

# Bacterial Dieback of Papaya Trees

by  
Senior Research Officer, Dr. Lily Eng

Bacterial dieback of papaya trees first occurred in Batu Pahat, Johore, in 2003. This devastating disease later spread to Perak, Malacca, Negeri Sembilan, Pahang and Perlis. The disease caused the export volume of papaya in Peninsular to plunge from 57,113 tonnes in 2003 to 10,323 tonnes in 2008. In 2008, 258.3 ha of papaya plantations were infected, resulting in an estimated loss of RM 51.5 million.

This disease, which is also known as bacterial crown rot or bacterial stem canker in other countries, is caused by a few species of bacteria from the family of Enterobacteriaceae and the genus, *Erwinia*. One of the species, *Erwinia papayae*, has been isolated in West Malaysia. This particular species is of plant quarantine importance. In West Malaysia, the affected papaya varieties were Eksotika, Solo, Hong Kong and Sekaki. The first reported incidence of this disease was in the Caribbean Islands, and in South East Asia, Java had the first infection. Other species of *Erwinia* have been isolated from papaya trees with dieback symptoms in Tawau, Sabah, by the Sarawak Department of Agriculture, during a collaborative research trip to Tawau. Fortunately, this disease has not been detected in papaya plantations in Sarawak.

When a papaya tree is infected, the axil end of the leaf stalk shows greyish to black water-soaked symptoms which later become necrotic. The leaf droops and wilts. Eventually all the infected leaves droop and drop as the disease progresses, causing a dieback of the tree. Infection can also occur on the shoots, leaves, and fruit. The typical symptoms are greyish to black water-soaked lesions on the infected parts of the plant. It is suspected that the disease is transmitted by insects, snails or birds, when they visit the tree. The bacteria need a wound on the plant tissue to cause an infection. Minor injuries, caused by the visiting fauna contaminated with the bacteria, provide the entry points for infection. Although there is no available scientific evidence at the moment that the disease is transmitted through seeds, there is a possibility of this occurring if the fruit is infected.

A few disease management steps are listed below:

- Since there is no cure for the disease, disease prevention is of paramount importance.
- Do not use seeds from infected areas as planting material.
- Before planting, soak seeds in 1% sodium hypochlorite (bleach) for 10 minutes, before rinsing three times with tap water.
- Remove infected trees promptly to prevent the disease from spreading to other trees.
- Clean pruning knives/secateurs with 1% sodium hypochlorite after each use during harvesting or plant maintenance.
- Harvest mature fruit as soon as possible to discourage visits by birds or fruit flies.
- Manually remove snails (if feasible) or use snail baits (for plantations).
- Where the bacterial disease has been detected and insects are in abundance, use insecticides such as cypermethrin or deltamethrin to control the insects.
- Report to the Department of Agriculture if you suspect that your papaya tree has this disease.



**Fig. 1 & 2**

*Dieback of crown of infected papaya tree in Tawau, Sabah*



**Fig. 3**

*Greyish to black water-soaked symptoms on infected trunk of papaya tree near axils of leaf stalk*



**Fig. 4**

*Greyish to black water-soaked symptoms at the base of infected leaf stalks*



**Fig. 5**  
*Infected crown and young shoots  
with water-soaked symptoms*



**Fig. 6**  
*Infected leaf turning necrotic*