



IVORYCHEM PTE LIMITED  
10 Jalan Besar  
#10-03 Sim Lim Towers  
Singapore 208787  
Tel / Fax +65 – 63145409  
contact@ivorychem.com  
www.ivorychem.com

Company Registration No 200405572W

## MANGO BROWN SPOTS MANAGEMENT - WHITE PAPER BY IVORYCHEM

Fungicides

Preventive  
Control

ARREST 25 EC  
SYSTAKIL 80 WP

### SYMPTOMS

**Flowers** – Flowers become blackened and fail to set fruit.

**Fruit** – Fruit that have just been set develop small black specks, which can enlarge up to 5 mm in diameter. These young fruit generally drop.

Developing fruit infected by the fungus do not usually show any signs of infection until the fruit begins to ripen. Symptoms on ripening fruit include slightly sunken, black spots on the skin, which vary in size from pin-point to large blotches, (See Photo).

**See Photo.** Mango florets diseased with anthracnose fail to set fruit.



**Twigs** – Twigs develop narrow black spots. This infection leads to dieback and cankers.





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Anthracnose failure to set fruit

Anthracnose on leaf

## SOURCE OF INFECTION

Spores of the fungus are produced on dead twigs, branches and leaves, and are spread by raindrop splash. Rainfall and heavy dews are ideal conditions for the spread of the disease.

## CONTROL

**Chemical** – Apply SYSTAKIL 80 WP' at the recommended label rate. Spray at weekly intervals during flowering and then monthly until near harvest. Re-apply after rain. 'SYSTAKIL 80 WP' may be purchased from Ivorychem Trinidad or your nearest distributor.

**Cultural** – Branches can be pruned to thin out the canopy if it is crowded. This allows air movement through the tree. Improved air movement helps the foliage and flowers to dry quicker after rainfall or a heavy dew. Remove dead twigs and branches before flowering.

In Florida, leaf spot is caused by *Pestalotia mangiferae*, *Phyllosticta mortoni*, and *Septoria sp.*; algal leaf spot, or green scurf by *Cephaleuros virescens*. In 1983, a new disease, crusty leaf spot, caused by the fungus, *Zimmermaniella trispora*, was reported as common on neglected mango trees in Malaya. Twig dieback and dieback are from infection by *Phomopsis sp.*, *Physalospora abdita*, and *P. rhodina*. Wilt is caused by *Verticillium alboatrum*; brown felt by *Septobasidium pilosum* and *S. pseudopedicellatum*; wood rot, by *Polyporus sanguineus*; and scab by *Elsinoe mangiferae* (*Sphaceloma mangiferae*). *Cercospora mangiferae* attacks the fruits in the Congo.

Anthracnose caused by *Colletotrichum gloeosporioides* (*Glomerella cingulata*) affects flowers, leaves, twigs, fruits, both young and mature. The latter show black spots externally and the corresponding flesh area is affected. Control measures must be taken in advance of flowering and regularly during dry spells. In Florida, mango growers apply up to 20 sprayings up to the cut-off point before harvesting. The black spots are similar to those produced by *Alternaria sp.* often associated with anthracnose in cold storage. Inside the fruits attacked by *Alternaria* there are corresponding areas of hard, corky, spongy lesions. Inasmuch as the fungus enters the stem-end of the fruit, it is combatted by applying Fungicopper paste in linseed oil to the cut stem and also by sterilizing the storage compartment with Formalin 1:20. A pre-harvest dry stem-end rot was first noticed on 'Tommy Atkins' in Mexico in 1973, and it has spread to all Mexican plantings of this cultivar causing losses of 10-80% especially in wet weather. *Fusarium*, *Alternaria* and *Cladosporium spp.* were prominent among associated fungi.

### Nutrient Deficiency:

Leaf tip burn may be a sign of excess chlorides. Manganese deficiency is indicated by paleness and limpness of foliage followed by yellowing, with distinct green veins and midrib, fine brown spots and browning of leaf tips. Inadequate zinc is evident in less noticeable paleness of foliage, distortion of new shoots, small leaves, necrosis, and stunting of the tree and its roots. In boron deficiency, there is reduced size and distortion of new leaves and browning of the midrib. Copper deficiency is seen in paleness of foliage and severe tip-burn with gray-brown patches on old



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leaves; abnormally large leaves; also die-back of terminal shoots; sometimes gummosis of twigs and branches. Magnesium is needed when young trees are stunted and pale, new leaves have yellow-white areas between the main veins and prominent yellow specks on both sides of the midrib. There may also be browning of the leaf tips and margins. Lack of iron produces chlorosis in young trees.

Source: Morton, J. 1987. Mango. p. 221–239. In: Fruits of warm climates. Julia F. Morton, Miami, FL