

## Bombacopsis quinata

red ceiba, cedro espino

(Jacq.) Dugand

Bombacaceae

### LOCAL NAMES

English (red ceiba); French (mahot coton); Spanish (tolu,saqui-saqui,pochote,ceiba tolú,ceiba roja,ceiba colorado,cedro espino); Trade name (red ceiba,cedro espino)

### BOTANIC DESCRIPTION

*Bombacopsis quinata* reaches a height of 40 m and a trunk diameter of more than 1 m in natural stands. Its most distinguishing features are its spiny main stem, fluted base, a rather wide spreading crown of heavy branches and a somewhat irregular bole inclined to be buttressed and completely clothed with heavy prickles towards the base; bark pale greyish-brown, trunk and branches generally covered by hard, stout spines up to 2 cm long; degree of spininess is extremely variable, as some trees are completely spineless.

Leaves alternate, palmate and composite, with 3-5 oblong or obovate glabrous leaflets.

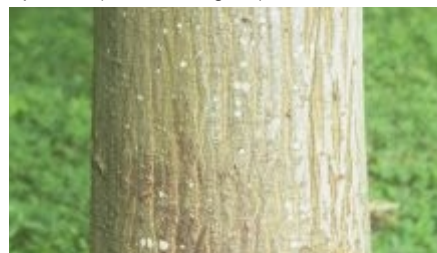
Fruit a woody 5-valved capsule that upon bursting frees soft brown vegetable wool enclosing 30-120 small, brown seeds.

### BIOLOGY

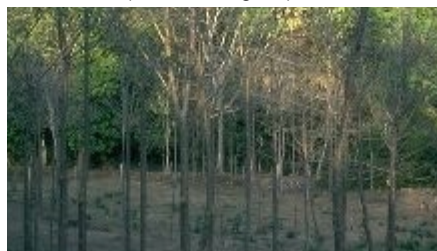
*B. quinata* is a monoecious species that is highly self-incompatible. It flowers at the beginning of the dry season. The stigmas of the flower protrude slightly from the anther, which appears to be an adaptation to avoid self-pollination. When the flower opens, the pistil is receptive and the pollen on the anthers is ready to be transported by pollinating agents, primarily bats (*Glossophaga sorisina*) and occasionally nocturnal moths. The bats are attracted to the flowers by the nectar located in nectar sacs in the ovary. Pollination occurs as the pollinators move among the trees to collect nectar. Capsule ripens after 3-4 months, releasing wind-dispersed seeds.



Mature tree of *B. quinata* in the seasonally dry forest of the Llanos of the northern Orinoco in the State of Barinas, Venezuela, showing the large size, root buttress formation and timber potential of this species. (Colin E. Hughes)



Variation in stem thorns in *B. quinata* is apparently under tight genetic control as revealed in 8-year-old stems of different half-sib families in a progeny trial in Brains Venezuela. (Colin E. Hughes)



Young trunks of *B. quinata* can be very densely covered in stout woody thorns. (Colin E. Hughes)

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### ECOLOGY

*B. quinata* is found in dry to very dry, or wet tropical forests, associated with *Acacia costaricensis*, *Acacia farnesiana*, *Albizia caribaea*, *Albizia saman*, *Anacardium excelsum*, *Astronium graveolens*, *Cedrela odorata*, *Cordia alliodora* and *Swietenia macrophylla*.

### BIOPHYSICAL LIMITS

Altitude: 0-900 m, Mean annual temperature: 21-27 deg C, Mean annual rainfall: 800-3000 mm

Soil type: *B. quinata* grows in a wide variety of situations, ranging from well-drained upland soils to imperfectly drained Vertisols, on low, flattened sites. Soil reactions at most locations are within pH 6-8.

### DOCUMENTED SPECIES DISTRIBUTION

Native: Colombia, Costa Rica, Honduras, Nicaragua, Panama, Venezuela

Exotic:



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**

Timber: The heartwood of *B. quinata* is reddish in colour and the sapwood cream or white. The wood is known for its durability and workability; it is used for furniture, doors, window and ceiling frames, roof construction, interior panelling, particleboard, plywood and veneer.

### **SERVICES**

Boundary or barrier or support: In Costa Rica and Nicaragua the establishment of living fencerows from vegetative propagated stakes is common practice, with spacings ranging from 2-5 m.

Shade or shelter: In other occasions, the trees have been left standing to give shade in coffee plantations (Nicaragua) or, most frequently, as remnant trees in cattle pasture.

Intercropping: There are examples of intercropping with maize, although only for the first two years of the plantation, due to a quick canopy closure.

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### **TREE MANAGEMENT**

Adequate weed control is essential to achieve acceptable survival and growth. Fertilization is not generally required at plantation establishment, in young plantations or on sites with good native soil fertility. Pruning and thinning are performed in plantations managed for veneer production. Pruning to leave a single stem is required within 1 year after planting to eliminate multiple stems that develop from sprouting of stump plants. This formation pruning occurs during the 1st dry season following planting, but on best sites where rapid tree growth occurs, it must be done 3-4 months after planting. Branch pruning is done to produce clear wood and begins when the trees are approximately 6 m tall, with the removal of lower branches up to 3 m stem height. Tentative thinning regime calls for the reduction of stems from a planting density of 1000 to 550 trees/ha at 5-7 years, with subsequent thinning to 300 trees/ha in 11-13 year-old plantations. At final harvest (age 16-18 years), trees are expected to have an average mean diameter at breast height of 40-45 cm.

### **GERMPLASM MANAGEMENT**

Seed storage behaviour is orthodox; seeds tolerate desiccation to 7.2% mc with 90% germination; 77% germination is achieved after 1 year subsequent storage at 5 deg. C. Seeds lose viability rapidly if the capsules are collected too early, but seed collected from capsules harvested at full maturity keep well for at least 2-3 years. There are 32 000 seeds/kg.

### **PESTS AND DISEASES**

Main problems at nursery stage such as root collar rot and damping off (*Fusarium* sp. and *Cylindrocladium* sp.), and damages associated with crickets (*Acheta assimilis*), cutworms (*Agrotis* spp.), grubworms (*Phyllophaga* sp.), and leaf cutter ants (*Atta* sp.) are unspecific.

At plantation level the most important damages are the insects of genera *Atta* (defoliation at nursery and young stages), *Phyllophaga* (root destruction of seedlings and plants younger than 3 years old) and *Steirastoma* (shoot borer at young and mature stages). Some rodents (e.g. *Orthogeomys cherriei*, *Sigmodon hispidus*) are sometimes problematic in nurseries or young plantations, causing destruction of plants and young trees, through debarking.

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### **FURTHER READNG**

CABI. 2000. Global Forestry Compendium. CD-ROM. CABI

Hong TD, Linington S, Ellis RH. 1996. Seed storage behaviour: a compendium. Handbooks for Genebanks: No. 4. IPGRI.

Kane M, et. al. 1993. The potential of *Bombacopsis quinata* as a commercial plantation species. *Forest Ecology and Management*. 56:99-112.

Lamprecht H. 1989. *Silviculture in the tropics: tropical forest ecosystems and their tree species; possibilities and methods for their long-term utilization*. Dt. Ges. für. Techn. Zusammenarbeit (GTZ) GmbH, Eschborn. (Translated by Brose J et. al.).

### **SUGGESTED CITATION**

Orwa C, Mutua A , Kindt R , Jamnadass R, Simons A. 2009. *Agroforestry Database:a tree reference and selection guide version 4.0* (<http://www.worldagroforestry.org/af/treedb/>)