



Foliar fungal disease round-up for 2022

By Megan Dewdney

The 2021 foliar fungal season was an easier than average year. The La Niña weather pattern predicted last fall came to pass, and the spring was relatively dry from January to the end of May with some rain in February and April.

While citrus trees in Florida were likely drought-stressed, the dry weather slowed the usual decomposition of leaf litter and the development of the fungal inoculum, which was in growers' favor for foliar disease management. Based on this year's October El Niño Southern Oscillation forecast, the beginning of spring 2022 will also have a La Niña weather pattern, bringing warm dry weather. It is too early to make any predictions about late spring. In terms of foliar pathogens, the weather will likely make management easier.

GREASY SPOT

Greasy spot and rind blotch have recently been a topic of discussion because fresh fruit blemishes have increased. All citrus types are vulnerable to defoliation from greasy spot, which

is observable from November to February and reduces productivity.

The fungus *Zasmidium citri-griseum* (formerly *Mycosphaerella citri*) reproduces in the leaf litter from leaves infected during the previous season. Once the spores are ejected from the leaf litter and germinate on fruit and leaves, the fungus grows on plant surfaces. This makes it vulnerable to fungicides in the early summer.

If greasy spot has been problematic, slow the tractor speed to thoroughly wet the whole canopy, increase the application volume to >250 gallons per acre and consider a third application in August. This will help control inoculum for later seasons.

Few fungicides compete with copper as an economical choice that can work for multiple diseases. Copper works well for greasy spot, melanose and canker. Copper does have a dark side though; high temperatures (>94 degrees Fahrenheit) and dry conditions promote fruit blemishes and can build to toxic levels in the soil.

Be cautious when combining copper with



Photo by Tonya Weeks

Greasy spot causes defoliation and reduces productivity.

petroleum oils or other products because burns can happen with devastating effects. To be safe, copper should be applied without any additives, particularly oils, at 2 pounds per acre or less on moderately warm days. If worried about phytotoxicity, strobilurin-containing fungicides [Fungicide Resistance Action Committee (FRAC) 11] or the demethylation inhibitor fungicide Enable (FRAC 3) are also effective control options with or without oil.

See edis.ifas.ufl.edu/publication/PP275 for a summary of the recommended fungicides for all diseases. The most appropriate timing for these fungicides is late May to early June because they are good melanose products, too. To keep processing orange leaves minimally infected, petroleum oils are good options. Fungicide resistance is problematic with *Z. citri-griseum*. Do not use two consecutive applications of a single-site mode of action for greasy spot.



Grapefruit is the most susceptible to melanose.

MELANOSE

Small dead twigs are a recipe for melanose inoculum. The fungus *Diaporthe citri* rapidly colonizes small-diameter twigs (<¼ inch) and forms spores in spring. Live twigs are also infected, but spores are not formed



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until twig death. Removing dead wood via hedging will reduce the number of infectious twigs.

Melanose is considerably more severe in periods of extended leaf wetness. Infection only needs 10 to 12 hours of leaf wetness at 70 to 80 degrees Fahrenheit to occur. With cooler temperatures, the fungus needs longer — up to 24 hours of leaf wetness. These are not unusual periods of wetness in Florida. Leaf and fruit lesions are sterile and are a dead end for the fungus because no spores are produced.

While its long residual activity makes copper highly economical for melanose control, fruit expansion and rainfall erode the coating. On average, whole canopy copper applications are needed every 21 days to maintain the protective coating from early May until fruit becomes resistant in early July. This is particularly true for grapefruit, the most susceptible cultivar. Off-season fruit complicates timing. Maintaining rind quality on fruit for the fresh market will be difficult.

Copper applications in early June also serve as the first greasy spot application. Strobilurin-containing fungicides can be used if phytotoxicity is problematic but follow the same restrictions as greasy spot. Residual activity of strobilurins is shorter than copper, so more frequent applications are needed.



Photo by Megan Dewdney

Black spot continues to spread northward in Florida.

BLACK SPOT

Areas affected with black spot continue to creep northward in Florida. The disease is known to be in Collier, Hendry, Lee, Charlotte and Glades counties. Growers in south DeSoto County should look for black spot since the disease is less than 10 miles from the county line.

Most citrus cultivars and species are susceptible to black spot, but late-hanging oranges are the most at risk. Spores are present in the leaf litter all year and are also formed on dead twigs and some fruit symptom types. These asexual spores are mostly spread by rain splash.

May to September are the primary fruit infection months, but fungicide applications are recommended in April if the weather is wet. Long wetting periods of at least 18 hours are needed for *Phyllosticta citricarpa* infection, but heavy dews in Florida make prolonged wetting periods routine.

Several fungicides are recommended for black spot management, including the strobilurin fungicides, Enable, copper and the pre-mixes Amistar Top and Pristine. Copper applications for canker will also keep black spot at low levels. However, most late-hanging oranges, principally Valencia, need additional applications for good management and inoculum suppression. Any non-copper-containing fungicides are recommended when phytotoxicity is a concern or if there was severe disease the previous season. Rotate modes of action when planning a fungicide program to reduce resistance selection.

POSTBLOOM FRUIT DROP

Pockets of postbloom fruit drop (PFD) still occur around the state, particularly on Navel oranges and other early-flowering cultivars. A major outbreak has not occurred since 2016, and one does not seem likely in 2022 if the forecasts are correct.

If a grove has persistent calyxes (buttons) from previous years, scout flowers for reddish, brown discoloration, which is a sign of infection. Inoculum stays dormant in the canopy. The fungus, *Colletotrichum acutatum*, is stimulated to grow and produce spores by flower exudates. Off-season or prolonged bloom periods favor PFD and make controlling it difficult, but



Reddish brown discoloration is a sign of postbloom fruit drop infection.

warm wet weather needs to occur at the same time. Many blocks have multiple bloom periods because of HLB, so target applications to the bloom that will provide the most fruit.

Application timing is essential for successful PFD management. The Citrus Advisory System (agroclimate.org/tools/cas/) is a PFD forecasting tool

that is simple to use and improves application timing. Studies show that it accurately predicted when not to spray and that the economic savings were significant.

All the currently recommended treatments for PFD contain a strobilurin. The straight strobilurin fungicides, tank-mixed with Ferbam,

still give the best control for high-risk events. Strobilurins have resistance risks, but the last seven years of trials have not yielded any alternate modes of action. Copper is generally ineffective for this disease.

Further detailed information on foliar diseases is available on the Citrus Research and Education Center (CREC) website, as well as in the Florida Citrus Production Guide (crec.ifas.ufl.edu/resources/production-guide) and the Electronic Data Information Source (edis.ifas.ufl.edu). Assistance is also available from your county agent or statewide specialist. 🍊

Megan Dewdney (mmdewdney@ufl.edu) is an associate professor at the University of Florida Institute of Food and Agricultural Sciences CREC in Lake Alfred.

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