

2019–2020 Florida Citrus Production Guide: Melanose¹

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Management 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 because of freezes or other causes. Melanose management is not usually needed in groves fewer than 10 years old or in those where fruit is intended for processing. Grapefruit is especially susceptible to melanose but all citrus may be damaged by the disease.

Spores produced by *D. citri* in the asexual stage are the primary inoculum of this fungus. The sexual stage 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, *D. citri* is able to colonize dead twigs that were originally healthy and can produce inoculum on them as well. Spores are produced during wet periods and dispersed to young, susceptible fruit, leaves, and twigs by rain splash. No spores are produced on symptomatic leaves, fruit, or living twigs. At 75°F–80°F (23.8°C–26.7°C), 10–12 hours of leaf wetness are required for infection, and at lower temperatures up to 18–24 hours may be needed. These leaf wetness periods are not uncommon in Florida.

Grapefruit is susceptible to melanose infection from fruit set until it reaches 2.5–3.0 inches (6.4–7.6 cm) 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, as in a year after a freeze. For fresh-market grapefruit, the first application should be made when the fruit reaches a diameter of 0.25 to 0.5 inch (0.64–1.3 cm) (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 reduced if applications are made more frequently or increased if applications are made less often. If using a calendar application schedule, 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, canker and/or greasy spot.

Copper residues are reduced with fruit expansion and as a result of rainfall. A model, the Citrus Copper Application Scheduler, estimates 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 application. It has proven helpful

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for optimizing the timing of applications for melanose control. Further information about the model is available in EDIS PP289, *A Web-Based Tool for Timing Copper Applications in Florida Citrus*.

An early-June application of copper to manage 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, Amistar Top, Gem, Headline, or Pristine 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 (FRAC 11) should never be used more than twice in a row, and no more than two strobilurin-containing applications should be used for melanose control.

Web addresses for links:

Citrus Copper Application Scheduler: <http://agroclimate.org/tools/citrus-copper-application-scheduler/>

EDIS PP289, *A Web-Based Tool for Timing Copper Applications in Florida Citrus*: <http://ufdc.ufl.edu/IR00007639/00001>

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 MOA²	Mature Trees Rate/Acre¹
copper fungicide	M01	Use label rate.
Abound ³	11	12.0–15.5 fl oz. Do not apply more than 92.3 fl oz (1.5 lb a.i.)/acre/season for all uses.
Amistar Top (formerly 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 a.i./acre/season difenoconazole. Do not apply more than 1.5 lb a.i./acre/season azoxystrobin.
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. Do not apply within 7 days of harvest.
Headline SC ³	11	12–15 fl oz. Do not apply more than 54 fl oz (0.88 lb a.i.)/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.

¹ Lower rates can be used on smaller trees. Do not use less than the minimum label rate.

² Mode of action class for citrus pesticides from the Fungicide Resistance Action Committee (FRAC) 2018. Refer to ENY624, *Pesticide Resistance Management*, in the *2019–2020 Florida Citrus Production Guide* for more details.

³ Do not use more than 4 applications of strobilurin-containing fungicides/season. Do not make more than 2 sequential applications of strobilurin-containing fungicides.

⁴ Do not make more than 4 applications of Pristine or Amistar Top/season. Do not make more than 2 sequential applications of Pristine or Amistar Top before alternating to a non-strobilurin, SDHI or DMI.