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Institute of Food and Agricultural Sciences

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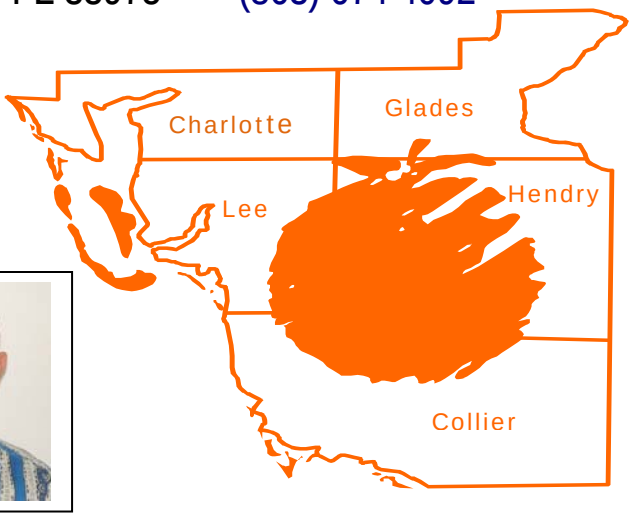
Flatwoods Citrus



Vol. 18, No. 11 **November 2015**

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

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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/

I M P O R T A N T E V E N T S

Please mark your calendar and plan to attend.

CRDF Thermotherapy Field Day- Dec 3 at CREC, Lake Alfred and Lake Wales

Pre-registration required by Dec 1 for BBQ lunch (at CREC, Lake Alfred) & Field Day at Lake Wales site.

Date: Thursday Dec 3, 2015, 12 n-2:30 PM (after Polk Co. OJ Break at CREC). Field Day will showcase D. Wheeler's TT trials conducted cooperatively with Premier Energy's team, Dr. R. Ehsani team and Mr. Brandon Page (CRDF)

Four Easy Ways to register by Dec 1 for lunch at CREC, Lake Alfred and to attend the TT Field Day in Lake Wales on Thursday Dec 3.

1. Online at https://thermotherapyfieldday2015.eventbrite.com
2. Fax the no cost registration form below to 863-956-8767
3. Call Sarah White 863-956-8632
4. Email completed registration form to Sarah White sewhite@ufl.edu!

Address for Field Day site: 2033 Tindel Camp Rd. Lake Wales, FL 33898
Latitude and Longitude: 27.982987, -81.570449

REGISTRATION FORM for TT Field Day Thursday, Dec 3, 2015

Submit form to: Sarah White, sewhite@ufl.edu Phone: 863-956-8632 Fax: 863-956-8767

Participant Name_____

Company Name: _____

Mailing Address: _____

Phone: _____ Fax: _____

Email: _____

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: Thursday, 4 February 2016, 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**.

Registration form and agenda were included in the previous issue. Detailed information is also available online:

http://www.freshfromflorida.com/Divisions-Offices/Florida-Forest-Service/Education/For-the-Community/Withlacoochee-Training-Center-WTC/Class-Schedule

Time: **10:00 AM – 12:00 Noon**
Location: Immokalee IFAS Center
Program Coordinator: Mongi Zekri, UF-IFAS

12:00 Noon, Sponsored Lunch

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

Megan Dewdney Pam Roberts	**02-11-2016 - All You Need to Know About Scouting and Managing Citrus Fungal Diseases** 1. Alternaria brown rot and citrus scab symptoms and managements 2. Melanose and greasy spot symptoms and management 3. The copper model and postbloom fruit drop 4. Citrus black spot and Phytophthora management
Phil Stansly Jawwad Qureshi Barry Kostyk	**01-12-2016 - All You Need to Know About Scouting and Management of Citrus Insect Pests** 1. Scouting citrus for pests and beneficials 2. Biological control of Asian citrus psyllid 3. Scouting and Insecticidal Control of Citrus Rust Mites


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

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

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EL NIÑO/SOUTHERN OSCILLATION (ENSO) DIAGNOSTIC DISCUSSION

issued by

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

ENSO Alert System Status: El Niño Advisory
8 October 2015

Synopsis: There is an approximately 95% chance that El Niño will continue through Northern Hemisphere winter 2015-16, gradually weakening through spring 2016.

During September, sea surface temperature (SST) anomalies were well above average across the central and eastern Pacific Ocean (Fig. 1). The Niño indices generally increased, although the far western Niño-4 index was nearly unchanged (Fig. 2). Also, relative to last month, the strength of the positive subsurface temperature anomalies decreased slightly in the central and eastern Pacific (Fig. 3), but the largest departures remained above 6°C (Fig. 4). The atmosphere was well coupled with the ocean, with significant low-level westerly wind anomalies and upper-level easterly wind anomalies persisting from the western to the east-central tropical Pacific. Also, the traditional and equatorial Southern Oscillation Index (SOI) values became more negative (stronger), consistent with enhanced convection over the central and eastern equatorial Pacific and suppressed convection over Indonesia (Fig. 5). Collectively, these atmospheric and oceanic anomalies reflect a strong El Niño.

All models surveyed predict El Niño to continue into the Northern Hemisphere spring 2016, and all multi-model averages predict a peak in late fall/early winter. The forecaster consensus unanimously favors a strong El Niño, with peak 3-month SST departures in the Niño 3.4 region near or exceeding +2.0°C. Overall, there is an approximately 95% chance that El Niño will continue through Northern Hemisphere winter 2015-16, gradually weakening through spring 2016 (click CPC/IRI consensus forecast for the chance of each outcome for each 3-month period).

Across the United States, temperature and precipitation impacts from El Niño are likely to be seen during the upcoming months (the 3-month seasonal outlook will be updated on Thursday October 15th). Outlooks generally favor below-average temperatures and above-median precipitation across the southern tier of the United States, and above-average temperatures and below-median precipitation over the northern tier of the United States.

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 November 2015. 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

FIRE ANTS

With the harvesting season just got started

Imported fire ants are reddish brown to black and are 1/8 to 1/4 in long. These ants are aggressive and notorious for their painful, burning sting that results in a pustule and intense itching, which may persist for a week. Some people have allergic reactions to fire ant stings that range from rashes and swelling to paralysis or even death. In addition to stinging humans, imported fire ants can sting pets, livestock, and wildlife. Crop losses are also reported due to fire ants feeding on plants and even citrus trees. Fire ants may damage young citrus by building nests at the trunk bases. The ants feed on the bark and cambium to obtain sap, often girdling and killing young citrus trees. Fire ants also chew off new growth at the tips of branches and feed on flowers and developing fruit. In groves infested with ants, harvesting crews may not be willing to work and may request a higher fee to do their job. The ants are also known to cause extensive damage to irrigation lines and plug emitters. They aggregate near electrical fields where they can cause short circuits or interfere with switches and equipment such as water pumps, computers and air conditioners.

BIOLOGY

Red imported fire ants live in colonies that contain cream-colored to white immature ants, called brood. The brood is comprised of the eggs, larvae, and pupae. Also within the colonies are adult ants of different types. They include winged males and winged females, workers, and one or more queens. While thousands of winged males and females can be produced per year in large colonies, they do not sting. Newly-mated queens can fly as far as 12 miles from the nest (or even farther in the wind), but most land within a mile. New colonies do not make conspicuous mounds for several months. Once a colony is established, a single queen can lay over 2,000 eggs per day. Depending on temperature, it can take 20 to 45 days for an egg to develop into an adult worker. Workers can live as long as 9 months at 75°F, but life spans usually are between 1 and 6 months under warmer outdoor conditions. Queens live an average of 6 to 7 years.

Fire ants are omnivorous feeders. Workers will forage for food more than 100 feet from the nest. They can forage during both the day and the night, generally when air temperatures are between 70° and 90°F. When a large food source is found, fire ants recruit other workers to help take the food back to the colony. Liquids are ingested at the food source, and stored within the ants until they are regurgitated to other ants within the colony. Liquids from solid foods are extracted at the source, or are carried back as solid particles. Large solids may be cut into smaller pieces so they can be carried back to the colony. There are two types of fire ant colonies: single-queen, and multiple-queen colonies. A colony may contain as many as 100,000 to 500,000 workers.

CONTROL STRATEGIES AND TECHNIQUES

Numerous methods have been developed to control fire ants. Unfortunately, there are no

control methods that will permanently eliminate fire ants. Four strategies are currently being used to control fire ants: broadcast bait applications, individual mound treatments, a combination of broadcast baiting and individual mound treatments, and barrier/spot treatments.

1. Broadcast Bait Applications

This strategy attempts to reduce fire ant populations by applying insecticides incorporated into an attractant or bait. The ants carry the bait to the colony. The slow action of the toxicant allows the ants to feed it to other members of the colony before they die. When the toxicant is fed to the queen(s), she either dies or no longer produces new workers and the colony will eventually collapse.

- ***Keep baits dry.*** Wet baits are not attractive to fire ants. Apply baits when the grass and ground are dry or drying, and rain is not expected, preferably for the next 24 hours.
- ***Apply baits when fire ants are actively foraging.*** During hot, summer weather, apply baits in the late afternoon or evening because fire ants will forage at night under these conditions.
- ***Follow the directions on the label.*** It is against the law to apply baits in areas not listed on the label.

2. Individual Mound Treatments

This strategy attempts to eliminate colonies of fire ants by treating mounds individually. Individual mound treatments are time consuming and labor intensive. However, colonies treated individually may be eliminated faster than colonies treated with broadcast bait applications.

Baits

Bait products used for broadcast bait applications can be applied to individual mounds. Sprinkle the recommended amount of bait around the base of the mound up to three feet away. In addition, follow the Guidelines for Effective Bait Applications given previously. As with broadcast bait applications, the use of baits for individual mound treatments may take one to several weeks to eliminate colonies.

Dusts

Dusts are dry powder insecticidal products. The dusts stick to the bodies of ants as they walk through treated soil. Ants that contact the dust will eventually die. Dusts are applied by evenly sprinkling a measured amount of dust over the mound. Avoid inhaling or touching the dust. Some dusts, such as those containing 75% acephate, should kill an entire colony within a week.

Aerosols

Some products are available in aerosol cans equipped with a probe, and contain insecticides that quickly immobilize and kill ants on contact. As the probe is inserted into a mound, the insecticide should be injected into the mound for a specified amount of time. Similar to other individual mound treatments, application on cool, sunny mornings will help maximize contact with the colony.

3. Combining Broadcast Baiting and Individual Mound Treatments

This strategy utilizes the efficiency of broadcast baiting and the fast action of individual mound treatments. Baits must be broadcast first to efficiently reduce fire ant populations. Wait a minimum of 3 days after broadcasting to allow fire ants to forage and distribute the bait before individually treating mounds. Treat mounds preferably with a dust, granular, or aerosol insecticide specifically labeled for fire ant control.

4. Barrier/Spot Treatments

These products are usually sold as sprays or dusts. They may be applied in wide bands on and around building foundations, equipment and other areas to create barriers that exclude ants. They also may be applied to ant trails to eliminate foraging ants. Barrier and spot treatments do not eliminate colonies.

BENEFITS OF ORANGE JUICE

http://www.med-health.net/Benefits-Of-Orange-Juice.html

Orange juice is made from unfermented fresh oranges and provides many benefits for the body. Fresh orange juice is the richest source of vitamin C and fulfills an entire day's worth of vitamin C in just one serving. Chock full of useful minerals like potassium and magnesium, orange juice is also very low in fat and contains no cholesterol whatsoever.

Benefits of Orange Juice

Provide Vitamin C. Vitamin C cannot be synthesized by the human body so we must ingest it in our food and drink. Drinking two glasses of orange juice each day can increase the Vitamin C concentration in your body by 40 to 64 percent. The vitamin C we get from orange juice protects our bodies from the harmful effects of free radicals that cause early aging, and aids in the absorption of essential minerals like calcium.

Reduce Inflammation. Eating meals with a lot of fat or glucose can lead to the development of inflammatory reactions. Inflammatory reactions lead to the resistance of insulin, which is a common cause of type II diabetes and atherosclerosis. Atherosclerosis is a very serious condition where the blood vessel walls harden due to fatty deposits. Drinking orange juice when ingesting a high-carbohydrate and high-fat meal will prevent the occurrence of this inflammation, making it a good preventative measure against insulin resistance and atherosclerosis.

Balance Blood Pressure. You can improve your diastolic blood pressure by adding a glass of orange juice into your diet. Studies have found that orange juice contains hesperidin, a very healthy, water-soluble plant pigment. It improves the activity of small blood vessels bringing your overall blood pressure into balance and helping to decrease cardiovascular risks.

Lower Bad Cholesterol. Drinking orange juice regularly is thought to decrease levels of low-density lipoprotein, or LDL, cholesterol. LDL cholesterol is commonly known as the "bad" cholesterol and it collects in your arteries and blood vessels, causing heart problems, cardiovascular issues, and problems with healthy blood and blood oxygen flow. The mechanism in drinking orange juice that is behind the improvement in LDL cholesterol levels is still unknown. More studies and clinical trials will need to be performed in order to hammer this out as concrete fact.

Promote Skin Condition. Drinking orange juice is said to bring a radiant glow to your skin and provide other skin benefits as well. Drinking this juice will help to hydrate skin and keep it firm. Using this juice as a topical treatment does wonders for the skin as well. It cleans out and tightens clogged pores and is believed to prevent wrinkles and fine lines. Orange juice is also a great natural remedy for treating sunburns.

Prevent Neural Tube Defects. Folate deficiency is one of the main causes of low birth weight and neural tube defects, which are congenital problems in the brain and spinal cord. It also one of the most preventable causes of these birth defects. Drinking ⅓ cup of orange juice each day provides 40 mcg of folates to expectant mothers. Folates are important micronutrients that are known to prevent a wide variety of birth defects. The ⅓ cup serving mentioned provides 10% of the recommended daily value of folates.

Produce Collagen. Vitamin C is the key ingredient for healthy production of collagen, which is the structural component of bones, tendons, ligaments and blood vessels. When the body is deficient in vitamin C it can lead to scurvy, a disease characterized by bruising, bleeding, tooth loss and immense joint pain. In order to prevent occurrences of scurvy it is recommended for an adult to take in at least 90 mg of vitamin C each day. Those who smoke may need to take in as much as 125 mg per day. Taking in these amounts should be easy as one 6 oz. glass of orange can provide up to 93 mg of vitamin C.
Other Benefits. The Vitamin B6 found in orange juice aids in the production of hemoglobin. Beta carotene from orange juice can help prevent cell damage. Orange juice has quite a bit of calcium in it, too. This helps promote bone health and strengthen teeth. Folic acids in orange juice help boost brain, spinal cord and neural system health. It has also been found that orange juice is highly beneficial to weight loss.

Nutritional Facts about Orange Juice

Drinking orange juice can provide you with many health benefits as it contains a variety of vitamins and minerals. The following table provides nutrition facts for a 1 cup serving frozen, concentrated orange juice that has been diluted with water.

Vitamins			
Vitamin C	96.9 mg	**Thiamin**	0.2 mg
Riboflavin	0.0 mg	**Niacin**	0.5 mg
Vitamin B6	0.1 mg	**Vitamin K**	0.2 mcg
Vitamin A	266 IU#	**Vitamin E**	0.5 mg
Minerals			
Calcium	22.4 mg	**Iron**	0.2 mg
Magnesium	24.9 mg	**Zinc**	0.1 mg
Sodium	2.5 mg	**Phosphorus**	39.8 mg
Potassium	473 mg	**Fluoride**	145 mcg
Fats			
Total Fat Content	0.1 g	**Monounsaturated Fat**	0.0 g
Polyunsaturated Fat	0.0 g	**Cholesterol**	0.0 mg
Other Nutrients			
Water	219 g	**Sugar**	20.9 g
Proteins	1.7 g	**Carbohydrates**	26.8 g

El Niño is back in the tropical Pacific Ocean: How will it impact agriculture in the Southeast? http://agroclimate.org/forecasts/Agricultural-Outlook/

A mature and strong El Niño is now present in the tropical Pacific Ocean. Most of the climate outlook models suggest that the 2015-16 El Niño is likely to strengthen further before the end of the year. Models and expert opinion suggest that surface water temperatures in the east-central tropical Pacific Ocean are likely to exceed 2° Celsius above average, potentially placing this El Niño event among the four strongest events since 1950 (1972-73, 1982-83, 1997-98).
The El Niño Southern Oscillation (ENSO) is the most important coupled ocean atmosphere phenomenon that causes global climate variability on interannual time scales. It manifests itself as changes in: (1) the sea-surface temperatures in the equatorial Pacific Ocean; (2) the sea level pressure difference between eastern Pacific high pressure and western Pacific low pressure (the "Southern Oscillation"). During El Niño events ocean surface temperatures warm in the central and eastern equatorial Pacific Ocean and easterlies are less strong. El Niño events normally bring cooler and wetter winter and springs to the Southeast USA. More information about ENSO impacts can be found at: http://agroclimate.org/fact-sheets-climate.php

El Niño is already causing conditions in the tropical Atlantic to be less conducive to tropical storm development and the systems that have formed have encountered high wind shear and struggled to survive. During the winter El Niño causes the Pacific jet stream current to dip into the Southeast. This provides cold fronts with more moisture and energy. El Nino typically leads to 40 to 50% more rainfall than normal for the Florida peninsula, and about 30% more than normal for South Georgia. El Niño's impacts on the weather in the Southeast US are usually most prominent in the winter, but given the strength of this year's event, we could begin to see its effects this fall. Many climate models are predicting a wet fall with above-normal temperatures for the Southeast. Detailed information on the effects of El Niño for selected weather stations in the Southeast can be found on AgroClimate: http://agroclimate.org/tools/climate-risk/

Seasonal Climate Forecast

The seasonal precipitation and temperature forecasts for October-November-December of 2015 produced by the International Research Institute for Climate and Society at Columbia University (http://iri.columbia.edu) are presented below. They were released in August and indicate increased probabilities for above average rainfall and temperature for the Southeast USA, reflecting the effects of El Niño in the region.

Impacts on Agriculture in the Southeast USA

In the case of temperate fruits (peach, nectarine, blueberry, strawberry), El Niño conditions generally result in increased chill accumulation in the early part of the winter (Nov-Jan) and can reduce the need for oil or other dormancy-compensating sprays in peaches and blueberries. Growers can keep track of chill accumulation by checking the AgroClimate chill hours calculator tool on AgroClimate (http://agroclimate.org/tools/Chill-Hours-Calculator/).

Flower Bud Induction Overview and Advisory

NOTICE FOR CITRUS EXTENSION AGENTS & SPECIALISTS AND GROWER NEWSLETTERS
The following information has been developed as part of the Decision Information System for Citrus

L. Gene Albrigo, Horticulturist Emeritus
Citrus Research & Education Center, Lake Alfred, FL

FLOWER BUD INDUCTION ADVISORY #1 for 2015-2016-11/5/15
http://www.crec.ifas.ufl.edu/extension/flowerbud/2016/11_05_15.shtml

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 below the current status paragraph.

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. Unfortunately next week's cool temperature accumulation estimate still need some work to make it work properly. By January we hope to have estimates of the start of vegetative flush and 5-10 % open flowers to aid in managing psyllid sprays for the bloom period, CRDF supported effort.

Flowering related to the current 2015 -16 Crop Estimate– Last spring's flowering was more consistent and should have resulted in a better crop than estimated. Spring stress was less so reduced tree numbers and poorer tree health must be responsible for the reduced estimate if in fact we will have a crop of only 80 million boxes of sweet oranges. There was a flowering cohort toward the end of February after nearly 850 hours of inductive temperature induction (< 68 degrees F) followed by a second from 1000 hours of induction.

Flower bud induction status 2015-16 for 2016-2017 crop- This is supposed to be a very strong ENSO winter with more cool temperature accumulation and rainfall. Currently however, citrus locations have accumulated low inductive temperatures, < 68 degrees F, of only 30 to 130 hours from southern to northern areas, respectively. The next 7 days will have low cool temperature accumulation with less than 50 hours, south to north. This is nearly 200 hours behind last year. Accumulation of cool temperatures and prevention of growth during a winter warm spell is very important for good 2016-17 citrus production. The weather needs to cool down soon and follow an expected El Niño pattern.

Normal healthy trees could have their induction boosted by applying some drought stress. Unfortunately, with vulnerable root systems associated with HLB you shouldn't risk heavier preharvest fruit drop of the current crop by using water stress to prevent unwanted early vegetative growth and enhance induction of flowers (see later section on use of drought stress). In fact the previous years with HLB have had late winter flowering due to drought induced flowering from infrequent irrigation in the fall. I am advocating daily, lower volume irrigations to minimize fall water stress.

Overview of flower bud induction in Florida – Citrus flower bud induction starts in the fall and usually is completed by early January. Low temperatures first stop growth and then promote induction of flower buds as more hours of low temperatures accumulate (below 68 degrees F, 19 0C). Periods of high temperatures in winter can then initiate bud differentiation which after sufficient days of warm winter-springtime temperatures leads to bloom. The meteorologists predict that this winter in Florida will be an ENSO-El Niño year, below average temperatures and above average rainfall. Under these conditions, enough hours of low temperatures below 68 degrees F. will usually accumulate to induce an economic level of flower buds, but intermediate warm periods during the winter lead to multiple flower cohorts and a very prolonged bloom. Other conditions that can interfere with good flower bud induction include: 1) exceptionally high previous crop or 2) excessive leaf loss from hurricanes, freezes or other causes (canker, HLB) where tree recovery is not complete. Excessive leaf loss leads to low carbohydrate levels in developing buds which reduces their ability to become flower buds and/or to set. None of the adverse environmental conditions appear to be in play for the coming season's flower bud induction as freezes are less likely in an El Niño year. The biggest concern will be reduced available carbohydrates because of HLB.

Under normal Florida weather conditions but with a moderate to heavy previous crop, sufficient flower bud induction should be achieved when total accumulated hours of low temperatures exceed 800-850 hours below 68 degrees F. If the crop load is light, sufficient flower bud induction may occur after 700-750 hours of accumulated low temperatures. A warm period of 7 to 12 days, with maximum temperatures from 80 to 85 degrees F., can trigger growth (bud swelling) if a minimum total hours of low temperatures have accumulated (350-450 hours below 68 degrees F). Later in the winter when the accumulated cool temperature induction hours are higher, fewer days and lower daytime highs (75 degrees F.) are required in a warm period to stimulate growth of buds. Weather information relative to Florida citrus flower bud development for the current and several previous years (back to 1998) can be obtained and evaluated with the Citrus Flowering Monitor System using data from the Florida Automated Weather System (fawn.ifas.ufl.edu) for locations near you. An 8 day forecast from the National Weather Service predicts Florida weather for several sites around the citrus belt for the next week. Find this information at: http://www.nws.noaa.gov/mdl/forecast/text/state/FL.MRF.htm. This is an easy way to see if a warm period, which could trigger flower bud growth, is predicted for your specific area in Florida.

Some flower buds will be induced in the range of 350 to 450 accumulated hrs < 68 degrees F. Warm events after these levels of induction are met result in weak flowering intensity, and therefore many buds remain that can be induced by later cool periods, or these buds may sprout as vegetative shoots if warm weather continues and the trees are well irrigated. The first situation results in multiple cohorts of flower buds developing to different bloom dates. The second condition leads to low flowering-fruit set and excessive

early spring vegetative growth. During the years from 1963 to 2003, multiple blooms occurred in over half of the years. Historically, the time period in which an early warm period (7-12 day) can lead to an initial low number of buds growing and flowering is roughly mid-November to mid-December. Then after more cool temperatures additional flower buds are induced and a later warm period starts their growth and repeats of this temperature cycle result in multiple blooms.

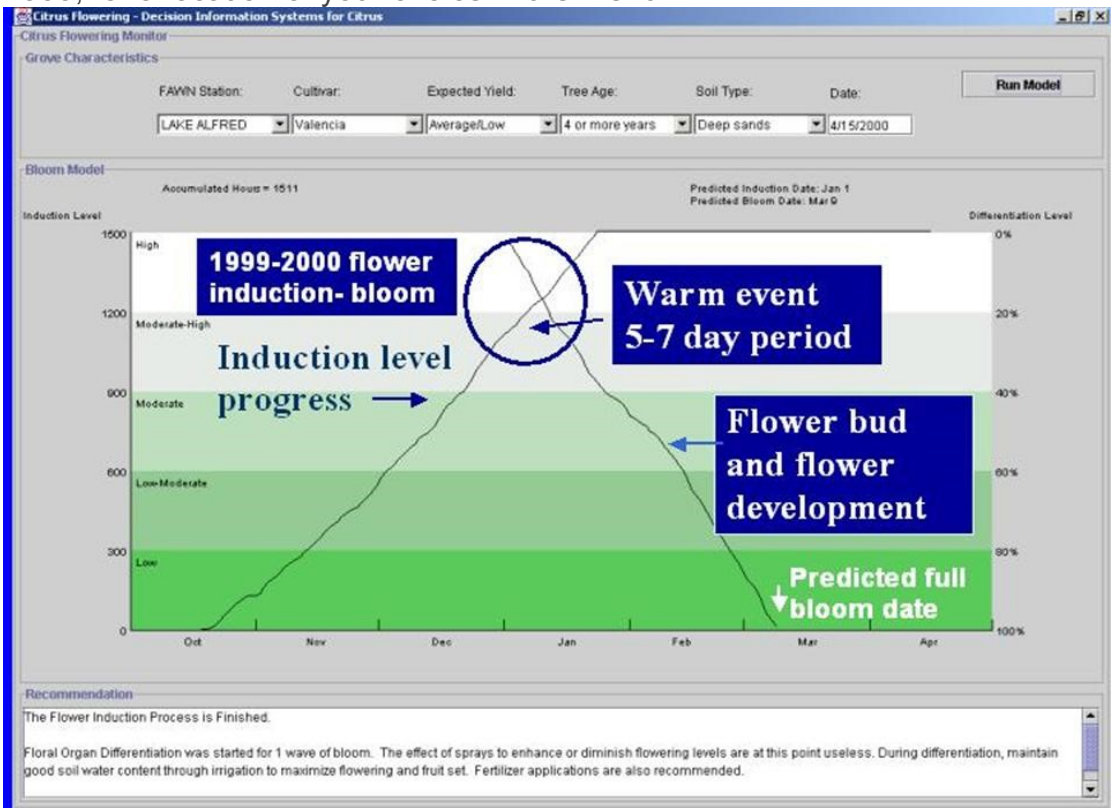
Presently, the only management tools available to eliminate or reduce the chance of multiple blooms are sufficient drought stress to stop growth or a timely gibberellin (GA) spray at the initiation of first wave bud growth. Water stress may be provided by stopping irrigation well before these predicted warm periods occur. If the warm periods(s) are of the typical 7 to 10 day duration, a coincident short period of drought stress will have little impact on current crop development or quality in healthy trees. Sufficient drought stress may be interpreted as leaf wilt observed by 10 or 11 am, but leaves recovering by early the next morning. If no rains interrupt a drought stress condition in citrus trees, buds will not grow in response to high temperatures. If a warm period has passed, trees again can be irrigated to minimize current crop stress. Although no weather prediction is guaranteed, rains in the winter usually come on the fronts for cool periods. Sufficiently cool temperatures (< 70 degrees F maximums) after a cold front rain will usually prevent growth even though soil moisture is adequate for growth. Since winter rains usually occur just before cool temperatures, the chances that drought stress will prevent an early flower bud differentiation event are reasonably good for many warm periods. Even so, growers in some growing districts have often found it difficult to maintain winter drought stress.

In the shallow soils of bedded groves, it is relatively easy to create sufficient water stress to suppress growth by withholding irrigation for a few days if no rains occur. In deeper, sandy soils, 2 or more weeks without irrigation or rainfall may be required. To minimize the time required for soil to dry sufficiently to initiate water stress, the soil should be allowed to dry out by mid-November so that trees show wilt by mid-day. For bedded groves, minimum irrigation can then be applied at low rates as needed until a weather prediction indicates a warm period is expected. At this time, irrigation should be shut down. For deep sands, the soil needs to be dried out and kept nearly dry below 6 to 8 inches of depth until at least Christmas so that no growth can occur. Minimum irrigations that re-wet perhaps the top 6 to 8 inches of the root zone may minimize excessive drought, while allowing quick return to a water stress condition if a high temperature period is forecast. Soil moisture monitoring can help to achieve these goals. Prolonged late-fall, early-winter drought may be risky for ‘Hamlin’ or other early maturing cultivars not yet harvested that tend to drop fruit near harvest. In pre-HLB studies, Valencia trees in Central Florida had good flowering and no apparent impact on current crop when irrigation was stopped in early December and resumed in the spring. **Unfortunately, with poorer root systems associated with HLB, trees are likely to be under some water stress much of the dry fall, even with normal irrigation practices. This has led to unwanted early flowering (late Dec. to Feb.) due to drought stress. For this reason plus associated preharvest fruit drop, drought stress management of flowering is not a good option for HLB infected trees, essentially all citrus trees in Florida.**

That leaves application of a GA spray as an alternative. GA will reverse induction and knock out a weak first flower initiation, but it has to be applied just before or as the warm period starts. If induction level is above 600 or 650 hours the spray will not completely

stop all of the flowering, but a more concentrated flowering should occur after the second warm period.

Much of what has been stated above has now been incorporated into a 'Citrus Flowering Monitor Expert System for Florida'. Figure 1 represents the different aspects of flower induction as depicted by the software program. The program gives an average bloom situation represented by the shades of green to white, vegetative to heavy flowering, respectively. If the current crop is very heavy, then more cool induction is needed to compensate for the crop load effect. If the current crop is lighter or tree condition better, then fewer total cool temperature hours are needed for an equal level of flowering. Recommendations (bottom text) do consider the current crop level in assessing when action should be taken to try to prevent or to promote initiation of the flower bud growth process. The system is available on-line: http://disc.ifas.ufl.edu/bloom . The on-line version can be fully appreciated by putting in a March or April date for any previous year, back to 1999, for a location of your choice in the menu.



Additional advisories will follow this preliminary one, roughly bi-weekly, and update the reader on accumulating hours of related cool or warm temperatures and other weather effects on flower bud induction. Methods for enhancing (urea or PO3 sprays) or reducing (GA3 sprays) flowering intensity as conditions and cultivars dictate will be discussed in later advisories. Read the archived advisories from previous years (link at top of this page) for more background.

See a previous background introduction for previous important yield responses to cool temperatures: **FLOWER BUD INDUCTION ADVISORY #1 for 2012-2013.**
If you have any questions, please contact me (albrigo@ufl.edu).

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HEDGING, TOPPING, AND SKIRTING CITRUS TREES

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The interception and utilization of sunlight should be an important consideration in citrus grove design. The effect of insufficient light is frequently observed in mature citrus groves that are not pruned (hedged, topped) regularly. Shading reduces yield and foliage on the lower parts of the trees. Sunlight not only influences flowering and fruit set but also enhances fruit quality and color development. Increased sunlight penetration within the tree canopy might also allow foliage to dry quicker after a rain shower and could help reduce establishment of fungal pathogens. Therefore, adjustments must be made in tree height and hedging angle to maximize sunlight interception.

Hedging and topping are important cultural grove practices. Severe hedging or topping of citrus trees during the winter can reduce cold hardiness. Trees with exposed internal scaffold wood and new tender growth are susceptible to cold injury.

In general, tree response to hedging and topping depends on several factors including variety, rootstock, tree age, growing conditions, time of pruning, and production practices. No one system or set of rules is adequate for the numerous situations encountered in the field. Growers are encouraged to gain a clear understanding of the principles involved in hedging and topping, and to take advantage of research results as well as consulting knowledgeable colleagues and custom operators for their observations.

Figure 1. Crowded trees needing hedging

Hedging should be started before canopy crowding (Figure 1) becomes a problem. As a general rule of thumb, pruning of branches greater than 0.13”- 0.25” in diameter should be avoided. Developing a pro-active pruning program should assist managers in removing the right-sized branches. Removal of a significant portion of the tree will result in excessive vegetative growth and a drastic reduction in subsequent yield. Hedging is usually done at an angle, with the boom tilted inward toward the treetops so that the hedged row middles are wider at the top than at the bottom. This angled hedging allows more light to reach the lower skirts of the tree. Hedging angles being commonly used vary from 10 to 15 degrees from vertical.

Topping should be done before trees have become excessively tall and should be an integral part of a tree size maintenance program. Long intervals between toppings increase the cost of the operation due to heavy cutting and more brush disposal. Furthermore, excessively tall trees are more difficult and expensive to harvest and spray. Topping trees will improve fruit quality and increase size. Some common topping heights are 10 to 12 ft at the shoulder and 13 to 14 ft at the peak (Figure 2). As a general rule, topping heights should be two times the row middle width.

Figure 2. Topping and hedging of large citrus trees

After severe hedging or topping, heavy nitrogen applications will produce vigorous vegetative regrowth at the expense of fruit production. Therefore, nitrogen applications should be adjusted to the severity of hedging and/or topping. Reducing or omitting a nitrogen application before and possibly after heavy hedging will reduce both costs and excessive vegetative regrowth. Light maintenance hedging should not affect fertilizer requirements.

Large crops tend to deplete carbohydrates and results in a reduced fruit yield 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 is recommended because it can help reduce alternate bearing which can be a significant problem in Valencia and Murcott production.

Severe hedging may create problems of brush disposal (Figure 3) and stimulates vigorous new vegetative growth, especially when done before a major growth flush. This happens because an undisturbed root system is providing water and nutrients to a reduced canopy area. The larger the wood that is cut, the larger is the subsequent shoot growth. Severe pruning reduces fruiting and increases fruit size.

Figure 3. Heavy hedging may create problems of brush disposal

The best time of year to hedge and/or top depends on variety, location, severity of pruning, and availability of equipment. Since pruning is usually done after removal of the crop, early maturing varieties are generally hedged before late maturing varieties. Most growers prefer to hedge before bloom, but trees will get more vegetative regrowth, which may not be desirable. Pruning could begin as early as November prior to harvesting in warmer areas. During this period, pruning operations should only cut minimal foliage and fruit from the trees.

Valencia trees may be hedged in late fall with only minimal crop reduction when the hedging process removes only a small amount of vegetative growth. In cases where excessive growth is to be

removed, the trees are usually harvested before hedging is conducted. Light maintenance pruning can be done throughout the summer and until early fall with little or no loss in fruit production. Moderate to severe pruning should not continue into the winter in freeze-prone areas, as trees with tender regrowth are susceptible to cold injury.

With citrus canker and greening diseases, selecting the best time for hedging and topping is becoming more complicated. New growth flushes promoted by hedging and topping in late spring, during the summer, and early fall can increase the population of leafminers and psyllids and aggravate the spread of citrus canker and greening. Declining trees with defoliated tops, dieback, reduced cropping, and severe root loss due to citrus greening are being hedged and topped to help balance the shoot to root ratio to improve tree performance and extend tree longevity.

Figure 4. Skirted and hedged citrus trees

Skirting is the pruning to raise tree skirts (Figure 4). Without skirting, the movement of herbicide booms and mechanical harvesting equipment is impeded. Fruit and limbs near the ground are often damaged by the passage of such equipment and by herbicide spray and fertilizer contact. Skirting allows uniform distribution of granular fertilizers and good water coverage of microsprinkler irrigation systems under tree canopies. Skirting facilitates the inspection of microirrigation systems and reduces the incidence of Phytophthora foot rot and brown rot because it allows good air circulation.

HLB ESCAPE TREES

To accelerate citrus gene discovery for HLB tolerance/resistance, UF-IFAS Citrus Researchers and Extension Agents are working closely with the citrus industry. They would like to know about trees that appear to be doing better than their cohorts in groves declining from HLB. We need your help in reporting to us about escape trees or potential survivor trees in your groves. Please contact Mongi Zekri (maz@ufl.edu or 863 674 4092) or any other citrus extension agent to determine if your trees meet this research criterion.

FLATWOODS CITRUS NEWSLETTER EVALUATION FORM

Please take a moment to rate the quality and usefulness of the information presented in the Flatwoods Citrus newsletter. Please send back the form to:

Dr. Mongi Zekri
University of Florida, IFAS
Hendry County Extension Office
P.O. Box 68
LaBelle, FL 33975
or Fax to 863 674 4636 or E-mail to maz@ufl.edu **Thank you for your input!!!**

Please circle or bold your answer

1	Was the information up to date and accurate?	Yes	No	Uncertain
2	Was the information delivered on time to be useful?	Yes	No	Uncertain
3	Was the information relevant to your situation?	Yes	No	Uncertain
4	Was the information easy to understand?	Yes	No	Uncertain
5	Have you had an opportunity to use the information?	Yes	No	Uncertain
6	Have you shared the information with someone else?	Yes	No	Uncertain

7 Overall, how do you feel about the Flatwoods Citrus Newsletter?

Satisfied Neither Satisfied Nor Dissatisfied Dissatisfied

8 **Do you have any suggestions that might improve the newsletter?**

(Please write in any comments)

9. How many years have you been using the Extension Service? _____ Years

10. What is your employment status?

_____ Grower	____ Chemical Industry	____ Service Provider
_____ Production Manager	____ Regulator	____ University
_____ Consultant	____ Association	Other _____

We appreciate your reactions and the time you have given us. Thank you, and please contact us when we may be of service to you.

Flatwoods Citrus

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Please send: Dr. Mongi Zekri
Multi-County Citrus Agent
Hendry County Extension Office
P.O. Box 68
LaBelle, FL 33975

Subscriber's Name:_____

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__Black, non-Hispanic

Gender

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__Male