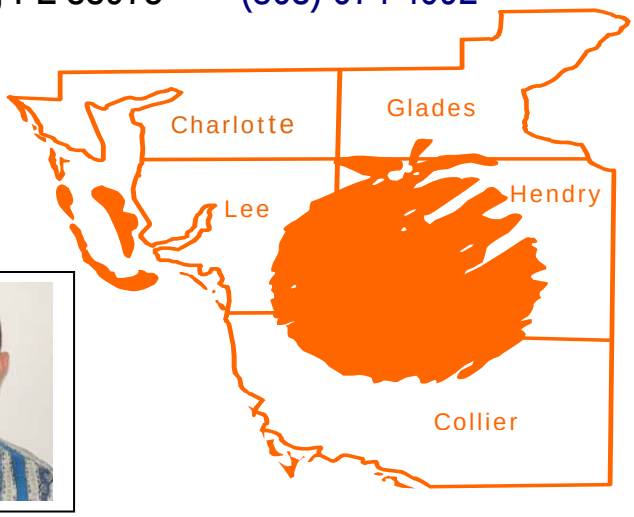
UF UNIVERSITY of FLORIDA
IFAS Extension

EXTENSION

Institute of Food and Agricultural Sciences

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

Flatwoods Citrus



Vol. 20, No. 1 **January 2017**

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

Have a Happy Holiday Season and a Productive Healthy New Year!!!

Table of Contents

Previous issues of the Flatwoods Citrus newsletter can be found at:
http://citrusagents.ifas.ufl.edu/agents/zekri/index.htm
http://irrec.ifas.ufl.edu/flcitrus/

Seminar

Citrus BMPs related to plant nutrition

Thursday, January 19, 2017, 10:00 AM - 1:00 PM

Location: Immokalee IFAS Center

Program Coordinator: Mongi Zekri, UF-IFAS

Agenda

10:00 Introductions – Mongi Zekri, UF-IFAS

10:05 BMP Update – Bonnie Wolf-Pelaez, FDACS, Office of Ag Water Policy
Best management practices related to plant nutrition and irrigation of crops

10:30 – Citrus Micronutrient Deficiency Symptoms – Mongi Zekri, UF-IFAS
Deficiency symptoms of iron, zinc, manganese, boron, copper, chlorine, molybdenum, and nickel and correction of those deficiencies for citrus

10:50 – Break

11:00 - Effect of Foliar Nutrient Applications and Current Studies in South Florida – Kelly Morgan, UF-IFAS
Importance of foliar nutrition with relation to citrus tree health

11:20 – Development of Slow/Controlled Release Fertilizers – Wes Haun, Tigersul
Importance of controlled release fertilizer in citrus plant nutrition

11:40 – Overview of Sulfur/Clay Encapsulated Macro and Micronutrients for HLB – Todd Wilson and Jack Zorn, Tigersul
Tigersul fertilizer products to alleviate citrus greening (HLB) negative impacts on citrus trees

12:00 – Lunch sponsored by Tigersul

2 CEUs for Certified Crop Advisors (CCAs)

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

Annual Certified Pile Burners Course in SW Florida

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

Registration fee: $50

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

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

Send your registration form and check as soon as possible. This class usually gets full 2-3 weeks before the event.

Date & time: Wednesday, 1 February 2017, 8:00 AM – 4:30 PM.

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 was included in the previous issue and is also available online: http://www.freshfromflorida.com/content/download/72725/1916331/Certified_Pile_Burner_Class_Hendry_2-1-2017.pdf

Registration Form

Florida's Certified Pile Burner Program
Wednesday, February 1st, 2017

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

Name

Mailing address

Email address

Phone Number

Florida Forester Service Customer Number

Register:
http://www.cvent.com/events/2017-florida-citrus-show/event-summary-32c16c9d26a14ca9924e9f8db2cd9a3e.aspx

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

Date: Wednesday, **February 8**, 2017, Time: 9:00 AM **– 1:00 PM**
Location: Immokalee IFAS Center
Program Coordinator: Mongi Zekri, UF-IFAS
Program Sponsor: Sam Monroe with Nichino

Agenda

----9:00 AM - 10:00 AM

1. Scouting citrus for pests and beneficials

Spider mites, rust mites, weevils, citrus leafminer, psyllid, scale insects, other pests

Dr. Phil Stansly, UF-IFAS

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

2. **Chemical and Biological Control of Asian Citrus Psyllid**

Psyllid suppression, Predators, Parasitoid Tamarixia radiate, Effect on Yield

Dr. Jawwad Qureshi, UF-IFAS

11:00 AM – 11:10 AM Break

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

3. Scouting and Management of Citrus Rust Mites (CRM)

Scouting methods, new products for CRM control

Barry Kostyk, UF-IFAS

----11:40 AM – 12:00 Noon

4. 2016 Nichino Citrus Product Update

Portal citrus pests controlled, Apta citrus pests controlled, Portal and Apta as part of your pesticide resistance management program

Dr. Scott Croxton, Nichino

3 CEUs for Certified Crop Advisors (CCAs)
3 CEUs for Pesticide License Renewal
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

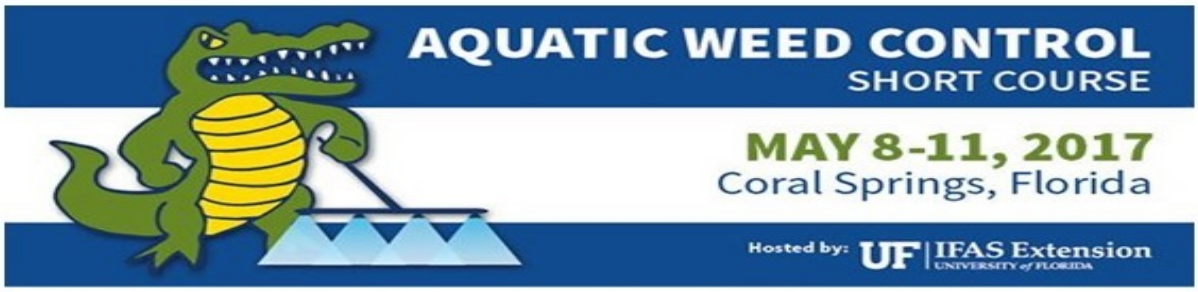
2017 ANNUAL FLORIDA CITRUS GROWERS' INSTITUTE

Date & Time: Tuesday, 4 April 2017, 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.



The 2017 Aquatic Weed Control Short Course will be held May 8-11, 2017 at the Coral Springs Marriott.

Certification Exams and CEUs

Just getting started?
Complimentary Commercial, Public, and/or Private pesticide applicator certification testing will be offered on Thursday, May 5th after the course concludes for those looking to become licensed.

Already licensed? Earn up to 22 Florida CEUs and fully re-certify your Aquatic, Natural Areas, Right-of-Way, Forestry, or Private applicator license!

The Short Course is appropriate for new and experienced applicators alike!

Registration opens in December and sponsorship opportunities will be announced soon, so be on the lookout for future announcements! Visit the website for more short course information.

This meeting is organized by the University of Florida | IFAS Office of Conferences & Institutes (OCI).

UF IFAS UNIVERSITY of FLORIDA

OCI is a full service conference planning division dedicated to assisting groups that support the IFAS mission "to develop knowledge in agriculture, natural resources, and the environment, and to make that knowledge accessible to sustain and enhance the quality of human life." Check out the OCI website to learn more about other events that may interest you.

http://conference.ifas.ufl.edu/aw/ | Registration Questions Call: 352-392-5930
Mandy Stage | Short Course Coordinator | mstage@ufl.edu

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

Donald Allen
AGLIME **SALES, INC.**
1375 Thornburg Road
Babson Park, FL 33827-9549
Mobile: 863 287 2925
Agnet # 52925
donald.allen@aglimesales.com

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

Ed Early
DuPont Crop Protection
P O Box 7768
Fort Myers, FL 33911
Phone: 239-994-8594
Edward.L.early@dupont.com

Cody Hoffman
syngenta®
Mobile: 321 436 2591
Fax: 239 479 6279
cody.hoffman@syngenta.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

Billy Hopkins

Hopkins Nursery

239 658 0370

tropicals@wildblue.net

Tropical fruit & peach trees

AGRO SOURCE™

Bo Meador
863 673 0727
www.AgroSource.net
bo.meador@agrosource.net

NICHINO **AMERICA**

Scott Croxton
scroxton@nichino.net
Samuel S. Monroe
smonroe@nichino.net

www.nichino.net

Thomas R. Summersill, Inc.
Jeff Summersill
Mobile: 561 722 4502
trsummersill@msn.com
Custom Aerial-Ground Application
"Thank you for 60+ years of service!"

Arysta LifeScience

Shan Brooks
Phone: 561-662-3558
E-mail: shan.brooks@arystacom

YARA

Eric Waldo
Yara North America, Inc.
352-215-8480
eric.waldo@yara.com

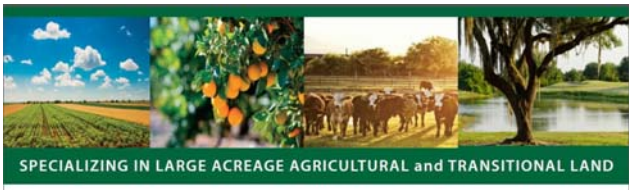
Magna-Bon®
AGRICULTURAL CONTROL SOLUTIONS

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

Michael Seese

239 336 9152
mpseese@aol.com

Infinity Ag Solutions
infinityagsolutions.com



Land Solutions inc.

AGRICULTURAL
LAND SERVICES
More Than Just Dirt.
www.landsolutions.net
239-489-4066

Garry Gibson

BASF Corporation

1502 53rd Avenue
Vero Beach, FL 32966
Cell: 772 473 1726
Fax: 772 567 2644
w.garry.gibson@basf.com

Sim Nifong

Timac AGRO USA

SENifong@timacusa.com
Cell: 863 441 1057
http://www.timacusa.com

FMC

FMC Corporation APG

Eric Johnson
Lakeland, FL
352-281-2325
EJ.Johnson@FMC.Com
fmccrop.com

actagro

Reese Martin
Reese.Martin@actagro.com
863 605 8533
www.actagro.com

AgroFlite®

"Ultimate Precision in Aerial Application"
CUSTOM AERIAL APPLICATION
Helicopter & Fixed-Wing Aircraft
Call for our Discounted Pricing today
(561) 600-8885
www.agroflite.com

MONSANTO

Jack Conroy
Phone: 863 318 1486
Fax: 886 318 8617
Mobile: 863 559 4468
andrew.j.conroy@monsanto.com

EL NIÑO/SOUTHERN OSCILLATION (ENSO) DIAGNOSTIC DISCUSSION

issued by

CLIMATE PREDICTION CENTER/NCEP/NWS
and the International Research Institute for Climate and Society
8 December 2016
ENSO Alert System Status: La Niña Advisory

Synopsis: La Niña conditions are present, with a transition to ENSO-neutral favored during January-March 2017.

La Niña conditions persisted during November, with negative sea surface temperature (SST) anomalies present across most of the central and eastern equatorial Pacific (Fig. 1). The Niño indices remained negative during November, except for the Niño1+2 index which reflected near-average SSTs in the extreme eastern Pacific late in the month (Fig. 2). Also, the upper-ocean heat content remained below average (Fig. 3) in association with cooler temperatures at depth (Fig. 4), although this cooling lessened somewhat during the month. Atmospheric convection remained suppressed over the central tropical Pacific and enhanced over part of Indonesia (Fig. 5). The low-level easterly winds remained enhanced in the west-central tropical Pacific, and upper-level westerly winds persisted across the tropical Pacific. However, these signals were masked at times by intra-seasonal activity. Overall, the ocean and atmosphere system during November reflected a continuation of weak La Niña conditions.

The multi-model averages favor La Niña (3-month average Niño-3.4 index ≤ -0.5°C) to continue through December – February (DJF) 2016-17 (Fig. 6). Given the current conditions and the model forecasts, the forecaster consensus also favors the continuation of weak La Niña conditions through DJF 2016-17. In summary, La Niña conditions are present, with a transition to ENSO-neutral favored during January – March 2017 (click CPC/IRI consensus forecast for the chance of each outcome for each 3-month period).

La Niña is anticipated to affect temperature and precipitation across the United States during the upcoming months (NOAA's 3-month seasonal outlook will be updated on Thursday December 15th). The current seasonal outlook for DJF 2016-17 favors above-average temperatures and below-median precipitation across much of the southern tier of the U.S., and below-average temperatures and above-median precipitation in portions of the northern tier of the U.S.

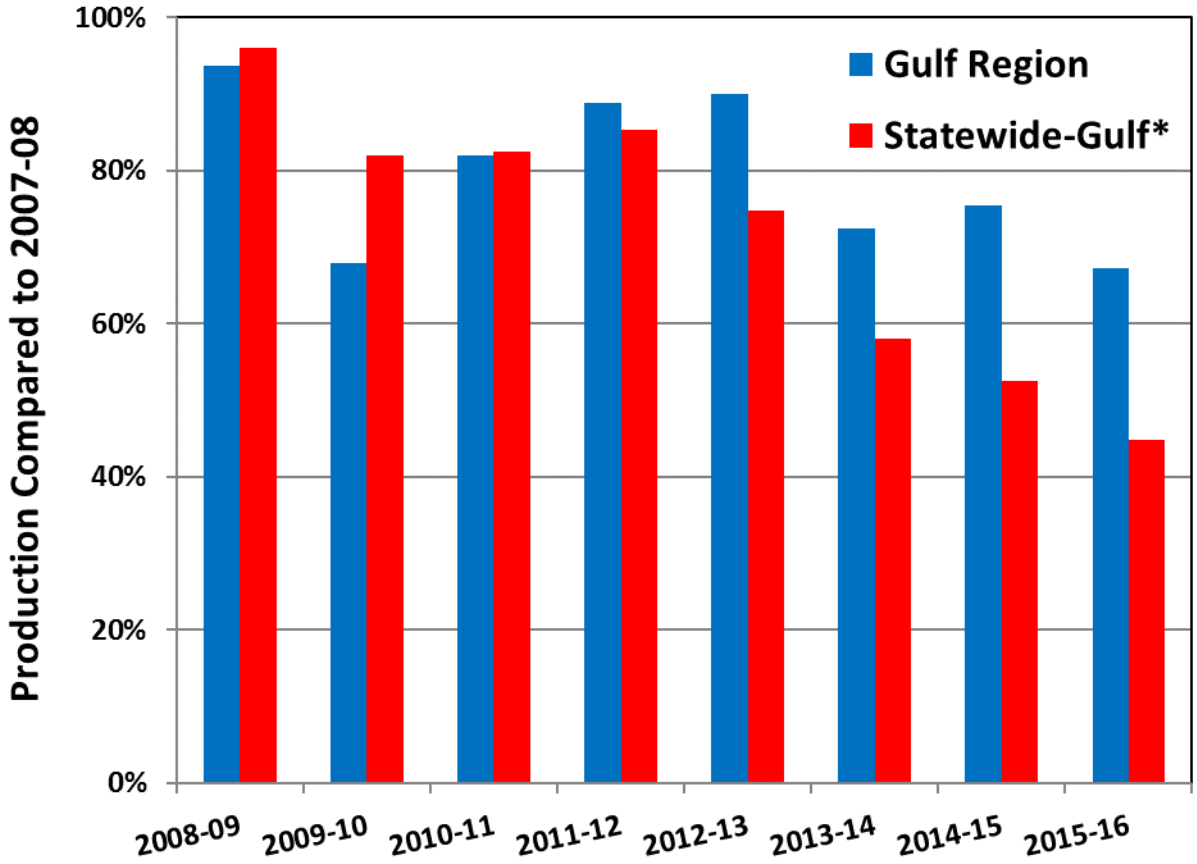
This discussion is a consolidated effort of the National Oceanic and Atmospheric Administration (NOAA), NOAA's National Weather Service, and their funded institutions. Oceanic and atmospheric conditions are updated weekly on the Climate Prediction Center web site (El Niño/La Niña Current Conditions and 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 12 January 2017. 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

Orange Production in the Gulf Region is Less Impacted by HLB than the Rest of the State!

By Dr. Phil Stansly, UF-IFAS

HLB has impacted all of Florida citrus, with statewide losses last season averaging 48% compared to the 2007-08 season. While Gulf production was down 37% last season compared to 2007-08 season, the rest of the state is down 55%. It is difficult to attribute this difference to any one cause. Still, early initiation of area wide dormant sprays in the 2008-09 season is a likely factor in the relative turn around in the Gulf by 2010-11.



*Orange production from the 2008-09 to the 2015-16 season compared to the 2007-08 season in the Gulf counties (**Hendry, Collier, Glades, Lee and Charlotte**) compared to the statewide average minus Gulf counties. Data from National Agricultural Statistics Service (https://www.nass.usda.gov/Statistics_by_State/Florida/Publications/Citrus/)

Winter is the Best Time to Spray for ACP

- **Dry and cool weather means:**
  - **Little or no flush**
  - **Declining ACP population**
  - **Few eggs and nymphs**
    - **Single ACP generation**
    - **Low canopy density**
    - **Best time for aerial applications**
  - **Longest residual activity**
  - **Best time for pyrethroids**
  - **Least impact on beneficials**
- **Dorman sprays reduce ACP population in spring flush**
  - **Spring flush is the source of most HLB infection**
- **Sets stage for entire year**
- **Most bang for the buck!**

When and What to Spray

The objective is to get in at least 2 good sprays between fall and spring flush. This could be one in December and another in January. However, if a rain event occurs within 5 days after the spray, then another should be scheduled. Also, if an offseason winter flush occurs, another spray should be scheduled before the main spring flush.

The organo-phosphates (dimethoate, phosmet = Imidan, chlorpyriphos) or pyrethroids (Danitol, Baythroid) are recommended.

Resistance management It is generally recommended not to apply the same mode of action to successive generations of target insects in the same year. Since, barring an offseason flush, there is basically only one generation of ACP in winter, the risk of back to back pyrethroids is not great at this time. However, it is recommended that pyrethroids or OPs not be repeated during the rest of the year with the possible exception of border sprays. This will reduce selection for resistance as well as negative effects of these broad spectrum insecticides on beneficials.

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 'Robinson', 'Nova', 'Orlando', 'Minneola', or other 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.

Changes to the WPS in 2015 - Effective in 2017

Changes announced in 2015 were designed to provide **more protection** for agricultural workers. Most new requirements will go in effect on January 2, 2017. Some highlights include:

- Annual mandatory training for farmworkers about their rights and responsibilities
- Expanded training and employer responsibilities that will reduce take-home pesticide exposure from clothing and protective equipment
- Children under 18 are no longer allowed to handle pesticides
- Expanded mandatory posting of no-entry signs for the most hazardous pesticides
- Applications must be suspended if people come within 100 feet of (some) application equipment, such as air-blast sprayers
- Mandatory record-keeping will improve states' ability to enforce the rules

Department of Labor rules about respirators, access to chemical information, and whistle-blower protection do not apply to agricultural workers. Now, many of those provisions have been added to the Worker Protection Standard, extending equal protection under the law.

- Workers who hold employers accountable will be protected from retaliation.
- Workers who use respirators will have training, medical evaluations, and fit-testing.
- Safety Data Sheets (SDS) will be available to workers and their physicians.
- Sufficient water will be available at mixing/loading sites for routine washing and emergency eye flushing.

The new Worker Protection Standard continues to exempt farm owners and their immediate families from many of the rules, and the definition of 'immediate family' was expanded.

Additional Resources:

- **Comparison Chart: Old and New WPS** - Environmental Protection Agency (EPA)
- **Revisions to the Worker Protection Standard** - Environmental Protection Agency (EPA)

https://www.epa.gov/sites/production/files/2015-09/documents/comparison-chart-wps.pdf

https://www.epa.gov/pesticide-worker-safety/revisions-worker-protection-standard

FLOWER BUD INDUCTION ADVISORY #5 for 2016-2017-1/3/17

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.

The on-line version has been updated so that you can shift from one FAWN weather site to another without back tracking. More FAWN sites have been added to the menu. Another added feature is that the total accumulated hours is now listed as is the projected hours to be accumulated the following week.

Current status: We now have December flower bud growth initiation which started from December 11 to 21 after 630 to 800 hours of induction, respectively, from south to north citrus areas. **The projected bloom dates for this cohort of flowers are from February 13 to 27 according to the Citrus Flowering Monitor System.** The bloom dates do not follow a sequential date pattern from south to north. There have been an additional 100 to 200 inductive hours from south to north since the first flowering wave was initiated. The weather service predicts an additional 90 to 140 hours of inductive temperatures this coming week, with most areas having 10 to 12 days of cooler temperatures. Since the first flowering wave was initiated with only 650 hours of induction from Central to South Florida, a second wave of flowering is very likely. If a second flower bud cohort is going to be initiated soon, it is likely to be right away since we are just finishing a warm period. Watch the on-line monitoring system over the next week to see if a second wave is shown for your area. If a flowering wave doesn't start within a week then the predicted 11 or 12 cool days should delay any second wave of flowering until after mid-January, not until we have another warm period.

If you didn't apply a flowering enhancement spray of urea or PO_3 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 accumulated, sufficient for a good two-part spring bloom.

Off-season bloom: If you are going to have some winter bloom, buds should have pushed by now and are probably in some stage of visible flowering. I have seen one poor condition grove with some flowers. Please email me if you have significant winter flowering on reasonably healthy (full canopied) trees. Hopefully, if you were on a daily, if needed, irrigation regime you are not seeing much off-season flowers.

Spring sprays for psyllids: At least two entomologists think that a spray just at spring budbreak might be a best time to get maximum adult psyllid control at the beginning of spring growth and minimize production of a new population on the spring flush. Over the last two years it appears that bud break may be as early as 56-57 days before full bloom. If this is correct then bud break may start any time. **Check your trees!** My crew will be looking at several blocks today and tomorrow. I'll post a new advisory if we see any significant bud break or bud swelling that shortly will lead to bud break.

If you have any suggestions or questions, please contact me (albrigo@ufl.edu) .

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 10 km/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 herbicides and insecticides. 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.

COLD HARDINESS AND COLD PROTECTION

Two major environmental factors in Florida citrus that regulate cold hardiness are temperature and water.

At 55^0 F, citrus plant growth slows. As temperatures remain below 55^0 F, citrus trees will continue to acquire acclimation to these cooler temperatures. This process is reversible during warm winter periods, and de-acclimation (loss of acclimation) can occur. The greatest amount of citrus acclimation occurs during consistently cool fall and winters. Once de-acclimation occurs citrus trees will generally not re-acclimate to the same level prior to the onset of de-acclimation.

Irrigation and fall/winter rainfall can have a pronounced effect on the citrus acclimation process. Drought induced stress has been shown to increase the tolerance of citrus trees to freezing temperatures when compared to well watered or over watered citrus trees in Florida. However, excessively drought stressed trees are more susceptible to freeze damage.

Critical Temperatures for Florida Citrus

It is very important to know the critical temperature at which freezing temperatures can damage citrus. Minimum temperature indicating thermometers are a wise investment for any grower concerned with freeze/frost protection. Thermometers should be installed in the coldest grove locations. They should be placed at a height of 42 inches (4.5 ft) on a stand, sheltered at the top and facing north. In citrus trees, there can be a great deal of variation in the minimum temperature at which plant damage will occur.

The reference temperature and duration for the initiation of the freezing process in round oranges is 28^0 F for four hours. Tangerines and fruit with smaller mass would receive freeze damage after shorter durations, while grapefruit would require longer durations.

Minimum temperatures of 26^0 F will damage fully mature, harden-off leaves that have not received any acclimation. Minimum temperatures of 30^0 F can significantly damage unhardened new flush leaves. Leaves that have received extensive acclimation have been shown to survive temperatures as low as 20^0 F in Florida.

Protecting citrus trees from cold damage

Cultural practices can have a major influence on the cold hardiness of citrus trees. A clean, hard-packed soil surface intercepts and stores more solar radiation during the day and releases more heat at night than a surface covered with vegetation or a newly tilled area. Irrigation should be applied minimally during the fall and winter. Reducing irrigation results in an increase in the cold tolerance of citrus trees and enhances tree stress resulting in an increase in the formation of flower buds. Excessive application of nutrients should be avoided late in the fall especially with young citrus trees. Heavy hedging or topping during the winter can reduce citrus cold hardiness by reducing canopy integrity that would trap heat released by the soil. This should be avoided.

Water from micro sprinkler irrigation protects young trees by transferring heat to the tree and the environment. The heat provided is from two sources, sensible heat and the latent heat of fusion. Most irrigation water comes out of the ground at 68° to 72°F, depending on the depth of the well. The major source of heat from irrigation is provided when the water in the liquid form changes to ice (latent heat of fusion).

As long as water is constantly changing to ice, the temperature of the ice-water mixture will remain at 32°F. The higher the rate of water application to a given area, the greater is the amount of heat energy that is applied. When expecting a freeze, turn on the water early before the air temperature reaches 32^0F. Remember that in cold pockets, the ground surface can be colder than the air temperature reading in a thermometer shelter. Once irrigation has begun, the system must run for the duration of the time plant temperatures are below the critical temperature. Growers are recommended to use the information at the FAWN website (http://fawn.ifas.ufl.edu) to determine when it would be safe to turn off or on their micro-sprinkler irrigation system. For more details, go to http://edis.ifas.ufl.edu/HS179, http://edis.ifas.ufl.edu/CH182, http://edis.ifas.ufl.edu/CH054

In bedded groves to provide additional cold protection, water should also be pumped high in the ditches the day before and during the time of freezing weather.

FROM THE

CITRUS BUDWOOD

Annual Report

2015-2016

Florida Department of Agriculture and Consumer Services • Adam H. Putnam, Commissioner

Citrus Nursery Activity

Nursery propagations starting this fiscal year are counted by amount budded instead of amount cut. When the amount budded is unknown the amount cut figure is used. The database field is labeled amount reported.

4,344,446 Nursery Propagations made in 2015-2016

54 Active Nurseries

Nursery Size	Number of Nurseries					
# of Propagations	2016	2015	2014	2013	2012	2011
<1,000	4	3	3	3	2	4
1,000-10,000	18	11	9	7	7	5
10,000-25,000	6	9	9	8	8	7
25,000-50,000	6	10	8	7	10	8
50,000-75,000	3	5	5	5	8	6
75,000-100,000	4	4	5	5	1	3
100,000-200,000	8	6	6	6	3	3
200,000-400,000	3	4	5	4	7	5
400,000-600,000	1	1	2	3	1	1
>600,000	1	1	0	0	0	0
	54	54	52	48	47	42

	2016	2015	2014	2013	2012	2011
Number Propagations	4,344,446	4,438,128	4,712,439	4,700,728	3,941,049	3,135,326
Propagations Change by	(93,682)	(274,311	11,711	759,679	805,723	134,140
Percent Change increase or	(2.11)	(5.8)	.3%	19.3	25.7	4.5%
Nurseries Increasing	25	15	25	18	26	22
Nurseries Decreasing	24	33	21	24	14	17
New or Resumed	3	6	5	6	7	3
Nurseries Not Propagating	2	4	1	4	2	6
Average # of Propagations per	80,452	82,188	90,624	97,932	83,672	74,517

Rootstocks

2016		#	Rank	2015	2014	2013	2012
1	Kuharske	829,742	1	Kuharske	Swingle	Swingle	Swingle
2	X-639	566,764	2	X-639	Kuharske	Sour Orange	Kuharske
3	Sour Orange	431,388	3	Swingle	Sour Orange	Kuharske	Sour Orange
4	US-897	372,752	4	Sour Orange	X-639	Carrizo	Carrizo
5	Swingle	362,667	5	Cleopatra	US-802	US-812	X-639
6	US-942	357,968	6	US-802	US-812	X-639	Volkamer
7	US-802	328,194	7	US-897	US-897	US-897	Cleopatra
8	US-812	222,676	8	US-942	Cleopatra	Cleopatra	US-802
9	Cleo	201,994	9	US-812	Carrizo	US-802	US-812
10	UFR-04	106,906	10	C-35 Citrange	Volkamer	Volkamer	Kinkoji
11	VOLK	102,166	11	Carrizo	US-942	Kinkoji	US-897
12	Kinkoji	35,232	12	Volkamer	C-35 Citrange	Flying Dragon	US-942
13	UFR-03	26,943	13	Own Root	Research Stock	Sun Chu Sha	Sun Chu Sha
14	Carrizo	21,862	14	UFR-04	Unknown	C-35 Citrange	Rough Lemon
15	Rough Lemon	20,259	15	Kinkoji	Rough Lemon	Rough Lemon	Research Stock
16	Research	17,150	16	Rough Lemon	Kinkoji	US-942	Smooth Flat Sev
17	UFR-02	12,614	17	Unknown	Flying Dragon	Research Stocks	C-35 Citrange
18	UFR-17	8,172	18	UFR-03	Pon trifoliata	Smooth Flat Sev	Flying Dragon
19	UFR-16	7,502	19	Benton	Sun Chu Sha	Pon trifoliata .	Pon trifoliata
20	Sun Chu Sha	6,636	20	Pon trifoliata	UF-02	Benton	Murcott
21	Pon Tri	3,794	21	Sun Chu Sha	US-896	Unknown*	Ridge Pineapple
22	Smooth Flat Seville	5,480	22	Research Stock	UF-04	Bittersweet	Orlando
23	UFR-05	3,633	23	C-54 Carpenter	Dickinson	Macrophylla	
24	C-57	3,510	24	C-22 Bitters	C-54 Carpenter	Changsha	
25	C-54	2,550	25	UFR-17	UF-03	C-22 Bitters	
26	C-22	2,040	26	UFR-02	UF-17	C-54 Carpenter	
27	UFR-15	1,884	27	C-57 Furr	Own Root	Willits Citrange	
28	Flying Dragon	1,641	28	Dickinson	Benton	C-57 Furr	

Top Clones Propagated in 2016

	Variety Clone	Descriptions
1	Valencia SPB-1-14-19	A Hughes nucellar line, entered budwood program in 1955. These SPB-1 trees are the first selections from open pollinated Valencia seedlings in a grove planted by Dr. and Mrs. Ausker Hughes near Plymouth in Orange County in 1941. The nucellar characteristics made them more cold hardy than the old line selections. Fruit production is better than the old-line selections. They have become the most popular Valencia selections in Florida. Similar to SPB-1-14-31, and SPB-1-12-7.
2	Hamlin 1-4-1	Is an old-line selection entered into the budwood program by Ward's Nursery in Avon Park. This was the first Hamlin selection entered into the budwood parent tree program in 1953 and still remains the most widely propagated early orange. It has typical Hamlin traits and excellent yields. Hamlin originated in Florida as a chance seedling near Glenwood in 1879. Named after citrus culturist Arthur George Hamlin who was DeLand's first attorney and a legal advisor to Henry Flagler.
3	Valencia F-55-4	The "55 series" are DPI nucellar lines. These selections are young nucellar lines from seedlings of fruit collected from the Hughes grove in Orange County. Fruit characteristics are typical of Valencia oranges. Trees are a little more vigorous than old line and Hughes nucellar selections. Fruit production has been slightly better than the Hughes selections and significantly better than the old lines. Similar to F-55-4, F-55-1, S-F-55-28, and F-55-23. Originally assigned SPB-5A, planted in I/4 Foundation Grove in 1961.
4	Vernia UF 35-15	This is Dr. Bill Castle's nucellar selection planted at Orie Lee's, St. Cloud. Entered in to the budwood program 5/15/1996. The seed for the DPI-441 clone originated from the Coca Cola, Hodgson Grove, Indian Town, same as the Vernia-3 clone. Vernia is a Spanish variety; fruit medium-small, egg shaped, well colored, very prolific, fruit holds well, inclined to produce off bloom fruit, smaller than Valencia. The season is several weeks earlier than Valencia.
5	Sweet Orange UF OLL8	Restricted University of Florida selection – proprietary – Description will be provided by IFAS upon release.
6	Valencia SPB-1-14-31	Similar to SPB-1-14-19 above.
7	Hamlin 8-1-4	Parent tree entered into the program from the Story Property in Winter Garden in 1953. A top yielding clone in the Budwood Foundation Grove. This clone has typical Hamlin traits and excellent yields.
8	Early Pride US 1-62-122	A USDA selection, released for evaluation in 2009. Originates from Fallglo budwood that Dr. Jack Hearn had irradiated in 1991. Identical to Fallglo except seedless (0-4 seeds) and slightly smaller sized fruit. Mid-October maturity thru mid-November. Origin: USDA FF-10B-8-29. Must have contract with NVDMC to propagate. First patented USDA citrus scion variety. Needs pollinator.
9	Hamlin 8-1-5	Similar to 8-1-4 above.
10	Salad Tree	Dooryard. Multi-grafted trees.
11	Sugar Belle UF LB8-9	Released in 2009 by Dr. Fred Gmitter, IFAS. It is a seedy variety resembling Mineola tangelo although smaller in size and having a late November maturity. Fruit color, flavor, tolerance to alternaria and earlier maturity are its main attributes. Florida Foundation Seed Producers, Inc. granted the New Varieties Development & Management Corp. the exclusive USA licensee for this variety. Must have license agreement with the New Varieties Development & Management Corp to propagate.
12	WG Man 911-17	Mandarin selection entered in 2007 by W. G. Roe. Restricted
13	Glen Navel F-56-11	This is a nucellar selection originating from Glen St. Mary's Nursery. Found as a group of trees in a Washington navel grove of W. G. Roe of Winter Haven. It was named and introduced by the Glen St. Mary Nurseries of Glen St. Mary, Florida. The 56 clonal selections are seedlings of the Glen navel. The DPI released clones originated as seed from flowers pollinated in March 1955. The seed were planted at the University of Florida horticultural greenhouses in December 1955. The seedlings were received in Winter Haven from the Gainesville laboratory 9/4/1957 and assigned the SPB number 43. These seedlings were moved to the original DPI foundation planting north of Haines City. The original 56-11 & 56-12 trees were planted 3/7/1960 in row 56 of the foundation grove in tree spaces 11 & 12 respectively. Glen fruit is typically large with an open non-protruding navel; yields are good with average brix/acid ratios.
14	Sweet Orange UF OLL4	Entered by Dr. Jude Grosser CREC, High quality processing sweet orange, also attractive for fresh market. Trees are more cold hardy and drought tolerant than Valencia, also has higher juice %, solids, and color than standard Valencia. This clone is repeating for exceptional yield and large fruit size.
15	Valencia F-55-23	The "55 series" are DPI nucellar lines. See F-55-4 & F-55-23 above.
16	Meyer Le US	Received budwood from the USDA 1/26/1996 for this selection. It is a typical Meyer lemon type popular with homeowners. The fruit is round, yellow and more cold hardy than typical lemons. Originally brought into the USA by Frank Meyer in 1908 who was a USDA plant explorer. Origin: China, also known as Peking lemon. Description: Everflowering mainly in spring, large size, smooth skin, lower acidity, more cold tolerant than lemons, dooryard, fruit tender and juicy, moderately seedy (10), low spreading growth habit. Season: Fruit throughout the year, mainly winter, November-March.
17	Valquarius UF SF14W-62	Entered by Dr. Jude Grosser, CREC 9/2004. Maturity is four to eight weeks ahead of the standard Valencia variety. Good juice color gives it potential to become a favored midseason processed orange variety. (Mid January-February) License has been granted to the New Varieties Development and Management Corporation.
18	Bingo UF 7-6-27	A completely seedless mandarin, very easy to peel fruit, small to medium size, red-orange external color, excellent flavor with high Brix and adequate acid to balance. November maturity. Tree is only moderately vigorous. The original tree shows substantially greater tolerance of HLB than most of the other seedlings in this family.
19	Tango CGIP-168	Developed by the University of California Riverside citrus breeding program (patented). This is a seedless version of the W Murcott achieved by irradiating budwood. Budwood from CCPP was tested by CGIP in 2007. The selection was planted at Chiefland in 2009. Propagation is restricted, must have license agreement with the New Varieties Development & Management Corp.
20	Harvey Le F-41-39	Entered into program in 1964 from seed from Kendall Groves, Goulds, FL. The Harvey variety is of unknown parentage, found by Harvey Smith of Clearwater on the property of George James in Clearwater. Fruit is reported to be similar to Eureka. Tree hardy, upright, thornless, peel oil 11.78 lbs/ton see DPI-29. Originally assigned SPB-268. Season: August-October.
21	Eureka Le UF 3-27	Entered into program by Dr. Knorr C.E.S. in 1968 from the Coca Cola Hodgeston grove at Indian Town. Eureka originated in California. Not widely grown in Florida. Origin: California, seedlings from Italian fruit, Cook is a nucellar clonal selection. Description: virtually thornless, precocious, productive compared to other varieties, more sensitive to cold, less vigorous, shorter

Top Clones Propagated in 2016

	Variety Clone	Descriptions
		lived, incompatible with PT and hybrids, peel oil 13.13 lbs/ton see DPI-29. Season: Everbearing, mainly August-December.
22	Eureka Le DPI-	Source of this Eureka is unknown, although in all probability one of the Eureka clones entered into the budwood program. This tree was for years located in Winter Haven greenhouse 4 in a large container. Origin: California, seedlings from Italian fruit, Cook is a nucellar clonal selection. Description: virtually thornless, precocious, productive compared to other varieties, more sensitive to cold, less vigorous, shorter lived, incompatible with PT and hybrids, peel oil 13.13 lbs/ton see DPI-29. Season: Everbearing, mainly August-December.
23	Persian Lime SPB-7	The original tree was entered into the budwood program in 1954 by Coral Reef Nursery as Li-38-1-1-X. This tree was owned by E. J. Norman of Homestead said to be one of the oldest in Dade county, and propagated by a man named English from one of the first five lime trees known to exist in the area. The current clone is a shoot-tip graft of the original clone. The first commercial Persian Lime planting in central Florida was in 1897 about 2 miles southeast of Lake Placid, planted by a grower whose Marion county trees were killed by the big freeze of 1895. The Persian lime SPB-7 clone was selected to be free of the lime blotch disorder in Florida and has performed well under Florida conditions. The variety is also known as a Tahiti lime. Origin: Unknown, introduced to California from Tahiti. Description: Normally seedless with a high degree of monoembryony, most likely a hybrid, fruit medium small, smooth, thin rind, juicy. Season: Everbearing, mainly winter, June-September.
24	Sunburst US 5	A USDA hybrid-Robinson tangerine x Osceola released in 1979. Early maturing with medium sized fruit requiring pollination for best yields. Foliage highly susceptible to rust mite infestations.
25	Murcott 130-1-1S	Entered 2/6/1959 by Leo Wilson from seedling tree near Bradenton in Manatee County. Seeds planted about 1940 from a source in the Clearwater area. Two seedling trees were selected and given the distinction N (North) and S (South). Many propagations were made from both selections, however, the south tree is the current program clone. Traits are characteristic of the Murcott variety, good yields and vigorous. Description: Thin rind, alternate bearing, cold sensitive, seedy 10-20, bud union problems with common citranges and citrumelos. Season: Mid-late, January. Murcott origin from The Citrus Industry Vol. 1 (1967): The origin of Murcott is unknown and its history obscure. The oldest known budded tree, from which the present commercial acreage largely if not entirely traces, still remains on the place formerly owned by a nurseryman, Charles Murcott Smith, in Bayview, Clearwater, Florida, and is thought to have been budded about 1922 (Ziegler and Wolfe, 1961). It is believed that the budwood was obtained from a neighbor, R. D. Hoyt of Safety Harbor, who was a cooperator in the citrus breeding program of the U.S. Department of Agriculture, which maintained a nursery of citrus hybrids at Little River, Miami, until about 1916. Evidently the parent tree was one of the hybrids which Mr. Hoyt received from the Department of Agriculture nursery at Miami sometime prior to 1916. Unfortunately, records are not available concerning this transaction or the labels for the trees provided. Under the name Honey Murcott, small-scale commercial propagation was undertaken by the Indian Rocks Nursery in 1928. The first commercial planting, which brought this variety to prominence and is largely responsible for its present popularity, seems to have been that of J. Ward Smith (no relation to C. Murcott Smith), near Brooksville in 1944, who first marketed the fruit under the name Smith tangerine, apparently unaware that it had already been named.
26	Minneola F-60-5	This nucellar honeybell selection originated from open pollinated seedlings at the Glen St. Mary Nursery in Dundee (Polk County), 3/25/1957. Seedlings planted at WHTP and planted at the Haines city foundation in rows 56 and 58 in 1963. Typical traits generally associated with Minneola tangelos. Origin: Florida, Duncan x Dancy, USDA release 1931. Description: Pronounced neck at stem end, deep orange-red color, needs pollinator (Temple, Sunburst, Fallglo), 7-12 seeds, susceptible to alternaria, brown spot and scab. Season: Mid-late, December-February.
27	Ray Ruby Gft CGIP-103	Originated from a Ruby Red grapefruit mutation in Texas. Discovered in a Weslaco, Texas Ruby Red grove 1970 by Robert Ray, identical or similar to Henderson? Flesh color and exterior blush is more red than Ruby Red but not as intense as Star Ruby. Good internal red fruit color slightly less than Flame. Good fruit size and shape. Excellent quality, comparable to Ruby Red. Good yields. Released in 1986.
28	Ruby Red Gft F-58-39	Originated from Dr. Mort Cohen's closed pollination selections made from the grove near the Century Tower on the campus of UF. This was the first Ruby Red grapefruit free of exocortis. Excellent fruit yields with typical fruit shape and color of the Ruby variety. Origin: Limb sport of Thompson, McAllen, Texas 1929. Description: Deeper flesh coloration than Thompson, blush in peel, flesh fades to pink later in the season. Season: November-May.
29	Cara Cara Navel CGIP-104	This red fleshed navel was believed to originate from a limb sport on a Washington navel orange tree on the property of Mr. Domingas. It was brought to the attention of E. P. Du Charme during a visit to the Hacienda Cara Cara in Venezuela. Dr. Al Krezdon, University of Florida, requested introduction of the Cara Cara in August 1975. Dr. Al Krezdon brought 5 sticks of budwood back from Venezuela in early July 1977. The budwood tested positive for exocortis viroid by CGIP and was shoot-tip grafted before being released to the budwood office 8/9/1983 for evaluation. Cara Cara was released to the citrus growers June 1, 1987. The Cara Cara name is interpreted as beloved in Italian. Trees tend toward variegation and variegated flushes are common.
30	Flame Gft US 1-26-71	Originated from seedlings planted in Florida from the Henderson variety which came from Texas. Seed collected by Dr. Wutscher in Texas and planted by Dr. Hearn in 1973. Entered into program by Jack Hearn 7/17/1981 and released by the USDA in 1987. Early evaluation block planted at DPI WHTP. The fruit color is nearly as good as Star Ruby and has a decent blush. Holds flesh color well into season.

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