Casuarina glauca

Sieb.

Casuarinaceae

swamp she-oak

LOCAL NAMES
Creole (pich pin,filao); English (swamp she oak,swamp oak,scaly bark beefwood,longleaf casuarina,grey buloke); French (pin d'Australie); Malay (ru paya); Spanish (pino de Australia); Trade name (swamp she-oak)

Habit at Kahoolawe, Hawaii (Forest & Kim Starr)

BOTANIC DESCRIPTION
Casuarina glauca is a medium-sized tree 8-20 m high, often with buttressed and fluted stem; rarely a shrub to about 2 m that frequently regenerates through vigorous root suckers. Branchlets spreading or drooping, to 38 cm long. Bark hard, grey or grey-brown, finely fissured and scaly, with a tessellated appearance.

Leaves 8-20 mm long and 0.9-1.2 mm in diameter, glabrous; leaf-teeth in whorls of 12-17, rarely 20, erect, 0.6-0.9 mm long. Leaf-teeth on new shoots long and recurved.

Male flowers, clusters with pollen along 1.2-4 cm of the tips of some branchlets 7-10 whorls/cm. Rounded female 'cones' are 3-12 mm on stalked heads, hairy when young, reddish- to white-pubescent, becoming glabrous, about 6 mm, with dark red stigmas.

Mature woody cones subglobose to shortly cylindrical, 9-18 x 7-9 mm, bracteoles broadly acute, opening to release 1 pale, winged nutlet 3.5-5 mm long.

Casuarina is from the Malay word 'kasuari', which indicates the supposed resemblance of the twigs to the plumage of the cassowary bird. One of the common names of Casuarina species, 'she-oak', widely used in Australia, refers to the attractive wood pattern of large lines or rays similar to oak but weaker.

The species name is derived from the Greek 'glaukos', in reference to the glaucous or bluish-green foliage.

BIOLOGY
The evidence for wind pollination in casuarinas is persuasive; however, insect pollination is not ruled out. Consists of both male and female trees, that is, it is dioecious (2n = 18).

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ECOLOGY
C. glauca is one of the most widely planted species of its genus to go out of Australia, especially since it has proved to be superior under Mediterranean type climates and many difficult sites. It grows naturally on estuarine plains flooded with brackish tidal water, and it thrives on dunes at the seaside. It forms pure stands in open forest and woodlands. It tolerates a wide range of conditions such as periodic waterlogging, frost, drought, sea spray, acidity, alkaline or highly saline soils. In fine-textured clays, even in waterlogged soils, it can develop a deep root system. Although hardy to drought and frost, it rarely tolerates temperatures lower than -3 deg. C. The species has the potential to become weedy.

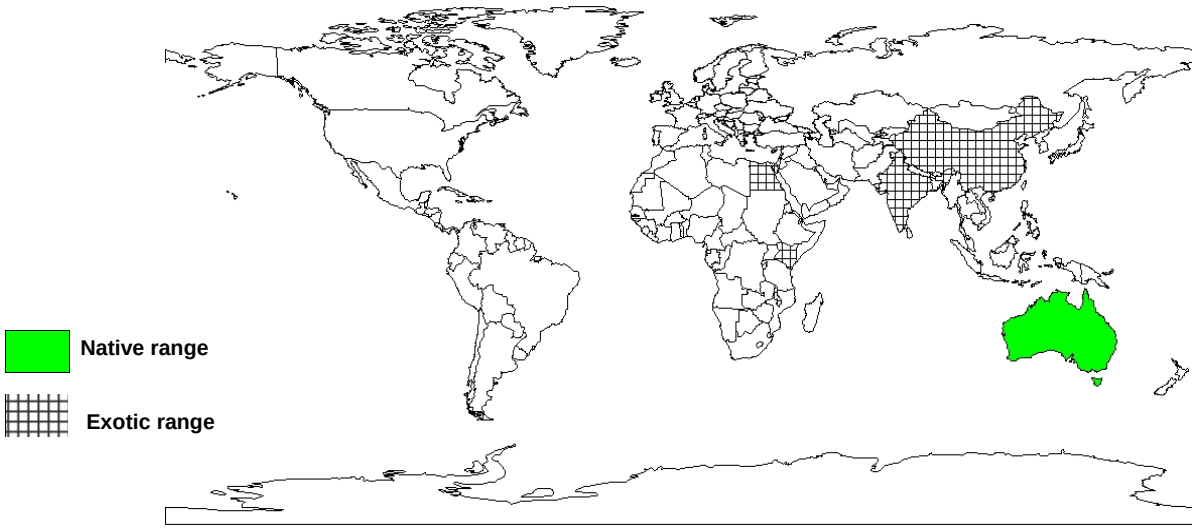
BIOPHYSICAL LIMITS
Altitude: 0-900 m, Mean annual temperature: 4-30 deg. C, Mean annual rainfall: 500-4 000 mm

Soil type: Although most natural stands are on acidic soils, it has grown well on alkaline clay-loam soils with shallow water tables in hot, semiarid areas. It also does well in pure limestone.

DOCUMENTED SPECIES DISTRIBUTION

Native: Australia

Exotic: China, Cyprus, Dominican Republic, Egypt, Haiti, India, Israel, Kenya, Malawi, Palestine, Puerto Rico, Singapore, South Africa, Thailand, Uganda, US



The map above shows countries where the species has been planted. It does neither suggest that the species can be planted in every ecological zone within that country, nor that the species can not be planted in other countries than those depicted. Since some tree species are invasive, you need to follow biosafety procedures that apply to your planting site.

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PRODUCTS
Fodder: Cattle, goats and sheep will graze C. glauca seedlings, suckers and branchlets. The ground foliage has been used as an ingredient in chicken feed and also has value as a drought fodder.

Apiculture: As a source of honey it has no value, and it has only a minor importance as a source of pollen.

Fuel: The wood has a calorific value of 4 700 kcal/kg, splits easily, and burns slowly with little smoke or ash. Can also be burned when green, an important advantage in fuel-short areas. Produces excellent charcoal. After 4 years, trees begin to shed about 4 t of cones/year. These, too, make good pellet-sized fuel. The wood is used as firewood in rural areas of Egypt.

Fibre: Average fibre length for young trees is 0.97 mm; fibre is used to make a particleboard of adequate strength and stability.

Timber: Sapwood is narrow, pale, and resistant to Lyctus borers; the heartwood is brownish with conspicuous rays, hard, tough and fissile, very dense (air-dry 900-980 kg/cubic m, basic density 650-700 kg/cubic m). Used for tool handles, rafters, flooring and turnery. The brownish timber is nicely marked and is used for fencing rails, shingles, and salt-water pilings.

SERVICES
Erosion control: The low branching habit and extensive litter production help reduce soil erosion; has been used successfully for dune soil and streambank stabilization.

Shade or shelter: C. glauca is an excellent tree for shelter-belts as windbreaks.

Reclamation: Has a rapid colonizing ability on disturbed soils, especially in coastal or salt affected situations.

Nitrogen fixing: Actively fixes atmospheric nitrogen; greatest when species are inoculated, especially with nodules from the same species. The associated symbiont is Frankia species. Although nitrogen-nodulation is most successful at pH 6-8, some natural stands are well nodulated in acidic soils (about pH 4).

Ornamental: Suitable as an ornamental in coastal locations, for example in California.

Intercropping: Used for wide-row intercropping. Has been found to increase yields of crops sheltered. To check spread by root suckers, a ditch can be dug between the crop and the shelterbelt, cutting the exposed shoots, or allowing goats and sheep to eat the roots before they become pests.

TREE MANAGEMENT
Irrigation is required to establish trees in desert areas. Moderately fast growing, and at the age of 7 years, the tree reaches an average height of 5 m with a 72% survival rate. By the age of 12 years, a yield of 295 cubic m/ha of wood and 34 t/ha of green foliage is expected; this is equivalent to 268 tonnes of total dry weight. In Israel, C. glauca outperforms other casuarinas, reaching 20 m in 12-14 years, even on saline water tables. Coppices and produces root suckers vigorously. Inoculation of seedlings with Frankia is recommended when introducing the species to new areas.

GERMPLASM MANAGEMENT
Seed storage behaviour is orthodox. There is a relative ease of storing seed for long periods under cool conditions. A 50% reduction in viability has been reported after 14-17 years in storage. There is an average of 414 900 seeds/kg.

PESTS AND DISEASES
A member of the order Coleoptera, Stromatium fluvum, attacks only C. glauca; the larval galleries occupy the inner bark, the sapwood and the heartwood. The wood-borer makes the stem susceptible to wind damage and rot. Casuarina bacterial wilt (CBW), Pseudomonas solanacearum, is a pathogen that attacks the roots of trees of all ages. In Egypt, serious insect pests of C. glauca are the dry-wood termite, Kalotermes flavicollis, and the coleopteran wood-borers Stromatium fulvum and Macrotema palmata. The larval stage of M. palmata bores into both the sapwood and the heartwood of living trees for many years. Attack by the termites Microtermes michaelseni and Ancistrotermes latinotus has reduced survival of the species to 33% on some sites in Zimbabwe.

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SUGGESTED CITATION

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