



# Berry Vegetable Times

2020, Issue II

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**For more information contact:  
UF/IFAS Extension Hillsborough  
County**

Alicia Whidden Agent/Editor  
(813) 744-5519  
ajwhidden@ufl.edu

**UF/IFAS Gulf Coast Research and  
Education Center**

Dr. Jack Rechcigl, Center Director  
Christine Cooley, Admin Assistant  
(813) 419-6670  
<https://grec.ifas.ufl.edu>

### *From Your Agent*

#### Staying Updated and Pesticide License CEUs

2020 has been a year we will all certainly remember. We are starting a new season and food safety and worker health safety will be paramount this year. Please stay up with all the latest requirements and with training opportunities for worker health. Pay attention to your email for messages that bringing you the latest updates. If you do not currently get emails from me and would like to be sure you do not miss out, send me an email and I will put you on my list. My email address is [awhidden@ufl.edu](mailto:awhidden@ufl.edu).

With the beginning of the season, you will need to have a current pesticide license to buy and apply fumigants. Remember you need 4 CORE and 4 Private Applicator CEUs to renew. Due to not being able to hold Agritech this spring, some of who are due to renew soon and be short CEUs. If you attend Agritech every year, you would have the 4 CORE and ample Private Applicator CEUs you need to renew your license every 4 years. If you have attended at least 2 years of Agritech you should have enough Private Applicator CEUs but will be short CORE. If all you need is CORE then you can go on-line and read articles and answer a question set then send in and if you have a passing grade you will be sent your CEU form. The IFAS Citrus Agents have 4 CEU articles right now. The link is <http://citrusindustry.net/ceu/>. This is the easiest way to get your CORE CEUs. If you have any questions about your license or anything else, just get in touch with me.

*Wishing you well in the upcoming season,*

*Alicia Whidden*

Extension Agent, Hillsborough County

For UF/IFAS Covid-19 Updates:

<https://coronavirus.ufl.edu/resources/health-guidance/>

<https://ifas.ufl.edu/covid19-information-updates/>

# Diagnostic Clinic Status and Strawberry Research Updates During COVID-19

Natalia A. Peres, Professor GCREC, nperes@ufl.edu

Our ways to do research and diagnostics have definitely changed during COVID-19, but we have not stopped. Although we are working at limited capacity, the clinic is still operational. Samples can be dropped-off by the GCREC front lobby or they can be mailed. It is very important to include a detailed description of the sample in the Plant Clinic Submission Form, which can be found at the UF-GCREC website (<https://gcrec.ifas.ufl.edu/plant-clinic/Samples>). Printed copies are also available at the GCREC drop off station.



As a reminder, samples that exhibit early symptom development and have plant parts that are still partially alive (green) offer the best quality samples for accurate plant disease diagnosis. Samples that are totally necrotic, dry, and long dead are not adequate for an accurate diagnosis.

Whenever possible, it is also

best to submit a generous amounts of plant material representing a range of symptoms. We recommend that samples are taken before pesticides are applied, otherwise the ability to recover pathogens may be limited. If sending samples by mail, do not add water or pack a sample that is wet, and do not mix samples in the same submission bag. Moisture from root samples will contribute to the decay of foliage samples if they are mixed together. Plant disease identification procedures do not utilize soil. Excess soil can be hand shaken from root systems but leave enough soil to keep roots at field moisture levels. Samples should be kept refrigerated after collection until they are submitted. Especially during the hot summer months, a good sample could be ruined if allowed to bake in the sun or on the back seat of a car prior to submission. Finally, mailing samples early in the week to avoid a weekend layover in the post office is preferred. Once your sample is submitted, it may take up to a week for results from our lab, and you will be personally contacted with the outcome and possible recommendations. Dr. Jim Mertely is available by phone (813-434-7543) if there are any questions during the drop-off or to check on sample results.

Since the annual Agritech meeting was cancelled due to COVID-19, we discussed with FSGA ways to disseminate our research information. Reports for all projects funded by FSREF and that would be presented at the meeting have been submitted and were made available to grower members on the FSGA website (<https://floridastrawberry.org/association>). To find the reports, go to <https://member.floridastrawberry.org/research/ifas-research/>. Additionally, for most critical information such as recent updates on



fumigant research, Dr. Juliana Baggio and I prepared a short video with our most current recommendations which is available at <https://www.youtube.com/watch?v=BUOZSNixR9s>. I highly encourage everyone to check it out!

# Strawberry Breeding Program Updates

Vance M. Whitaker, Associate Professor GREC, vwhitaker@ufl.edu

In the following article, I will provide some reminders regarding management of ‘Florida Brilliance’ and an update on two new variety releases.

## ‘Florida Brilliance’ Management Reminders

In the April newsletter, Dr. Agehara and I provided several management recommendations for ‘Florida Brilliance’. I will briefly recap some of those here, in case you missed the previous article. We are all still learning how to manage this variety going into the second season of full-scale production. In February during the “spring flush”, plants of all strawberry varieties in Florida become more vigorous in response to increasing daylengths. This is also accompanied by decreased fruit quality, including uneven surface color, lower soluble solids and softer skin. These changes in fruit quality are also influenced by variety, and it is clear that ‘Florida Brilliance’ suffers a little more from soft skin during the “spring flush” than others.

The primary management recommendations for increasing skin firmness are to reduce nitrogen fertilization and decrease watering volumes. Just before the spring flush period we strongly recommend reducing water and fertilizer for ‘Florida Brilliance’, especially if the period coincides with unseasonably warm weather. Keep in mind that ‘Florida Brilliance’ requires less nitrogen overall than ‘Florida Radiance’, and that overfertilization of this variety can cause other problems such as a higher percentage of misshapen fruit.

## New Releases Coming Soon

Two new selections have been approved for release by IFAS and are going through the commercialization process. Trade names have not been finalized yet but should but should be chosen in the next six months.

The first release is an early short-day variety with excellent fruit shape and quality. It has slightly lower November and December yields than ‘Florida Brilliance’ but had excellent January yields this past season, and thus may complement the yield curve of ‘Florida Brilliance’. It has excellent flavor, with taste panels ranking it equal to or even better than Sensation® ‘Florida127’ depending on the harvest date. It has high brix through the season similar to Sensation® ‘Florida127’. The grower cooperators will have slightly larger trials during the coming season, with commercial quantities expected to be available for the 2021-2022 season.



Figure 1. A new release with excellent shape and flavor.

The second release is a white-fruited strawberry. While white-fruited varieties have been popular in Japan for some time, this is expected to be the first such variety on the market in the US. It has a pink blush on the sun-side and red achenes when ripe, with a unique pineapple-like aroma. The fruit are smaller than the current varieties, similar to the size of ‘Festival’ fruit on average. Yield is about  $\frac{3}{4}$  of the current varieties.

Larger trial quantities will be tested this coming season, with commercial quantities of plants available for the 2021-2022 season. The FSGA and its member growers are exploring licensing models that will promote the development of white strawberries as a product, which may involve substantial resource investment and limited availability over the first few years.



Figure 2. A new white-fruited release with unique appearance and aroma.

Photo credit: Cristina Carrizosa, UF/IFAS Communications.

## Conclusions

As we continue to learn how to manage ‘Florida Brilliance’ optimally, In just over two years from now, the industry will have two new varieties. One will hopefully quickly take its place alongside ‘Florida Brilliance’ and Sensation® ‘Florida127’ in the industry, while the other will represent another type of product altogether to expand the market opportunities for our growers. For any questions, please contact Vance Whitaker at 813.419.6608.

## Dr. Natalia Peres Receives Highest Honor at APS Conference

The society grants this honor to a current APS member in recognition of distinguished contributions to plant pathology or to The American Phytopathological Society. Fellow recognition is based on significant contributions in one or more of the following areas: original research, teaching, administration, professional and public service, and/or extension and outreach. *Congratulations to Dr. Peres!*

Peres is a superbly gifted and dedicated mentor of undergraduate, graduate, and postgraduate researchers. Her excellence in this area has served to generate multipliers of her research and outreach effort. She has produced a generation of skilled and broadly trained researchers and crop advisors. Her commitment to mentor international students and postgraduate researchers is particularly notable. She has been an effective advocate of closer ties between the American Phytopathological Society and Brazilian Society of Plant Pathology and has been frequently engaged in these efforts by the leadership of APS. She has mentored 27 such undergraduate and 10 graduate and postgraduate researchers in her program since 2010. With Peres's support, the foregoing students have made 65 oral and poster presentations at APS national and regional meetings. During the same period, these students received 24 awards from APS Foundation, the University of Florida, and others, in recognition of their research and extension achievements, an incredible achievement in light of her off-campus responsibilities at UFL- GCREC. Peres has also served her profession through her engagement in APS, having served as associate and senior editors of Plant Disease; as the society representative to ICPP, as a coordinator and volunteer translator for the Portuguese language for the APS Education Center, and as the lead editor of the upcoming 3rd edition of the APS Compendium of Strawberry Diseases, Disorders, and Pests.

## New Blackberry Cultivars in Trials

Zhanao Deng, Professor GCREC , zdeng@ufl.edu

Florida growers interested in growing blackberries as an alternative crop have been looking for cultivars that are adapted to Florida's warm climate. To meet this need, we began trialing blackberry cultivars at the Gulf Coast Research and Education Center (GCREC) several years ago. So far five floricanefruiting cultivars ('Apache', 'Natchez', 'Osage', 'Ouachita' and 'Von') and three primocanefruiting cultivars ('Prime-Ark® 45', 'Prime-Ark® Freedom', and 'Prime-Ark® Traveler') have been trialed. 'Osage' outperformed the other four floricanefruiting cultivars with an average yield of 3.9 pounds of berries per plant, and 'Prime-Ark® Freedom produced the highest yield, an average of 6.3 pounds of berries per plant. In May, 2020, we introduced into our trials 'Caddo' and 'Ponca', the latest releases from the University of Arkansas blackberry breeding program, which has been the primary supplier of blackberry cultivars for growers in Florida and other southeastern United States. The first batch of 'Caddo' and 'Ponca' plants were transplanted to our orchard two weeks ago. Another batch of plants will be set up in the orchard in September or October. These cultivars will be tested under a new plant management scheme that is being developed by our plant physiologist, Dr. Shin-suke Agehera, and his graduate student. According to the release statement by the University of Arkansas blackberry breeding program, 'Caddo' was released in 2018. It is high-yielding and thornless, and have erect canes with medium-large fruit that is sweet with very good fruit flavor. 'Ponca' was released in 2019. It is also high-yielding, thornless, erect canes with medium-sized fruit with enhanced sweetness and good post-harvest handling traits. This cultivar is the sweetest cultivar released to date. Plants have shorter internodes and new canes emerge about or after fruit harvest is done. We hope these cultivars can do well in Florida so Florida growers have more choices of cultivars and better berry yields!



Our blackberry breeding effort has resulted in development of a number of promising lines. Several lines have been established in tissue culture; one of the lines has been sent out to growers for "real world" tests. In the meantime, a replicated trial was set up last month at GCREC to test this line's yield potential and berry quality against commercial cultivars. Another replicated trial has been planned to begin in about two months later. These lines were selected in our low chilling environment and under our high disease and insect pest pressure, we expect to them to continue performing well in these trials. If so, then a new generation of UF-bred blackberry cultivars will be available to Florida growers.

Please remember... The use of any trade names in this publication is solely for the purpose of providing specific information. It is not a guarantee or warranty of the products named and does not signify that they are approved to the exclusion of others of suitable composition. Use pesticides safely. Read and follow directions on the manufacturer's label.

## UPDATE from GCREC Entomology Program for Small Fruits

Sriyanka Lahiri, Assistant Professor GCREC, lahiris@ufl.edu

**What are our research plans?** - We are proceeding with field research plans same as last year and will be happy to receive strawberry samples from growers this season. Growers should feel free to contact me directly, just as last year, if some insect pest issues arise. We will be conducting industrial trials and other research projects pertaining to thrips and mite management in strawberry. Graduate students will sample at least four strawberry fields throughout the season to assess the population dynamics of thrips species and their natural enemies, same as last year but following the UF safety guidelines for social distancing protocols.

**What pest situation to expect** - Growers should expect chilli thrips early in the strawberry season almost as soon as overhead irrigation ceases. Based on last year's trend, some fields had cyclamen mites that had hitchhiked from nurseries. Therefore, steam treatment of transplants may be considered. To control chilli thrips and western flower thrips, predatory mites, *Amblyseius swirskii* can be released in within-field hotspots, since they feed on the thrips nymphs. Growers may decide to knock down adult chilli thrips population early, by foliar application of softer conventional insecticides and then release this predator after a week of foliar insecticide application to suppress the chilli thrips nymph population.

## UF/IFAS Researchers Share Data on Copper Concentrations in Stormwater Ponds

Mike Loizzo—Mike Loizzo is a communications specialist with UF/IFAS. He has more than 20 years of experience in journalism and communications.

If you ask the average Floridian what copper sulfate is, chances are most won't know. But ask them if they've ever seen a bright blue stormwater pond and they'll likely say yes. Copper sulfate kills algae in ponds and changes its color to bright blue. Now, UF/IFAS researchers are sharing data on copper concentrations in stormwater ponds.

Mary Lusk, assistant professor of urban soil and water quality with UF/IFAS Gulf Coast Research Center and her lab's environmental technician, Kylie Chapman, focused their study on Lakewood Ranch, a neighborhood in Bradenton Fla., south of Tampa.



They took water samples from three random spots in each of six ponds. They also surveyed non-turfgrass vegetation growing half a meter from the shoreline, both inside and outside the ponds. Analysis of the data drew some interesting conclusions.

“In particular, we were surprised dollarweed (also known as pennywort) accumulated up to 1600 mg/Kg of copper when growing next to ponds that have been treated with copper sulfate algacide,” explained Chapman.

“That means dollarweed may have potential as a plant you can purposely grow to remove copper – and maybe other metals – from contaminated soils and sediments,” added Lusk, a UF/IFAS Soil and Water Sciences

Department faculty member at the Gulf Coast Research and Education Center.

The Natural Resources Conservation Service reports copper is one of the most problematic heavy metals that can contaminate soil. Others include mercury, lead, and nickel.

By sharing this dataset, Lusk and Chapman hope others can use the information to further their own research. You can find more information about their work and the copper concentrations data here: <https://doi.org/10.1016/j.dib.2020.105982>.

Mary Lusk, Assistant Professor GCREC, mary.lusk@ufl.edu

# Managing Nematodes in Organic Strawberries

Johan Desaegeer, Assistant Professor, GCREC jad@ufl.edu

Organic strawberry production has been growing steadily in Florida in recent years due to consumer demand and favorable pricing. Expectations are that this trend will continue, and that organic production will likely expand into other crops like vegetables. One of the main challenges in organic strawberry production are soilborne pests and diseases, including weeds, charcoal rot, and nematodes. The standard practice to manage nematodes and other soilborne diseases in Florida strawberries since the 1950's is pre-plant soil fumigation. None of the fumigant products that are currently registered can be used in organic fields, and it does not seem likely that an organic fumigant product will become available anytime soon. The historic reliance on fumigation in Florida strawberries has limited research into organic nematode management options, which means that organic strawberry growers are lacking reliable information on how to manage nematodes organically. It can therefore be hardly surprising that several newly developed organic strawberry fields in our area have seen severe infestation with nematodes, in particular sting nematodes (Photos 1 and 2).

Plant-parasitic nematodes are secretive and unpredictable parasites, and ubiquitous in Florida. Vegetable and strawberry growers in particular are well aware how hard it is to get rid of a sting or root-knot nematode problem. Both nematodes find conditions in Florida ideal, with warm temperatures that allow rapid nematode reproduction and sandy soils that allow for easy movement. In particular sting nematodes can devastate strawberries, and they are considered one of the main limiting factors to strawberry production in the state. Even with fumigation, these nematodes can be hard to manage, as they actively move up and down the soil profile throughout the year. Dr. J. Noling's work at the University of Florida demonstrated that often additional deep shank applications of 1,3-D are required to effectively manage nematodes in Florida.

Without the option of soil fumigation, organic strawberry growers have few options available, and are understandably struggling to cope with these nematodes. The nematology group at the University of Florida's Gulf Coast research and Education Center in Wimauma, has therefore initiated a new research program to study nematode management in organic strawberries. While it is too early for reliable recommendations, we wanted to give a brief overview of some of the options that can be utilized in organic fields:

**Summer cover crops:** sunnhemp is one of the most common cover crops planted by strawberry growers, and for good reason. The crop is a nitrogen-fixing legume, and does very well in Florida. Sunnhemp is also a poor host to root-knot and sting nematodes, and therefore a good cover crop to help manage these nematodes in strawberries. Sorghum sudangrass is another fast-growing cover crop that does well in Florida, and while it is often a poor host to root-knot, it is a very good host for sting nematodes, and as such should not be grown in strawberry fields that have a problem with this nematode. Our lab at the GCREC continues to evaluate these and other cover crops for their nematode host status, as well as to look into the effect of cover crop mixtures on nematode populations.

**Pre-plant fumigation alternatives** such as anaerobic soil disinfestation (ASD), solarization and soil steaming: all these pre-plant strategies can potentially be used in organic production. Currently Dr. E. Roskopf from USDA Ft. Pierce is evaluating ASD using molasses and chicken manure as a pre-plant option in strawberries. Solarization and soil steaming are other options that we plan to look into. All these strategies have shown potential in other regions and crops, but not yet in the challenging environment of Florida.

**Soil amendments and compost applications:** like most of Florida's sandy soils, strawberry soils are very low in organic matter. Increasing soil organic matter in these poor soils through the application of soil amendments and compost will improve soil quality and stimulate the natural nematode suppressiveness of soils. Figuring out how to manipulate natural soil suppressiveness could be a key component of a productive organic production system in Florida.

**OMRI-approved nematicides:** several organic nematicides are available for use in strawberries, and we are currently testing a range of different products for their effect on root-knot and sting nematodes. Products are mostly botanicals (containing neem, mustard, thyme and other essential oils, capsaicin, and others), (dead) bacterial toxins and (live) fungal nematode parasites.

**Clean planting material:** strawberry transplants are grown in nurseries in Canada, North Carolina, California and a few other states. Pests and pathogens, including root-knot, lesion and foliar nematodes, have been

found on those transplants, and can cause significant damage in Florida production fields. A technique using steam heat treatment was developed for reducing fungal pathogens on these transplants, and is now also being evaluated for its potential to rid transplants from nematodes. Initial studies look promising, and steaming of transplants may become a useful tool for organic strawberry growers.

As our research evolves, we will continue to report progress on organic nematode management in future issues of this journal. While the current focus is on cover crops, organic nematicides, and clean planting material, we plan to include other options as well, including organic pre-plant fumigant alternatives, the use of soil amendments, and the holy grail of nematode management which is how to successfully create nematode-suppressive soils.

Organic strawberry growers that have or suspect they have problems with nematodes are welcome to reach out to our lab or contact the author (Johan Desaegeer, [jad@ufl.edu](mailto:jad@ufl.edu), 813-431-6246).



Photo 1 – Sting nematode (*Belonolaimus longicaudatus*) damage in an organic strawberry field, Wimauma, January 2020.



Photo 2 – Strawberry root system damaged by sting nematode – note severe pruning and slightly swollen root tips.

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## Fumigant Research at GCREC

Nathan Boyd, Associate Professor GCREC [nsboyd@ufl.edu](mailto:nsboyd@ufl.edu)

Faculty at GCREC have collaborated with other faculty throughout the state and across the United States to develop improved fumigant programs. For example, Drs. Nathan Boyd, Gary Vallad, and Joe Noling worked together for several years to develop the concept of fumigant management zones which emphasizes the placement of fumigants where pests occur. This concept has been widely adopted in regions of the southeast especially where nematodes are a serious issue.

In recent years, Dr. Nathan Boyd has focused on the evaluation of alternative fumigants, application technology, and fumigant combinations that improve pest control. Research conducted in tomato has clearly demonstrated that fumigant combinations are more effective than relying on a single active ingredient and that the ratio of fumigants also affects how well they work (Figure 1). The fumigant research team at GCREC has just begun evaluating multiple fumigant ratios on commercial vegetable and strawberry farms in Florida. This research will greatly enhance our understanding of the optimal fumigation combination for specific pest complexes.



Nontreated

50 lbs Pic

50 lbs Pic + 1,3-D



## Tomato Food Safety Workshop / T-GAP Renewal

**Description:** The annual Tomato Food Safety / T-GAP Certification workshop **will be held virtually on September 9 from 1:00 to 5:00 pm. Participation is free thanks to the sponsorship of the Florida Tomato Committee.** Due to the ongoing pandemic, this workshop will be held virtually using Zoom Webinar. If you do not have Zoom on your computer already, you will be prompted to download when signing in. Please give yourself about 10 extra minutes if you've never used Zoom before.

This year, the pre- and post-test will be conducted using the polling feature in Zoom Webinar. We will prompt you to take the exam at the appropriate time. Attendance and completed the pre- and post-test are required to get your renewal certificates.

### **Speakers and topics include:**

Keith R. Schneider (UF) – COVID Overview

Gene McAvoy (UF-SWREC) – COVID 19 Best Practices for Farms, Housing, Employee Transportation and Cleaning and Sanitation

Elizabeth Miller (FDACS) – TGAPS FDACS Regulatory Update

Mark Ritenour (UF-IRREC) – Harvest Bucket Best Practices on Washing, Frequency and Bucket Design

Taylor Langford (UF) – On Farm Readiness Reviews

Michelle Danyluk (UF-CREC) – Water Quality Standards: TGAPs vs. FSMA

**Time:** Sep 9, 2020 01:00 PM in Eastern Time (US and Canada)

**Register online at [https://ufl.zoom.us/webinar/register/WN\\_Orqc05MgTym8o3LJAYNEKA](https://ufl.zoom.us/webinar/register/WN_Orqc05MgTym8o3LJAYNEKA)**

## Using Simple Image Analysis for Collecting Plant Data

Lillian Pride [lpride3@ufl.edu](mailto:lpride3@ufl.edu) and Shinsuke Agehara [sagahara@ufl.edu](mailto:sagahara@ufl.edu) UF/IFAS Gulf Coast Research and Education Center

These last few months have been a unique time. For many of us, these months have formed the creative challenge of redirecting our energies to tasks we can accomplish at home. One way this redirection has manifested itself in the Horticultural Crop Physiology Lab or “Horticulture Lab” at GCREC is the use of image analysis for more efficient plant data collection.

Would you like to know the official way we collect scientific plant growth data in the Horticulture Lab? Would you like to do it yourself? The redirection of our efforts may valuably influence yours as well.

This is the link for our ImageJ YouTube playlist: <https://www.youtube.com/playlist?list=PL4qrjj3jZ6i568ToiUV-DvAsQ0Gyb30hK>

With this set of YouTube videos, you can learn how to collect plant growth metrics like leaf and canopy area and plant width in the same way we do at our research station. And not only can you learn how—you can do it yourself, because ImageJ is a free image-processing program. Supportive tools for our tutorials include a cellphone or digital camera and ordinary office supplies (e.g. clipboard, folder, etc.).

So why do we use image analysis for our data collection? Traditionally, plant growth and health assessment in horticultural research has been performed manually in the field or after destructive plant sampling. However, manual measurements and plant sampling are time-consuming, and visual scoring lacks accurate and repeatable quantification. Image-based measurements can save time in the field and provide quantitative data that are generally more objective, accurate, and repeatable—with the added bonus of resulting in

gorgeous processed images which can be shared in presentations as visual confirmation of this data collection method's effectiveness.

Besides the fact that making ImageJ tutorials provided meaningful employment under the present constraints, the process itself (processing images with ImageJ) can be done remotely in a collaborative manner. Presently in the Horticulture Lab, one employee takes field plot photos and saves them in the cloud. Then, another employee, working remotely at home, analyzes the photos with ImageJ to extract various plant data, such as plant height, plant width, leaf area, canopy area, and stem diameter. Theoretically, both employees could work on different image sets simultaneously, with no losses in productivity. This is an ideal social distancing process.

May these video tutorials give you many happy, productive hours with ImageJ, as they have given us.

WIMAUMA

### ImageJ Tutorial 1 - Measure Leaf Disease Area & Lesion Counts

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