Inga edulis

Mart.

Fabaceae - Mimosoideae

guaba

LOCAL NAMES
English (ice-cream bean tree); French (pois sucre,ingá); Portuguese (inga-de-metro,inga-cipo,cajasciro); Spanish (rabo de mico,inga,huaba,guano,guamo bejuco,guabo,guaba); Trade name (guaba)

BOTANIC DESCRIPTION
Inga edulis mature trees reach 30 m high and 60 cm diameter at breast height, usually branching from below 3 m. The branches form a broad, flat, moderately dense canopy. The bark is pale grey and smooth with pale elongated lenticels. The young twigs are angular in cross-section and covered with fine short hairs.

Leaves, once-pinnate, up to 24 cm long, with 4-6 pairs of opposite leaflets. The terminal pair of leaflets is larger than the basal pair and can be up to 18 cm long and 11 cm wide. Between each leaflet there is a nectary gland on the leaf rachis. The seedlings have a characteristic greyish sheen on the upper leaf surface.

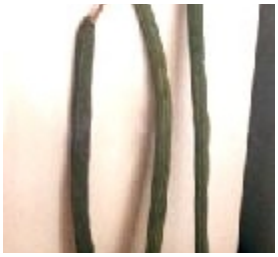
Inflorescence in dense axillary spikes of flowers, each consisting of a calyx tube with 5 lobes, a corolla tube with 5 lobes, and a large number of white stamens up to 4.5 cm long, united in a tube in the lower half.

Fruits ribbed, cylindrical pods, straight or often spirally twisted, up to 1 m long. They contain fleshy green seeds in a sweet, white, cottony pulp. They are produced during the wet season, and monkeys and birds eat the sweet pulp and scatter the soft seeds.

The name ‘inga’ is derived from its name with the Tupi Indians of South America. The specific name, ‘edulis’, means edible.

BIOLOGY
The major flowering season throughout its range is June to October, but in Brazil there is a minor peak in March and April. The fruiting season is difficult to assess, but field observations throughout western Amazonia indicate that the major fruiting season is from October.

Inga edulis: Inga edulis fruits sold by the side of the road in Iquitos city, Peru. (Soraya Alvarenga Botelho)



Inga edulis: Fruits the longest one of approximatley 1.7 m long. (Soraya Alvarenga Botelho)

Inga edulis (Soraya Alvarenga Botelho)

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ECOLOGY
I. edulis grows rapidly on the poorest Exisols and can also be found on floodplains that are waterlogged for 2-3 months each year. Although generally associated with warm, lowland, wet tropics, it is also remarkably resistant to drought and cold, occurring in regions with a 6-month drought. It is a light-demanding gap species of lowland rain forest, where it becomes a large tree, and it is also found in riparian situations.

BIOPHYSICAL LIMITS
Altitude: 0-1600 m, Mean annual rainfall: 1200 mm

Soil type: Particularly tolerant to acid and poor soils.

DOCUMENTED SPECIES DISTRIBUTION

Native: Bolivia, Brazil, Colombia, Ecuador, Peru
Exotic: Costa Rica, Panama

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 large fruit is popular in all the regions where I. edulis is grown. In Bolivia, Brazil, Costa Rica and Ecuador, they are sold in the marketplace.

Fodder: Pigs eat seeds when hungry, and cattle will even eat whole pods and leaves.

Fuel: The ease with which the seed germinates, its quick growth, rusticity and high coppicing ability make this species useful for the smallholder's woodlot and it is also a useful bush-fallow species. The branches are a popular source of firewood, with a high calorific value and little smoke, although the tree is not cultivated specifically for fuel.

SERVICES
Shade or shelter: I. edulis has been used as a shade tree for perennial crops, mainly coffee and cacao since the beginning of the 19th century. The open crown and rapid growth provide excellent shade, and trees are widely used for this purpose around dwellings.

Reclamation: In trial experiments on cultivated slopes, I. edulis mulch reduced soil erosion to levels almost equal to those in secondary forests.

Nitrogen fixing: Due to its nitrogen-fixation ability, I. edulis has been employed in improved fallows.

Soil improver: The litter is high in nitrogen, lignins and polyphenols. It is slow to decompose, but provides a long-term build up of organic nitrogen and effective weed control. Weed biomass decreased considerably in all agroforestry trials with I. edulis, much more than with other leguminous species. Existing trials are too new to ascertain whether the species can maintain or improve soil fertility on acid sites in the long term, but results so far are promising.

TREE MANAGEMENT
An area 1 m in diameter should be kept clear around the tree for the 1st 6 months of growth. I. edulis grows back well after pruning, but not if cut below 0.75 m. There is a better response if pruning height is varied and a few branches are left uncut. The cut should be made carefully, at least 3 cm above a node from which the shoots can grow again.

GERMPLASM MANAGEMENT
The seeds are recalcitrant and sometimes begin to germinate in the pod, often within a few days of reaching the ground, where they need moisture to survive. The seeds can be stored for only 2 weeks. Best results have been achieved by removing the pulp and storing the seed in impermeable bags.

PESTS AND DISEASES
Although the trees are resistant to leaf-cutting ants, Lepidoptera larvae have been seen to completely defoliate it. Fruit fly larvae often damage the seed testa, especially in late maturity. Slight damage from fungal attack (Rhizoctonia) of seedlings has been noticed; otherwise the trees seem very resistant to diseases and pests. In Ecuador, I. edulis is particularly susceptible to infestation with mistletoe.

FURTHER READNG

Alegre JC, Weber JC, Bandy DE. 1998. The potential of Inga species for improved woody fallows and multistrata agroforests in Peruvian Amazon basin: The Genus Inga: utilization. p. 87-100.

Anegbeh PO, Ladipo DO, Simons AJ. Tchoundjeu Z, Roy-Macauley H. 2006. Effect of fallowing and inter-row spacing of a tree legume Inga edulis on nutrient status of soils of Onne, Niger delta region of Nigeria: Scientia Africana. 5(2):121-126.

Anegbeh PO, Tchoundjeu Z, Amakiri MA, Wahua TAT, Opuwaribo EE, Ujor G. 2004. Chemical composition and nutritive value of foliage of Inga edulis mart, an agroforestry tree legume for fodder: International Journal of Science and Technology. 3(1):28-33.

FAO. 1983. Food and fruit bearing forest species. 3: Examples from Latin America. FAO Forestry Paper. 44/3. Rome.

Kanmegne J, Bayomock LA, Degrande A, Asaah E, Duguma B. 2003. Establishment of Inga edulis and Calliandra calothyrsus in improved fallow systems in southern Cameroon. The Netherlands: Kluwer Academic Publishers. Agroforestry Systems. 58(2):119-124.

MacDicken GK. 1994. Selection and management of nitrogen fixing trees. Winrock International, and Bangkok: FAO.

NFTA. 1993. Inga edulis: a tree for acid soils in the humid tropics. NFTA 93-04. Waimanalo.

SUGGESTED CITATION

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