



EXOTIC INVASIVE SPECIES, US VIRGIN ISLANDS

Neem (*Azadirachta indica*)

Sweet Lime (*Triphasia trifolia*)

Forest Invaders

NEEM (*Azadirachta indica*)

Mahogany Family (Meliaceae)

Native Range Northeast India



Neem is a fast growing tree, generally reaching 50 or 60 feet in the Virgin Islands. Leaves are dark green and compound with serrated edges. Flowers are cream colored, small and very fragrant. Neem copiously produces clusters of bean-sized, yellowish fruit, each containing one seed. Annually, a single neem tree produces between 40,000 and 200,000 seeds!

Historical Introduction

Neem has been used for centuries in India to make effective organic pesticides. It has been promoted worldwide as a miracle tree with chemical properties that can be used as insecticide and for healing, in a way that likely overstated the benefits. Touted by many international development agencies as “the tree that could help every person on the planet”, such publications overlooked the invasive nature of the tree. Neem was introduced to the Virgin Islands in the 1970s and has quickly spread. Neem trees are erroneously believed to deter mosquitos, probably because neem oil applied to human skin has some effect.

Ecological Threat

In the Virgin Islands, dense thickets of neem saplings crowd-out native vegetation, usually near where neem trees have been planted. Forested guts of dry east-ends are frequently invaded by neem. Its prolific seed production and popularity with wildlife results in the rapid spread from one

planted tree to invading forest habitat. It outgrows native species in areas of Africa and Australia, where neem plantations previously existed. These areas have lost much of their forest diversity to neem trees, which continue to dominate the landscape.

Preferred Habitat

Neem trees grow well in dry conditions. Once a tree has become established, it can survive for droughts of 6-7 months.

Dispersal

Neem produces large amounts of seeds that are primarily dispersed by bats. Birds also eat the seeds for their sweet pulp and the seeds are passed out of the body undigested, germinating at near 100%.

Management Options

Neem is difficult to fully remove and the best management is to not plant neem trees in the first place. However, once they are established, mechanical removal is the only option. Mature trees can be cut and seedlings can be pulled manually. Neem coppices readily so follow-up herbicide treatments are also recommended.

SWEET LIME (*Triphasia trifolia*)

Citrus Family (Rutacea)

Native Range SE Asia and Malaysia



This evergreen shrub grows to roughly 10 feet tall. Its compound leaves are dark green with three leaflets and are fragrant when crushed. It has pairs of short spines on its branches. The white, cup-shaped flowers are fragrant and attractive. Fruit are dark red, berry-like with a thick skin

and a sweet gooey fruit surrounding a single ¼” seed. Fruiting and flowering occur throughout the year.

Historical Introduction

Sweet lime was originally brought to the Virgin Islands by gardeners to create dense, fragrant hedges. Birds carried away fruits from these hedges, creating wild populations of the aggressive weeds. It is now naturalized in the USVI, Barbados and Florida.

Ecological Threat/Dispersal

The Florida Exotic Pest Council requested that Florida nursery growers, landscape professionals and garden center retailers voluntarily stop using *T. trifolia*. Sweet lime is one of the most problematic and invasive exotic plants in the Virgin Islands. Birds eat the fruit and carry the seeds into the forest, usually near a gut. The seeds grow and form impenetrably dense thickets in the shady understory of secondary forests. Sweet lime spreads and suppress-

es native plants, outcompeting them for light and water.

Preferred Habitat

Sweet lime can tolerate shade or full sun. It prefers moister areas of the Virgin Islands, thriving in slopes around guts. The bush adapts well to the frequent and severe pruning required to create a hedge. Sweet lime is also tolerant of inhospitable caliche soil.

Management Options

The flexible hard wood makes sweet lime a challenge to chop with a machete or remove by hand. Wasps or Jack Spaniards build their nests in the thorny shrubs, creating a further challenge. Individual bushes can be chopped up and then a few drops of concentrated herbicide applied to the freshly cut, white wood. Once a thicket is established it is difficult to remove them without heavy machinery and it re-sprouts from stumps and roots, similar to tan-tan. Removal sites usually have to be re-treated.





EXOTIC INVASIVE SPECIES; US VIRGIN ISLANDS

Genip (*Meliococcus bijugatus*)

Forest Invaders

There are a number of plant species that are invasive in Virgin Islands' forests, but the three presented here are among the most ubiquitous and most damaging. "Forest invaders" share several characteristics that make them successful invaders: shade tolerant, prolific, fast growing, quick to produce seeds, and their seeds are easily transported by wildlife. Many invasive species depend on disturbances, but these species can invade healthy forests.

Description

Genip trees can grow up to 100 feet tall, but adults in the Virgin Islands usually reach 60 feet. They are distinctive trees, characterized by long pinnate leaves with a winged midrib, and clusters of green edible fruits, about 1 inch in diameter. They have smooth, grayish bark on trunks that can grow to be very wide with old age. Flowers are very small, growing in clusters on long narrow stalks.

Historical Introduction

The exact date of genip introduction to the Virgin Islands is not known, but they were likely brought to the Virgin Islands by pre-Columbian Amerindians for their abundant, tasty fruit. They have been introduced throughout the Caribbean, in Central America, Mexico, Africa and in parts of the Pacific.

Ecological Threat

The sheer numbers of genip trees and their wide range of ecological tolerance have

made them one of the most successful invaders of native forest. Once introduced they can quickly convert a diverse native forest into a homogenous stand of genip trees, crowding out all other vegetation.

Preferred Habitat

Although genip grows best in full sun and well-drained soil, it also tolerates a variety of conditions including shade, salt, wind and drought. On St. Croix, genip trees can be found in dry east-end pastures and grow larger in the moist forest of the west end. Their broad range of habitat tolerances make them an especially dangerous invasive plant.

Dispersal

Seeds are primarily dispersed by wildlife, especially birds and bats, but also by people that consume the fruits and then discard the seeds, often tossing them out of the window of their cars on to the roadsides. A recent

Soapberry Family (Sapindaceae)

Native Range South America

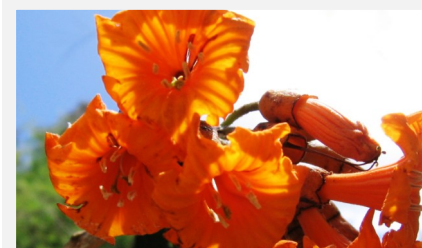


Photo by Garden of Delights, <http://gardenofdelights.com/>

inventory of the roadside trees on St. Croix found that genip was by far the most common tree species, accounting for one out of every three trees along the roadside.

Management Options

Genip is very difficult to control, given the number of seeds each tree produces and the popularity of the fruit as a snack for wildlife and humans alike. Individual trees can be mechanically removed and then treated with herbicide. Seeds may continue to germinate for several weeks and require follow-up treatments.



(Native orange manjack flowers)

Replacement Species

Both neem and sweet lime are popular landscaping plants that have escaped from cultivation to wreak havoc on the native forest. Sweet lime is popular for its utility as a thorny, but attractive hedge. An alternative to sweet lime is **bread and cheese** (*Pithecellobium unguis-cati*), an attractive native plant that is easily grown into a dense hedge and has short spines that are a deterrent, but are not dangerous to a gardener's hands. The young leaves begin red and turn green, making for a colorful hedge and the cork-screw shaped fruit open to reveal black seeds in a red flesh. Neem is popular because it grows well in harsh conditions, such as the dry east end of St. Croix. There are many beautiful native trees that also do well in these conditions. Jamaica caper (*Capparis jamaicensis*) and lignum vitae (*Guaiacum officinale*) are small drought tolerant trees perfect for smaller spaces around utility lines and roadsides. Jamaica caper is a smallish tree that profusely produces showy white, brush-like flowers that turn purple with age. Orange manjack (*Cordia rickseckeri*) produces bright orange flowers that are attractive to wildlife such as bananaquits and hummingbirds. Native plants are adapted to local climate and soil conditions and do not pose ecological threats

