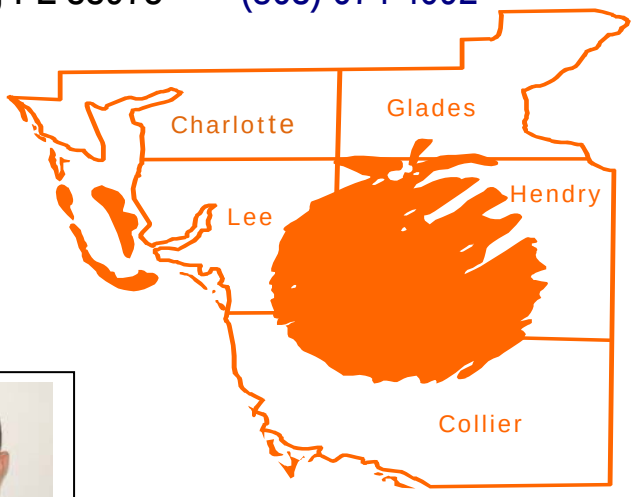
UF UNIVERSITY of FLORIDA
IFAS Extension

EXTENSION

Institute of Food and Agricultural Sciences

Hendry County Extension, P.O. Box 68, LaBelle, FL 33975 (863) 674 4092

Flatwoods Citrus



Vol. 23, No. 1 **January 2020**

Dr. Mongi Zekri
Multi-County Citrus Agent, SW Florida

Table of Contents

Seminar

Scouting and managing citrus diseases in 2020

Pre-registration is required.
No registration fee and lunch is free Thanks to **Morgan McKenna with Syngenta.**
To reserve a seat, call 863 674 4092, or send an e-mail to Dr. Mongi Zekri at: maz@ufl.edu

Location: Southwest Florida Research & Education Center, Immokalee
Date & time: Wednesday, January 15, 2020, 10:00 AM – 12:00 Noon.
Speakers: Dr. Ozgur Batuman and Dr. Megan Dewdney, UF-IFAS
Program Coordinator: Dr. Mongi Zekri, UF-IFAS
Sponsor: **Morgan McKenna with Syngenta**

2 CEUs for certified crop advisors (CCAs)
2 CEUs for pesticide license renewal

Agenda

10:00 AM - 10:50 AM
Dr. Megan Dewdney, UF-IFAS

1. Brown rot: scouting, symptoms, life cycle, epidemiology, damage, management
2. Citrus canker: scouting, symptoms, life cycle, epidemiology, damage, management

10:50 AM - 11:40 AM
Dr. Megan Dewdney, UF-IFAS

3. Citrus black spot: scouting, symptoms, life cycle, epidemiology, damage, management
4. Postbloom fruit drop: scouting, symptoms, life cycle, epidemiology, damage, management

11:40 AM - 12:00 Noon
Dr. Ozgur Batuman, UF-IFAS

5. Citrus greening (HLB): scouting, symptoms, life cycle, epidemiology, damage, management

Institute of Food and Agricultural Sciences
UF-IFAS Hendry County Extension Service
P.O. Box 68, LaBelle, FL 33975

Information for the next Certified Pile Burners Course:

The Florida Forest Service and University of Florida Cooperative Extension Service will be conducting a Certified Pile Burners Course on **Wednesday, February 5, 2020**. This course will show you how to burn piles ***legally, safely and efficiently***. Most importantly, it could save a life. If you burn piles regularly, don't put off registering for this training. When the weather is dry, certified pile burners will receive priority for authorization to burn. Also, certified pile burners are allowed to burn up to two hours longer per day and get multiple day authorizations. Don't wait. The number of trainings offered and attendance at each training is LIMITED. This training will be held from 8:30 am till 4:30 pm at the **Southwest Florida Research and Education Center, Immokalee, Florida**. Included are a registration form and program agenda.

Registration is required to attend and class size is limited. To attend please send the following information (see form on next page):

1. Your full name (as wanted on your pile burning certificate).
2. Your mailing address (where you want the certificate mailed).
3. Your Florida Forest Service Customer Number (It is the number that you are required to give the FFS when you call in for your burn permits. If you do not know it, please call the local FFS office and ask them to create one for you).
4. Your email address (or your office e-mail address).
5. Your contact phone number.
6. A check made out to: Hendry County 4-H for $50.00.

The first fifty individuals to provide these six requirements will be registered; there will be a 7-day non refundable fee limit. If you do not make the training and did not contact our office at least one week before the class, you will not receive a refund. There will be a test at the end of the session. You must receive a grade of 70% or higher on the exam and demonstrate a proper pile burn with your local FFS office to become certified. Once you are certified it will be noted with your customer number, thus it is important for us to have the proper number. If you do not have a customer number the FFS office will set one up for you. Fill out the registration form on the next page and return it as directed.

Sincerely,

Mongi Zekri

For Questions Contact: Dr. Mongi Zekri at maz@ufl.edu or 239-595-5494

Registration Form

Florida's Certified Pile Burner Program
Wednesday, February 5, 2020

Hendry County Extension Office
P.O. Box 68, LaBelle, FL 33975
(863) 674-4092

Please send this form and a check for $50.00 made payable to:

Hendry County 4-H

Mail to: **Dr. Mongi Zekri**
Hendry County Extension Office
P. O. Box 68
LaBelle, FL 33975

Name

Mailing address

Email address

Phone Number

Florida Forest Service Customer Number, https://www.freshfromflorida.com/Divisions-Offices/Florida-Forest-Service/Our-Forests/Field-Operations/County-Foresters/Find-a-County-Forester

Florida's Certified Pile Burner Training
Wednesday, February 5, 2020
Location: Southwest Florida Research and Education Center
2685 State Road 29 North, Immokalee, FL 34142
(239) 658-3400

All Times Are Local

1. Opening Comments and Introduction	08:30 – 09:10
2. Fire Weather	09:10 – 09:50
3. BREAK	09:50 – 10:00
4. Smoke Management	10:00 – 11:20
5. Open Burning Regulations	11:20 – 12:15
6. LUNCH (provided)	12:15 – 01:15
7. Planning and Implementation	01:15 – 02:30
8. Safety	02:30 – 03:10
9. BREAK	03:10 – 03:20
10. Public Relations	03:20 – 04:00
11. Wrap Up & Test	04:00 – 04:30

Please bring a Pencil for the Exam!

Location & Contact Information

<u>Location</u>: Southwest Florida Research and Education Center (Immokalee IFAS Center)
2685 State Road 29 North, Immokalee, FL 34142 (239) 658-3400

<u>Contact</u>: Dr. Mongi Zekri, Multi-County Citrus Extension Agent
Hendry County Extension Office, P.O. Box 68, LaBelle, FL 33975
Office Phone: 863 674 4092
Cell: 239 595 5494
E-mail: maz@ufl.edu

Q: Why should I be a certified pile burner?

A: Certified pile burners are trained to burn piles ***legally, safely and efficiently***. Most importantly, it could save a life. Also, when the weather is dry, certified pile burners will receive priority for authorization to burn by the Florida Forest Service (FFS). Also, certified pile burners are allowed to burn up to two hours longer per day and get multiple day authorizations.

Q: What is a Pile Burner Customer Number?

A: When you call the FFS for an authorization to burn, you will be assigned a personal customer number. This number references your information so it doesn't need to be gathered each time you call for an authorization. You must have your individual FFS customer number in order to be certified.

Q: Is there a test?

A: Yes, the test is 20 questions and open-book. You must receive a score of at least 70% to pass.

Q: What if I don't pass?

A: Very few people fail the test but if you do, you will be provided another opportunity to take the test at a later date. If you fail the second time, you must re-register and take the training again.

Q: Why do you ask for my email on the application form?

A: Email is the fastest and most convenient method to inform registrants of their registration status. If no email address is provided then all correspondence will be sent through the federal mail. This can take several days to relay messages and this may not be practical if changes are made to the course schedule or for last minute registrations.

Q: How much does it cost to register for the training?

A: Registration for the training is $50 per person and includes lunch, training materials and testing.

Q: How long does my certification last, and how long do I have to complete the certification from the time I finish the class?

A: As long as the person with the certification uses their number at least 5 times in a period of 5 years their certification will not expire under the current program. You MUST complete the certification burn within a year of taking the class.

Q: Will certified burners be notified if their certification expires?

A: Yes, notification will be sent out to them to let them know of their upcoming certification expiration date.

Q: Will I be certified at the end of the one day training?

A: No, you will need to follow the written instructions that you will receive from the FFS to become certified. You will need to complete a simple burn plan, have it reviewed and approved locally by the FFS and also have the burn itself reviewed and approved by the FFS.

Q: Is there a minimum age to be a certified pile burner?

A: Yes, you must be at least 18 years old to take the test and be a certified pile burner.

Seminar

Food safety

Pre-registration is required.

To reserve a seat, call 863 674 4092, or send an e-mail to Dr. Mongi Zekri at: maz@ufl.edu

Location: Southwest Florida Research & Education Center, Immokalee

Date & time: Wednesday, February 19, 2020, 10:00 AM – 12:00 Noon.

Speakers: Dr. Mark Ritenour and Matt Krug, UF-IFAS

Program Coordinator: Mongi Zekri, UF-IFAS

Sponsor: ?

In-Service Training/Workshop

Beneath the Citrus Canopy – Weeds, Roots, and Microbes.

Purpose and Objectives: This training will provide county extension faculty with science-based information on weed management and identification in citrus groves, history and importance of rootstocks for Florida citrus production, rootstock propagation, and the benefits of a healthy soil environment for crop production.

Description and agenda for In-service Training:

This IST addresses the Extension Roadmap High Priority Initiatives #1 (Increasing the sustainability, profitability, and competitiveness of agricultural and horticultural enterprises).

Date and timeline: 18 March 2020, 8:30 AM – 1:30 PM

Location: Southwest Florida Research and Education Center (SWFREC), Immokalee and Zoom

Speakers)/Instructors)
Dr. Ute Albrecht (UF), Dr. Ramdas Kanissery (UF), Dr. Sarah Strauss (UF)

For more information and for registration, please contact Dr. Ute Albrecht at ualbrecht@ufl.edu

2020 ANNUAL FLORIDA CITRUS GROWERS' INSTITUTE

Date & Time: Tuesday, 14 April 2020, 8:00 AM – 3:35 PM

Location: Avon Park Campus of South Florida Community College

Coordinators: Citrus Extension Agents, UF-IFAS

Agenda and information on registration will be available in March.

The 30th Annual Farm Safety Day

Friday, 1 May 2020
Saturday, 2 May 2020

AN IMPORTANT MESSAGE TO EMPLOYERS

Safe and competent equipment operators are important to you as an employer. Accidents, which cause damage, injury or death to employees, equipment and crops, are costly. We believe all types of accidents can be reduced with proper employee training. Our training has been designed to help your employees perform better, operate safely to prevent accidents, fulfill necessary training requirements and build pride in themselves and their farm company.

Certificates

The 2020 Southwest Florida Farm Safety Day is almost here. Farm Safety Day is an educational event designed to emphasize the importance of farm/equipment safety. Each participant is presented with a certificate of attendance and **the employer will be provided with a certificate of training that can be placed into the employee's file**.

Registration Info

The deadline for registration is Friday, April 17, 2020. It is the employer's responsibility to assure that the employee is present at 7:30 AM on Friday, May 1 **or** on Saturday, May 2 at the Immokalee IFAS Center, 2685 State Rd. 29 North, Immokalee, FL 34142 to receive their nametag. Upon arrival each participant will check in at the registration table and receive a packet containing their nametag, instructions (in both English and Spanish) session handouts, an evaluation form, rodeo cap and pencil. They will be directed to their respective course sessions.

Please give us the names of those who will be attending our 30th Farm Safety Day on **Friday, 1 May or Saturday, 2 May 2020 (please select the date)**. The cost is **$25.00** per person, which will include educational sessions, handouts, pencils, refreshments, lunch, and a cap.

Make checks payable to: SW Florida Citrus Advisory Committee

Mail registration and checks to:
University of Florida, IFAS, SWFREC
Attention: Barbara Hyman
2685 State Rd. 29 North
Immokalee, FL 34142

Or fax registration to: 239 658 3403
Deadline is Friday, April 17, 2020

Don't wait. The number of trainings offered and attendance at each training is LIMITED. For each day, class size is limited to the first 80 Spanish-speaking and 20 English-speaking people.

30th ANNUAL SAFETY DAY

Friday, 1 May 2020
Saturday, 2 May 2020

Location: University of Florida, IFAS, SWFREC
2685 State Rd. 29 North
Immokalee, FL 34142

SCHEDULE:

7:30-8:10	Check In, Coffee, Juice, Refreshments, Door Prizes
8:10-9:00	Session 1 (Begin sessions)
9:00-9:10	Break (change session, door prizes)
9:10-10:00	Session 2
10:00-10:10	Break (change session, door prizes)
10:10-11:00	Session 3
11:00-11:10	Break (change session, door prizes)
11:10-12:00	Session 4
12:00-1:30	Lunch and Adjourn

The 2020 FARM SAFETY DAY
REGISTRATION FORM

Please give us the names of those who will be attending our 30th Farm Safety Day on **Friday, 1 May or Saturday, 2 May 2020** at the Immokalee IFAS Center, 2685 State Rd. 29 North, Immokalee, FL 34142. The cost is **$25.00** per person, which will include educational sessions, handouts, refreshments, lunch, and a cap.

Make checks payable to:
Citrus Advisory Committee

Mail registration and checks to:
University of Florida, IFAS, SWFREC
Attention: Barbara Hyman
2685 State Rd. 29 North
Immokalee, FL 34142

Or fax registration to: 239 658 3403
Deadline is Friday, April 17, 2020

Company Name:

Administrative Contact Person:

E-mail address:

Mailing Address:

Telephone: _____ Fax:_____ County:_____

Please list the employees who will be attending our safety training and please check their language preference*****. If there is not enough space to fill in all attendants, please attach an additional sheet with the necessary information.

Name	Friday or Saturday	English	Spanish	Name	Friday or Saturday	English	Spanish
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***Please Note: It is very important that we know the date (Friday, 1 May or Saturday, 2 May 2020) and the language capabilities for each attendee.**
Next to each attendee's name please mark in which language they are more fluent.
If there are any questions, please contact **Barbara Hyman (hymanb@ufl.edu) at 239 658 3400.**
Don't wait. The number of trainings offered and attendance at each training is LIMITED. Don't wait. For each day, class size is limited to the first 80 Spanish-speaking and 20 English-speaking people.

Special Thanks to sponsors of the “Flatwoods Citrus” newsletter for their generous contribution and support.
If you would like to be among them, please contact me at 863 674 4092 or maz@ufl.edu

Steve Fletcher
Fletcher Flying Service, Inc.
Phone: 239 860 2028
Fax: 863 675 3725

Scott Houk
Dow AgroSciences
13543 Troia Drive
Estero, FL 33928
Phone: 239-243-6927
SEHouk@dow.com

Adrian Jahna
BASF Corporation
Cell: 863 443 2404
Adrian.jahna@basf.com

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Brad Lang
Territory Sales Manager
Phone: 229 894 0568
brad.lang@nufarm.com

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AGLIME SALES, INC.
P.O. Box 60
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863-241-9007
clint.wise@aglimesales.com

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Phone: 239-994-8594
Edward.Early@fmc.com
Eric Johnson
Eric.R.Johnson@fmc.com

EL NIÑO/SOUTHERN OSCILLATION (ENSO) DIAGNOSTIC DISCUSSION

issued by

CLIMATE PREDICTION CENTER/NCEP/NWS
and the International Research Institute for Climate and Society

12 December 2019

ENSO Alert System Status: Not Active

Synopsis: ENSO-neutral is favored during the Northern Hemisphere winter 2019-20 (70% chance), continuing through spring 2020 (~65% chance).

Above-average sea surface temperatures (SSTs) were observed in the central tropical Pacific Ocean during November, with regions of above and below average SSTs observed farther east (Fig. 1). In the most recent week, the SST indices were near average in the east-central and eastern Niño regions (+0.1°C to +0.3°C) and were above average in the westernmost Niño-4 region (+0.9°C; Fig. 2). The equatorial subsurface temperature anomalies (averaged across 180°-100°W) returned to near zero during the month (Fig. 3), reflecting the progression of Kelvin waves to the east (Fig. 4). The low-level winds were near average during November, while easterly upper-level wind anomalies were observed over the western Pacific. Finally, tropical convection was suppressed near and east of the Date Line and also over Indonesia, and somewhat enhanced over the western Pacific northeast of Papua New Guinea (Fig. 5). The overall oceanic and atmospheric system was consistent with ENSO-neutral.

The majority of models in the IRI/CPC plume (Fig. 6) continue to favor ENSO-neutral (Niño-3.4 index between -0.5°C and +0.5°C) through the Northern Hemisphere summer. Many dynamical model forecasts suggest Niño-3.4 SST index values may remain near +0.5°C into December before decreasing toward zero. Forecasters agree with this consensus and believe the chances for El Niño to be 25-30% during the winter and spring. In summary, ENSO-neutral is favored during the Northern Hemisphere winter 2019-20 (70% chance), continuing through spring 2020 (~65% chance; click CPC/IRI consensus forecast for the chance of each outcome for each 3-month period).

This discussion is a consolidated effort of the National Oceanic and Atmospheric Administration (NOAA), NOAA's National Weather Service, and their funded institutions. Oceanic and atmospheric conditions are updated weekly on the Climate Prediction Center web site (El Niño/La Niña Current Conditions and Expert Discussions). Forecasts are also updated monthly in the Forecast Forum of CPC's Climate Diagnostics Bulletin. Additional perspectives and analysis are also available in an ENSO blog. The next ENSO Diagnostics Discussion is scheduled for 9 January 2020. To receive an e-mail notification when the monthly ENSO Diagnostic Discussions are released, please send an e-mail message to: ncep.list.enso-update@noaa.gov.

Climate Prediction Center
National Centers for Environmental Prediction
NOAA/National Weather Service
College Park, MD 20740

FACTORS AFFECTING CITRUS FRUIT PRODUCTION AND QUALITY

Citrus fruit production and quality are influenced by many factors including climatic conditions and production practices.

In subtropical climates, the temperature usually falls below 70 °F for several months during winter. This period of cool temperatures causes growth to cease and citrus trees to become dormant for about 3 months. The cool temperatures during this dormant period promote floral induction. When warm spring temperatures, among other things, stimulate the resumption of vegetative growth, induced buds grow and produce flowers. In tropical climates, there is no period of cold temperature to induce dormancy. However, with periods of less than ample soil moisture (drought stress), flushes of bloom and vegetative growth normally follow these drought periods.

It is well documented that vegetative and reproductive (fruit) growth compete for available resources, such as carbohydrates (sugars) and mineral nutrients. Flushes of heavy vegetative growth will reduce the resources available to developing fruit, resulting in fruit with lower total soluble solids (TSS). A period of dormancy, during which there is little or no vegetative growth, reduces this competition for resources and results in fruit with increased TSS. The competition for resources between vegetative and reproductive growth is one of the reasons that citrus fruit grown in tropical climates tend to have lower TSS than those grown in subtropical climates.

CLIMATE

Within fairly broad parameters of adequate soil and reasonably good cultural and crop protection practices, climate is the most important component of the climate-soil-culture complex causing differences in fruit quality among commercial citrus production areas.

There is considerable diversity among citrus cultivars in their response to climate, especially as regards to market quality of the fruit. For example, ‘Navel’ orange develops its best eating and eye-appeal qualities in a Mediterranean type climate with cool, wet winters and hot, dry summers. In wet, tropical regions, ‘Navel’ fruit tends to be large, with poorly colored rinds, and low TSS and acid in the juice. Unlike ‘Navel’, grapefruit cultivars develop optimum internal quality in warm climates with little winter chilling. ‘Valencia’ orange is adapted to a broad range of climates, producing excellent to acceptable fruit quality in most of the world’s important citrus regions.

Some, but not all of these climate-induced differences can be overcome with cultural practices. For example, there is no known cultural practice that allows California (a Mediterranean climate) to produce low-acid, thin-peel grapefruit similar to the world’s top quality grapefruit grown in Florida (a humid subtropical climate).

Worldwide climate has a significant effect on citrus yield, growth, fruit quality, and economic returns. In growing regions where the average temperatures remain high all year (tropical climates), fruit peel chlorophyll does not degrade and oranges and tangerines remain green, whereas in cool-winter subtropical climates oranges and tangerines develop more intense orange peel color and greater eye-appeal at maturity.

In lowland tropical areas, due to high respiration rates at warm

temperatures, fruit mature quickly and do not have sufficient time to accumulate high TSS and acidity declines rapidly so that the soluble solids/acid ratio increases sharply and the fruit quickly become insipid and dry. TSS in fruit accumulate most slowly in cool coastal areas. Maximum levels of TSS are usually attained in the mid-tropics and in humid subtropical regions with warm winters. Total acid (TA) levels are generally greatest in semiarid or arid subtropical and coastal climates and decline more slowly as fruit mature compared with other climates. Decrease in TA is primarily a function of temperature (heat unit accumulation) and the rapid respiration of organic acids at those higher temperatures.

GROWTH REGULATORS

Application of plant growth regulators (PGRs) can provide significant economic advantages to citrus growers when used in appropriate situations. Depending on cultivar and timing, PGRs may improve fruit set, increase fruit size by reducing cropload, extend the harvest season by delaying rind aging, and reduce preharvest fruit drop.

Gibberellic acid (GA) is recommended for citrus hybrids that are weakly parthenocarpic and without sufficient cross-pollination to improve fruit set. Applied from full bloom to two-third petal fall, GA can effectively set and produce an excellent crop of seedless self-incompatible mandarin hybrids. Application of GA to citrus fruit approaching maturity enhances peel firmness and delays peel senescence.

Application of GA in the fall often increases juice extraction from sweet oranges. It is likely that GA enhances juice extraction efficiency because increased peel firmness provides better mechanical support for fruit within extraction cups.

Applied in winter during floral induction to cultivars that routinely flower heavily but set poor crops such as ‘Navel’, ‘Ambersweet’, and ‘Ortanique’, GA reduces flowering and often results in increased fruit set. A combination of GA and 2,4-D has been used in many fresh fruit growing regions to enhance peel strength and extend the harvest seasons for grapefruit and sweet oranges.

Naphthalene acetic acid (NAA) is used to thin fruit when excessive set occurs. Thinning heavily cropping trees with NAA increases fruit size. The greatest thinning response to NAA has been shown to occur when applications are made when the average fruit diameter is about 1/2 inch, which typically occurs 6 to 8 weeks post bloom. Thinning of ‘Murcott’ and ‘Sunburst’ tangerines with NAA was found to increase fruit size, average fruit weight, and percent packout through improved fruit appearance.

CULTIVAR/ROOTSTOCK

The most important determinant of fruit production and quality under the grower’s control is cultivar selection. Under comparable conditions, ‘Hamlin’ orange always has poorer juice color and lower TSS than ‘Midsweet’ or ‘Valencia’ orange. On the other hand, ‘Hamlin’ produces higher, more consistent yields per acre than any other sweet orange cultivar. Worldwide, ‘Valencia’ produces premium quality fruit with excellent internal quality, high sugars, superior flavor, and deep orange juice color at maturity.

Besides cultivar, many of the horticultural characteristics of cultivars are influenced by the rootstock, including tree vigor and size, and fruit yield, size,

maturity date, and quality. One of the best-known examples is the small fruit size of 'Valencia' budded on 'Cleopatra' mandarin (Cleo) rootstock. Cleo is well suited for use with 'Temple' orange, tangerines and tangerine hybrids. Sweet orange and grapefruit cultivars on Cleo generally produce small fruit and are not precocious, thus it is not commonly used for these varieties. Low yield associated with Cleo rootstock is the result of poor fruit set and size, and fruit splitting. Scions on Cleo are most productive on heavier soils.

Larger fruit with thicker, rougher peel, and lower concentrations of TSS and acid in the juice are generally associated with cultivars budded on fast-growing vigorous rootstocks such as rough lemon, 'Volkamer' lemon, *Citrus macrophylla*, and 'Rangpur'. However, these rootstocks impart high vigor to the scion and induce high yield. Tangerine fruit from trees grown on vigorous rootstocks tend to be puffy, hold poorly on the tree, and have high incidence of granulation.

Cultivars on slower-growing rootstocks generally do not produce vigorous vegetative growth, but tend to produce small to medium size fruit with smooth peel texture and good quality fruit with high TSS and acid content in the juice. This latter group of rootstocks includes trifoliate orange and some of its hybrids (citranges and citrumelos). Sweet oranges budded on 'Carrizo' citrange have been among the most profitable combinations over the long term in Florida. Planted on the right soils, trees on 'Swingle' citrumelo are very productive at high-density plantings.

IRRIGATION AND NUTRITION

Although citrus trees develop largely in response to their genetic endowment and the climate, good production practices can have favorable influences on fruit production and quality. Cultural practices that attempt to cope with climatic or weather problems include irrigation and nutrition. Irrigation is of particular importance during the spring, which coincides with the critical stages of leaf expansion, bloom, fruit set, and fruit enlargement.

Proper irrigation increases fruit size and weight, juice content and soluble solids:acid ratio. Soluble solids per acre may increase due to yield increase. However soluble solids per box and acid contents are reduced. Through its tendency to stimulate vegetative growth, irrigation in the dry fall and winter may reduce soluble solids in the fruit. Decline in total acid levels can also be aggravated by excessive irrigation.

Citrus trees require a good water management system and a balanced nutrition program formulated to provide specific needs for maintenance and for expected yield and fruit quality performance. Adequately watered and nourished trees grow stronger, have better tolerance to pests and stresses, yield more consistently, and produce good quality fruit. On the other hand, excessive or deficient levels of water or fertilizer will result in low fruit yield and oversize fruit with poor quality and diluted soluble solids content.

The most important nutrients influencing fruit quality are nitrogen, phosphorus, and potassium. However, when any other nutrient is deficient or in excess, fruit yield and quality are negatively altered. Nitrogen (N) increases juice content, TSS per box and per acre, and acid content. However, excessive N can induce excess vigor and promote a

vegetative rather than a flowering tree and can result in lower yields with lower TSS per acre. In contrast, low N levels promote extensive flowering but fruit set and yields are poor.

Phosphorus reduces acid content, which increases soluble solids:acid ratio. Potassium (K) increases fruit production, fruit size, green fruit and peel thickness. Foliar spray of potassium nitrate or monopotassium phosphate in the spring often increases fruit size of tangerine and grapefruit, and fruit size and total pound solids of 'Valencia' orange. Foliar application (6-8 weeks before bloom) of urea can increase flowering and fruit set.

SUNLIGHT AND PRUNING

Even though citrus trees can tolerate shade and still flower and fruit, maximum flowering occurs when trees are grown in full sun and light penetration through the canopy is maximized. Therefore, pruning, including topping and hedging, to avoid crowding is extremely important for optimum flowering. The amount of fruit that is set has a very significant effect on fruit quality. There is a positive correlation between the number of fruit per tree and fruit quality. When the number of fruit per tree is low, the peel texture, shape of fruit, and often fruit color are poor. Quality of individual fruit varies significantly, even on the same tree. Heavily shaded fruit borne on the interior of the canopy have less TSS than fruit on the exterior of the canopy. Insufficient light contributes to reduced TSS concentration of interior fruit nourished by heavily shaded leaves.

It is well established that shoots with fruit do not flower the following year. A heavy fruit crop tends to deplete carbohydrates and results in a small crop and increased vegetative growth the following year. Pruning after a heavy crop additionally stimulates vegetative growth and reduces fruit yield the following year. Pruning after a light crop and before an expected heavy crop can increase fruit size and help reduce alternate bearing. Pruning or topping and hedging usually increase fruit size and packout of fresh-market fruit by reducing crop load, thus increasing net cash returns to growers.

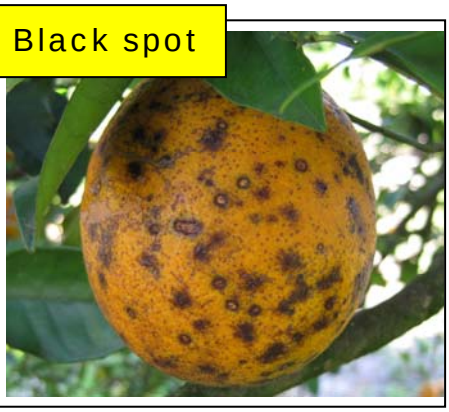
CONCLUSION

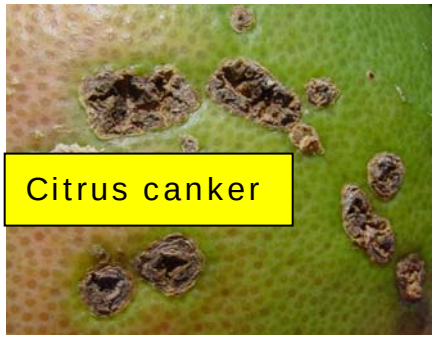
The improvement in citrus fruit production and quality that a grower can achieve through choice of scion/rootstock combinations, good irrigation management, balanced nutrition, and proper pruning may easily be overwhelmed by pests, diseases, and other injuries. Excessive leaf loss will noticeably reduce flowering the following spring and subsequent fruit production. The primary causes of leaf loss are freeze, tropical storm injury, salt and water stress problems including drought stress and flooding injuries, mites, greasy spot, herbicides and pesticide toxicities. Excessive leaf loss in the fall and in early winter is the worst thing that can happen to citrus trees. It will reduce accumulation of carbohydrates affecting flowering, fruit set, and fruit yield. Therefore, good practices in citrus groves should be adapted to minimize negative plant physiological stresses, improve tree health and performance, and enhance citrus trees to produce high yield of good fruit quality.

Fungicide effectiveness

Products	Canker	Greasy Spot	Alternaria	Scab	Melanose	Black spot	PFD
Copper	**Good**	**Good**	**Good**	Moderate	**Good**	Moderate	**Weak**
Oil	None	**Good**	None	None	None	None	None
Ferbam	None	Weak	Moderate	Moderate	Weak	Weak	Weak
Enable 2F		**Good**		**Good**		**Good**	
Headline	None	**Good**	**Good**	**Good**	**Good**	**Good**	**Good**
Abound	None	**Good**	**Good**	**Good**	**Good**	**Good**	**Good**
Gem	None	**Good**	**Good**	**Good**	**Good**	**Good**	**Good**
Pristine	None	**Good**	**Good**	**Good**	**Good**	**Good**	**Good**
Amistar Top	None	**Good**	**Good**	**Good**	**Good**	**Good**	**Good**

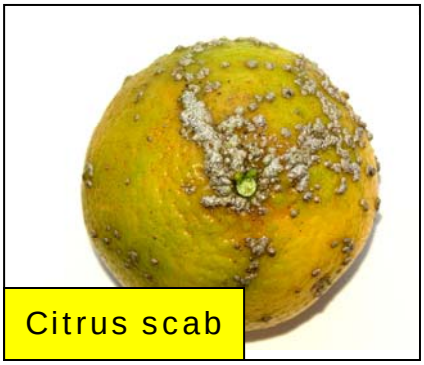
Black spot



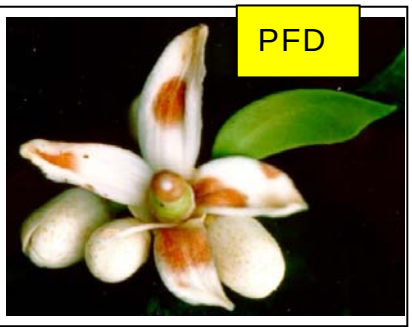


Greasy spot

Alternaria Brown spot



PFD



Citrus Spray Programs

Dr. Jawwad Qureshi and Dr. Phil Stansly, UF IFAS- Immokalee

Asian citrus psyllid (ACP) control has been the main objective of Florida citrus growers for more than 10 years. While some may question the value of controlling ACP in trees with high HLB incidence, replicated field studies have shown the economic benefit of maintaining young flush pathogen free. Good ACP control starts with effective dormant sprays that will control ACP when populations are low, reducing ACP infestation and thus HLB infection of the all-important spring flush. Pyrethroids (Danitol, Baythroid or Mustang) and organophosphates (dimethoate, chlorpyrifos,or Imidan) provide great winter season control of ACP. Best not to use pyrethroids or OPs again during the year except for border sprays which will reduce the need for whole block applications. Follow up with bloom sprays of labeled products to clean up stragglers. Subsequent whole block sprays should target ACP as well as other pests like rust mites and leafminers that may be problematic.

The table below offers alternative products for different months, depending on which pests are of major concern at the time. Neonicotinoids like imidacloprid, thiamethoxam or clothianidin have not been included as spray options due to their importance for controlling ACP in young trees. Superscripts after the pesticide name are now in sequential order to facilitate use and correspond to superscripts after pests controlled. Make choices based on: (1) effectiveness against ACP and other pests that may be problematic, (2) avoiding repetition of any insecticide mode of action in the interest of resistance management, and (3) rebuilding and maintaining an effective natural enemy complex in the grove. Confining the broad-spectrum insecticides (pyrethroids and organo-phosphates) to the winter season and border sprays during growing season will help conserve these products as well as populations of beneficial insects and mites.

Spray Options for Citrus Pest Management

Dormant Season — **Growing Season**

Months	Nov-Dec	Jan	Feb-Mar	Apr	May - June	July - Aug	Sep-Oct
Products *** Labeled for bloom**	OP[1] (e.g. Imidan, Dimethoate, chlorpyrifos)	Pyrethroid[2] (Mustang Danitol Baythroid)	*Sivanto[3] *Movento[4] *Portal[5] *Micromite[6] Intrepid[7] Exirel[8]	Portal[5] Micromite[6] Exirel[8] Apta[9] Sivanto[3] Oil[13]	Movento[4] Delegate[11] Abamectin[12] Knack[14] Exirel[8] Apta[9] Sivanto[3] Oil[13] MinectoPro[10]	Sivanto[3] Apta[9] OP[1] MinectoPro[10] Oil[13]	Movento[4] Delegate[11] Apta[9] Sivanto[3] Oil[13]
Pests	ACP Weevils	ACP Weevils	ACP Mites Leafminer Weevils Scales Aphids	ACP Mites Leafminer Weevils Aphids	ACP Rustmite Leafminer Scales	ACP	ACP Rustmite Leafminer

ACP^{+++} [1,2,3,4,8,9,10] ACP^{++} [5,11] ACP^{+} [6,12] Leafminer [6,7,8, 9,11, 12] Rustmite [4, 12]
Scales [4,13] Aphids [3,4] Mealybugs [3,4] (+++ excellent, ++ good,+ fair)

AERIAL APPLICATION OF PESTICIDES

Aerial application of pesticides can be done using various types of fixed wing aircraft or helicopters. The selection of aircraft depends on the size of the application area, application window, budgets and terrain. The objective is to use aircraft that apply the insecticide in the safest and most efficient manner.

Fixed wing aircraft are used when there are large, continuous areas that may be sprayed with the minimum number of turns. Helicopters are useful for treating discrete or isolated patches of host material. Fixed wing treatment is less costly than by helicopter. Monitoring of the spray operation will be done by project team members from both the ground and the air. Airborne observers will be using small twin-engine aircraft or helicopters. These personnel relay on-site information back to the project team leaders and the pilots to ensure that the spray is carried out as planned.

Weather Monitoring

The weather is the most crucial factor in determining if a spray will occur on a particular day. Successful control of pests requires at least 1 hour without precipitation to allow the insecticide to adequately dry and stick to foliage and pest.

Wind speed is also a critical factor to the actual delivery of the spray from aircraft. The morning is usually the most calm period of the day; however, spraying can be done with some wind. Application is halted when sustained wind speeds exceed 6 miles/hr to prevent unnecessary drift of the pesticide. Specific weather conditions are required to allow the delivery of the insecticide at the desired concentration. Because of the uncertainty of weather, planned aerial spraying for any particular day may be cancelled at the last minute.

Determining the Aircraft Flight Paths

Aircraft apply insecticides in a series of parallel swaths over a spray zone. Well before spraying actually occurs, the route and pattern taken by the spray aircraft will be determined to ensure that the shortest time is spent over the spray zones. Optimal patterns will be designed to minimize the number of times the aircraft has to turn. Each turn wastes time in re-orienting the aircraft as it lines up for its run through the zone.

Safety considerations also play a large role in determining the aircraft's flight pattern.

Identifying the Spray Boundaries

Spray aircraft use sophisticated Global Positioning System-based navigational aids to pin-point their precise location. The GPS system also provides a record of the exact time

and location the aircraft were over the spray area and also records the precise moment when the spray equipment was on or off.

Monitoring the Spray Pattern

Even though spray equipment onboard the aircraft are calibrated well before the time of spraying, ground monitoring of spray pattern and deposits are done to ensure that the pesticide was delivered to the target foliage at the desired concentration and distribution. Deposit monitoring is also done to insure that the application does not drift beyond the spray boundaries. Even application is critical to the performance of most pesticides. Uneven application results in under-dosing and poor control of the target pest in some areas and over-dosing and wasted pesticide in other areas.

Some pesticide labels say the pesticide can be applied by either fixed-wing aircraft or by helicopters. The main advantage of aerial spraying is that it can be carried out quickly and at times when ground equipment cannot operate. The main disadvantage is the increased possibility of pesticide drift onto neighboring areas and decreased spray coverage. Even when properly calibrated and operated, aircraft sprayers are often not as thorough in applying material as ground rigs, especially to the lower surfaces of the leaves and to the lower portions of the trees.

Aerial applications should not be used for small acreages or in residential areas, and should be done only by properly trained individuals who hold a valid pesticide applicator's certificate and have licenses.

Flatwoods Citrus

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Multi-County Citrus Agent
Hendry County Extension Office
P.O. Box 68
LaBelle, FL 33975

Subscriber's Name:_____

Company:_____

Address:_____

City:_____State:_____Zip:_____

Phone:_____

Fax:_____

E-mail:_____

Racial-Ethnic Background

__American Indian or native Alaskan
__Asian American
__Hispanic
__White, non-Hispanic
__Black, non-Hispanic

Gender

__Female __Male