



Fig. 1. Anthracnose; dark brown irregular lesions on the orange fruit (a); *Colletotrichum gloeosporioides* acervuli, abundant pinkish conidia on PDA (b); conidia (c) and appressoria (d). Photos credits H. Golzar

Common Name: Post-harvest fruit rot

Disease: Anthracnose

Classification: K: Fungi, D: Ascomycota, C: Sordariomycetes, O: Phyllachorales, F: Phyllachoraceae

Colletotrichum gloeosporioides (teleomorph *Glomerella cingulata* (Stoneman) Spauld. & H. Schrenk) causes the disease commonly known as anthracnose on a wide range of plant species in tropical, subtropical, and temperate regions. The disease can occur on leaves, stems and fruits of host plants. However *C. gloeosporioides* has seldom been reported to be a primary pathogen on citrus species.

Symptom and impact:

The fungus is a primary invader of injured or weakened tissues of citrus plants in orchards and may render infected fruits un-marketable. Unfortunately, infected tissue remains symptomless and the disease only becomes apparent after plants become senescent or have experienced stress conditions. Disease symptoms are rarely evident on the rind of fruit during the 'pre-harvest' period but at 'post-harvest' may appear as dark brown irregular lesions and that become sunken on the rind tissues (Fig.1). In moist conditions these lesions can also ooze pinkish spore masses from the acervuli.

Disease dispersal and life cycle:

C. gloeosporioides colonises dead twigs and injured plant tissues and forms an abundance of acervuli and conidia. Conidia can spread over relatively short distances by rain splash or overhead irrigation. Ascospores are airborne and important in long distance dispersal. Conidia that come in contact with leaves, twigs, and fruit germinate to produce appressoria and quiescent infections which result in tissue necrosis. This

tissue is subsequently colonized, acervuli are formed, thus completing the pathogen's life cycle. Dead wood and plant debris are primary sources of inocula. Fruits with quiescent infections remain asymptomatic before harvesting. Injuries and tissues weakened by other factors cause further development of quiescent infections to form lesions at post-harvesting.

Control:

Cultural practices to reduce disease prevalence include pruning dead wood and removal of infected plant debris to reduce dispersal of the fungus inocula; avoiding fruit injury during transport, packaging and storage process; pre-harvest insecticide application for control of fruit damaging pests and post-harvest treatment with registered fungicides. If degreening (artificial ripening) is necessary, proper ethylene concentrations and optimum duration of degreening should be maintained. The higher levels of ethylene exposure enhance anthracnose significantly. Delay in harvesting for better natural fruit colour development will reduce the time of degreening required and subsequently reduce disease incidence.

Further Reading:

Brown, G.E (1992) Proc. Int. Soc. Citric. 3, 1044-1048

Brown, G.E (2000) Compendium of Citrus Diseases. P, 37-38

Timmer L.W (1998) Plant Disease. 82, 415-418

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