



INSTITUTE OF FOOD AND
AGRICULTURAL SCIENCES
UNIVERSITY OF FLORIDA

FLORIDA
COOPERATIVE
EXTENSION SERVICE

PACKINGHOUSE NEWSLETTER

W. Wardowski, Editor
CREC
700 Experiment Station Road
Lake Alfred, FL 33850
Phone (813) 956-1151

Packinghouse Newsletter No. 155
October 14, 1988

Key Index Words: Alternaria Brown Spot, Benlate, Copper, Greasy Spot, Melanose, Rind Blemishes, Scab, Sooty Blotch

GROVE PRACTICES TO PREVENT RIND BLEMISHES CAUSED BY FUNGAL DISEASES

Fruit is suitable for the fresh market only if it has an attractive color and is free from rind blemish. Common causes of rind blemish include fungal diseases, windscar and rust mites. This article deals with the fungal diseases which cause rind blemish, namely melanose, scab, greasy spot rind blotch (previously called pink pitting), Alternaria brown spot and sooty blotch.

Melanose affects all varieties of citrus to some extent and it is particularly prominent on grapefruit. Scab seldom occurs on sweet oranges but is frequently a problem on Temples, Honey tangerines (Murcotts) and certain other specialty varieties. Occasionally, it is serious on grapefruit. Greasy spot rind blotch produces a conspicuous blemish only on grapefruit. The symptoms of this disease are commonly confused with the injury caused by rust mites. Alternaria brown spot does not affect sweet oranges, grapefruit and most other citrus varieties, but it is very common and serious on Dancy tangerines and Minneola tangelos. Sooty blotch produces a rather inconspicuous blemish but is sufficiently severe in some years to affect packouts, particularly of grapefruit.

Much more tree spraying is normally required for the successful production of fruit for the fresh market than for processing. The acreage allocated to fresh fruit production can be limited by the amount of spraying equipment available to apply the required fungicide treatments on a timely basis.

A brief account follows of the treatments required to prevent or control each type of fungal-induced rind blemish. A table is provided to show some of the spray programs needed to control fungal diseases on the fruit of different citrus varieties.

Melanose

This disease is more severe where there is much dead wood in the trees, as in weak groves or after a freeze. Generally, the incidence of this disease is not substantially increased by overhead irrigation. The only currently available effective materials for melanose control are copper fungicides. They have to be applied postbloom. Copper fungicides are not effective if applied before petal fall. The fruit remain susceptible to melanose for about 3 months after petal fall.

If only one spray treatment is to be applied, it is best delayed until late April or early May. Because of prevailing dry climatic conditions in April, there is little risk of fruit infection occurring until May. If only one treatment is applied and it is applied soon after petal fall, there will not be enough spray residue left to protect the fruit in May and June when the risks of infection increase. If two treatments against melanose are planned, the first one should be applied 2 to 3 weeks after petal fall and the second one 3 to 4 weeks later. This timing would normally correspond with the first half of April and the first half of May. The second treatment usually turns out to be the more essential of the two.

Scab

The loss of Difolatan is going to make scab control much more difficult. Therefore, it is important to avoid those irrigation practices that will promote the disease. It is safer to use under-tree irrigation, but if overhead irrigation has to be used, it should only be applied as necessary during the emergence of the spring growth flush and early stages of fruit development. Fruit remain susceptible to scab for about 3 months after petal fall. However, infection of fruit during the latter part of this period usually has less impact on fruit quality than early infection. The later the infection occurs the smaller the resulting pustules.

Benlate could be used effectively for a few years if it has not been applied previously. However, some growers have experienced control failures due to the development of fungal resistance after applying Benlate only once a year for 4 consecutive years. If only a single Benlate is to be used, it is best applied at two-thirds petal fall. It should always be followed by one or two copper fungicide treatments postbloom.

Copper fungicides applied before petal fall provide little control of scab. Rather than applying a copper fungicide late dormant it is better to hold it and apply it as an additional postbloom treatment. Copper acts mostly as a protectant and, therefore, it needs to be applied to the fruit surface for effective results. If only copper is used for scab control, it should be applied at two-thirds petal fall and again 3 weeks later. A third treatment might be needed in problem groves.

Greasy spot rind blotch

While oil may provide adequate control of greasy spot on foliage, it is usually ineffective against greasy spot on rind. Therefore, in grapefruit groves intended for the production of fruit for the fresh market, it is necessary to add a fungicide to the oil spray. Benlate might still be used if it has not been applied previously, but control failures due to fungal resistance to this product can occur after only 4 years of use. There is no practical way of monitoring for tolerance to Benlate to forewarn of control failures. Copper fungicides have consistently provided effective control of greasy spot on fruit when applied in July.

Spray Programs for Control of Fungal Diseases on Fruit

Variety	Diseases to be controlled	Time of treatment with copper fungicide (C) and Benlate (B) ^w					
		Mar	Apr	May	June	July	Aug
Grapefruit	Melanose & greasy spot rind blotch			C			C or B ^x
			C	C			C or B ^x
Grapefruit	Melanose, scab & greasy spot rind blotch		C ^y	C			C or B ^x
Oranges	Melanose			C			
Temples & Murcotts	Scab & melanose		C ^y	C			
		B ^z		C			
Dancy tangerines & Minneola tangelos	Alternaria brown spot & melanose						
			C	C	C		

^wBenlate (B) may fail after repeated use because of a buildup of resistance.

^xFungicide (C or B) would normally be added to the summer oil spray.

^yTreatment is needed soon after petal fall and timing would be adjusted if bloom is earlier or later than late March.

^zSeasonal adjustment may be needed for this treatment for it to coincide with two-thirds petal fall.

Alternaria brown spot

When Difolatan was available, it was often applied late dormant to prevent infection of the spring growth flush and/or at open bloom to prevent early infection of fruit. Copper fungicides do not perform well when applied at these times but are useful when applied to the fruit surface. Therefore, it is better to conserve copper sprays for the 3 to 4 month period of fruit susceptibility than to apply them earlier. Treatments need to be applied monthly, beginning about mid-April. The last treatment would normally be applied in June.

Spraying with fungicides is only part of the solution to Alternaria brown spot. The Alternaria fungus produces spores more readily on leaf spots than on the rind pustules and it infects exceptionally soft and lush shoots much more easily than less vigorous shoots. Therefore, it is important to avoid promoting excessively vigorous growth through heavy applications of nitrogen, frequent irrigation and hard pruning. Also, it is much safer to use under-tree irrigation systems for Dancy tangerine and Minneola tangelo groves because overhead irrigation promotes infection.

Sooty blotch

This blemish is due to the black color of various causal fungi which grow on the fruit surface and become embedded in the surface waxes. This disease is more conspicuous on grapefruit than on darker colored varieties. It is usually controlled on grapefruit by the copper fungicides applied in July to prevent greasy spot rind blotch.

Jack O. Whiteside
Plant Pathologist
Lake Alfred

AVAILABLE PUBLICATIONS

Available from Dr. W. Wardowski, CREC, 700 Experiment Station Rd., Lake Alfred, FL 33850

Greasy Spot of Citrus, by T. Kucharek and J. Whiteside. University of Florida Plant Pathology Fact Sheet. 4 pages. 1984.

Citrus Scab, by T. Kucharek and J. Whiteside. University of Florida Plant Pathology Fact Sheet. 3 pages. 1983.

Melanose and Phomopsis Stem-End Rot of Citrus, by T. Kucharek, J. Whiteside and E. Brown. University of Florida Plant Pathology Fact Sheet. 4 pages. 1983.



W. Wardowski, Editor
Professor
Extension Horticulturist