

2021–2022 Florida Citrus Production Guide: Greasy Spot¹

Megan M. Dewdney²

Greasy spot is caused by the fungus *Mycosphaerella citri*, which was recently renamed *Zasmidium citri-griseum*. Management must be considered in groves intended for processing and fresh-market fruit. Greasy spot is usually more severe on leaves of grapefruit, pineapples, Hamlins, and tangelos than on Valencias, Temples, Murcotts, or most tangerines and their hybrids. Greasy spot rind blotch (GSRB) is particularly problematic for grapefruit destined for the fresh-fruit market.

Airborne ascospores produced in decomposing leaf litter on the grove floor are the main inoculum source for greasy spot. These spores germinate on the fruit and the underside of the leaves, where the fungus grows for a time on the leaf surface before penetrating through the stomates (natural openings on fruit and lower leaf surfaces). Internal growth is slow, and symptoms do not appear for several months. Warm, humid nights and high rainfall, typical of Florida summers, promote infection and disease development. Major ascospore releases usually occur from April to early June with favorable conditions for infection occurring from June through September. Leaves are susceptible throughout their lives.

On processing Valencias, a single spray of oil (5–10 gal/acre) or copper + oil (5 gal/acre) should provide acceptable control when applied from mid-May to June. With

average-quality copper products, 2 lb of metallic copper per acre usually provides adequate control. The strobilurin-containing fungicides (Abound, Amistar Top, Gem, Headline, or Pristine) and Enable 2F are also suitable with or without petroleum oil. On early and mid-season oranges as well as processing grapefruit, two sprays may be needed, especially in the southern part of the state, where summer flushes constitute a large portion of the foliage. Two applications also may be needed where severe defoliation from greasy spot occurred in the previous year. In those cases, the first spray should be applied from mid-May to June and the second soon after the major summer flush has expanded. Copper fungicides provide more consistent control than oil sprays. Control of greasy spot on late summer flushes is less important than on the spring and early summer growth flushes because the disease develops slowly and defoliation will not occur until after the next year's spring flush. Thorough coverage of the underside of leaves is necessary for maximum control of greasy spot, which can be achieved with higher spray volumes. Slower tractor speeds may be needed than for control of other pests and diseases.

The treatment program is essentially the same for fresh fruit. That is, a fungicide application in May–June and a

1. This document is PP-144, one of a series of the Plant Pathology Department, UF/IFAS Extension. Original publication date December 1995. Revised March 2021. Visit the EDIS website at <https://edis.ifas.ufl.edu> for the currently supported version of this publication.

2. Megan M. Dewdney, associate professor, Plant Pathology Department, UF/IFAS Citrus Research and Education Center, Lake Alfred, FL 33850.

The use of trade names in this publication is solely for the purpose of providing specific information. UF/IFAS does not guarantee or warranty the products named, and references to them in this publication do not signify our approval to the exclusion of other products of suitable composition.

The Institute of Food and Agricultural Sciences (IFAS) is an Equal Opportunity Institution authorized to provide research, educational information and other services only to individuals and institutions that function with non-discrimination with respect to race, creed, color, religion, age, disability, sex, sexual orientation, marital status, national origin, political opinions or affiliations. For more information on obtaining other UF/IFAS Extension publications, contact your county's UF/IFAS Extension office. U.S. Department of Agriculture, UF/IFAS Extension Service, University of Florida, IFAS, Florida A & M University Cooperative Extension Program, and Boards of County Commissioners Cooperating. Nick T. Place, dean for UF/IFAS Extension.

second in July should provide control of rind blotch. A third application in August may be needed if rind blotch has been severe in the grove. Petroleum oil alone is less effective than other fungicides for control of GSRB. Heavier oils (455 or 470) are more effective for GSRB control than lighter oils (435). Copper fungicides are effective for control of GSRB but may result in fruit spotting, especially if applied at high rates in hot, dry weather, or if applied with petroleum oil. If copper fungicides are applied in summer, 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 or other additives, and using spray volumes of at least 125 gal/acre. Copper residue levels can be monitored with the [Citrus Copper Application Scheduler](#). Further details are available in [EDIS publication PP289, A Web-Based Tool for Timing Copper Applications in Florida Citrus](#). Enable 2F can be applied for greasy spot control at any time but is especially indicated in mid-to-late summer for rind blotch control.

The strobilurin-containing fungicides (Abound, Amistar Top, Gem, Headline, or Pristine) or Enable 2F can be applied at any time to all citrus and provide effective control of the disease on leaves or fruit. Use of a strobilurin is especially recommended in late May and early June since it controls both melanose and greasy spot and avoids potential fruit damage from the copper fungicides applied at that time of year. A strobilurin-containing fungicide should not be applied more than once a year for greasy spot control because of the potential for the development of resistance. The addition of petroleum oil increases the efficacy of these products.

Web addresses for links:

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

EDIS publication PP289, *A Web-Based Tool for Timing Copper Applications in Florida Citrus*: <https://journals.flvc.org/edis/article/view/119506>

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 250 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 greasy spot.

Pesticide	FRAC MOA ¹	Mature Trees Rate/Acre ²
Petroleum Oil 97+% (FC 435-66, FC 455-88, or 470 oil)	NC3	5–10 gal. Do not apply when temperatures exceed 94°F. 470 weight oil has not been evaluated for effects on fruit coloring or ripening. These oils are more likely to be phytotoxic than lighter oils.
copper fungicide	M 01	Use label rate.
copper fungicide + Petroleum Oil 97+% (FC 435-66, FC 455-88, or 470 oil)	M 01 and NC	Use label rate + 5 gal. Do not apply when temperatures exceed 94°F. 470 weight oil has not been evaluated for effects on fruit coloring or ripening. These oils are more likely to be phytotoxic than lighter oils.
Abound ⁴	11	12.0–15.5 fl oz. Do not apply more than 90 fl oz (1.5 lb a.i.)/acre/season for all uses. Best applied with petroleum oil.
Amistar Top ^{4,5}	11/3	10–15.4 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. For best results, use with a spreading/penetrating surfactant.
Enable 2F ⁵	3	8 fl oz. Do not apply more than 3 times per year; no more than 24 fl oz (0.38 lb a.i.)/acre. Minimum retreatment interval is 21 days. Do not apply with polymer-based spray adjuvants.
Gem 500 SC ⁴	11	1.9–3.8 fl oz. Do not apply more than 15.2 fl oz/acre/season for all uses. Best applied with petroleum oil. Do not apply within 7 days of harvest.
Headline SC ⁴	11	9–12 fl oz. Do not apply more than 54 fl oz (0.88 lb a.i.)/acre/season for all uses. Best applied with petroleum oil.
Pristine ^{4,5}	11/7	16–18.5 oz. Do not apply more than 74 oz/acre/season for all uses. Do not apply more than 1.17 lb a.i./acre/season of boscalid. Do not apply more than 0.592 lb a.i./acre/season of pyraclostrobin as Pristine.

¹ Mode of action class for citrus pesticides from the Fungicide Resistance Action Committee (FRAC) 2021. Refer to chapter 4, *Pesticide Resistance and Resistance Management*, for more details.

² Lower rates can be used on smaller trees. Do not use less than the minimum label rate.

³ No resistance potential exists for these products.

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

⁵ 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, non-SDHI, non-DMI fungicide.