

2012 Florida Citrus Pest Management Guide: Melanose¹

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Control of melanose, caused by the fungus *Diaporthe citri*, is often necessary in mature groves where fruit is intended for the fresh market, particularly if recently killed twigs and wood are present as a result of freezes or other causes. It is not usually necessary in groves less than 10 years old or those where fruit is intended for processing. Grapefruit is very susceptible to melanose, but all citrus may be damaged by the disease.

Inoculum of this fungus is spores produced by the asexual stage, *Phomopsis citri*. *Diaporthe citri* is the sexual stage and is relatively unimportant for the disease. The asexual spores are produced in flask-shaped structures embedded in dead twigs in the tree canopy, especially those twigs that have died within the last several months. In addition to producing spores on melanose-affected twigs after they die, *P. citri* is able to colonize dead twigs that were originally healthy and produce inoculum on those twigs as well. Spores are produced during wet periods and dispersed to young, susceptible leaves and fruit by rain splash. No spores are produced on symptomatic leaves, fruit, or living twigs. At 75-80°F, 10-12 hours of leaf wetness are required for infection and at lower temperatures up to 18-24 hours may be needed.

Grapefruit is susceptible to melanose infection from fruit set until it reaches 2.5-3 inches in diameter, normally in late June or early July. Fungicides are effective for only short periods when applied to rapidly expanding fruit or

leaves. Since April is usually a low rainfall month and fruit is small and growing rapidly, the first spray for melanose control is not usually applied until mid to late April. One or two applications are sufficient for control on oranges and most tangerines unless the trees have abundant dead wood, like in a year after a freeze. For fresh market grapefruit, the first application should be made when the fruit reaches a diameter of 1/4 to 1/2 inch (about mid to late April depending on local conditions). With average quality copper products, usually about 2 lb/acre of metallic copper are needed for each 3-week period. Rates can be decreased if applications are made more frequently or increased if applications are made less often. Additional applications should be made at 3-week intervals until the fruit becomes resistant. For melanose control on large trees, no more than 8-12 lb metallic copper are needed per year even if copper is also used for the control of scab and/or greasy spot.

Copper residues are reduced with fruit expansion and as a result of rainfall. A model, <http://www.agroclimate.org/tools/cudecay/>, is available to determine whether residues remaining on fruit are sufficient to control the disease. It is based on fruit growth models, the rate and time of the last application, and rainfall since the last spray. It has proven helpful for timing of sprays for melanose control. Further information about the model is available in EDIS PP289 *A Web-Based Tool for Timing Copper Applications in Florida Citrus*.

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An early June spray of copper to control late melanose damage will serve as the first greasy spot spray. However, applications of copper in hot, dry weather may cause fruit spotting or darken existing blemishes. If copper fungicides are applied from May to September, they should be applied when temperatures are moderate (<94°F), at rates no more than 2 lb of metallic copper per acre, without petroleum oil, and using spray volumes of at least 125 gal/acre.

The strobilurin-containing fungicides, Abound, Gem, Headline, Pristine and Quadris Top, are also effective for melanose control and can be used at any time for disease control. Copper fungicides are more economical and are most important for melanose control. However, since copper fungicides applied in hot weather can damage fruit, use of strobilurin-containing fungicides at that time will avoid this damage and control greasy spot as well as melanose. Strobilurins appear to have lower residual activity for melanose control than do copper fungicides.

Thus, applications may have to be made at shorter intervals, especially when rainfall is high.

Fungi may develop resistance to strobilurin fungicides. These materials should never be used more than twice in a row, and no more than two strobilurin applications should be used for melanose control.

Recommended Chemical Controls

READ THE LABEL

See Table 1.

Rates for pesticides are given as the maximum amount required to treat mature citrus trees unless otherwise noted. To treat smaller trees with commercial application equipment including handguns, mix the per acre rate for mature trees in 125 gallons of water. Calibrate and arrange nozzles to deliver thorough distribution and treat as many acres as this volume of spray allows.

Table 1. Recommended Chemical Controls for Melanose

Pesticide	FRAC MOA ²	Mature Trees Rate/Acre ¹
Copper fungicide	M1	Use label rate.
Abound 2.08F ³	11	12.0-15.5 fl oz. Do not apply more than 92.3 fl oz/acre/season for all uses.
Gem 25WG ³	11	4.0-8.0 oz. Do not apply more than 32 oz/acre/season for all uses.
Gem 500 SC ³	11	1.9-3.8 fl oz. Do not apply more than 15.2 fl oz/acre/season for all uses.
Headline ³	11	12-15 fl oz. Do not apply more than 54 fl oz/acre/season for all uses.
Pristine ³	11/7	16-18.5 oz. Do not apply more than 74 oz/acre/season for all uses.
Quadris Top ³	11/3	15.4 fl oz. Do not apply more than 61.5 fl oz/acre/season for all uses. Do not apply more than 0.5 lb ai/acre/season difenconazole. Do not apply more than 1.5 lb ai/acre/season azoxystrobin

¹Lower rates can be used on smaller trees. Do not use less than the minimum label rate.
²Mode of action class for citrus pesticides from the Fungicide Resistance Action Committee (FRAC) 2011. Refer to ENY624, Pesticide Resistance and Resistance Management, in the 2012 Florida Citrus Pest Management Guide for more details.³Do not use more than 4 applications of strobilurin-containing fungicides/season. Do not make more than 2 sequential applications of strobilurin fungicides.