

Diseases of Pineapple in Sarawak

By
Dr. Lily Eng

Sarawak has been fortunate that disease incidences in pineapple are few. Sometimes, problems caused by nutritional disorders, insect pest damage or herbicide damage, are misconstrued as disease problems. The few diseases that have been detected in Sarawak are Phytophthora heart rot, fruitlet core rot, fruit rot caused by the fungi, *Thielaviopsis paradoxa* and *Curvularia eragrostidis*. There has been no confirmation that the mealybug wilt-associated virus disease is present in Sarawak.

Phytophthora heart rot

One incident of Phytophthora heart rot (Figure 1) was detected in Sarawak in 2006. Symptoms of rotting appeared at the base of the leaves, in the centre of the leaf whorl (heart) of young non-flowering plants. The leaves had turned brownish red and could be easily pulled off. The base of the infected leaves had dark brown to black zones. This disease occurred in an area with acid sulphate soil, where liming was carried out to increase the soil pH. Unfortunately the higher soil pH favoured the growth of this soil-borne pathogen (disease causing organism). For pineapples grown under normal peat conditions without liming, this disease has never been known to occur. Peat soil has a low pH (acidic). Wet environmental conditions also tend to favour the spread and severity of this disease. By the time an infected plant is detected, it is too late to cure that plant. Soil drainage has to be improved, and liming avoided. At present, there is no suitable fungicide registered with the Malaysian Pesticide Board for the control of this disease on pineapple.



Leaves from plant with heart rot disease

Fruitlet core rot

Fruitlet core rot (Figures 2 & 3) is usually caused by a combination of two fungi, *Penicillium* and *Fusarium* spp. (For your information, a pineapple fruit is made up of many little fruit (fruitlets) attached to a central core. Each fruitlet ends up externally as what we sometimes call the “eye” underneath a spiny bract.) The infected tissue turns light to dark brown, with water-soaked symptoms (Figure 3). Mites are thought to be associated with this disease, through causing injury to the fruitlets. The soil-borne fungi then enter through the wounds to infect the fruitlets. This problem is usually sporadic and is not serious.



Fruit with fruitlet core rot



Cross-section of fruit with fruitlet core rot

Thielaviopsis soft rot

The fungus that causes this disease (Figure 4), *Thielaviopsis paradoxa*, is also known as *Chalara paradoxa*. The greyish fungus on the infected part of the fruit later turns dark to almost black, giving the disease its other name, “black rot”. This fungus enters the fruit through natural growth cracks or wounds that can occur during harvesting or by other causes. It can become severe with higher rainfall, especially if the disease organisms are present in higher concentrations in the field. Avoidance of injury to the fruit, when carrying out farm practices and proper handling of the fruit during harvesting, should reduce the incidence, as this fungus needs a wound to enter the fruit. In the case of a high infection rate that warrants a chemical control, spraying with the fungicide, benomyl, can be carried out. The application of this fungicide should be carried out according to the instructions on the label of the fungicide packaging.



Fruit rot caused by *Thielaviopsis paradoxa*

Curvularia fruit rot

The causal fungus of this disease (Figure 5), *Curvularia eragrostidis*, was found to enter the fruit through cracks at the “eyes” of the pineapple fruit. As the fungus grows, the infected tissue starts to rot. The symptom caused by this fungus is quite similar to those caused by fruitlet core rot and the *Thielaviopsis* soft rot. Wounding is also necessary for this fungus to infect the fruit. Care should therefore be taken when handling the fruit.



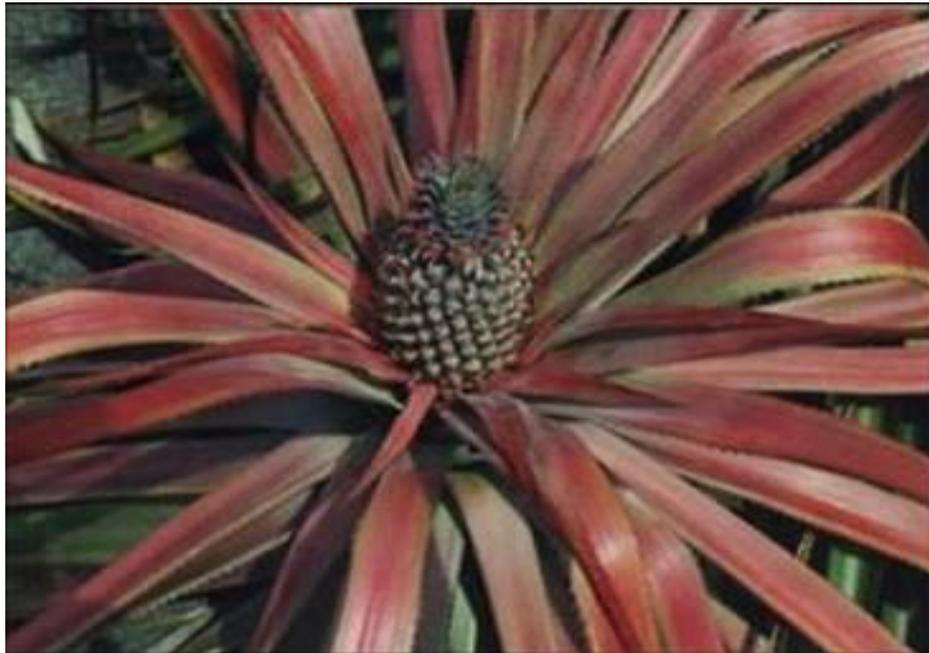
Fruit rot caused by *Curvularia eragrostidis*

Mealybug wilt-associated virus disease

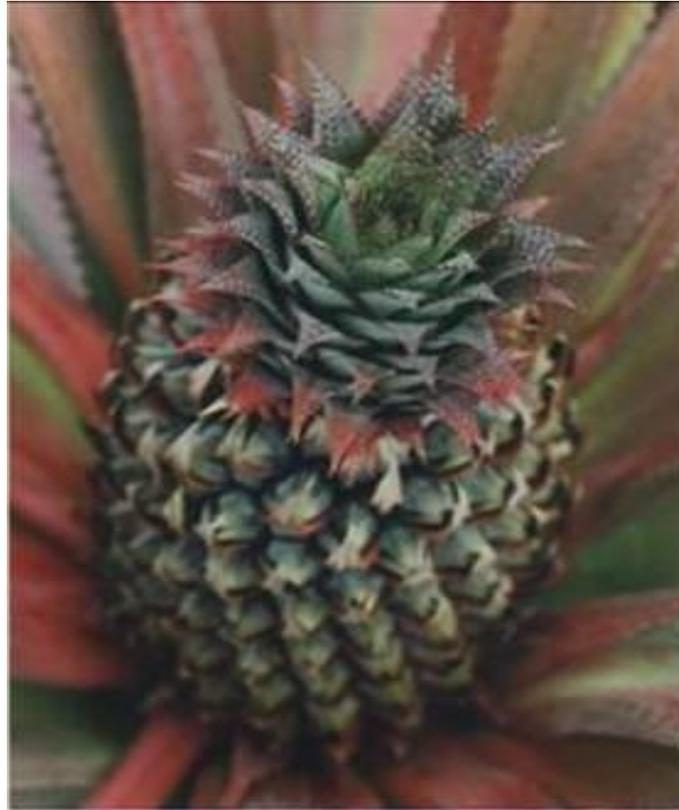
Mealybug wilt-associated virus disease is caused by a complex of two viruses (PMWaV-1 and PMWaV-2) with the mealybug (an insect) as their vector (carrier). Symptoms of infection are reddening and downward curling of leaves, sometimes with leaf tip dieback and wilting. Yield loss, especially in the ratoon crop occurs and severely infected plants can die. A yield loss of 35% has been recorded in Hawaii. The red leaf symptom can also be caused by mealybug infestation alone, without the presence of the viruses. Similar symptoms can also be caused by nutrient deficiencies or root damage by nematodes. Therefore, positive identification of the viral infection has to be done in the laboratory using RT-PCR (a molecular technique) or monoclonal antibodies. These tests are currently not available in Sarawak. Control of the mealybugs using albolinum oil (white oil) is one way to get rid of the red leaf symptoms, even if the virus is absent. Figures 6-8 show plants with red leaf symptoms.



Plants with red leaf symptom



Plant with red leaf symptom



Fruit from plant with red leaf symptom

Concluding remarks

Since pineapple plantations in Sarawak have been relatively free from major outbreaks of serious diseases, it must be ensured that disease-free planting material should always be used. This is especially important for new plantations, where large quantities of planting material are required within a short space of time. The source of planting material must be carefully selected and inspected. The two most threatening diseases, as far as Sarawak is concerned, are the *Phytophthora* heart rot and the mealybug wilt-associated virus disease. Both of these can be transmitted through infected planting material and can develop into epidemic proportions. If Sarawakians were to continue enjoying this wonderful fruit, growers must take heed of this.