

# Florida Citrus Production Guide

2019-2020

Editors: L.M. Diepenbrock, M.M. Dewdney, and T. Vashisth

**UF** | IFAS Extension  
UNIVERSITY of FLORIDA

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EFFECTIVE AND SAFE CITRUS PRODUCTION STRATEGIES

FOR USE IN COMMERCIAL GROVES ONLY

Before using any pesticide:  
Read the complete label and the general  
instructions in this guide.

A contribution of the University of Florida Institute of Food and Agricultural Sciences citrus faculty located at the Citrus Research and Education Center–Lake Alfred, Southwest Florida REC–Immokalee, Indian River REC–Ft. Pierce, UF main campus–Gainesville, and researchers from the Florida Department of Citrus–Lake Alfred.

Lauren M. Diepenbrock, Megan M. Dewdney,  
and Tripti Vashisth.

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Dear Florida Citrus Growers:

## **Welcome to the 2019–2020 Florida Citrus Production Guide!**

With citrus greening disease here to stay in Florida, we all know that we cannot grow citrus like we did for decades. Experience has taught us that the combination of hard work, a commitment to success and trust in science-backed solutions is the winning formula for Florida citrus production.

As such, this publication has changed as well. Prior to 2017, this guide was known as the Florida Citrus Pest Management Guide and provided information on controlling insect, mite, disease and weed pests affecting citrus production. As UF/IFAS researchers have learned more about HLB, it became evident that growing citrus when nearly all trees have HLB requires more than just focusing on killing psyllids or the HLB-causing bacteria. Success includes developing a plan for maintaining the health and productivity of HLB-diseased trees, starting at planting with what rootstock/scion combinations to plant and changing horticultural practices to maintain the productivity of citrus trees once affected by HLB.

Coupled with the other pests and disease issues growers had to contend with prior to HLB, there's a lot to account for. Every grower's program will be different based on their specific growing conditions and location in the state.

The good news is that the past decade of research on HLB research has paid off. We have learned enough about HLB to be able to live with this disease and remain an economically viable industry.

The production guide you have in your hands is a collection of our latest knowledge and recommendations to manage not only HLB but the other issues that can affect citrus production here in Florida. Every day UF/IFAS scientists are at work in the lab or field where we learn something new that can be added to our knowledge on how to live with HLB. So, as new information is developed, this guide is updated and provided annually to keep you up to date on the latest science-based information you can put to use in your groves. You can also find research and Extension updates at <https://citrusresearch.ifas.ufl.edu>, which is regularly updated, and you can subscribe to the "All in for Citrus" newsletter. Faculty also provide regular updates at field days and seminars. UF/IFAS Extension agents are also available to answer your questions and provide important information. Contact information is available in the production guide.

The UF/IFAS Statewide Citrus Team is your partner in finding ways to profitably grow citrus in Florida. Together we will continue to keep citrus Florida's premier agricultural commodity.

Sincerely,

Michael Rogers, Ph.D.  
UF/IFAS Statewide Citrus Team  
Center Director, UF/IFAS Citrus Research and Education Center

The University of Florida's Institute of Food and Agricultural Sciences (UF/IFAS) is all in to help our citrus growers be successful, profitable, and resilient in the fight against HLB and other citrus diseases.

We have nearly 60 citrus faculty in Lake Alfred, Fort Pierce, Immokalee, and Gainesville. And we have additional faculty who weren't hired to do citrus research but have responded to our all-hands-on-deck call to provide solutions to growers.

UF/IFAS has made a greater commitment to citrus than it has to any other of Florida's nearly 300 crops and commodities. We have added 20 new citrus faculty members to our ranks in just the past four years.

We understand the psyllid much better, so we can more effectively attack it. We've developed tolerant varieties such as Sugar Belle® and Bingo®.

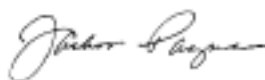
The responses to citrus diseases are examples of what happens when a scientific community is all in to tackle a problem.

Surely, that kind of commitment can deliver what we need to know so we can continue to grow citrus. And that's what you have from UF/IFAS.

We're continuing to invest heavily in giving our citrus scientists the tools they need to do their best work. The cost of being in the anti-HLB business is high. We're paying those costs to improve our laboratories and greenhouses and purchase the equipment needed to get the job done.

There's no Peach Research and Education Center. No Blueberry REC. No Tomato REC. Citrus is our deepest commitment, where we can say most forcefully that we're all in.

Sincerely,



Jack M. Payne  
UF Senior Vice President  
Agriculture and Natural Resources

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# 2019–2020 Florida Citrus Production Guide: Introduction<sup>1</sup>

Lauren M. Diepenbrock, Megan M. Dewdney, and Tripti Vashisth<sup>2</sup>

Over the past decade, Florida citrus production practices have changed dramatically due to the challenges presented by huanglongbing (HLB). As we have learned more about this disease, how it is spread by the Asian citrus psyllid, and the overall effects on citrus tree health, it is increasingly evident that management of this disease requires changes to *all* aspects of citrus production. Several factors must all be considered together when developing a site-specific management plan for citrus production in the presence of HLB. The Florida Citrus Production Guide will continue to be updated annually with the latest information to help growers refine their production practices using the latest research-based findings proven to be effective for Florida citrus production.

In addition to changes in production practices needed to manage emerging pest problems in Florida, the regulatory environment is also constantly changing. For example, in 2015 new rules for Worker Protection Standards (WPS) were passed and should have been fully implemented by January 2, 2018. These new rules include important changes to worker training, reporting, and posting of pesticide applications. Likewise, new rules regarding food safety training, reporting, and monitoring are also being implemented. These rules directly affect Florida citrus growers and all agriculture and are explained in the chapters on WPS and food safety. As changes in these rules are likely

to occur, the guide will be updated to reflect the latest information growers need to know to ensure compliance, so please continue to review these chapters in the coming years.

Overall, the goal of the Florida Citrus Production Guide is to serve as a reference for information needed to guide decision-making in Florida citrus-growing operations. **It is not intended to replace agricultural product labels that contain important usage information and should be immediately accessible for reference. Violations of directions for use printed on the label are against State and Federal laws. Always read and follow label instructions!** Likewise, State and Federal Regulations on topics such as WPS are constantly changing, and not all the information needed to ensure compliance can be covered in this guide. The chapter in this guide covers some of the important highlights of these rules. **It is imperative that growers obtain copies of and follow the detailed rules outlined in the regulatory documents referenced in this guide. The Florida Citrus Production Guide provides general guidance and is NOT the final regulatory document that should be followed!**

For specific information on pest identification, biology, damage or non-chemical management techniques, refer to Extension Digital Information System (EDIS) and other

1. This document is CPMG01, one of a series of the Plant Pathology Department, UF/IFAS Extension. Original publication date December 1999. Revised September 2013, April 2016, May 2018, and March 2019. Visit the EDIS website at <https://edis.ifas.ufl.edu> for the currently supported version of this publication.

2. Lauren M. Diepenbrock, assistant professor, Entomology and Nematology Department; Megan M. Dewdney, associate professor, Plant Pathology Department; and Tripti Vashisth, assistant professor, Horticultural Sciences Department, UF/IFAS Citrus Research and Education Center; UF/IFAS Extension, Gainesville, FL 32611.

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UF/IFAS, USDA, and Florida Department of Agriculture and Consumer Services (FDACS) publications. In addition to the authors listed throughout the Florida Citrus Production Guide, the citrus Extension specialists, faculty, and Extension agents listed below can provide assistance with citrus production practices.

## **UF/IFAS Research and Education Centers**

### **UF/IFAS Citrus REC**

700 Experiment Station Road  
Lake Alfred, FL 33850-2299  
<http://crec.ifas.ufl.edu>  
(863) 956-1151

Dr. Michael E. Rogers, Center Director/Entomology  
Mr. Travis K. Chapin, Food Safety  
Dr. Michelle D. Danyluk, Food Safety  
Dr. William O. Dawson, Plant Pathology  
Dr. Megan M. Dewdney, Plant Pathology  
Dr. Lauren M. Diepenbrock, Entomology  
Dr. Larry W. Duncan, Nematology  
Dr. Manjul Dutt, Horticulture  
Dr. Fred G. Gmitter, Horticulture  
Dr. Jude W. Grosser, Horticulture  
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Dr. Davie M. Kadyampakeni, Soil & Water Sciences  
Dr. Nabil Killiny, Plant Pathology  
Dr. Amit Levy, Plant Pathology  
Dr. Chooa El-Mohtar, Plant Pathology  
Dr. Ahmad Omar, Horticulture  
Dr. Kirsten Pelz-Stelinski, Entomology  
Dr. Arnold W. Schumann, Soil and Water Science  
Dr. Ariel Singerman, Economics  
Dr. Lukasz L. Stelinski, Entomology  
Dr. Tripti Vashisth, Horticulture  
Dr. Christopher I. Vincent, Horticulture  
Dr. Nian Wang, Cell Science  
Dr. Yu Wang, Food Science

### **UF/IFAS Indian River REC**

2199 South Rock Road  
Ft. Pierce, FL 34945-3138  
<https://irrec.ifas.ufl.edu/>  
(772) 468-3922

Dr. Ron Cave, Center Director/Entomology  
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Dr. Rhuanito S. “Johnny” Ferrarezi, Horticulture  
Dr. Sandra Guzman, Agricultural Engineering

Dr. Mark A. Ritenour, Postharvest Physiology  
Dr. Lorenzo Rossi, Horticulture  
Dr. Alan Wright, Soil & Water Science

### **UF/IFAS North Florida REC**

155 Research Road  
Quincy, FL 32351  
<http://nfrec.ifas.ufl.edu>  
(850) 875-7100

Dr. Glen Aiken, Center Director/Soil and Water Science  
Dr. Pete C. Andersen, Horticulture  
Dr. Xavier Martini, Entomology

### **UF/IFAS Range Cattle REC**

3401 Experiment Station  
Ona, FL 33865  
<http://rcrec-ona.ifas.ufl.edu/>  
(863) 735-1314

Dr. Brent Sellers, Center Director/Weed Science

### **UF/IFAS Southwest Florida REC**

2686 State Road 29 N  
Immokalee, FL 34142-9515  
<https://swfrec.ifas.ufl.edu/>  
(239) 658-3400

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Dr. Fernando Alferez, Horticulture  
Dr. Ioannis Ampatzidis, Agricultural and Biological Engineering  
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Dr. Jawwad Qureshi, Entomology  
Dr. Fritz M. Roka, Economics  
Dr. Sarah Strauss, Soil and Water Science/Soil Microbiology  
Dr. Tara Wade, Economics

### **UF/IFAS Tropical REC**

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Homestead, FL 33031-3314  
<https://trec.ifas.ufl.edu/>  
(305) 246-7000

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