

LOCAL NAMES

Creole (saman); English (saman tree, algarrabo, rain tree, cow bean tree, cow tamarind, monkey pod, giant thibet, acacia); Filipino (acacia); French (gouanegoul, saman); Hindi (belati-siris, guango, nidra-ganneru, majhamaram); Indonesian (slubin, kihujan, mungur, trembesi); Spanish (dormilón, delmonte, samán, guanegoul, carreto negro, raintree, algarrobo del país, algarrobo); Thai (cham cha, kam kram); Vietnamese (cồng)

BOTANIC DESCRIPTION

Albizia saman is a conspicuous, semi-deciduous tree that can attain a height of 60 m, although it rarely exceeds 30 m and 4.5 m at DBH; crown dense, spreading, sometimes 30 m across; bole short, usually crooked, often with huge, widely spreading branches from low down. Bark distinctly grey-brown, yellow or cream-brown, smooth, becoming slightly to deeply fissured with age, peeling off in long, fibrous strips; slash yellowish-pink and fibrous beneath, exuding a brown gum; branches velvety.

Leaves bipinnately compound, 15-40 cm long, velvety, with a circular gland at the base and usually between each of the pinnae; pinnae 4-6 opposite, 7-15 cm long, velvety, with small glands between most of the leaflets and a common stalk grooved on the upper surface; leaflets 4-8 pairs, opposite, progressively larger upwards, the end pair 4-5 cm long, 18-32 mm broad, unsymmetrical with the midrib curved inwards and the outer margin more curved than the inner; lower leaflets approximately in the shape of a parallelogram with the midrib running diagonally upwards, bright green, oblong, smooth, stalkless, finely hairy underside, almost glabrous topside, with prominent midribs and lateral nerves.

Flowers white below, pink above, solitary or in small clusters in the leaf axils or clustered at the ends of shoots, forming subglobose heads are 5-7 cm wide, central flower different from the others, the heads on stalks 5-8 cm long; whole inflorescence finely hairy; stamens conspicuous.

Pods more or less straight with conspicuously thickened edges, black or green and set in brownish pulp, 12-20 cm long, 1-2 cm long, 1.2 cm thick, indehiscent, containing numerous seeds embedded in the pulp.

The genus was named after the 18th-century Florentine nobleman and naturalist Filippo del Albizzi, who in 1749 introduced *A. julibrissin* into cultivation. The common name 'rain tree' comes from the observation that grass is often greener under the tree's canopy.

BIOLOGY

A. saman is hermaphroditic.



Typical flowering tree of *A. saman* with heavy branching and wide spreading crown here protected in fields in Choluteca, Honduras for dry season shade and fodder (from pods) for cattle. (Colin E. Hughes)



Flowers of *Albizia saman* are arranged in loose heads of capitula which are heteromorphic, with an enlarged nectar-producing flower and striking pink or pale scarlet stamen filaments. (Colin E. Hughes)



A. saman provides an attractive display of pink flower heads and typical glossy upper leaflet surfaces and has been widely cultivated as an ornamental street tree throughout the tropics. (Colin E. Hughes)

ECOLOGY

It is a component of dry forest and grass savannahs.

BIOPHYSICAL LIMITS

Altitude: 0-1300 m, Mean annual temperature: 20-35 deg. C, Mean annual rainfall: 600-3000 mm

Soil type: A. saman is normally found on neutral to moderately acid soils and can grow on soil with pH as low as 4.6. It grows on light or heavy soils and tolerates infertile or waterlogged conditions.

DOCUMENTED SPECIES DISTRIBUTION

Native: Bolivia, Brazil, Guatemala, Peru

Exotic: Australia, Fiji, Kenya, New Zealand, Papua New Guinea, Philippines, Samoa, Solomon Islands, Tanzania, Tonga, Uganda



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

Food: Children eat the pods, which contain a sticky, sweet-flavoured pulp. A fruit drink is also made from the pulp.

Fodder: Pods, which fall to the ground when ripe, have a crude protein content of 12-18% (dry matter) with 41% digestibility for goats, and are popular with cattle, horses, goats and other animals. Some South American countries have begun exporting the pods. Although the leaves are nutritious, they are not considered an important fodder.

Fuel: The facts that *A. saman* wood produces 5200-5600 kcal/kg when it burns and that it regrows vigorous after lopping or pollarding make it a valuable source of high-quality firewood and charcoal. However, where there is a strong market for wood carvings, the wood is considered too valuable to be used as fuel.

Timber: The sapwood is a cream colour and the heartwood is dark brown, taking a high polish. With its rich dark-and-light pattern, the wood is highly prized for carvings, furniture and panelling. The wood shrinks so little that products may be carved out of green wood without fear of splitting or warping as the wood dries. In Hawaii, bowls and other craft products made from the wood are in such high demand that the local wood supply is supplemented by imports from Indonesia and the Philippines. A moderately durable wood, it is also used in boat building. The beautiful, high-quality wood is used for interior trim, crafts, boxes, veneer, plywood and general construction.

Gum or resin: The bark is an abundant source of gums and resins.

Medicine: A decoction of the inner bark and fresh leaves is treatment for diarrhoea, while a brew of small sections of the bark is taken to treat stomach-ache. A crude aqueous or alcoholic extract of the leaves is observed to have an inhibiting effect on *Mycobacterium tuberculosis*.

SERVICES

Shade or shelter: The trees provide a microclimate effect for the plants growing under their canopies. At night and on cloudy days, branches hang down and the leaves fold down and inward, allowing rain to fall directly on the ground and promoting cooling through exposing the ground. In the morning the leaves unfold and resume a horizontal position, giving full shade and helping to preserve moisture. The species is used as a shade for tea, coffee, cocoa, nutmeg and vanilla, and provides shade for pasture and grazing animals.

Nitrogen fixing: *A. saman* forms nitrogen-fixing symbiotic relationships with many strains of *Rhizobium*, and root nodulation has been confirmed but no roots were found within the grass-root zone. This suggests that the deciduous habit of the tree is the main mechanism of fertility transfer.

Soil improver: Pruned to yield nitrogen-rich green manure, and in pastures, *A. saman* is prized for its shade, high-quality, nutritious pods, and for promoting the health of the grass growing in its vicinity. This is because the soil under the tree has a higher nitrogen content than surrounding soil.

Ornamental: The attractive tree is one of the most commonly planted avenue and park trees in the tropics.

TREE MANAGEMENT

Trees are planted at a spacing of 1.5-2 m. Owing to its rapid growth, it is possible to plant *A. saman* in closely spaced plantations where it will produce fewer branches and a longer, straighter bole of timber quality. Under favourable conditions, trees reach a diameter of 18 cm in 5 years. Average annual wood production has been estimated at 25-30 cubic m/ha per year. Grass growing under the tree canopies does not show a decrease in dry matter content, but the fibre content is lower, and the protein content is significantly increased. The tree responds to pruning and coppices well. There is rapid regrowth of lopped and pollarded trees, making it possible for the trees to be used sustainably for fuelwood.

GERMPLASM MANAGEMENT

Seed storage behaviour is orthodox. Viability is maintained for more than 3 years in hermetic storage at room temperature with 11-15% mc. The number of seeds/kg is 5000-74 000.

PESTS AND DISEASES

In most places, *A. saman* is free from pests and diseases. Many defoliators, including the *Leucaena leucocephala* psyllid, *Heteropsylla cubana*, attack the tree in various countries, but usually do not cause severe stress problems. Cicadas also feed on *A. saman*.

FURTHER READING

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SUGGESTED CITATION

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