOW

Texture: NO SAND; Salt resistant: NO; Drainage: MODERATE/HIGH; Lime resistant: YES

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 (SPANISH) | GINEBRE VALENCIAN | COMMON JUNIPER (ENGLISH) | GENÉBRIER COMMUN (FRENCH)

STRUCTURE

Shape	Height	Diameter
VARIABLE	0.3-4 M	2-3 M
Texture	**Shade**	**Root**
FINE	FULL	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: "POSTRATE"	Height: 1 M	Diameter: 2-3 M
Texture: FINE	Shade: FULL	Root: 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
	Year 0/1 and 1/1	
POT 7	20/40	
CT 2.5	20/40	
CT 3	40/50	
CT 7	40/60	
CT 10		

JUNIPERUS

CONIFER

Juniperus oxycedrus L.

ENEBRO DE LA MIERA (SPANISH) | GINEBRÓ (VALENCIAN) | BROWN-BERRIED CEDAR (ENGLISH) | GENÉVRIER OXYCEDRE (FRENCH)

STRUCTURE

Shape	Height	Diameter
CONICAL ± EXTENDED	1.5-4 M	1-2 M
Texture	**Shade**	**Root**
FINE	FULL	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	COMPOUND: NO	
	HARDNESS: CORIACEOUS	
EVERGREEN ( )	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	Type: GALBULUS (2 YEARS)	Color: BROWN/RED
SIZE: 8-10x 8-10MM	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	MÉLÈZE 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

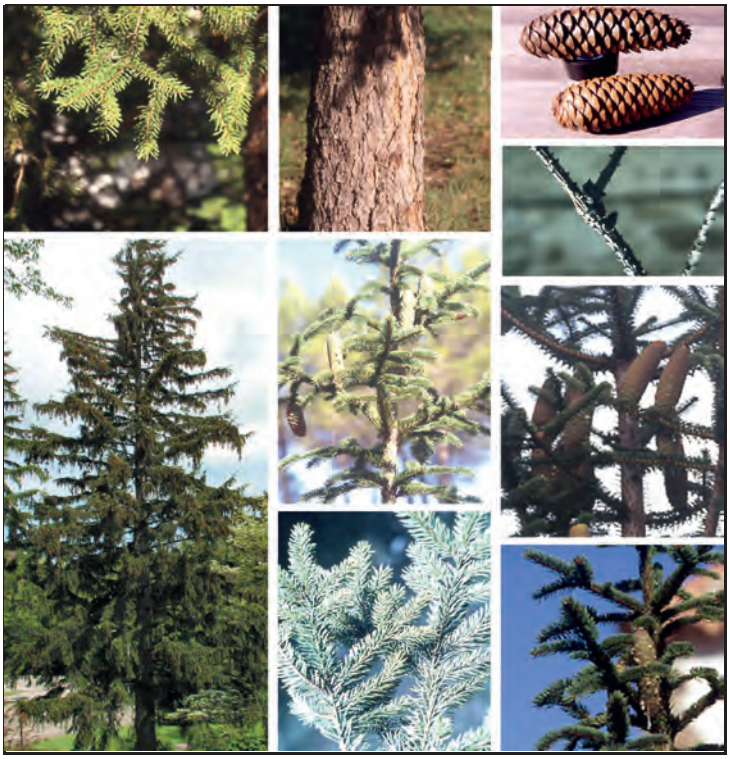
VARIETIES

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 (SPANISH) | PICEA PUNGENT (VALENCIAN) | BLUE SPRUCE (ENGLISH) | SAPIN DU COLORADO (FRENCH)

STRUCTURE		
Shape: CONICAL OR COLUMNAR	Height: 10-15 M	Diameter: 3-5 M
Texture: FINE/MEDIUM	Shade: FULL	Root: 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: EVERGREEN	COMPOUND: NO	
SIZE: 20-30 x 2 MM	HARDNESS: CORIACEOUS	
LEAFLETS: NO	ARRANGEMENT: ALTERNATE(SPIRAL)	
COLOR: US: BLUE GREEN	VENATION: 1 CENTRAL VEIN	
LS: BLUE GREEN	SHAPE: ACICULAR	
TEXTURE: US:GLOSSY	MARGIN: ENTIRE	
LS: GLOSSY	APEX: ACUTE (SHARP POINT)	
	LEAF BASE: EXPANDED (CUSHION-LIKE)	
	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	Height	Diameter
CONICAL/LOBED	10-12 M	5-8 M
Texture	**Shade**	**Root**
COARSE	PARTIAL	TAPROOT/HORIZONTAL

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	CONIFERPHYTAS
TYPE:	PINOPSIDA
ORDER:	PINALES
FAMILY:	PINACEA

VARIETIES

MORPHOLOGY

Trunk	Bark: FISSURED	Color: LIGHT RED
Leaf	COMPOUND: NO	
EVERGREEN (2 years)	HARDNESS: CORIACEOUS	
SIZE: 10-15x0.15 CM	ARRANGEMENT: FASCICUALTE (X2)	
LEAFLETS: NO	VENATION: 1 CENTRAL VEIN	
COLOR: US: DARK GREEN	SHAPE: ACICULAR	
LS: DARK 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/SPIKE	Fragrance: NO
♀/F 10MM	VIOLET/SOLITARY	
Fruit	Type: CONE (2 YEARS)	Color: RED BROWN
SIZE: 6-10 x 4-5 CM	Edible: NO	Fruiting season: SEPT-OCT
Growth	Rate: FAST	Longevity: >200 YEARS

ECOLOGY

Climate	Temperature: 0º to -5ºC	Drought resistant: YES
ALTITUDE: 0-1000M	Sun exposure: SUN	Frost resistant: MODERATE
IRRIGATION: MOD/LOW		
Soil	Texture: CLAYEY	Salt resistant: NO
pH: 7-8.5	Drainage: HIGH	Lime resistant: YES
FERTILITY: MOD/LOW		

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

Pinus canariensis Chr. Sm. ex DC.

CONIFER

PINO CANARIO (SPANISH) · PI DE CANARIES (VALENCIAN) · CANARY ISLANDS PINE (ENGLISH) · PIN DES CANARIES (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: EVERGREEN (2-3YEARS)	COMPOUND: NO	
	HARDNESS: SOFT (FLEXIBLE)	
	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: SIZE: 12-15x 5-6CM	Type: CONE (2 YEARS)	Color: LIGHT RED
	Edible: NO	Fruiting season: JUL-SEPT
Growth	Rate: MEDIUM/FAST	Longevity: > 200 YEARS

ECOLOGY		
Climate: ALTITUDE: 0- 2000M; IRRIGATION: MODERATE	Temperature: H-5	Drought resistant: MODERATE/HIGH
	Sun exposure: SUN	Frost resistant: YES
Soil: pH: 6-8; FERTILITY: MOD/LOW	Texture: ALL TYPES	Salt resistant: NO
	Drainage: HIGH	Lime resistant: YES

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	PI BORD	ALEPO PINE	PIN D'ALEP
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE		
Shape: OBLONG-LOBED	Height: 12-15M	Diameter: 6-8 M
Texture: COARSE	Shape: 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	PI DE AUSTRIA, PI DE L'ASEGA	AUSTRIAN PINE	PIN NOIR D'AUSTRIA
SPANISH	VALENCIAN	ENGLISH	FRENCH

STRUCTURE

Shape	Height	Diameter
CONICAL-IRREGULAR	15-25M	8-12M
Texture	**Shade**	**Root**
COARSE	PARTIAL	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	
EVERGREEN(2-3YEARS)		HARDNESS: CORIACEOUS	
SIZE: 15-25x0.25CM		ARRANGEMENT: FASCICULATE (X2)	
LEAFLETS:NO		VENATION: 1 CENTRAL VEIN	
COLOR: US:DARK GREEN		SHAPE: ACICULAR	
LS:DARK 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 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: SPREADING	Height: 15-25 M	Diameter: 8-10 M
Texture: COARSE	Shade: FULL	Root: TAPROOT/HORIZONTAL

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	PINOPHYTAS
TYPE:	PINOPSIDA
ORDER:	PINALES
FAMILY:	PINACEAE

VARIETIES

MORPHOLOGY		
Trunk	Bark: RETICULATE	Color: Reddish brown
Leaf: EVERGREEN; SIZE: 15-20x0.15CM; LEAFLETS:NO; COLOR: US: MED. GREEN; LS: MED. GREEN; TEXTURE: US:GLOSSY; LS: GLOSSY	COMPOUND: NO; HARDNESS: CORIACEOUS; ARRANGEMENT: FASCICULATE (X2); VENATION: 1 CENTRAL VEIN; SHAPE: ACICULAR; MARGIN: ENTIRE; APEX: ACUTE; LEAF BASE: WITH BASAL SHEATH; PETIOLE: SESSILE	
Strobilus	Sex: UNISEXUAL	Distribution: MONOECIOUS
SIZE AND TYPE: ♂/M 12 MM YELLOW/SPIKE; ♀/F 20MM GR.YELLOW-SOLITARY		Fragrant: NO
Fruit: SIZE: 10-15x8-10CM	Type: CONE (3 YEARS); Edible: YES (THE SEED)	Color: Reddish brown; Fruiting season: SEPT-NOV
Growth	Rate: MEDIUM	Longevity: > 300 YEARS





ECOLOGY		
Climate: ALTITUDE: 0-1000M; IRRIGATION: MOD/LOW	Temperature: 0 to -5ºC; Sun exposure: SUN	Drought resistant: YES; Frost resistant: YES
Soil: pH: 6.5-7.5; FERTILITY: LOW	Texture: LOAMY/SANDY; Drainage: HIGH	Salt resistant: YES; Lime resistant: YES

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) | PÍ 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 (SPANISH) | PI NEGRE (VALENCIAN) | BLUE PINE (ENGLISH) | PIN PLEUREUR DE L'HIMALAYA (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.

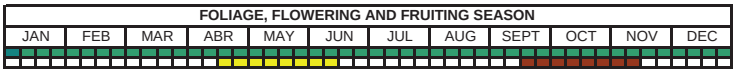
SPACING: 6 m

PLANTING AND PLANT HEALTH

Propagation by seed (spring) or by graft. Transplanting can be delicate (winter). This species is prone to insect plagues.

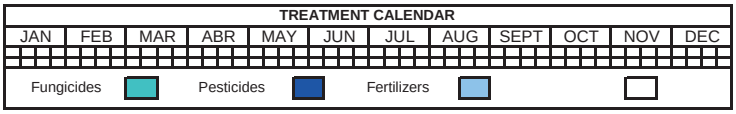
CHROMATIC CALENDAR

FOLIAGE, FLOWERING AND FRUITING SEASON



CULTIVATION CALENDAR

TREATMENT CALENDAR



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

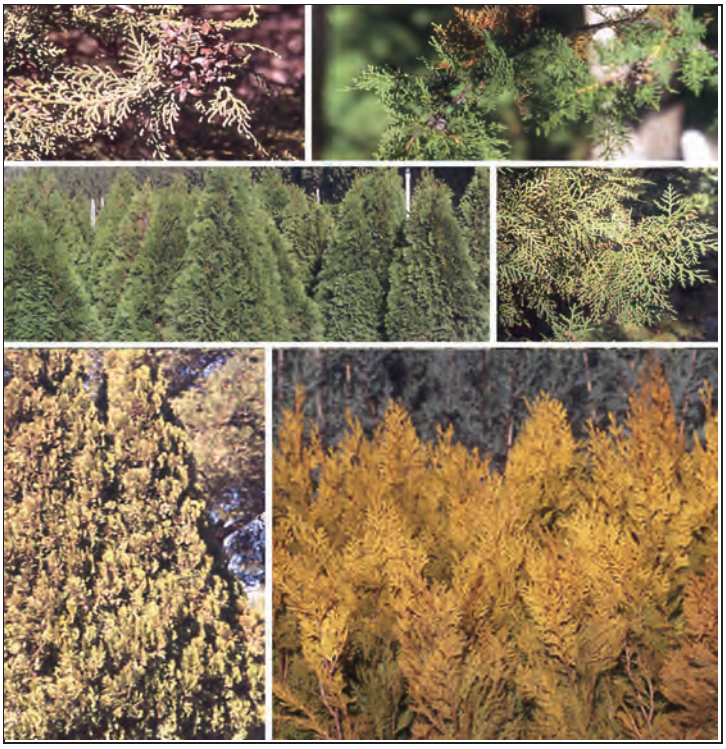
Trunk	Bark: FISSURED	Color: LIGHT RED
Leaf: EVERGREEN; SIZE: 1.5x1.5MM; LEAFLET: NO; COLOR: US: LIGHT GREEN, LS: LIGHT GREEN; TEXTURE: US: GLOSSY, LS: GLOSSY	COMPOUND: NO; HARDNESS: ; ARRANGEMENT: OPPOSITE (TUYOIDE); VENATION: ; SHAPE: SCALE; MARGIN: ENTIRE; APEX: ACUTE; LEAF BASE: DECURRENT; PETIOLE: SESSILE	
Strobilus: SIZE AND TYPE: ♂/M 4-5 MM YELLOW- SOLITARY; ♀/F 2.5-3MM BLUE/GREEN-SOLITARY	Sex: UNISEXUAL	Distribution: MONOECIOUS; Fragrant: NO
Fruit: SIZE: 1.5-2x1 CM	Type: CONE (1 YEAR); Edible: NO	Color: BROWN/RED; Fruiting season: SEPT-NOV
Growth	Rate: SLOW	Longevity: > 300 YEARS

ECOLOGY

Climate: ALTITUDE: 0-500 M; IRRIGATION: MOD/HIGH	Temperature: -10 to-15ºC; Sun exposure: SUN/PARTIAL SHADE	Drought resistant: YES; Frost resistant: MODERATE
Soil: pH: 7 - 8.5; FERTILITY: MODERATE	Texture: INDIFFERENT; Drainage: HIGH	Salt resistant: NO; Lime resistant: YES

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	Height	Diameter
OBLONG/OVAL	15-20 M	8-10 M
Texture	Shade	Root
COARSE/FINE	FULL	OBLIQUE

DIVISION:	SPERMATOPHYTES
SUBDIVISION:	PINOPHYTAS
TYPE:	PINOPSIDA
ORDER:	PINALES
FAMILY:	PODOCARPACEAE

VARIETIES

MORPHOLOGY		
Trunk	Bark: FISSURED	Color: LIGHT GRAY
Leaf	COMPOUND: NO	
EVERGREEN	HARDNESS: CORIACEOUS	
SIZE: 8-10x0.6 CM	ARRANGEMENT: ALTERNATE	
LEAFLET:NO	VENATION: 1 CENTRAL VEIN	
COLOR: US: DARK GREEN	SHAPE: LANCEOLATE/FALCATE	
LS: MED. GREEN	MARGIN: ENTIRE	
TEXTURE: US: GLOSSY	APEX: ACUTE/ACCUMINATE	
LS: SMOOTH	LEAF BASE: EXTENDED	
	PETIOLE: SHORT	
STROBILUS	Sex: UNISEXUAL	Distribution: DIOECIOUS
SIZE AND TYPE: ♂/M 2-3CM YELLOW/GREEN-GROUP		Fragrant: NO
♀/F 1CM LIGHT GREEN -SOLITARY		
Fruit	Type: EPIMATIUM (1 YEAR)	Color: RED/VIOLET
SIZE: 3.5-4 x 1.5 CM	Comestible: NO	Fruiting season: SEP-OCT
Growth	Rate: MEDIUM/SLOW	Longevity: < 150 YEARS

ECOLOGY		
Climate	Temperature: H-4	Drought resistant: MODERATE/LOW
ALTITUDE : 0-600M	Sun exposure: SUN	Frost resistant: MODERATE
IRRIGATION: MODERATE		
Soil	Texture: INDIFFERENT	Salt resistant: NO
pH: 6.5-8.5	Drainage: HIGH	Lime resistant: YES
FERTILITY: MOD/POOR		

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	Sex: UNISEXUAL	Distribution: MONOECIOUS
SIZE AND TYPE: ♂/M 15-20 MM YELLOWIRED- SOLITARY; ♀/F 15 MM GREEN/YELLOW- SOLITARY		Fragrant: NO
Fruit: SIZE: 6-9 x 3-4 CM	Type: CONE (1 YEAR); Edible: NO	Color: REDDISH BROWN; Fruiting season: SEPT-DEC
Growth	Rate: HIGH	Longevity: > 300 YEARS

ECOLOGY		
Climate: ALTITUDE: 200-2000; IRRIGATION: MOD/HIGH	Temperature: -15º to -20ºC; Sun exposure: SUN /PARTIAL SHADE	Drought resistant: NO; Frost resistant: YES
Soil: pH: 5.5 -7.5; FERTILITY: MODERATE	Texture: LOAMY/SANDY; Drainage: HIGH	Salt resistant: NO; 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

SEQUIOIA 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	Sex: UNISEXUAL	Distribution: MONOECIOUS
SIZE AND TYPE: ♂/M 5-6 MM LIGHT YELLOW -SOLITARY; ♀/F 10 MM GREEN/VIOLET -SOLITARY		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	Drought resistant: NO
	Sun exposure: SUN /PARTIAL SHADE	Frost resistant: YES
Soil: pH: 6-8; FERTILITY: MOD/HIGH	Texture: LOAMY/CLAYEY	Salt resistant: NO
	Drainage: HIGH	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

Taxodium distichum (L.) Rich.

CONIFER

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; Sun exposure: SUN	Drought resistant: YES; Frost resistant: NO
Soil; pH: 6.5-8; FERTILITY: MOD/POOR	Texture: LOAMY; Drainage: HIGH	Salt resistant: NO; 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	HARDNESS:
SIZE: 4*2MM	ARRANGEMENT: OPPOSITE (THUYOIDE)	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 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).

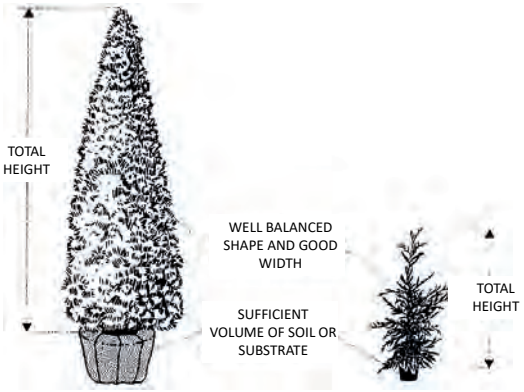


Figure 3.3.1: Measurements to classify conifers in height NT07C of the Technical Standards for Gardening and Landscaping, COITAPAC

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).

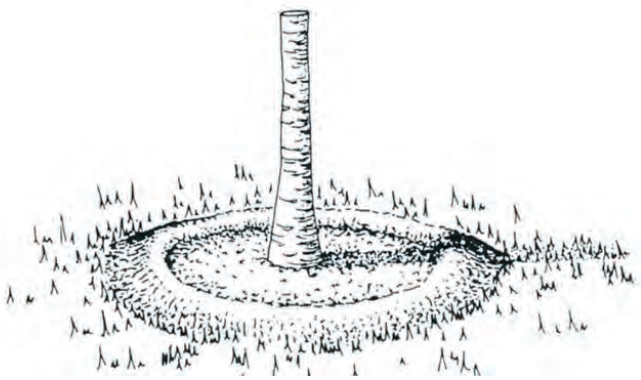


Figure 3.3.3: Making a planting pit. NT08C of the Technical Standards for Gardening and Landscaping, COITAPAC

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.

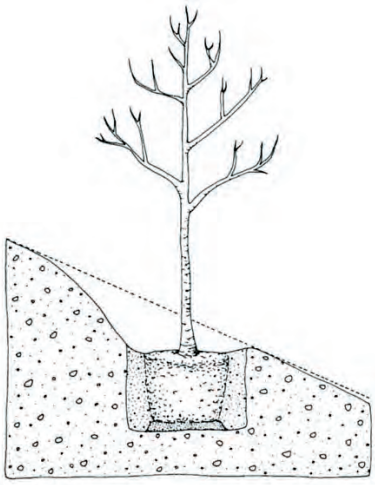


Figure 3.3.4: Making a tree pit on a slope. NT08C of the Technical Standards for Gardening and Landscaping, COITAPAC

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.

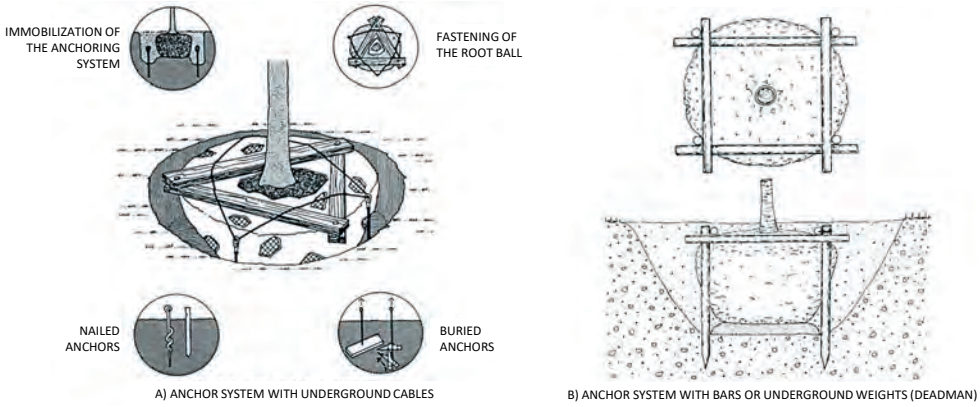


Figure 3.3.5: Examples of underground anchoring. NT08C of the Technical Standards for Gardening and Landscaping, COITAPAC

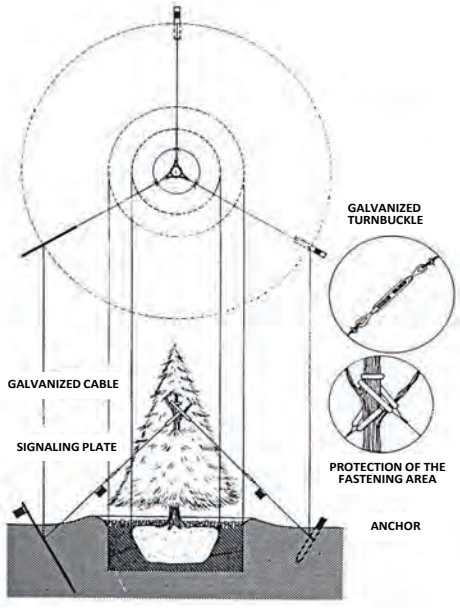


Figure 3.3.6: Example of cable anchoring system NT08C of the Technical Standards for Gardening and Landscaping, COITAPAC

- *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.

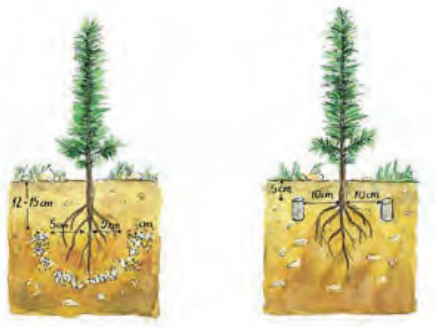


Figure 3.4.3: Granulated or pellet fertilizers

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

Subchapter 3.5 Bibliography

• BAILEY, L. H. (1948)- *Manual of Cultivated Plants*. Mcmillan Publihing Company. Inc. New York..

• CAÑIZO PERATE, J.A. DEL AND R. GONZÁLEZ ANDREU (1979). *Jardines, diseño, proyecto y plantación*. Ed. Mundi-Prensa. Madrid

• CATALAN BACHILLER, G. (1985). *Semillas de árboles y arbustos forestales*. Ed. ICONA (M.A.P.A.). Madrid

• Catálogos de Viveros de Planta Ornamental. Varios años.

• COLEGIO OFICIAL DE INGENIEROS TÉCNICOS AGRÍCOLAS Y PERITOS AGRÍCOLAS DE CATALUÑA (varios años). Normas Tecnológicas de Jardinería y Paisajismo (NTJ). Barcelona.

- NTJ 07 A: Calidad General
- NTJ 07 C: Coníferas
- NTJ 07 Z: Transporte, recepción y acopio en vivero de obra
- NTJ 08 B: Trabajos de plantación
- NTJ 08 C: Técnicas de plantación de árboles
- NTJ 08 E: Transplante de grandes ejemplares
- NTJ 14 A: Especificaciones generales de mantenimiento
- NTJ 14 C (2): Mantenimiento de arbolado: poda
- NTJ 14 C (3): Mantenimiento del arbolado: otras operaciones
- NTJ 14 D: Mantenimiento de plantaciones arbustivas

• CHANES, R. (1979). *Deodendron. Árboles y arbustos de jardín en clima templado*. Ed. Blume. Barcelona.

• MICHAU, E. (1996). *La poda de los árboles ornamentales*. Ed. Mundi-Prensa.

• NAVES, F; J. PUJOL, X. ARGIMON AND L. SAMPERE (1995). *El árbol en jardinería y paisajismo*. Ed. Omega. Barcelona.

• GELDEREN, D. M. VAN AND J. R. P. VAN HOEY SMITH (1996). *Conifers. The illustrated encyclopaedia. 2 vol.* The Royal Boskoop Horticultural Society. Timber Press. Hong Kong.

• LÓPEZ GONZÁLEZ, G. (2001). L*os árboles y arbustos de la Península Ibérica e Islas Baleares*. Ediciones Mundi Prensa. Madrid.

• LÓPEZ LILLO, A. Y A. RAMOS FERNÁNDEZ. (1972). O*rdenación del Paisaje II. Flora Ornamental de España*. 1. Gimnospermas. E.T.S.I. Montes. Madrid.

• PAPWORTH, D. (1987). *Guía ilustrada de Coníferas*. Editorial Blume S.A. Barcelona

• PARDÉ, L. (1961). *Les confieres.* Edición 100. La Maison Rustique. Paris.

• PEÑA ARRIBAS, J. AND J. PEÑA ARRIBAS (1958). *Coníferas ornamentales*. Floraprint España, S.A. Valencia.

• PARDÉ, L. (1961). *Les confieres.* Edición 100. La Maison Rustique. Paris.

• PAÑELLA, J. (1991). *Las plantas de jardín cultivadas en España*. Floraprint España S.A. Barcelona.

• ROYAL HORTICULTURAL SOCIETY (1994). *Index of Garden Plants*. Ed. Mark Griffiths.

• RUIZ DE LA TORRE, J. (1971). *Árboles y arbustos de la España Peninsular.* Instituto Forestal de Investigaciones y Experiencias y E.T.S.I.Montes. OFFO. Madrid.

• RUIZ DE LA TORRE, J. (1990). *Catálogo de especies vegetales a utilizar en plantaciones de carreteras.* Ministerio de Obras públicas y urbanismo. Alcobendas Madrid.

• SANCHEZ DE LORENZO CÁCERES, J.M. (2002). *Arboles ornamentales*. Editorial Mundi-Prensa. Madrid.

• WALTERS, S. M. AND OTHERS (Ed.) (1986). *The European Garden Flora. Vol I : Pteridophyta, Gymnospermae, Angyospermae – Monocotyledons (Part I)*. Ambridge University Press.