

# Native Tree Sheet:

## Stinking Toe, Locust

### *Hymenaea courbaril*

#### Bean Family (FABACEAE or LEGUMINOSAE)

#### Cassia Subfamily (CAESALPINIACEAE)



By Brian Daley and Thomas W. Zimmerman, Ph.D.  
UVI-AES Biotechnology & Agroforestry

A publication of the University of the Virgin Islands Agricultural Experiment Station

October, 2007

#### Common Names

Stinking toe (Virgin Islands), locust (West Indies), algarrobo (Puerto Rico), guapinol (Costa Rica), koubari (Haiti), corobore (Venezuela).

#### Description

A medium- to large-sized, spreading, usually evergreen, tree capable of reaching 120 in height with a trunk 4 feet in diameter, but rarely growing to more than 65 feet in the Virgin Islands. Its bark is smooth and light gray. Compound, alternate leaves are shiny, green with paired leaflets having pointed tips and a distinctly off-centered mid-vein. Flowers are white, bell-shaped, 1 ¼ inches across, with five thin petals and 10 anthers and grow in dense clusters or panicles. Locust produces unmistakable, large, woody fruit pods 1 ½ to 2 inches wide and 3 to 5 inches long. The sweet, edible, but strong-smelling pulp gives it the name 'stinking toe' in the Virgin Islands.

#### Distribution and Ecology

Its native range extends from southern Mexico through Central America and south to Peru, Brazil and Bolivia. It is also found throughout the Caribbean Islands from Cuba and Jamaica to Trinidad and Tobago. In the Virgin Islands, it is found most frequently on the island of St. Croix, primarily in guts or streams banks from Mon Bijou and to the west. In the Virgin Islands, the native Antillean Fruit Bat (*Brachyphylla cavernarum*) feeds on the flowers' nectar. Throughout most of its range the fruit pods are opened by agoutis and other rodents that eat some seeds and distribute others. There are no such animals native to the Virgin Islands, raising the question of how seeds are naturally released from the pods and distributed.

#### Flowering and Fruiting

Locust has a long flowering season with



Figure 1. This 50-foot tall locust tree is growing on the banks of a gut.

open blooms on some scattered individuals from April through October, though each population will have a two month peak in flowering. Green fruit expand to full size (3-5 inches or 8-13 cm) in 4 to 6 weeks and mature in the canopy for up to nine months before falling to the ground unbroken. Virtually all trees flower every year but most do not set fruit every year, aborting the young pods in non-fruiting years. Trees in the Virgin Islands frequently produce fruit in only a portion of their canopy, presumably because the trees have insufficient reserves to produce a heavy fruit crop. Several collections from various years on St. Croix had an average fruit weight of 3.1 oz. (88.8 g).

#### Seed Collection and Processing

Ripe seeds are usually available in the Virgin Islands from May to August. Ripe, brown, woody pods can be cut from the tree canopy or freshly fallen fruits can be collected from the ground. Each contains from 3-8, hard, inch-long, reddish-brown, elliptical seeds. The hard pods do not open when ripe but can be cracked open with a hammer. The seeds should be removed from the surrounding yellowish-white, edible pulp and scraped clean. Any remaining pulp is easily removed by soaking the seeds for a few minutes in water,



Figure 2. Leaves, flowers, seedling and fruit (Illustration from J.A. Vozzo).

then rubbing them clean. Cleaned seeds may be stored in sealed containers and refrigerated for up to one year without losing viability. Trees on St. Croix average 300 seeds per pound (450/kg).

#### Seed Treatments and Germination

Germination rates of roughly 80% can be achieved without using any treatment, making this species is well suited to direct seeding in pots or bags. Germination trials at UVI-AES indicate germination begins after 15-20 days and is relatively uniform. Seed treatments such as an overnight soak in water, manual scarification and using acid were observed to speed up germination and make it more uniform for large groups of seeds.

#### Greenhouse Management

Seedlings need to be kept fairly moist in the greenhouse and should be gradually acclimated to full sunlight after 60 days. These plants produce long tap roots and should be



Figure 3. Green fruit.

transplanted to deep pots before the root becomes deformed by their pot. Some greenhouses on St. Croix have reported that seedlings fail after about 90 days, growing chlorotic and weak before dying. Locust trees naturally form mutualisms in their roots with both fungus and bacteria that help the plant absorb water and nutrients more efficiently. Potting soil can be inoculated with these beneficial organisms by including some soil from beneath the parent tree in the seedlings' pots or by using commercially available inoculants.

### Outplanting and growth

Two separate experiments at UVI-AES to establish locust seedlings without supplemental irrigation resulted in very low growth rates and high mortality. The tree also does not grow well in caliche or calcareous soils as it prefers pH ranges between 4.8 and 6.8.



Figure 5. Seed and early seedling development. Note that the seeds rise several inches above the soil surface during early growth and fully formed leaves unfold and emerge from the seed.

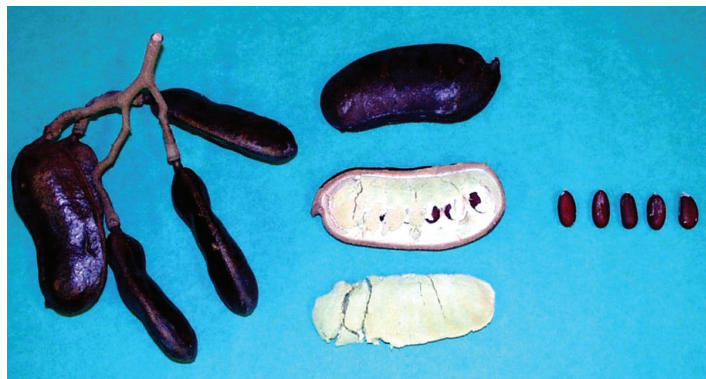


Figure 4. Ripe fruit cluster, a fruit in cross section and cleaned seeds ready to be planted.

Growth rates of roughly 3 feet (1 m) per year are reported for adult trees in Puerto Rico.

### Landscape Uses

Locust is becoming increasingly rare in the Virgin Islands and should be planted more often. However, suitable sites are limited because locust requires moist conditions relative to other native trees and should either be planted under irrigation or in guts/waterways. Its size makes the tree suitable for parks, reforestation and large commercial plantings but the large fruit make it unsuitable for roadside planting.

### Traditional Uses

Traditionally, only children eat this fruit, probably due to the strong odor. The pulp can also be mixed with water for a drink. In the children's game 'cock' the locust seeds are fixed with a string and used to strike against one another. The tree produces a durable, heavy, hard, highly valuable wood for timber, but attempts to establish plantation in the Caribbean islands have not been successful. The wood is sold under the trade name Brazilian cherry.

For further information contact Brian Daley, Research Specialist, University of the Virgin Islands Agricultural Experiment Station, RR 1 Box 10,000, Kingshill, VI 00850. (340) 692-4078, [bdaley@uvi.edu](mailto:bdaley@uvi.edu)

### Additional Reading

Jones, K., 1995. *Native Trees for Community Forests*. St. George Village Botanical Garden of St Croix, Inc. 124 p.

Little, E.L., Wadsworth, F.H. 1964 *Common Trees of Puerto Rico and the Virgin Islands*. Agricultural Handbook No. 249. US Dept. of Ag., Forest Service. Washington DC. 548 p

Vozzo, J.A. 2002. (Ed.) *Tropical Tree Seed Manual*. Agricultural Handbook 712. USDA, Forest Service. Washington DC. 899 p.

Prepared by Brian Daley, Agroforestry Research Specialist, and Dr. Thomas W. Zimmerman, Biotechnology Program Leader. Issued by the University of the Virgin Islands Agricultural Experiment Station, Dr. James Rakocy, Director. This work was made possible through support from a USDA McIntire-Stennis grant # UVI-201073. USDA-Cris 0201950.

University of the Virgin Islands  
Agricultural Experiment Station  
RR 2, Box 10,000  
Kingshill, VI 00850  
Telephone: (340) 692-4020  
Fax: (340) 692-4035  
[http://rps.uvi.edu/AES/aes\\_home.html](http://rps.uvi.edu/AES/aes_home.html)

University of the Virgin Islands

[www.uvi.edu](http://www.uvi.edu)

SPECIALIZING IN FUTURES



HISTORICALLY AMERICAN.  
UNIQUELY CARIBBEAN.  
GLOBALLY INTERACTIVE.