

The Pink Hibiscus Mealybug

The pink hibiscus mealybug, *Maconellicoccus hirsutus* (Green), is a pest of many plants, trees, and shrubs. It infests hibiscus, citrus, coffee, sugar cane, annonas, plums, guava, mango, okra, sorrel, teak, mora, pigeon pea, peanut, grape vines, maize, asparagus, chrysanthemum, beans, cotton, soybean, cocoa, and many other plants.

This pest occurs in most tropical areas of the world, including Asia, the Middle East, Africa, Australia, and Oceania. The pink hibiscus mealybug arrived in Egypt from India in 1912 and in Hawaii in 1984. It appeared in Grenada, Trinidad, and St. Kitts in the 1990's and has spread to other islands in the Caribbean, where it attacks many hosts of economic importance.

The U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS) is charged with protecting American agriculture from exotic plant pests like the pink hibiscus mealybug. Anticipating the pest's spread to the U.S. mainland, APHIS has developed successful biological control technology that is being implemented in the Caribbean. Introductions of specific natural enemies have resulted in dramatic mealybug population reductions there.

Description and Life Cycle

The pink hibiscus mealybug is also known as the grape mealybug, the grapevine mealybug, the pink mealybug, and the hibiscus mealybug. The pest forms colonies on the host plant. If left undisturbed, the colonies will grow into large masses of white, waxy deposits on branches, fruiting structures, leaves, and even whole plants, including large trees.

Adults of both sexes are about one-eighth inch (3 mm) long. The females are pink, and their bodies have a white, waxy covering. They are wingless and look like ovoid shapes covered by a mass of white, mealy wax. Males have a pair of wings and two long waxy tails and are capable of flight.

In cool climates, the pest overwinters on the host plant, either in the egg stage or as an adult. In warm climates, the insects stay active and reproduce year 'round.

The mature female lays eggs in an eggsack of white wax, usually in clusters on the twigs, branches, or bark of the host plant but sometimes on the plant's



Adult female (arrow) and immatures. (Photo taken by Marshall Johnson of the Department of Entomology, University of Hawaii at Manoa, and used by permission.)

leaves and terminal ends. Initially, eggs are orange but turn pink as they age. Egg development takes between 3 and 9 days. Eggs are minute, varying from 0.3 to 0.4 mm in length, and number as many as 654 per sack.

Eggs hatch into nymphs called crawlers and are very mobile. They may disperse over the host, especially toward tender growing parts, or be carried away by wind, people, or animals. In appearance, nymphs of both sexes resemble female adults. But female nymphs of the pink hibiscus mealybug have three instars while male nymphs have four. The last instar of the male is an inactive stage with wing buds within a cocoon of mealy wax. Individual mealybugs may take as long as 30 days to grow through all the nymphal stages.

Spread

In its egg and crawler stages, the pink hibiscus mealybug disperses most easily by wind. The wax, which sticks to each egg, also facilitates passive transport by animals or people.

Wingless crawlers and adult females have been known to travel short distances over the ground to get to other host plants in adjoining fields. Though the pink hibiscus mealybug is more likely to be spread through the movement of infested nursery stock, it may also be spread through agricultural commerce.

This insect can complete its entire life cycle in as little as 30 days. Under optimum laboratory conditions, there can be as many as 15 generations a year. Windborne mealybugs can start new infestations in areas where the climate is colder than the species normally prefers. Scientists believe the pest can

adapt to cooler weather: nymphs move to sheltered locations, and adult females choose protected places to position their eggsacks.

Damage

As it feeds, using a piercing and sucking process, the pink hibiscus mealybug injects into the plant a toxic saliva that results in malformed leaf and shoot growth, stunting, and, occasionally, death. Leaves show a characteristic curling, similar to damage caused by viruses. Heavily infested plants have shortened internodes leading to rosette-ing or a "bunchy top" appearance. A heavy, black, sooty mold may develop on an infested plant's leaves and stems as a result of the mealybug's heavy honey-dew secretions.

Saman tree killed by heavy pink hibiscus mealybug infestation. White mealybug egg masses cover the trunk and branches. (Photo taken by Tony Cross of the International Institute of Biological Control, Centre for Agriculture and Biosciences International, and reproduced by permission.)



When fruits are infested, they can be entirely covered with the white, waxy coating of the mealybug. Infestation can lead to fruit drop, or fruit may remain on the host in a dried and shriveled condition. If flower blossoms are attacked, the fruit sets poorly. In plants such as peanuts, potatoes, and some grasses, the pest has been reported to attack the root systems.

The pink hibiscus mealybug has a wide range of hundreds of unrelated plant hosts, and the list is growing as the pest spreads into new geographic areas. So far, this insect has been found on 215 genera of plants. Its wide host range favors rapid spread and complicates effective control.

In spite of its wide distribution, the pink hibiscus mealybug was a major pest only in India and Egypt prior to its discovery in the Caribbean. In India, it is a major pest of grapes, reducing yields 50 to 100 percent. Yield losses on other crops, such as sorrel, jute, mesta, and roselle, range up to 75 percent. In Egypt, the mealybug is a pest of shade trees, such as the lebbek and the bauhinia, and of mulberry, pigeon pea, and guava. Cotton is particularly susceptible if planted near mealybug-infested trees.



Infested hibiscus twig.
(Photo taken by APHIS' Dale Meyerdirk.)

In Hawaii, the pink hibiscus mealybug has not become an economically important pest, probably because it is regulated by several natural enemies.

In Grenada, the pink hibiscus mealybug infests cocoa, many types of fruits and vegetables, and ornamental plants, such as hibiscus, oleander, and croton. The pest has also affected Grenada's forests, killing individual trees and even whole groves.



"Bunchy top" in citrus.
(Photo by Dale Meyerdirk.)

Control

Experience in the Caribbean has shown that using pesticides and cutting and burning infested host plants are not successful techniques. The pink hibiscus mealybug can be suppressed by employing biological control agents (parasites). For environmental reasons, biological control is the best long-term management option.

A number of natural enemies are known, including the coccinellid predator *Cryptolaemus montrouzieri* and the parasites *Anagyrus kamali* and *Gyranusoidea indica*. In Egypt and India, biological controls have been quite successful in suppressing the pink hibiscus mealybug. Other coccinellid predators have also been reported in India. At present, 21 parasites and 41 predators are known to attack this pest worldwide.