



Figure 1. Papaya leaf infected with Papaya ringspot virus.

# Papaya Ringspot Virus

## Established on Maui

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**Introduction.** In April 2002, a sample of mottled papaya foliage from Wailuku, Maui, was diagnosed as being infected by the papaya ringspot virus (PRV) by the Cooperative Extension Service (CES) and confirmed by the Agricultural Diagnostic Service Center on Oahu. This is the second time that papaya ringspot disease has occurred on Maui. In 1974, the disease was found in the Wailuku area of Maui but was eradicated by the end of 1975 through an intense roguing program. PRV was first reported to occur in the State on Oahu in 1945 and is widespread on the island. The disease also occurs on Hawaii island where a rigorous management program is in effect.

**Description.** Papaya ringspot is a destructive disease characterized by a yellowing and stunting of the crown of papaya trees, a mottling of the foliage (Figure 1), shoe-stringing of younger leaves (Figure 2), water-soaked streaking of the petioles (stalks), and small darkened rings on the surface of fruit (Figure 3). Other pest organisms, such as various species of mites and powdery mildew, may cause symptoms similar to PRV. Herbicides drifting onto developing papaya trees may also cause symptoms such as shoe-stringing. In severe cases, fruits may become distorted.



Figure 2. PRV-infected papaya leaf exhibiting shoe-stringing.



Figure 3. Close up of PRV-infected papaya fruit showing ring spots.

**Damage.** Since the leaf canopy of an infected tree declines as the disease progresses, fruit yield, size and quality are reduced.

**Distribution.** Subsequent surveys conducted by the Hawaii Department of Agriculture (HDOA) and CES revealed that the disease occurs in Wailuku, Wailuku Heights, Iao Parkside, Waikapu, Kihei, Omaopio, Pukalani, Makawao, Kula Glen, and Hana (Figure 4).

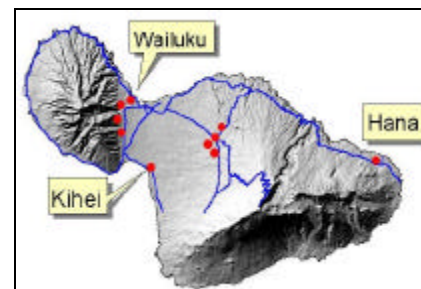


Figure 4. Maui map showing PRV infected areas as of May 2002.

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**Transmission and spread.** Papaya ringspot virus is transmitted from infected papaya trees to healthy trees by the feeding action of various species of aphids, especially the green peach aphid and melon aphid. The virus is transmitted in a non-persistent manner, meaning that the virus does not multiply within the aphid but is instead carried on its mouthparts and is transmitted from plant to plant while feeding.

It is unlikely that PRV can be transmitted by mechanical means such as by using the same garden tools on both infected and non-infected papaya trees. The main mode of transmission is through the feeding of aphids.

The disease can also be spread by planting PRV-infected papaya seedlings in uninfected areas.

**Quarantine.** HDOA Plant Quarantine regulations prohibit the movement of papaya plants and plant parts from an island known to have PRV (Oahu, Hawaii and Maui) to islands where the disease is not known to occur (Kauai, Molokai and Lanai). Papaya fruit and seeds are allowed to be transported.

**Control.** Homeowners are requested to examine their papaya trees. If there are any symptoms as previously described, the trees are probably infected with PRV. There is no cure for infected trees. They should be destroyed by cutting them as close to the ground as possible and immediately applying an herbicide such as concentrated Roundup to the cut stumps (Nishina 1994)

Avoid planting crops such as cucumber and cabbages nearby since they harbor the aphid vectors.

The University of Hawaii College of Tropical Agriculture and Human Resources is making available PRV-resistant papaya varieties. Homeowners and commercial growers wishing to grow these resistant varieties must first become certified by the U.H. For more information on the disease or if you wish to become certified, call the U.H. Cooperative Extension Service on Maui at (244-3242).

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