

2026–2029 Florida Citrus Production Guide: *Alternaria* Brown Spot¹

Megan M. Dewdney²

Alternaria brown spot, caused by the fungus *Alternaria alternata*, affects Minneola tangelos, Dancy tangerines, Murcotts, and less frequently Orlando tangelos, Novas, Lees, and Sunburst. The susceptibility of many newer tangerine cultivars to *Alternaria* brown spot is currently unknown. Of the newer cultivars, Sugar Belle® is known to be highly tolerant, but Marathon is at least moderately susceptible and possibly highly susceptible. In rare cases, *Alternaria* may also infect grapefruit. Where severe, the disease results in extensive fruit drop and must be controlled on processing and fresh-market fruit.

Spores of *Alternaria* are airborne. Most spores are produced by lesions on mature leaves in the canopy or recently fallen infected leaves in the leaf litter on the grove floor. Many cultural management practices are helpful in reducing the severity of *Alternaria* brown spot. When new groves of susceptible cultivars are planted, they should be established with disease-free nursery stock. Trees grown in greenhouses without overhead irrigation are usually free of *Alternaria* but should be inspected carefully to ensure that no trees have unexpected lesions. Even though spores are airborne, plantings of healthy trees will remain disease-free for long periods. If *Alternaria* is present from the outset, the fungus builds to high populations when young trees have the most vegetative growth and subsequently is difficult to control on fruit. When establishing new plantings, it is best to locate susceptible cultivars in higher areas where air drainage and ventilation are good and leaves dry more rapidly. Less vigorous rootstocks, such as Cleopatra mandarin, should be selected rather than vigorous stocks, such as Carrizo citrange. Minneola tangelo groves in low, wet areas have conditions so favorable for *Alternaria* brown spot that it may be virtually uncontrollable there. Susceptible trees should be spaced more widely than oranges to promote rapid canopy drying. In existing plantings, it is important to minimize excessive vegetative growth. Overwatering and excessive fertilization should be avoided. Light hedging should be done regularly rather than hedging severely but less frequently.

Copper fungicides, Amistar Top, Gem, Headline, Pristine, and Quadris are the registered products that are effective

for disease control. Disease favorability varies considerably according to the cultivar susceptibility, the grove disease history, and the environmental conditions each year. Generally, the first spray should be applied before disease development when the spring flush is about ¼–½ of full expansion. In severe cases, another spray may be needed when the flush is near full expansion because, if high levels of infection occur on the spring flush, brown spot becomes difficult to control on fruit. Another spray should be applied shortly after petal fall. Amistar Top, Gem, Headline, Pristine, or Quadris may be the best choice for one or both of these two applications, especially if the grove has problems with both citrus scab and *Alternaria* brown spot. Thereafter, all sprays should be applied solely to maintain a protective coating on the fruit. During April and May, applications may be needed as often as every 10 days or as infrequently as once per month. Spray intervals should be determined based on the frequency of rainfall and grove disease history. By June, high rainfall and humid nights usually assure an abundant supply of inoculum and favorable conditions for infection. In most cases, two applications will be needed during this month. Copper fungicides may blemish the fruit if applied during hot weather. Thus, Amistar Top, Gem, Headline, Pristine, or Quadris are good substitutes for copper applications as needed from May to July. The fruit generally becomes resistant by early to mid-July, although affected fruit may continue to drop for some time afterward. The scenario described is for difficult cases, and it is sometimes possible to use many fewer sprays.

Amistar Top, Gem, Headline, Pristine, and Quadris are all strobilurin-containing fungicides, and *Alternaria* has been documented to be resistant to strobilurins in most parts of the Florida tangerine production areas. The susceptibility of the pathogen may vary by block and history of strobilurin use. Strobilurin (FRAC MOA 11), DMI (FRAC MOA 3), or SDHI (FRAC MOA 7) fungicides should not be used for *Alternaria* control more than four times in a season; never use more than two applications of the same mode of action in a row. Gem is slightly less effective for control of this disease and should be used at the highest rate where disease is moderate to severe. Ferbam is no longer registered as of 2025. This has removed the only

multi-site broad-spectrum fungicide other than copper for *Alternaria* brown spot. Keep this in mind when designing rotation plans.

The preferred method to time fungicide sprays is the ALTER-RATER, a weather-based model. Brown spot is most severe when rainfall is greater than 0.1 inch, daily leaf wetness duration exceeds 10 hr, and average daily temperature is between 68°F and 83°F. Daily leaf wetness estimations for FAWN stations can be found on the [Citrus Advisory System](#) website, under the daily summary tab for each station. Once the suggested ALTER-RATER thresholds are reached, make a fungicide application. Refer to the [Florida Citrus Production Guide](#) tables booklet for the thresholds.

With such frequent sprays, low rates of copper may be used. With average-quality products, usually about 2 lb of metallic copper per acre is needed for each three-week period, or 1 lb if sprays are more frequent. Even lower rates of metallic copper can be used if high-quality products are employed. The copper residue levels over

time can be monitored with the use of the [Citrus Copper Application Scheduler](#). More details are available in UF/IFAS publication [PP289](#), "A Web-Based Tool for Timing Copper Applications in Florida Citrus."

DO NOT APPLY AMISTAR TOP, GEM, HEADLINE, PRISTINE, OR QUADRIS IN NURSERIES. Application of these fungicides in nurseries can result in selection of resistant strains, which are then distributed on nursery stock to groves.

Web Addresses for Links

Citrus Advisory System: <http://agroclimate.org/tools/cas/>

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

UF/IFAS publication PP289, "A Web-Based Tool for Timing Copper Applications in Florida Citrus": <https://doi.org/10.32473/edis-pp289-2012>

¹ This document is PP-147, one of a series of the Department of Plant Pathology, UF/IFAS Extension. Original publication date December 1995. Revised annually. Most recent revision August 2026. Visit the Ask IFAS website at <https://ask.ifas.ufl.edu> for the currently supported version of this publication. © 2026 UF/IFAS. This publication is licensed under [CC BY-NC-ND 4.0](#).

² Megan M. Dewdney, professor and Extension specialist, Department of Plant Pathology, UF/IFAS Citrus Research and Education Center, Lake Alfred, FL; UF/IFAS Extension, Gainesville, FL 32611.

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.

Use pesticides safely. Read and follow directions on the manufacturer's label.

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 operate in compliance with applicable federal and state non-discrimination laws and policies. 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. Andra Johnson, Dean for UF/IFAS Extension.