



NSW DEPARTMENT OF  
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# Blight diseases in mangoes

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G. E. Stovold, Plant Pathologist

J. F. Dirou, District Horticulturist,  
NSW Centre for Tropical Horticulture,  
Alstonville

The two main diseases of mangoes are anthracnose and bacterial black spot. This Agnote explains the diseases, causes, symptoms and the pesticide program for their control.

## ANTHRACNOSE

Anthracnose is a fungal disease caused by *Colletotrichum gloeosporioides*. It is the most common disease of mangoes on the north coast of NSW, devastating young leaves and often causing defoliation of flush growth. If wet weather occurs during flowering, anthracnose causes severe blossom blight which can destroy inflorescences (flower panicles) and prevent fruit set. Fruit can

Symptoms of both anthracnose (left) and bacterial black spot (right) on mango leaves



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be infected up to harvest but visual symptoms usually do not develop until the fruit begins to ripen.

Spores of the fungus are produced from lesions on leaves, dead twigs, mummified inflorescences and flower sepals. However, the major source of inoculum for blossom blight is diseased immature leaves. On leaves, spores are readily produced over a wide range of environmental conditions and are dispersed by rain throughout the year. Infection of flowers depends on the temperature and duration of surface wetness. Much longer periods of wetness are required at lower temperatures (10°–13°C) than at higher temperatures (22°–25°C).

## Disease symptoms

### Flowers

Black and irregular shaped spots grow and coalesce to cause the death of flower panicles.

### Leaves

New leaf growth is particularly susceptible. Initially, small, dark spots form and then they coalesce to form irregularly shaped, dark, dry lesions. The dead tissue often cracks and falls out.

A mango panicle infected with anthracnose disease





Anthracnose ripe rot affecting Kensington Pride fruit



Fruit infected with bacterial black spot. Mango on the left is exuding bacterial ooze.

### **Fruit**

Anthracnose is usually only a problem in fruit that is ripening, as the fungus remains dormant in green fruit during the growing season. Small dark spots form at first and then enlarge rapidly under favourable conditions. Pink spore masses grow on the infected tissue. Such fruit has no market value.

Fruit can also show a 'tear-stained' pattern where the infection commences at the stalk-end and runs down the fruit.

### **BACTERIAL BLACK SPOT**

Bacterial black spot is a bacterial disease caused by *Xanthomonas campestris* pv. *mangiferaeindicae*.

It can potentially be more damaging to flowers than anthracnose. Leaf lesions consist of black, raised, angular areas, restricted by the veins and frequently surrounded by a yellow margin. Elongated stem cankers occur on the bark and can cause terminal dieback. Fruit lesions consist of individual or multiple star-shaped cracks, often appearing with anthracnose lesions in a tearstain pattern. Unlike anthracnose, bacterial lesions do not expand as the fruit ripen.

The disease attacks through natural openings such as stomata, wax and oil glands, leaf and fruit abrasions, leaf scars, and at the apex of branches in the panicle. Damage by adverse environmental conditions such as frost and wind can also create sites for infection. In young trees the disease can cause dieback of branches.

### **PREHARVEST FUNGICIDE SPRAY PROGRAM**

The spray recommendations for control of anthracnose and black spot diseases in NSW are as follows.

- From panicle emergence to fruit set (early August to end of October), apply a fungicide registered for control of anthracnose (e.g. prochloraz, mancozeb) every two weeks and a copper fungicide registered for control of bacterial leaf spot every three weeks. Begin the spray program with a copper fungicide.
- From fruit set until harvest, alternate a fungicide registered for control of anthracnose with a copper fungicide every 14–28 days depending on the weather. In dry seasons fewer sprays are needed, saving time and pesticide. New flush growth should be sprayed during autumn. This prevents a build-up of disease on young foliage.
- Azoxystrobin (Amistar WG®), a new strobilurin fungicide, can be included in the spray schedule to improve control of anthracnose. Include one or two azoxystrobin applications at flowering and/or early fruit set, depending on the weather, at no less than 14 day intervals and again at 21 and 7 days before harvest. Do not apply more than three applications per crop, or more than two consecutive applications.

### **POSTHARVEST TREATMENT OF FRUIT**

It is absolutely necessary for North Coast mango growers to use a postharvest treatment before packing their fruit to control anthracnose ripe rot.

- Cold water prochloraz. The breakdown rate of prochloraz has not been determined so it is only approved as a non-recirculated spray. Prochloraz is not effective against stem-end rot.

Spray fruit for 30 seconds. A spraying unit can be made using two TX2 hollow cone nozzles

mounted above the fruit on the packing line. An operating pressure of 320 kPa delivers 16 L per hour.

- Hot water carbendazim. Submerge fruit for five minutes at 52°C. Maintaining the correct dipping temperature is critical to the success of this treatment, so monitor the dip temperature carefully and regularly. Allow 3 L of dip per kilogram of fruit. Agitate the tank mix to keep the fungicide in suspension and de-sap the fruit before dipping. Carbendazim will also control stem-end rot.

Postharvest treatments will not provide complete disease control. It is important to follow field spray recommendations to reduce the level of postharvest disease, and to cool fruit promptly following harvest.

A fruit fly treatment is required for the interstate movement of fruit. Dipping or a flood spray of either dimethoate or fenthion must be the last treatment applied before packing.

## **CULTURAL PRACTICES AND TREE MANAGEMENT**

All commercial varieties have some susceptibility to anthracnose and bacterial black spot. Site selection and planting density are important in disease control. Plantings should be located where sunlight and good air movement will minimise the duration of leaf wetness following rain, yet stop wind from damaging young shoots, which predisposes them to bacterial infection.

Pruning trees is extremely important. This should be done to remove all sources of inoculum and to maximise air circulation and penetration of sunlight.

Internal growth should be removed, leaving only the peripheral foliage. Prune defoliated branch terminals and mummified inflorescences during the growing season and clip spent fruit stalks during harvest.

Apply fertiliser sparingly and with caution. Too much fertiliser encourages a rapid leaf flush and if this occurs during periods of frequent wet weather trees can become diseased. The best time to apply fertilisers is immediately following harvest so that trees produce an autumn flush.

## **FURTHER INFORMATION**

For further information contact the authors or your district horticulturist.

### **DISCLAIMER**

The information contained in this publication is based on knowledge and understanding at the time of writing (January 2004). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of the New South Wales Agriculture or the user's independent advisor.

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Edited by Bill Noad  
Communications Branch  
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