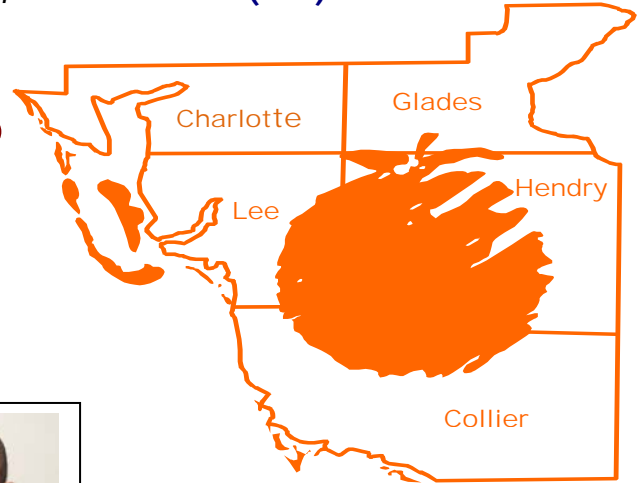


Hendry County Extension, P.O. Box 68, LaBelle, FL 33975 (863) 674 4092

# Flatwoods Citrus



Vol. 22, No. 1

January 2019

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



**Have a Productive New Year!!!**

## *Table of Contents*

Upcoming Event	2-4
Flatwoods Citrus Newsletter Sponsors – Thank you!	5-7
El Niño/Southern Oscillation (ENSO) Diagnostic Discussion	8
Critical Temperature	9
Flower Bud Induction Advisory #5 for 2018-2019-1/7/19	10
Factors Affecting Citrus Fruit Production and Quality	11-14
Fungicide Effectiveness	15
Spray Options for Citrus Pest Management	16
Certified Pile Burners Course	17-21

The Institute of Food and Agricultural Sciences (IFAS) is an Equal Employment Opportunity – Affirmative Action Employer authorized to provide research, educational information and other services only to individuals and institutions that function without regard to race, color, sex, age, handicap or national origin.  
U.S. DEPARTMENT OF AGRICULTURE, COOPERATIVE EXTENSION SERVICE, UNIVERSITY OF FLORIDA, IFAS, FLORIDA A. & M. UNIVERSITY COOPERATIVE EXTENSION PROGRAM, AND BOARDS OF COUNTY COMMISSIONERS COOPERATING.

## Seminar--Scouting and managing citrus diseases

**Pre-registration is required.** No registration fee and lunch is free Thanks to **Ed Early with FMC Corporation**. To reserve a seat, call 863 674 4092 or send an e-mail to Dr. Mongi Zekri at [maz@ufl.edu](mailto:maz@ufl.edu)

Location: Southwest Florida Research & Education Center, Immokalee

Date & time: Wednesday, January 16, 2019, 10:00 AM – 12:00 Noon.

Speakers: Dr. Ozgur Batuman and Dr. Megan Dewdney, UF-IFAS

Program Coordinator: Dr. Mongi Zekri, UF-IFAS

Sponsor: **Ed Early with FMC Corporation**

2 CEUs for certified crop advisors (CCAs)

2 CEUs for pesticide license renewal

### **Agenda**

**10:00 AM - 10:40 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

**10:40 AM - 11:20 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

**11:20 AM - 11:45 AM**

**Dr. Ozgur Batuman, UF-IFAS**

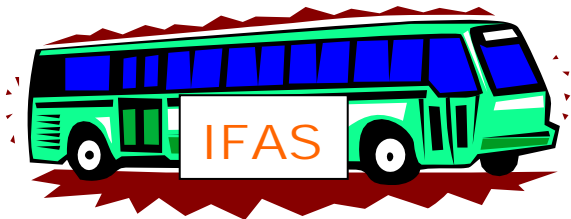
5. Citrus greening (HLB): scouting, symptoms, life cycle, epidemiology, damage, management

**11:45 AM - 12:00 Noon**

6. **Update on products from FMC Corporation, Dennis Johnson**

**12:00 Noon, Lunch**

## HENDRY COUNTY EXTENSION AG TOURS



**Saturday, 2 February 2019**  
**Saturday, 9 March 2019**  
**For more information or to sign up,**  
**call Debra at 863 674 4092**

# Seminar

## **Pre-registration is required.**

No registration fee and lunch is free Thanks to **Sam Monroe with Nichino**.  
To reserve a seat, call 863 674 4092, or send an e-mail to Dr. Mongi Zekri at:  
[maz@ufl.edu](mailto:maz@ufl.edu)

**2 CEUs for Certified Crop Advisors (CCAs)**  
**2 CEUs for Pesticide License Renewal**

## **All You Need to Know About Scouting and Management of Citrus Insect Pests**

Date: Thursday, **February 14, 2019**, Time: 10:00 AM – 12:00 Noon

Location: Immokalee IFAS Center

Program Coordinator: Mongi Zekri, UF-IFAS

Program Sponsor: Sam Monroe with Nichino

### **Agenda**

----10:00 AM - 11:00 AM

1. **Scouting and managing citrus pests and beneficials**

Citrus leafminer and citrus psyllid: damage, symptoms, scouting, life cycle, management

**Dr. Jawwad Qureshi, UF-IFAS**

**11:00 AM – 11:10 AM Break**

----11:10 AM - 11:40 AM

2. **Scouting and managing citrus rust mites (CRM)**

Scouting methods, update on new products for CRM control

**Barry Kostyk, UF-IFAS**

----11:40 AM – 12:00 Noon

3. **Nichino Citrus Product Update** as part of your pesticide resistance management program

**Dr. Scott Croxton, Nichino**

## **2019 ANNUAL FLORIDA CITRUS GROWERS' INSTITUTE**

Date & Time: Tuesday, 2 April 2019, 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 February.**

## Annual Certified Pile Burners Course in SW Florida

Wednesday, 6 February 2019

**Pre-registration is required to attend, and class size is limited to the first 50 people.**

PRE-REGISTRATION WILL NOT BE ACCEPTED WITHOUT PAYMENT OF THE REGISTRATION FEE.

**Registration fee: \$50**

**The \$50 fee covers the training sessions, a booklet with all the presentations in color, other handouts, refreshments, and lunch.**

Send your registration form and check as soon as possible.

*Location: The Immokalee IFAS Center*

The Florida Division of Forestry and University of Florida Cooperative Extension Service will be conducting a Certified Pile Burners Course that 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 8:00 am till 4:30 pm at the **Southwest Florida Research and Education Center in Immokalee.**

[Detailed information including registration is attached here in this newsletter issue.](#)



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



**Sam Thayer**  
President

P.O. Box 1849  
Dundee, FL 33838  
Phone: (863) 439-3667  
Fax: (863) 439-6608

[www.maxijet.com](http://www.maxijet.com)  
[sam@maxijet.com](mailto:sam@maxijet.com)

The Standard of Quality In Low-Volume Irrigation

**AGRICULTURAL  
LAND SERVICES**



Land Solutions inc.

AG Specialists Billy Rollins & Hunter Ward

**LandSolutions.net | 239.489.4066**

**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**



Proven Broad spectrum systemic bactericide, fungicide, exempted from EPA registration to combat HLB, canker, PFD and other diseases.

407 302-6116  
[www.agroresearchinternational.com](http://www.agroresearchinternational.com)



**Billy Hopkins**  
*Hopkins Nursery*  
239 658 0370  
[tropicals@wildblue.net](mailto:tropicals@wildblue.net)  
Tropical fruit & peach trees

**Clint Wise Jr.**  
AGLIME SALES, INC.  
P.O. Box 60  
Babson Park, FL 33827  
863-241-9007  
[clint.wise@aglimesales.com](mailto:clint.wise@aglimesales.com)



**BLACKSMITH  
BIOSCIENCE**  
Jack Kilgore  
Technical Sales Rep, SE US

Office: 7150 East Brentwood Road  
Ft. Myers, FL 33919

(239) 707-7677  
g8trmanjek@comcast.net  
www.blacksmithbio.com

**NICHINO AMERICA**  
**Scott Croxton**  
[scroxton@nichino.net](mailto:scroxton@nichino.net)  
**Samuel S. Monroe**  
[smonroe@nichino.net](mailto:smonroe@nichino.net)  
[www.nichino.net](http://www.nichino.net)

**Stacey Howell**  
**BAYER**  
**Cell: 239-272-8575**  
[stacey.howell@bayer.com](mailto:stacey.howell@bayer.com)



**Frank Miele**  
**Office: 863 357 0400**  
**Cell: 954 275 1830**  
**Fax: 863 357 1083**  
**E-mail: famiele1@aol.com**

**TIGER-SUL IS A PROUD SPONSOR OF  
FL CITRUS GREENING RESEARCH**

Discover how TIGER Greening Guard Citrus Mix is helping maintain strong returns on investments and keeping HLB infected trees as healthy and productive as possible, for as long as possible.

**Mark Douglas**  
Tiger-Sul Products, LLC  
[mdouglas@tigersul.com](mailto:mdouglas@tigersul.com)  
Phone: 850.501.6127  
[www.tigersul.com](http://www.tigersul.com)




**ASK FOR TIGER!**

**Heath Prescott**  
**KeyPlex®**  
**Toll Free: 800 433 7117**  
**Mobile: 863 781 9096**  
**Nextel: 159\*499803\*6**

**Arysta LifeScience**  
**Shaun Yule**  
**Phone: 386-561-0493**  
**E-mail: shaun.yule@arysta.com**

**Wellmark**  
**Extinguish**  
**www.extinguishfireants.com**  
**Jack Kilgore**  
**M: 239-707-7677**  
[g8trmanjek@comcast.net](mailto:g8trmanjek@comcast.net)



**Plant Food  
Systems, Inc.**

P.O. Box 775  
Zellwood, FL 32798  
Tel: 407 889 7755

POLYON® Controlled-Release fertilizer  
makes you more efficient. *Ask me how!*



**Brett Howell (239-986-6638)**  
**Trey Whitehurst (863-633-8711)**  
[www.harrells.com](http://www.harrells.com)



**Imidan**  
Agricultural Insecticide

**Bart Hoopingarner**  
(941) 737-7444  
bhoopingarner@gowanco.com



**FMC Corporation**

**Ed Early**

**Phone: 239-994-8594**

**Edward.Early@fmc.com**

**Eric Johnson**

**Eric.R.Johnson@fmc.com**



**Mark White**

**Cell: 239-214-1072**

**MWhite@GPSolutionsFL.com**

**Toll Free: 866-648-7630**

**www.GPSolutionsFL.com**



FOLLOW  
US:



**Charles McCartney**  
**CMcCartney@timacusa.com**  
**www.us.timacagro.com**



**Reese Martin**

**Reese.Martin@actagro.com**

**863 605 8533**

**www.actagro.com**

**Adrian Jahna**  
**BASF Corporation**

**Cell: 863 443 2404**

**Adrian.jahna@basf.com**

# EL NIÑO/SOUTHERN OSCILLATION (ENSO) DIAGNOSTIC DISCUSSION

issued by

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

10 January 2019

**ENSO Alert System Status: El Niño Watch**

**Synopsis: El Niño is expected to form and continue through the Northern Hemisphere spring 2019 (~65% chance).**

ENSO-neutral continued during December 2018, despite widespread above-average sea surface temperatures (SSTs) across the equatorial Pacific Ocean (Fig. 1). In the last couple of weeks, all four Niño indices decreased, with the latest weekly values at +0.2°C in the Niño-1+2 region and near +0.7°C in the other regions (Fig. 2). Positive subsurface temperature anomalies (averaged across 180°-100°W) also weakened (Fig. 3), but above-average temperatures continued at depth across most of the equatorial Pacific Ocean (Fig. 4). The atmospheric anomalies largely reflected intra-seasonal variability related to the Madden-Julian Oscillation, and have not yet shown a clear coupling to the above-average ocean temperatures. Equatorial convection was generally enhanced west of the Date Line and suppressed east of the Date Line, while anomalies were weak or near average over Indonesia (Fig. 5). Low-level winds were near average, while upper-level wind anomalies were westerly over the eastern Pacific. The traditional Southern Oscillation index was positive, while the equatorial Southern Oscillation index was slightly negative. Despite the above-average ocean temperatures across the equatorial Pacific Ocean, the overall coupled ocean-atmosphere system continued to reflect ENSO-neutral.

The majority of models in the IRI/CPC plume predict a Niño3.4 index of +0.5°C or greater to continue through at least the Northern Hemisphere spring 2019 (Fig. 6). Regardless of the above-average SSTs, the atmospheric circulation over the tropical Pacific has not yet shown clear evidence of coupling to the ocean. The late winter and early spring tend to be the most favorable months for coupling, so forecasters still believe weak El Niño conditions will emerge shortly. However, given the timing and that a weak event is favored, significant global impacts are not anticipated during the remainder of winter, even if conditions were to form. In summary, El Niño is expected to form and continue through the Northern Hemisphere spring 2019 (~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 14 February 2019. 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](mailto:ncep.list.enso-update@noaa.gov).

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



## [Determining Critical Temperature](https://fawn.ifas.ufl.edu/tools/coldp/crit_temp_select_guide_citrus.php)

[https://fawn.ifas.ufl.edu/tools/coldp/crit\\_temp\\_select\\_guide\\_citrus.php](https://fawn.ifas.ufl.edu/tools/coldp/crit_temp_select_guide_citrus.php)

### Using Citrus Leaf Freezing Information to Determine Critical Temperature

**Chris Oswalt**, Polk County Extension [E-mail Chris Oswalt](mailto:Chris.Oswalt@floridaextension.com)

With the onset of cooler temperatures citrus trees cease active growth and become quiescent. This continued quiescence at lower temperatures results in a subsequent increase in cold hardiness termed acclimation. Citrus trees proceed through many changes during acclimation. These changes include: increases in sugars and amino acids with decreases in starch levels within plant tissues. Tissue moisture decreases along with increases in the stability and binding of cell water. These factors combine to increase the ability of citrus tissues to withstand the formation and presence of ice.

Citrus trees acclimated to cold temperatures have survive temperatures as low as 14°F. Acclimation is affected by exposure temperatures, scion cultivar, rootstock cultivar, rootstock/scion combination, tree nutritional status, crop load and water stress. Acclimation is dynamic and will change during the winter in response to warming exposure temperatures with a possible resumption of growth.

Leaf killing points vary in magnitude in response to the above conditions, although the predominate factor, would be exposure temperatures. Studies of citrus leaf killing point temperatures clearly indicate that citrus trees grown in more northern growing areas acquire greater acclimation than trees grown in growing regions further south. Trees grown in southern regions of the state are also more susceptible to active growth due to favorable growing conditions during the winter. Non-acclimated citrus leaves will generally survive to temperatures of 24°F. New spring flush leaves formed in April will rarely survive temperatures of 31°F, by mid May these leaves will have similar leaf killing points to mature leaves. Research studies indicated that citrus leaf killing points can range from 16°F to 24°F during the winter with a Satsuma cultivar reaching 14°F during one year. Field observations indicated that these leaf killing point values hold up in a number of freezes.

#### Citrus Leaf Killing Temperatures for Florida Citrus

Location	Variety/Rootstock	12/03/18	12/10/18	12/17/18	12/26/18	1/2/19
Balm	Valencia/Carrizo	20.5	23	23	24	23
Ft. Meade	Valencia/Cleo	20	22	23	24	23
Frostproof	Hamlin/Swingle	20.5	22	23	24	22
Green Swamp	Hamlin/Swingle	18	21	23	22	21.5

FLOWER BUD INDUCTION ADVISORY #5 for 2018-2019-  
01/07/2019



[L. Gene Albrigo](#), Horticulturist Emeritus  
Citrus Research & Education Center, Lake Alfred, FL

This is a service to our citrus growers posted on the CREC website. The indicated Expert System on intensity and time of bloom can be accessed at the designated Web Site: <http://disc.ifas.ufl.edu/bloom> If you are not familiar with the website and flower bud induction in citrus you should read the overview section in the first advisory this year.

**Current Status:** We now have December flower bud growth initiation indicated for north, south and western FAWN sites but not Sebring to Lake Alfred. The first wave or cohort of flower buds initiated growth from 20 December in Umatilla to about Christmas in most other areas with 680 to 840 hours of induction, respectively, from south to north citrus areas. **The projected bloom dates for this cohort of flowers are now from February 23 in Umatilla to at or near March 1st for most other areas according to the 'Citrus Flowering Monitor System'.** The weather services predict cooler weather this coming week, which should delay flowering a bit pushing the full bloom date to March 1st as of now.

Since the first flowering wave was initiated with only 680 to 750 hours of induction in the south, a second wave of flowering is very likely in the Indian River and Immokalee areas.

**If you didn't apply a flowering enhancement spray of urea or PO3 at the beginning of initiation of the current flowering wave, it is now too late.** I don't advise applying a spray at the beginning of a second wave since over 800 hours of induction will have been accumulated, sufficient for a good two-part spring bloom.

**For spring psyllid control:** The small amount of flush associated with a little flowering has passed the egg and nymph stage and adult stage psyllids predominate. Bud break of the new spring flush should be about 15 to 20 January so watch carefully and get an adult spray on before feather flush is present. If you wait until you see flush it is too late and the adults have started laying eggs.

**For bee keepers.** I think the bloom will be delayed until early March and earliest 10 % open flowers will likely be no sooner than mid-February. I will keep you posted on a weekly basis.

If you have any questions, please contact me ([albrigo@ufl.edu](mailto:albrigo@ufl.edu)).

## 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.

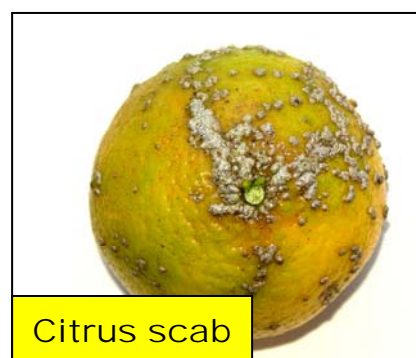
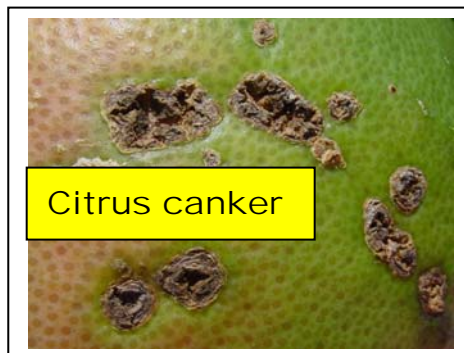
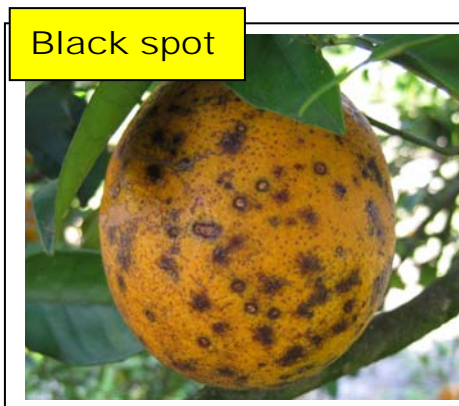
It is well established that shoots with fruit do not flower the following year. A heavy fruit crop tends to deplete carbohydrates and results in a small crop and increased vegetative growth the following year. Pruning after a heavy crop additionally stimulates vegetative growth and reduces fruit yield 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	<u>Canker</u>	<u>Greasy Spot</u>	<u>Alternaria</u>	<u>Scab</u>	<u>Melanose</u>	<u>Black spot</u>	<u>PFD</u>
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



# Spray Options for Citrus Pest Management

Dormant Season

Growing Season

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

Insecticide alternatives for different times of the year based on pest controlled, efficacy against ACP (+++ excellent, ++ good, + fair) resistance management, conservation of beneficials and cost. Subscripts on products indicate pests controlled. Neonicotinoids and premixes not included. \* Permitted on bloom







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 6, 2019**. 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 (if you have one) and/or contact phone number.
5. A check made out to: Hendry County 4-H for \$50.00.

The first fifty individuals to provide these five 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 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 6, 2019*

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 6, 2019**

**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

**Location: Southwest Florida Research and Education Center  
(Immokalee IFAS Center)**

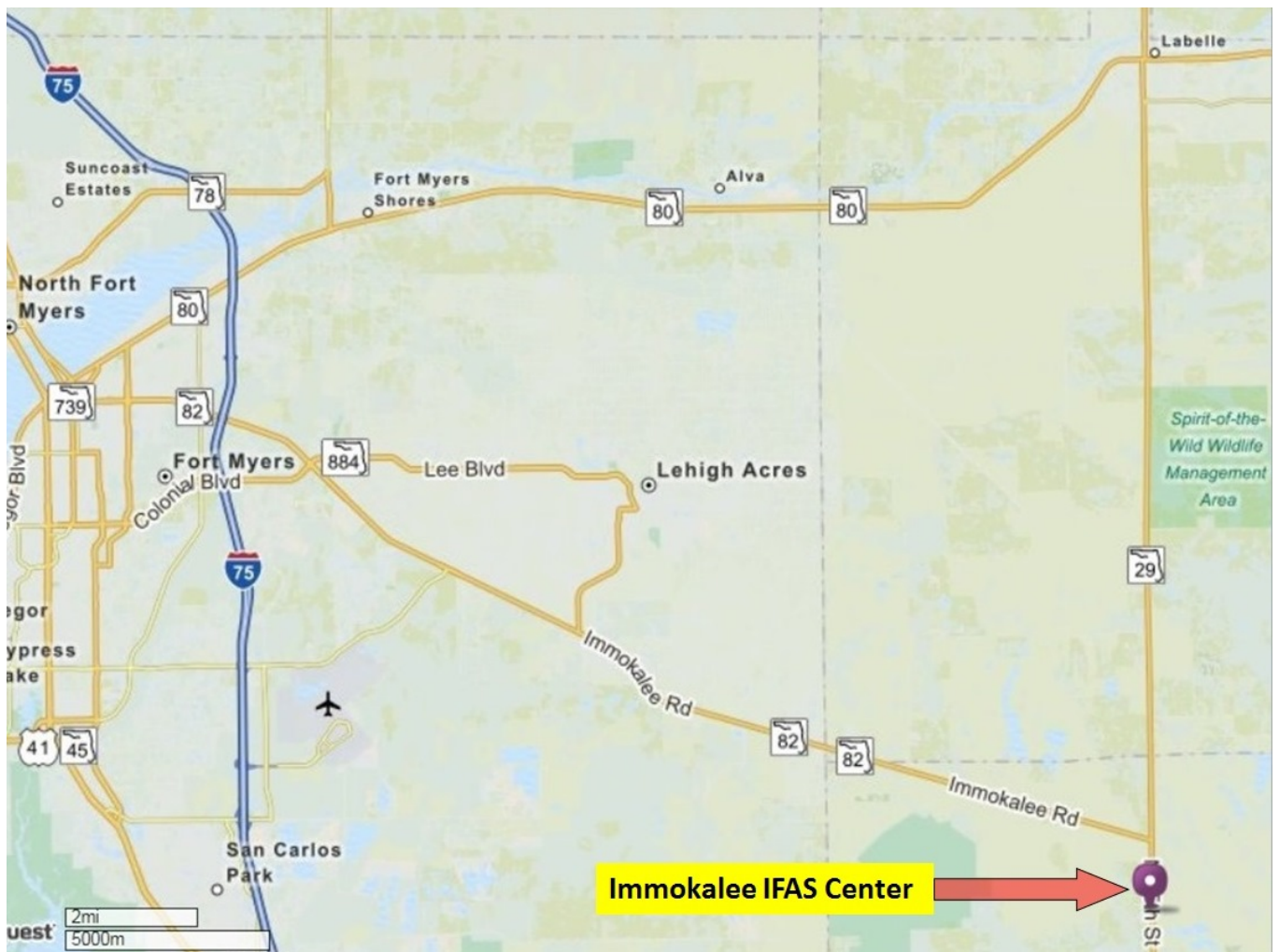
2685 State Road 29 North, Immokalee, FL 34142 (239) 658-3400

**Contact: 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**



## Florida's Certified Pile Burner Training Frequently Asked Questions



**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.

# Flatwoods Citrus

If you did not receive the *Flatwoods Citrus* newsletter and would like to be on our mailing list, please check this box and complete the information requested below.

If you wish to be removed from our mailing list, please check this box and complete the information requested below.

Please send: Dr. Mongi Zekri  
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