



Outbreak of papaya ringspot disease reported on Rarotonga, Cook Islands

On 3 June 2004, a single papaya tree showing typical ringspot disease symptoms was reported to the Cook Islands Ministry of Agriculture (CIMoA). This tree was destroyed by CIMoA on 3 June after leaf samples were taken from it. These samples were received at the SPC Plant Protection Services plant virology laboratory in Fiji Islands on 7 June, where they tested positive in a double antibody sandwich enzyme linked immunosorbent assay (DAS-ELISA) conducted by Dr Richard Davis, SPC Plant Virologist. Papaya ringspot disease is caused by the papaya infecting strain of papaya ringspot virus (PRSV-P).

A follow-up survey, timed to ensure detection of any spread from the infected tree to nearby trees prior to its death, of every commercial crop plus many domestic properties on Rarotonga was conducted. No ringspot disease-like leaf or fruit symptoms were found on any trees examined. Leaf samples from a total of 281 trees were collected and tested for PRSV by ELISA at Totokoitu Research Station. Of these samples, 71 were collected from the infected planting area, 83 from plantings or domestic compounds within a 2 km radius of the infection focus and the remainder were taken from elsewhere on the island. No new positive results were obtained and CIMoA is confident of total eradication in the near future.

PRSV-P infected trees are less vigorous, produce few fruit and the fruit quality, especially flavour, is reduced. It is the main production problem in many countries in southeast Asia and South America. PRSV-P was confirmed in Hawaii in 1949, southeast Queensland, Australia, in 1991, Saipan, Northern Mariana Islands and Guam in 1994, and Tahiti, French Polynesia, in 2003.

It is not known if the disease outbreak resulted from a quarantine incursion or from a natural change in the local PRSV population. PRSV exists in two closely related forms (biotypes). PRSV-W (previously known as watermelon mosaic virus-1) is the other form; it causes important disease in cucurbit crops through much of the world. PRSV-P can infect both papaya and cucurbits and there is strong evidence from elsewhere in the world that PRSV-P evolved from PRSV-W in cucurbit crops growing with or near papaya. This may have been what happened on Rarotonga.

Symptoms include a strong yellow pattern (mosaic and mottling) on leaves (Fig.1), plus blistering and leaf distortion. Dark green on lighter green water-soaked streaks can be seen on leaf stalks and stems. The key distinctive symptoms are those seen on fruits: dark green on light green target-like rings, spots and C-shaped markings (Fig.2). These become dark orange-brown as the fruit ripens and changes colour.



Figure 1. Yellow mosaic pattern



Figure 2. C-shaped markings seen on the fruit

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