

Pinus caribaea

Honduran yellow pine

LOCAL NAMES

English (pitch pine, Caribbean pitch pine, Cuban pine, Honduras pine, Nicaragua pine, Caribbean pine, slash pine); French (pin mate, pin jaune); German (karibische Kiefer); Spanish (pino amarillo, pino caribaea de Honduras, pino Colorado, pino Cubano, pino de Cuba, pino de la Costa, pino macho, ocote blanco); Swahili (msindano); Trade name (Honduran yellow pine)

BOTANIC DESCRIPTION

Pinus caribaea is a fine tree to 20-30 m tall, often 35 m, with a diameter of 50-80 cm and occasionally up to 1 m; trunk generally straight and well formed; lower branches large, horizontal and drooping; upper branches often ascending to form an open, rounded to pyramidal crown; young trees with a dense, pyramidal crown.

Leaves needlelike, crowded and spreading at ends of twigs, remaining attached for 2 years, in fascicles of 3-5, mostly 15-25 cm long, 1.5 mm broad or less, rigid serrulate, dark or yellowish-green, slightly shiny, with stomata in whitish lines on all surfaces.

Strobili appear before the new leaves; male strobili many and sessile in whorled, short, crowded clusters near ends of twigs, mostly in lower part of the crown; mature cones usually reflexed, symmetrical; cone scales reflexed or wide spreading, thin, flat, dark chocolate-brown on inner surfaces; seeds narrowly ovoid, about twice as long as broad, pointed at both ends, 3 angled, averaging less than 6 mm long, 3 mm wide, black, mottled grey or light brown.

'Pinus' is from the Greek word 'pinos' (pine tree), possibly from the Celtic term 'pin' or 'pyn' (mountain or rock), referring to the habitat of the pine.

BIOLOGY

Young plantations usually start bearing female cones when they are 3-4 years old but these do not produce fertile seed owing to the inadequate supply of pollen at this age, unless older plantations adjoin the site. Male and female flowers are borne on the same plant. The female cones are the equivalent of long shoots whereas the male cones are the equivalent of needle bundles (short shoots). There is a variation in the proportion of male to female cones, with some trees producing almost entirely male cones and others almost entirely female cones.

Morelet

Pinaceae



P. caribaea, young seedlings in nursery. (David Boshier)



Extensive natural stands of *P. caribaea*, Poptun provenance, Peten, Guatemala. (Colin E. Hughes)



Extensive natural stands of *P. caribaea*, Poptun provenance, Peten, Guatemala. (Colin E. Hughes)

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ECOLOGY

This species grows best in frost-free areas up to about 700 m in more fertile sites with good subsoil drainage and annual rainfall of 2000-3000 mm. Generally at elevations of 600-800 m it is associated with *P. oocarpa* var. *hondurensis* and *P. oocarpa* var. *ochoterenai*. *P. caribaea* is rated as moderately fire resistant. It tolerates salt winds and hence may be planted near the coast.

BIOPHYSICAL LIMITS

Altitude: 0-1 500 m, Mean annual temperature: 22-37 deg. C, Mean annual rainfall: 1 000-3 000 mm

Soil type: Soils are usually loams or sandy loams, sometimes with high amounts of gravel and generally well drained. The pH is usually between 5.0 and 5.5.

DOCUMENTED SPECIES DISTRIBUTION

- Native: Bahamas, Colombia, Cuba, Guatemala, Honduras, Mexico, Nicaragua, Panama
Exotic: Australia, Brazil, Canada, Costa Rica, Gambia, Ghana, Guyana, India, Indonesia, Jamaica, Kenya, Madagascar, Malawi, Malaysia, Mozambique, Nigeria, Philippines, Puerto Rico, Sierra Leone, South Africa, Sri Lanka, Sudan, Surinam, Tanzania, Trinidad and Tobago, Uganda, US, Venezuela, Zambia, Zimbabwe



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.

PRODUCTS

Fuel: *P. caribaea*, being a fast-growing species, can be used for fuelwood for both industrial and home use. However, it throws out sparks when burning.

Fibre: The presence of long tracheids makes *P. caribaea* (and other pines) a good source of wood pulp. Plantations at 15 years are ideal for pulpwood production. The tree is used in Nicaragua and Honduras for general-purpose pulpwood. Wood pulp is also used for the manufacture of particleboard, fibreboard and chipboard.

Timber: Plantation-grown wood has an average density of 410 kg/m³. The grain is even to finely interlocked with a coarse texture. Transmission poles of *P. caribaea* are popular in Tanzania and Malaysia, among other places. Its low timber density and other poor properties, however, render the timber unstable for structural work or even furniture. The wood exudes much resin, which makes it less suitable for certain uses such as joinery and flooring. It can be used for shuttering, temporary applications and packaging. Ease of setting, ease of nailing it, and its resistance to splitting render it useful for turnery, toys, moulding and other novelty items.

Gum or resin: *P. caribaea* can be effectively tapped for oleoresins from when it is 10 years old and has a 20 cm dbh. In Sri Lanka, an industry has been established to manufacture gum resin, turpentine and heavy oils from oleoresins. An average of 25 g per tree per day of oleoresins can be tapped. About 75% gum resin and 20% turpentine can be manufactured from the oleoresin.

Tannin or dyestuff: *P. caribaea* bark contains tannin; about 10% can be extracted and dried to a reddish powder soluble in water.

Medicine: *P. caribaea* leaf oil is sometimes used for medicinal baths; locally, the seeds may be consumed.

SERVICES

Erosion control: In many places where *P. caribaea* grows, the mat of needles on the ground is considered valuable for the protection of the soil surface from erosion.

Reclamation: In Sri Lanka a massive reforestation programme was undertaken with plantations of *P. caribaea* to convert heavily eroded lands on which nothing else could be grown. It is the only species so far successfully used to clothe barren eroded and denuded lands with a tree cover.

TREE MANAGEMENT

Initial spacing for *P. caribaea* depends on the markets for which the pine is being grown and the technique used in tending the plantation. Mechanical cultivation requires a spacing of at least 3 m between rows, but close spacing is possible within rows. When it is grown for pulpwood, a spacing of 2 x 2 m is used to give maximum stem production of suitable sizes in the shortest time possible without thinning. Pruning is recommended to reduce fire danger, improve form, improve access within the crop, and reduce the size and frequency of knots, especially in saw logs. In *P. caribaea* plantations grown for pulpwood on a short rotation of 10-15 years, there may be 1 early cleaning thinning at 3-4 years old to remove malformed trees, or no thinning at all. Where both saw logs and pulpwood are being produced, a heavy thinning at 10 years for pulpwood may leave an open crop for logs saw harvested during the 2nd thinning at 17 years. The tree responds well to low levels of nitrogen fertilization, but trials in the Philippines showed no response to either phosphorus or potassium.

GERMPLASM MANAGEMENT

Seed storage behaviour is orthodox; viability is lost within 1 year in hermetic storage with seeds at room temperature with $13 \pm 2\%$ mc; no loss in viability during 2 years hermetic storage at room temperature; no loss in viability after 5 years of storage at 0-5 deg. C with over 8% mc; hermetic storage at 4.5% mc recommended; about 16% viability lost after 2.7 years of hermetic storage at 8 deg. C. There are 59 000-72 000 seeds/kg, depending on the variety.

PESTS AND DISEASES

One of the most important insect pests is a bark beetle, the southern pine beetle (*Dendroctonus frontalis*), found in the southern USA and Central America. A related species is *D. mexicana*, whose outbreak caused damage to several hectares of *P. caribaea* var. *hondurensis* in Honduras. Other bark beetles include *Ips calligraphus*, which is widely distributed in Canada and Central America to West Indies. Aphids such as the pine aphid (*Pineus laevis*) and *Cinara carolina* (North American aphid), leaf cutting insects such as *Atta* spp., and termites also attack the tree.

P. caribaea diseases are the nursery diseases, which include 'damping off' and seedling blight, and plantation diseases such as foliage blight, stem rot, stem die-back, cone rust, sap stain, heart rot and root rot.

FURTHER READING

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SUGGESTED CITATION

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