

JUNE 2020 | VOL. 1

Citrus from the Ridge to the Valley

CENTRAL FLORIDA CITRUS EXTENSION

Welcome to the first issue of the Central Florida Citrus Extension Newsletter – From the Ridge to the Valley!

As your central Florida citrus extension agents, we wanted to work together to help give you, our growers, a central source of resources and information on the topics that you need to be successful in your operations. In our six county area we all cover, it is not uncommon for growers to have groves in multiple counties. After all, groves don't adhere to county lines! Of course, we still provide local support and educational activities in our individual counties- Laurie Hurner, CED and citrus agent for Highlands county, Chris Oswalt, multi-county citrus agent for Polk and Hillsborough counties, and Ajia Paolillo, multi-county citrus agent for DeSoto, Hardee, and Manatee counties. We hope that you will find our collective newsletter beneficial and we welcome your suggestions as we move forward working together. Just as with our past individual newsletters, our goal is to bring you not only the most up-to-date research and information, but also to include topics that are relevant throughout the year. As we enter June, it will get even hotter and we will be looking forward to much needed rain. We have included in this issue tips on how to battle the heat and the forecasted Florida weather patterns. With our fruit harvest wrapping up and the last of the fruit being picked and hauled to the juice plants and packinghouses, growers are switching gears and tackling other grove operations. Pesticide, fertilizer, and herbicide applications, hedging and topping, are happening all over our area. This is also the time of year to evaluate your trees nutritional requirements using soil and leaf analysis. This issue provides information on proper soil sampling techniques. The summer rain and heat puts managing pests and diseases at the top of everyone's list and here you will find the UF/IFAS recommendations for controlling greasy spot and *Diaprepes* Root Weevil. So take a break, grab a glass of cold Florida OJ and we hope you enjoy reading our newsletter.



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The Foundation for the Gator Nation
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2020 Florida Citrus Growers' Institute



The canceled 2020 Florida Citrus Growers' Institute has passed, but it's not over. We are currently having the presentations recorded and posted to the citrus agent's website (<https://bit.ly/2XvdHe8>). When you open the 2020 Florida Citrus Growers' Institute program link, you see the currently available presentations. At this time, three presentations are available with more to follow so, check back often. For growers needing CEU's for your restricted use pesticide license (RUP) or your certified crop advisor (CCA) designation, a CEU link at the top of the program page directs you to these grouped presentations. The grouped presentations are one CEU credit modules (50 minutes of instruction). You can also view PDF copies of the presentation from the main Institute program page. The information in the files is useful in answering the questions at the end of the RUP section.

If you have any issues with accessing or receiving CEU credits, please let one of us know.

USDA Announces Details of Direct Assistance to Farmers through the Coronavirus Food Assistance Program

WASHINGTON, D.C., May 19, 2020 - U.S. Secretary of Agriculture Sonny Perdue today announced details of the Coronavirus Food Assistance Program (CFAP), which will provide up to \$16 billion in direct payments to deliver relief to America's farmers and ranchers impacted by the coronavirus pandemic. In addition to this direct support to farmers and ranchers, USDA's Farmers to Families Food Box program is partnering with regional and local distributors, whose workforces have been significantly impacted by the closure of many restaurants, hotels, and other food service entities, to purchase \$3 billion in fresh produce, dairy, and meat and deliver boxes to Americans in need.

For more information visit <https://bit.ly/2UOn4BN>





According to the USDA, Florida Agricultural Statistical Service, citrus acreage in the Ridge to the Valley production area is 252,010 acres.

2020 Atlantic Hurricane Season Forecast

BY CHRIS OSWALT

Not that I want to talk about this now, but hurricane season is just around the corner. The Atlantic hurricane season begins on June 1 and based on the forecast from Colorado State University (CSU), we are heading for above-normal activity. The CSU forecast is looking at the scenario (April 2, 2020) of warm neutral El Niño conditions evolving into cool neutral El Niño conditions or even possibly a weak La Niña situation into this summer and fall. At this time, average sea surface temperatures in the tropical Atlantic are running above normal.

Furthermore, the forecast has posted probabilities for a major hurricane (category 3-4-5) making landfall on the following coastal areas: Entire continental U.S. coastline: 69% (average for last century 52%) U.S. East coast including peninsula Florida: 45%

(average for last century 31%)

Gulf Coast from the Florida panhandle westward to Brownsville: 44% (average for last century 30%)

Tracking into the Caribbean (10-200N, 88-660W): 58% (average for last century 42%)

Not part of the CSU forecast, but I generally consider under El Niño conditions there is a significant amount of zonal upper airflow from west to east (not necessarily conducive for hurricanes). On the other hand, La Niña conditions are when this zonal upper airflow is less prevalent or as consistent (more conducive conditions for hurricanes). Based on my experience, when we have La Niña conditions with associated weak zonal upper airflow, coupled with the above-normal tropical Atlantic sea surface temperatures are more conducive environmental conditions for hurricanes.

Forecast Date April, 2 2020		
Number of Storms		
	1984-2010 Average	Forecast
Named Storms	12.1	16
Hurricanes	6.5	8
Major Hurricanes (category 3-4-5)	2.7	5



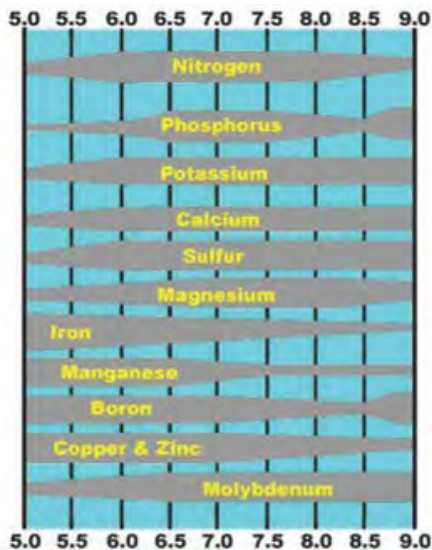
Summertime is Analysis Time

BY CHRIS OSWALT

Citrus soil and leaf analysis is a must when wanting to evaluate the nutritional status of your trees and your fertilizer program. It is recommended leaf samples be collected from 4 to 6-month-old spring flush leaves. The recommendation is to collect soil samples also at this time. This time frame is typically July through August, give or take, depending on the emergence of the past season's spring flush. The sampling should also occur before any fall scheduled fertilization.

In this issue of the newsletter, we are going to start by discussing soil sampling, and in the next issue, we will be touching on leaf sampling. We will be explaining why and where to collect the soil samples and how to interpret the results.

What information can soil sampling provide you as a grower? It typically provides information on the nutritional content of the soil sampled and soil pH. Most soil testing laboratories run a basic analysis package that includes extractable phosphorous, potassium, calcium, magnesium, and copper. Many labs report other soil nutrients, but the information is of limited use due to the absence of research-based data on recommended soil levels for citrus. It represents a point in time for which over subsequent soil analysis, you can see the trends in these soil nutrient levels, but nothing to actively manage. Leaf analysis will provide the data needed to make effective fertilization decisions. On the other hand, the most valuable determination made by a standard soil test for citrus is soil pH. The availability of plant nutrients varies significantly over a wide range of pH (Figure 1). Soil pH affects not only the precipitation (comes out of soil solution) or sorption (fixed to the soil) of a nutrient but also the leachability (solubility) of nutrients (Table 2).



Nutrient	Ionic form taken up by plants	Nutrient subject to precipitation or sorption?	Nutrient mobile in sandy soil?
N	$\text{NH}_4^+, \text{NO}_3^-$	No	Yes
P	PO_4^{3-}	Yes	Yes/No*
K	K^+	No	Yes
Ca, Mg	$\text{Ca}^{2+}, \text{Mg}^{2+}$	Yes	No
S	SO_4^{2-}	Yes	Yes/No*
Cu, Mn, Fe, Zn	$\text{Cu}^{2+}, \text{Mn}^{2+}, \text{Fe}^{3+}, \text{Zn}^{2+}$	Yes	No
B	H_2BO_3^-	No	Yes
Mo	MoO_4^{2-}	Yes	No

Figure 1. Effect of soil pH on nutrient availability. Nutrient movement in sandy soil is summarized in Table 2.



Summertime is Analysis Time (continued)

It is, therefore, essential to collect the samples from the appropriate area of the grove. A soil sample should consist of 15 to 20 individual soil cores taken to a depth of 8 inches from a representative and uniform grove or block (you can collect your leaf samples from these same trees). Most citrus roots reside in the wetted zone of the micro-sprinkler, and irrigation frequency and duration have a pronounced effect on this area compared to areas outside the wetted zone. The area at the tree drip line can also be of interest, depending on the fertilizer application practices. An example would be by applying dry fertilizer spread from the row middles versus fertigation applied in the irrigation water in the wetted zone. In dry broadcast fertilizer applications, a fraction of the applied fertilizer will be in the wetted area of the micro-sprinkler. The remainder of the fertilizer not in the wetted zone is susceptible to adverse environmental conditions that could reduce the effectiveness of the applied nutrients. Areas located in the row middles typically contain fewer roots. As such, the decisions you make based on this area would likely have a limited effect on the overall nutrient level on the trees. Therefore the soil cores should be collected near the tree drip line and within the wetted irrigation zone (Figure 3).



Figure 3. Collect cores along line at the drip line/irrigation wetted zone

Summertime is Analysis Time (continued)

The nutritional content interpretations are limited to those nutrients that have research data on the appropriate levels. The levels of soil nutrients can vary based on the extraction method used by the laboratory. When looking at the results, remember to consult the appropriate section of the interpretation table to make any management decisions (Tables 4 and 5). In closing, it is essential to remember that soil sampling gives us a limited amount of information. The ultimate goal of any citrus nutrition program is to determine if what you applied got into the tree. In our next newsletter, we will discuss the usefulness of leaf sampling and analysis.

Table 4. Interpretation of soil analysis data for citrus using the Mehlich 1 (double-acid) extractant.

Element	Soil test interpretation				
	Very Low	Low	Medium	High	Very High
			mg/kg (ppm) ¹		
P	< 10	10-15	16-30	31-60	> 60
Mg ²		< 15	15-30	> 30	
Ca ³			250 ⁴	> 250	
Cu			< 25 ⁵	25-50 ⁶	> 50 ⁶

¹ parts per million (ppm) x 2 = lb/acre.
² A Ca-to-Mg ratio greater than 10 may induce Mg deficiency.
³ The UF/IFAS Extension Soil Testing Laboratory does not interpret extractable Ca. Work with Florida citrus trees suggests that a Mehlich 1 soil test Ca of 250 mg/kg or greater is sufficient.
⁴ Cu toxicity is unlikely even if soil pH is less than 5.5.
⁵ Cu toxicity is possible if soil pH is less than 5.5.
⁶ Cu toxicity is likely unless soil pH is raised to 6.5.

Table 5. Soil test interpretations for other extraction methods compared with Mehlich 1.

Extractant	Nutrient	Soil test interpretation				
		Very Low	Low	Medium	High	Very High
Mehlich 1	P mg/kg (ppm) ¹	< 10	10-15	16-30	31-60	> 60
Mehlich 3 ²		< 11	11-16	17-29	30-56	> 56
Ammonium acetate pH 4.8 ³			≤ 11			> 11
Bray P1 ⁴				≤ 40		> 40
Bray P2 ⁴				≤ 65		> 65
Mehlich 1	Mg mg/kg (ppm)		Low	Medium	High	
Mehlich 3 ²			< 15	15-30	> 30	
Ammonium acetate pH 4.8 ³			< 25	25-33	> 33	
			< 14	14-26	> 26	
Ammonium acetate pH 7.0 ⁵			Less than sufficient		Sufficient	
			≤ 50		> 50	
Mehlich 1	Ca mg/kg (ppm)		Less than sufficient		Sufficient	
Mehlich 3 ²			≤ 250		> 250	
Ammonium acetate pH 4.8 ³			≤ 200		> 200	
Ammonium acetate pH 4.8 ³			≤ 270		> 270	
Ammonium acetate pH 7.0 ⁵			≤ 250		> 250	

¹ parts per million (ppm) x 2 = lb/acre.
² Estimated from unpublished correlation data (T. A. Obreza 2006).
³ From Koo et al. (1984).
⁴ Estimated from correlation data (Alva 1993).
⁵ Estimated from correlation data (Sartain 1978).

(All of the tables referred to in this article come from the newly available: Nutrition of Florida Citrus Trees, 3rd Edition. <https://bit.ly/3cafIS8>.)





Florida Department of Agriculture Restricted-Use Pesticide License Testing Update

BY LAURIE HURNER

Throughout the COVID-19 event, some things have stopped, some things have changed, and other things will never be the same. During the time that many extension offices have been closed, FDACS decided not to administer RUP pesticide license exams. This was the right decision as there was no way to administer these exams safely and effectively. As things are changing, RUP pesticide license testing is slowly beginning across the state. Following is an excerpt from a Q&A document provided to extension agents from the UF Pesticide Information office*. After reading the Q&A if you have additional questions, please do not hesitate to contact me at lhurner@ufl.edu if I can be of further assistance with RUP licensing and testing.

1. Can UF/IFAS Extension offices provide testing?

Yes, after May 15th. This is at the discretion of the county director and exam administrators in each county. CDC guidelines must be followed. Testing rooms and equipment should be sanitized before and after each session. The most up-to date list of testing locations can be found at <https://bit.ly/3gnJ9DP>.

2. Can offices provide paper or computer tests?

No. ONLY computer testing may be done at this time.

3. How many people can test at one time?

This number will vary by facility, BUT social distancing guidelines must be followed.

4. Can I walk-in and test?

At this time, it is recommended that clients call to schedule or use the online test scheduling. To set up an online test, please visit <https://bit.ly/3gtMlxH> and select the county you want to test in.

5. Can I offer CEU classes?

Yes, online and webinar CEUs are possible, but guidelines from FDACS must be followed. Online courses are being set up at this time and will be available soon. For a list of online courses currently available, please visit <https://bit.ly/3dbR70A>.

6. Isn't there a 60-day extension for pesticide licenses?

The extension applies ONLY to late fees during this period. If someone's license is expired, or expired during the extension, it is EXPIRED.

***Questions prepared by Dr. Brett Bultemeier, Assistant Professor, Pesticide Information Office, bwbult@ufl.edu and Erin Harlow, Horticulture Agent III, Columbia County, eeeck@ufl.edu**

Although we live in
the SUNSHINE state,
remember, summer
brings its own
hazards!

LIGHTNING KILLS!

*Lightning strikes
may be rare, but
they still happen,
and the risk of
serious injury or
death is severe.
So, take
thunderstorms
seriously. Learn
and follow these
safety rules to
keep yourself safe
from lightning.*

*For more
information,*

*<https://bit.ly/2ZF9xmF>
to view the
CDC website.*

Lightning

BY LAURIE HURNER

As dry as it has been, rain would be a welcome sight. We have had some great showers on and off. As we move into summer, we need to be reminded that with rain comes thunder and with thunder comes lightning! According to the National Lightning Safety Institute's website on average 10 people per year in Florida are killed by lightning. The average number of people killed per year across the U.S. is 93. Yes, this number is much less than the flu or COVID-19, but what matters is that you or your loved one is not one of the casualties. The Centers for Disease Control and Prevention have some great safety precautions we should follow regarding lightning. This is not only important for our citrus companies, their employees, and their families, but it is also important for us as boaters, fishermen, golfers, and beach goers. I would highly encourage you to have an "educational moment" with all the important people in your life.

Safety Precautions Outdoors

If the weather forecast calls for thunderstorms, postpone your trip or activity. Remember: When thunder roars, go indoors. Find a safe, Enclosed shelter. Do not forget the 30-30 rule. After you see lightning, start counting to 30. If you hear thunder before you reach 30, go indoors. Suspend activities for at least 30 minutes after the last clap of thunder. If no shelter is available, crouch low, with as little of your body touching the ground as possible. Lightning causes electric currents along the top of the ground that can be deadly over 100 feet away. Stay away from concrete floors or walls. Lightning can travel through any metal wires or bars in concrete walls or flooring. Although you should move into a non-concrete structure if possible, being indoors does not automatically protect you from lightning. In fact, about one-third of lightning-strike injuries occur indoors.

Safety Precautions Indoors

Avoid water during a thunderstorm. Lightning can travel through plumbing. Avoid electronic equipment of all types. Lightning can travel through electrical systems and radio and television reception systems. Avoid corded phones. However, cordless, or cellular phones are safe to use during a storm. Avoid concrete floors and walls.



Summer is Coming!

Have you thought about heat stress?

BY LAURIE HURNER



Photo Credit: UF/IFAS

Summer heat is something we take in stride in Florida. Since we have warm weather all year it does not dawn on most of us that too much heat can be a problem. When you talk to “Old Timers” they call it “bear caught”. You know the feeling, its hot and you are sweating. You continue to work because that is what we do. Then you begin to feel weary, tired, your mouth gets dry and your energy is zapped. Congratulations you are now officially heat stressed. Most times this will pass and the worst thing that happens is we are exhausted when we get home and cannot seem to get enough to drink. However, if you feel the above things happening and then you get clammy, stop sweating, and get dizzy you are now having a heat stroke. At this point, you need to get out of the heat, begin to cool your body temperature gradually and seek medical attention. Do not jump into a swimming pool or other cool body of water. This can set you up for a heart attack or worse. As employers of agriculture workers, we need to be thinking about these things for them as well. This is the perfect time of year to take a little time and train workers and supervisors on how to control heat stress and to recognize symptoms of heat illness. The United States Environmental Protection Agency (EPA) has some great suggestions:

- Monitor temperature and humidity, and workers' responses at least hourly in hot environments.
- Schedule heavy work and tasks requiring personal protective equipment (PPE) for the cooler hours of the day.
- Acclimatize workers gradually to hot temperatures.
- Shorten the length of work periods and increase the length of rest periods.
- Give workers shade or cooling during breaks.
- Halt work altogether under extreme conditions.



Drinking. Make sure employees drink at least the minimum required amounts of water to replace body fluid lost through sweating. Thirst does not give a good indication of how much water a person needs to drink.

Monitoring and Adjusting Workloads. Consider the weather, workload, and condition of the workers, and adjust work practices accordingly. Higher temperatures, high humidity, direct sun, heavy workloads, older workers, and workers unaccustomed to heat are more likely to become ill from heat. EPA also provides some great resources for you to dive into regarding more information about heat stress.

More Information

- Know the difference between heat stress and pesticide poisoning. Review the information in the table comparing symptoms of heat exhaustion and exposure to organophosphate and carbamate pesticides. (<https://bit.ly/2zCEiOj>)
- Information on managing occupational heat exposure from the Occupational Safety and Health Administration. (<https://bit.ly/2M3tOp1>)
- Extreme Heat. (<https://bit.ly/3gt9v7l>)

Be on the lookout for *Diaprepes* Root Weevil

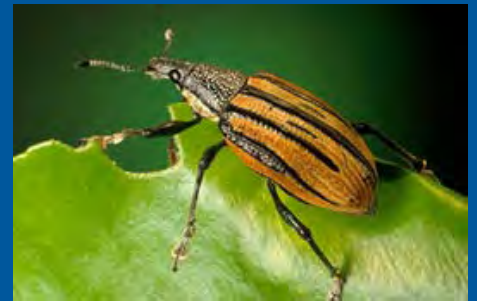
BY AJIA PAOLILLO

Managing root weevils in the grove is important for root health and overall tree health. The most concerning root weevil for citrus growers is *Diaprepes abbreviatus*. *Diaprepes* larval feeding causes significant injury and damage to citrus root systems. Let's begin with the life cycle stages of the *Diaprepes*. Adults emerge from the soil and relocate to the tree canopy, where they cause damage by feeding on the leaves. There, they also lay eggs on the leaves. Once the eggs hatch, the neonate larvae fall to the ground and begin working their way into the soil. Once in the soil, they move toward the citrus tree roots and begin feeding. *Diaprepes* larvae feed on roots throughout the year. As the neonate larvae grow larger, they feed on different parts of the roots. The neonates feed on the smaller fibrous roots, while the older larvae feed on the structural roots. Neonate feeding destroys the fibrous roots, which are essential for nutrient and water uptake. The larger larvae feed on the bark and cambium of the structural roots, where they cause deep grooves resulting in open wounds and girdling on the roots. These wounds leave the roots vulnerable for infection by *Phytophthora* spp. to enter the tissue, causing root and crown rot and leading to further damage and even tree death. The larvae then pupate and grow into adults, which emerge from the soil, and the cycle starts over.

Control measures for *Diaprepes* should be applied to the tree canopy using foliar sprays at the peak emergence of adults from the soil. Peak emergence of adults from the soil is usually around late May to early June. By targeting this peak emergence, the number of reproducing adults can be reduced; thereby, reducing the number of eggs deposited on the leaves and larvae that enter the soil. There can also be a second peak of adults in late August to mid-October. To monitor adult populations, the use of ground traps, such as a Tedders ground trap, are effective for monitoring the adults emerging from the soil. Foliar sprays of contact insecticides + oil, can kill adults and eggs in the canopy. Research studies from central Florida have shown that 2 spray applications timed at 4 weeks apart in late-May to June help to reduce the injury to roots. One recommendation is to include an egg sterilant in the last application. An example of an egg sterilant used on citrus is Micromite 80 WGS, which is referenced in the 2019-2020 Florida Citrus Production Guide. The addition of an egg sterilant works by causing females to produce sterile eggs, and making any non-sterile eggs laid on the leaf surface nonviable.



Diaprepes eggs.



Diaprepes abbreviatus adult.
Photo Credit: Keith Weller, USDA,
<https://bit.ly/2yG62Bn>



Be on the lookout for *Diaprepes* Root Weevil (continued)

Controlling the neonates as they fall to the soil, involves using a chemical barrier under the tree in early July. The chemical barrier is applied to the soil and will kill the neonate larvae as they pass through the soil surface before reaching the roots of the tree. The chemical barrier is applied from the trunk of mature trees up to the dripline on bare soil using a herbicide applicator. This management practice is also recommended for new plantings with young trees and resets. The barrier should be applied from the trunk out to the furthest extent of the young tree's foliage. It is best to keep the soil undisturbed after the application to keep that barrier in place.

Control of the larvae once in the soil can be achieved by using biological control of parasitic nematodes. These nematodes are sold as biopesticides and can be applied using microirrigation or a modified herbicide applicator. Peak populations of larvae in the soil occur mid-July to September, and it is recommended to apply nematodes one or more times during this period. Soil temperatures should be above 70°F and have adequate moisture either from rain or irrigation. Avoid making applications during sunny days or high temperatures, where the nematodes can be exposed to UV rays and heat. Larval control using nematodes is most effective on sandy soils with a courser texture. It may be necessary to also apply a fungicide to help control *Phytophthora* spp. This will depend on soil type, adult and larval populations, and rootstock susceptibility to *Phytophthora* spp. refer to the 2019-2020 Florida Citrus Production Guide: Citrus Root Weevils.

This information comes from the 2019-2020 *Florida Citrus Production Guide: Citrus Root Weevils*, by Dr. L.W. Duncan and Dr. C. Mannion. For more information on the current UF/IFAS recommendations and chemical control rates please refer to the 2019-2020 *Florida Citrus Production Guide*. <https://bit.ly/2TCy6f6>



Tedders ground trap for monitoring emerging adults. Photo Credit: <https://bit.ly/2XbQNK1>



Managing Greasy Spot

BY AJIA PAOLILLO

This is the time of year for the first recommended spray treatment for greasy spot control. Greasy spot is a fungal disease caused by *Zasmidium citri-griseum* (formerly called *Mycosphaerella citri*). Greasy spot causes dark spots on the leaves, rind blotch on grapefruit, and can cause severe defoliation if not treated. Decaying leaf litter on the grove floor is where the ascospores of this fungus are found, and they are the main source of inoculum. When the leaf litter becomes wet due to rain or microjet irrigation, the ascospores are ejected into the air, reaching the tree canopy, landing on the fruit and the leaves. The peak release of ascospores is April to early June. Continued infection occurs throughout the summer from June to September, because of the warm, humid nights and summer rainfall. The spores enter into the stomates on the underside of the leaves, where they grow and infect the leaf tissue. Symptoms do not appear on fruit or foliage until months after infection, usually around November to December. A good practice for monitoring greasy spot severity is to inspect the amount of symptomatic leaves that drop in January and February before the spring flush. This will help determine the spray treatments needed for the upcoming season. Greasy spot affects leaves at any stage of growth. The most susceptible varieties are grapefruit, tangelos, Hamlin, and Pineapple, with Valencia oranges and most tangerines being less susceptible.

Both processed fruit and fresh fruit should be treated for greasy spot. Spray treatments should be based on the type of fruit grown and the past year's severity of the disease in the grove. For Valencia's, the recommended spray treatment would be one oil spray or one oil+copper spray applied in mid-May to June. For early and mid-season juice oranges, processed grapefruit, and areas where the disease was severe in the past years, it may be necessary to apply 2 sprays of oil or oil+copper. The first treatment should be applied in Mid-May to June and the second spray should be applied once the major summer flush leaves are fully expanded. Fungicides containing strobilurins can also be effective as treatments and can be applied anytime either with or without oil, but oil can increase efficacy. Strobilurins applied in late-May to early-June can also help control melanose in the grove. To avoid resistance, it is recommended to only apply strobilurin-containing fungicides once a year for control of greasy spot.

Managing Greasy Spot (continued)

If you are growing fresh fruit, 3 spray treatments may be needed. The first spray should be applied as stated above in Mid-May to June. The second spray should be applied in July to help control Greasy Spot Rind Blotch (GSRB). This is a major problem for fresh market grapefruit, as it affects the appearance with small black spots surrounded by green tissue on the peel. If GRSB has been severe in the past, a third spray in August may be necessary. Oil or copper can be used in these spray applications, but oil is less effective at controlling GSRB. With fresh grapefruit, the concern is not only to avoid blotches created by the disease, but also to avoid chemical injury that could occur on the fruit. If you choose to apply copper, remember to time the applications in the cooler part of the day and do not mix with oil to avoid spray phytotoxicity. Throughout the summer and into the fall, it is important to monitor copper residue levels to keep fruit and leaves protected. Heavy rains can wash away the protective copper residue and fruit growth results in untreated portions of the peel. You can use the Copper Application Scheduler to help determine the level of copper residue in the grove: <https://bit.ly/3dbiJ67>.

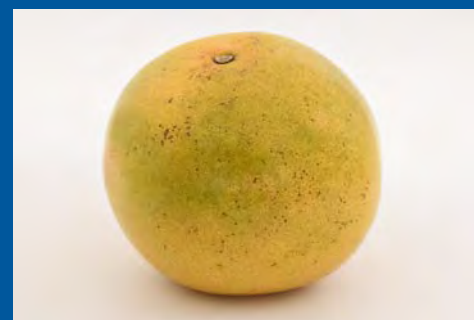
This information is from the 2019-2020 Florida Citrus Production Guide: Greasy Spot, by Dr. M. Dewdney and from Field Identification and Management of Greasy Spot Disease, EDIS Publication #HS-1016, by Dr. S. Futch and Dr. L.W. Timmer. For more information including the most current UF/IFAS spray rates and recommendations please refer to the 2019-2020 Florida Citrus Production Guide: Greasy Spot <https://bit.ly/2X8Lw5l>.



Greasy spot symptoms on leaf.
Photo Credit: Esther Serrano, USDA,
<https://bit.ly/3d9NpES>



Greasy spot rind blotch on grapefruit.
Photo Credit: Tim Gottwald, USDA-ARS,
<https://bit.ly/2M1YUCb>



Greasy spot on grapefruit.

UF/IFAS Extension Highlands County Program Sponsor 2020-2021

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