

## Simaruba glauca

simaruba

DC.

Simaroubaceae

### LOCAL NAMES

Creole (doliv, fwenn, bwa blan, bwa fwenn); English (simarouba, princess tree, bitter ash, bitter damson); French (quinquina d'Europe, bois amer, bois blanc, bois Frêne, bois négresse); Spanish (acajou blanc, daguillo, gavilan, juan primero, laguilla olivio, palo amargo, daguilla); Trade name (simaruba)

### BOTANIC DESCRIPTION

The mature tree attains a height of 25-27 m and a stem diameter of 40-50 cm, often with a clear, cylindrical bole to 9 m. The crown is narrow, with a width averaging 4-6 m, and a crown width-to-dbh ratio of 22:25.

Simarouba glauca develops a shallow root system often suitable to mountain soils.

Leaves dark green above; oblong, and often notched or smooth at the apex.

The specific name 'glauca' means covered with a bloom, which refers to the bluish-green foliage; it is derived from the Greek work 'glaukos' (bluish).

### BIOLOGY

The plant is dioecious, with both unisexual and bisexual flowers. It is pollinated by bees. Male trees make up to about 40% of the population in some plantation establishments. Birds relish the ripe drupes and play an important role in seed dispersal. Other fauna that feed on the fruit also help in dispersal, including a lizard species (*Ctenosaura similis*) in Costa Rica, which ingests the fruit and disperses intact seeds away from the mother trees.



Young trees in trial near Choluteca, Honduras (Anthony Simons)

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### ECOLOGY

*S. glauca* is shade tolerant and occurs as an understory tree, particularly under the canopy of large fruit trees where birds perch and deposit the seeds. It is found as an associated species of the subtropical moist forest, sharing a position with other common trees of the home and humid perennial gardens, such as mango (*Mangifera indica*), royal palm (*Roystonea borinquena*), avocado (*Persea americana*) and plantain (*Musa x paradisiaca*). The species does poorly on severely degraded sites and approaches the limits of its optimal range in regions receiving less than 1200 mm. It is resistant to storms and drought.

### BIOPHYSICAL LIMITS

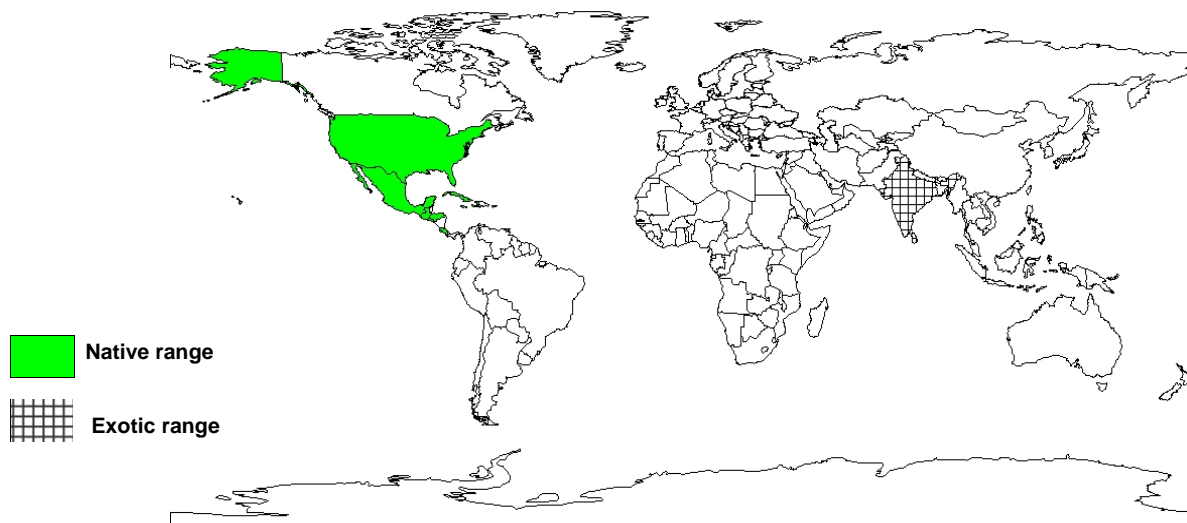
Altitude: 0-800 m, Mean annual temperature: 22-29 deg. C, Mean annual rainfall: Over 1200 mm

Soil type: It is found on rocky, shallow calcareous soils of mountain slopes and ridges, as well as on the deeper soils of the ravines and alluvial plains.

### DOCUMENTED SPECIES DISTRIBUTION

Native: Bahamas, Costa Rica, Cuba, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Puerto Rico, US

Exotic: India, Sri Lanka



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:** The edible parts of *S. glauca* are the fruit and the oil from its seed.

**Apiculture:** During the flowering season, *S. glauca* is visited by swarms of bees and considered an important honey plant.

**Timber:** *S. glauca* wood has a moderate density, is soft and easy to work, grows fast and is broadly adapted with an ample natural regeneration. These factors ensure an adequate supply for local wood industries, thus making it a popular wood for house construction and common furniture for the local farmers. The creamy white colour of the heartwood is barely distinguishable from the sapwood.

The wood is light (specific gravity 0.38) and soft, with strength properties normal for a wood its density. It is commonly reported in Haiti and India that the wood has a tendency to split during sawing. Seasoning with prolonged weather exposure causes severe surface and end splitting. The wood is generally sawn into planks that are easy to work as a general utility wood. Staining fungi that attack the wood actually enhance its appearance for decorative uses. The wood industry in Central America uses the species in match manufacture, plywood core, veneer, wood chips and lumber.

**Lipids:** Seed of *S. glauca* yield oil. The aceiteuno fat is also used for soap manufacture in India, where plantations have been established for its commercial production.

**Poison:** The residual cake left after processing the crude fat from the seed contains a toxin.

**Medicine:** All parts of the tree are used for medicinal purposes. The bark is taken as a decoction or tea for diarrhoea and fever. Leaves are used for rheumatism or are applied in the form of a lotion for body pain, bruises or skin itch.

**SERVICES**

**Soil improver:** The press cake resulting from the milling operation is used as an organic fertilizer and has given good results on coffee, sugarcane, cotton and maize.

**Intercropping:** The fast, straight growth and wide adaptability on shallow soils of Haitian mountains combine to make this tree an attractive choice for agroforestry.

**TREE MANAGEMENT**

If the objective of managing the trees is seed production, male plants should be eliminated and replaced with bisexual ones. For saw log production, pruning lateral branches is essential to obtain boles clear of branches. Pruning also allows flexibility in growing the tree as part of the upperstorey of a perennial garden or in pure, dense stands of a woodlot. At least 2 branch storeys or whorls must be left when pruning to avoid impairing growth rates. Plantations have been reported to resist storms and drought and in India are favoured over cashew (*Anacardium occidentale*) for such reasons. The species coppices, though not vigorously. The bitter leaves are avoided by livestock, an advantage for seedlings that develop slowly on tough sites. Height growth has never been observed to exceed 2 m/year. The fastest growth measured in Haiti was 1.8 m/year, with the average close to 1 m/year.

**GERMPLASM MANAGEMENT**

The high oil content of the seed causes it to lose viability after a couple of months when it is stored at ambient conditions. Drying seed to mc below 10% and storing in airtight containers improves seed longevity. There are 1600-1800 seeds/kg.

**PESTS AND DISEASES**

*S. glauca* exhibits variability in its resistance to decay, although it is generally considered low in resistance to decay and fungi and highly susceptible to dry-wood termites and marine borers. This is contrary to a widely held belief that the characteristic bitter taste of the bark and wood impart a resistance to insects.

The most common insect pest is the larval stage of the thread worm (*Atteva ergantica*), which feeds on the growth tips, particularly among the panicles of male flowers, where the larvae weave intricate webs. Several species of scale insects, such as *Chianapsis* spp. and *Ceroplastes* spp., attack the young trees. Mites have also been recorded to affect *S. glauca*, causing the 'witch's broom' appearance.

Young seedlings under shade are susceptible to root- and stem-rot diseases that should be controlled by proper watering and fungicide treatments.

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### **FURTHER READNG**

Burns RM, Mosquera MS and Whitmone JL (eds.). 1998. Useful trees of the tropical region of North America. North American Forestry Commission Publication Number 3. North American Forestry Commission.

Timyan J. 1996. Bwa Yo: important trees of Haiti. South-East Consortium for International Development. Washington D.C.

### **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/>)