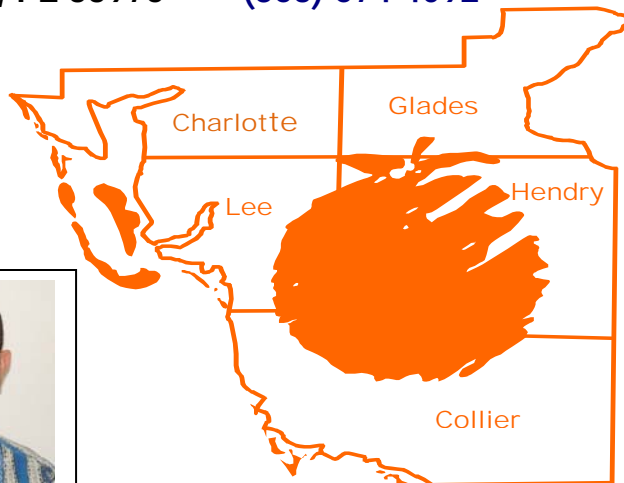


Hendry County Extension, P.O. Box 68, LaBelle, FL 33975 (863) 674 4092

# Flatwoods Citrus



**Vol. 18, No. 12**      **December 2015**

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



## Table of Contents

Important Events	2-3
Newsletter Sponsors – Thank You!	4-7
El Niño/Southern Oscillation (Enso) Diagnostic Discussion	8
Water Watch	9
Flower Bud Induction Overview and Advisory	10
What, When, How Often and What to Spray for Asian Citrus Psyllid Control	11-12
Asian Citrus Psyllid	13-14
Aerial Application of Pesticides	15-16
Cold Hardiness and Cold Protection	17
FAWN	18
Gulf Citrus Growers Association Scholarship Foundation, Inc.	19-21
Topics Discussed in the Flatwoods Citrus Newsletter -Year 2015-	22

**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

## 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**

Phil Stansly Jawwad Qureshi Barry Kostyk	<p><b><u>01-12-2016 - All You Need to Know About Scouting and Management of Citrus Insect Pests</u></b></p> <ol style="list-style-type: none"> <li>1. Scouting citrus for pests and beneficials</li> <li>2. Biological control of Asian citrus psyllid</li> <li>3. Scouting and Insecticidal Control of Citrus Rust Mites</li> </ol>
<b>Sponsor:</b>	<b>Stacey Howell with Bayer CropScience</b>
Megan Dewdney Pam Roberts	<p><b><u>02-11-2016 - All You Need to Know About Scouting and Managing Citrus Fungal Diseases</u></b></p> <ol style="list-style-type: none"> <li>1. Alternaria brown rot and citrus scab symptoms and managements</li> <li>2. Melanose and greasy spot symptoms and management</li> <li>3. The copper model and postbloom fruit drop</li> <li>4. Citrus black spot and Phytophthora management</li> </ol>
<b>Sponsor:</b>	<b>Cody Hoffman with Syngenta</b>



**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](mailto: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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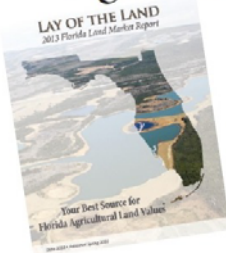
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# EL NIÑO/SOUTHERN OSCILLATION (ENSO) DIAGNOSTIC DISCUSSION

issued by

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

**ENSO Alert System Status: El Niño Advisory  
12 November 2015**

---

**Synopsis: El Niño will likely peak during the Northern Hemisphere winter 2015-16, with a transition to ENSO-neutral anticipated during the late spring or early summer 2016.**

A strong El Niño continued during October as indicated by well above-average sea surface temperatures (SSTs) across the central and eastern equatorial Pacific Ocean (Fig. 1). Most Niño indices increased during the month, although the far eastern Niño-1+2 index decreased, accentuating the maximum in anomalous SST farther west (Fig. 2). The subsurface temperature anomalies also increased in the central and eastern Pacific, in association with another downwelling equatorial oceanic Kelvin wave (Figs. 3, 4). Low-level westerly wind anomalies and upper-level easterly wind anomalies continued over the western to east-central tropical Pacific. Also, the traditional and equatorial Southern Oscillation Index (SOI) values remained negative. These conditions are associated with enhanced convection over the central and eastern tropical Pacific and with suppressed convection over Indonesia (Fig. 5). Collectively, these atmospheric and oceanic anomalies reflect a strong and mature El Niño episode.

Most models indicate that a strong El Niño will continue through the Northern Hemisphere winter 2015-16, followed by weakening and a transition to ENSO-neutral during the late spring or early summer (Fig. 6). The forecaster consensus remains nearly unchanged, with the expectation that this El Niño could rank among the top three strongest episodes as measured by the 3-month SST departures in the Niño 3.4 region going back to 1950. El Niño will likely peak during the Northern Hemisphere winter 2015-16, with a transition to ENSO-neutral anticipated during the late spring or early summer 2016 (click [CPC/IRI consensus forecast](#) for the chance of each outcome for each 3-month period).

El Niño has already produced significant global impacts. El Niño is expected to affect temperature and precipitation patterns across the United States during the upcoming months (the [3-month seasonal outlook](#) will be updated on Thursday November 19<sup>th</sup>). Seasonal 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 10 December 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](mailto:ncep.list.enso-update@noaa.gov).

---

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



# WATER WATCH

*Keeping an Eye on Water Resources*

## District-Wide Conditions for November 18, 2015

The South Florida Water Management District (SFWMD) is issuing the following briefing:

A stalled frontal boundary helped to focus rain across dry areas along South Florida's east coast this week. This included rainfall relief for key areas such as the Water Conservation Areas. More rain is expected during the next few days.

The Upper Kissimmee Basin, which received negligible rainfall, and portions of the Southwest Coast and East Caloosahatchee basins, received the least amount of rainfall in the District during the past week.

Water Levels in Key Locations (Nov. 18)		
Location	Today's level (NGVD29)	Water Supply Floor
WCA-1	17.00 feet	14.00 feet
WCA-2A	12.56 feet	10.50 feet
WCA-3A	10.13 feet	7.50 feet

### Water Conservation is Essential

- South Florida is under the District's Year-Round Landscape Irrigation Rule, which limits residential and business landscape irrigation to two or three days per week.
  - To determine watering days and times in your area, contact your local government or visit [www.sfwmd.gov/2days](http://www.sfwmd.gov/2days).
- Permitted water users such as nurseries, agriculture, golf courses and utilities can find water use conditions in their permits online at [www.sfwmd.gov/ePermitting](http://www.sfwmd.gov/ePermitting).
- For tips and information about water conservation, visit [www.sfwmd.gov/conserv](http://www.sfwmd.gov/conserv).

### Lake Okeechobee Operations

- The U.S. Army Corps of Engineers manages Lake Okeechobee water levels based on its regulation schedule.
- Corps water managers prefer to maintain water levels between 12.5 feet and 15.5 feet.
  - The most recent Operational Position Statement is available at [www.sfwmd.gov/opsreports](http://www.sfwmd.gov/opsreports).

Lake Okeechobee Levels	
Today (Nov. 18)	14.27 feet
This Date One Year Ago	15.62 feet

# # #

Media inquiries can be directed to:

**Gabe Margasak**

South Florida Water Management District

Office: (561) 682-2800 or Cell: (561) 682-2292

# Flower Bud Induction Overview and Advisory



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](http://www.crec.ifas.ufl.edu/extension/flowerbud/2016/11_05_15.shtml)

**FLOWER BUD INDUCTION ADVISORY #2**  
for 2015-2016-11/24/15

[http://www.crec.ifas.ufl.edu/extension/flowerbud/2016/11\\_24\\_15.shtml](http://www.crec.ifas.ufl.edu/extension/flowerbud/2016/11_24_15.shtml)

**EMERGENCY FLOWER BUD INDUCTION ADVISORY #3**  
for 2015-2016-12/01/15

[http://www.crec.ifas.ufl.edu/extension/flowerbud/2016/12\\_01\\_15.shtml](http://www.crec.ifas.ufl.edu/extension/flowerbud/2016/12_01_15.shtml)

# What, When, How Often and What to Spray for Asian Citrus Psyllid Control

Dr. Phil Stansly, UF IFAS- Immokalee

Most process orange growers back in the day didn't have to think too much about what to spray. A post bloom and summer oil spray usually got you through. You couldn't afford much more anyway with 85¢ pound solids. Leafminer came along and required more attention on young trees but not much else, at least until we got canker. Then came the Asian Citrus Psyllid (ACP) which also seemed mostly a young tree problem until greening set in with a vengeance. Decisions on what, when, how often and what to spray since then have become increasingly complex. Seems like there's no way to spray enough to avoid HLB but also that the more aggressive programs have the best looking groves. Still, everyone has a budget and cost is a major criterion to consider along with effectiveness, pest population, resistance management, impact on beneficials and CHMA considerations. Juggling all these factors to find the optimal program for each grower can cause major headaches!

The second table below is an attempt to suggest at least one set of alternatives based on a pre-determined number of sprays, from 1 to 10 per year. The criteria employed are (1) effectiveness against ACP and other pests that may be present, (2) for the most part not repeating any insecticide mode of action nor spraying a neonicotinoid (needed most for soil application to young trees) in the interest of resistance management, and (3) confining the broad-spectrum insecticides (pyrethroids or organo-phosphates) to the dormant season where they are most effective and have least impact on beneficials.

The first table offers different alternative products for different months, depending on what pest are of major concern. The superscripts after the pesticide name correspond to superscripts on pests controlled. Many of these products are not cheap, so cost would have to be controlled by number of sprays applied. Another way to reduce costs would be increased use of inexpensive but still effective products, i.e. pyrethroids, organo-phosphates, and imidacloprid. However, this option would be inviting trouble from resistance. These are individual choices for each grower to make although they affect the whole group. I look forward to your input and the opportunity to discuss your particular issues. We'll do what we can to find the best solutions.

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

## Example Insecticide Programs for ACP and Other Pests in Florida that Avoid Repeating Modes of Action

	Insecticide Sprays per year (excluding oil alone)						Other pests Controlled	MOA** Group
	One	Two	Four	Five	Eight	Ten		
Jan	Pyrethroid	Pyrethroid	Pyrethroid	Pyrethroid	Pyrethroid	Pyrethroid	Weevils	3
Feb			Movento*^	Movento*^	Movento *^	Movento *^	Rustmite Scales	23
Mar						Portal^	Spidermites, Rustmites	21
Apr	Oil	Oil	Oil	Oil	Micromite*^	Micromite*^	Leafminer Rustmite Weevils	15
					Voliam Flexi		Leafminer	4A,28
May						Abamectin*	Leafminer, Rustmite	6
Jun			Delegate*	Delegate*	Delegate*	Voliam Flexi	Leafminer	5 4A+23
Jul	Oil	Oil	Oil	Oil	Abamectin*	OP	Leafminers, Rustmites Weevils	1B
Aug						Oil	Rustmite, Leafminer	
Sep						Delegate*	Leafminer	5
					APTA^		Rustmite, Spidermites	21
				Micromite*^			Rustmite ,Weevils Leafminer	15
Oct						APTA^	Rustmite Spidermites	21
Nov-Dec		OP	OP	OP	OP	OP	Weevils	1B

\*Generally applied with oil or another surfactant ‡ May not be necessary due to low populations ^ Primarily for control of nymphs \*\* [www.irac-online.org](http://www.irac-online.org)

# ASIAN CITRUS PSYLLID

## Psyllid Management



The Asian citrus psyllid (*Diaphorina citri* Kuwayama) has become the most important insect pest of Florida citrus due to the presence of citrus greening disease also known as Huanglongbing (HLB) which is spread by the psyllid. Use of insecticides to control the psyllid vector is a major component of greening management strategies in Florida and elsewhere. There is good evidence that reducing psyllid populations via insecticide application not only slows the rate of HLB spread but also reduces severity of the disease once established. However, it should be noted that elimination of HLB from an area has never been successful and would not be possible with vector control alone.

Products recommended in this chapter for psyllid suppression have been demonstrated in field trials conducted by the University of Florida to be effective for reducing psyllid populations.

However, *most of these products will have negative effects on natural enemy populations. Thus, it is possible that new pest problems may develop as a result of increased insecticide use for*

*psyllid suppression.* However, the problems posed by these other potential pests are generally less serious than the threat posed by citrus greening disease.

**The goal of psyllid management programs is to reduce psyllid populations in commercial citrus groves to as low of levels as possible and still remain economically viable.**

Management programs should be developed specifically to optimize benefits while minimizing costs and negative impacts on beneficial insects and mites. The following information is provided to aid in the development of site-specific psyllid management programs.

### **Factors Affecting Psyllid Populations**

New flush is required for psyllid females to lay eggs as well as for subsequent development of the psyllid nymphs. Female psyllids lay their eggs in developing leaf buds and on feather stage flush which has not yet unfurled. Once young leaves have expanded, they are no longer attractive to psyllids for egg laying.

When suitable flush is not available for egg laying, psyllids may either remain on a tree feeding on the mature leaves until new flush is available for reproduction or they may leave the tree in search of other host plants on which to lay their eggs.

These plants may be citrus trees within the same grove (particularly young resets which flush more often) or trees producing flush in neighboring groves. Therefore, psyllid management practices in one grove may affect future psyllid populations in nearby surrounding citrus groves.

Temperature is also closely linked to the abundance of psyllids in the field. The ideal temperature conditions for psyllids are between 77-86°F. At these

temperatures, the reproductive potential of ACP is highest. When the daily temperatures are above 90°F, the average lifespan of a female psyllid decreases to less than 30 days in the laboratory with an average of fewer than 70 eggs produced per female. Below 60°F, egg-laying slows to less than 2 per day and development time increases to 2 months. Thus, under Florida conditions, psyllid populations will be lower during the mid-summer months and in winter compared to late spring and even early fall due to both temperature and a reduced amount of new flush available for egg laying.

#### **Chemical Control during the dormant season (mid-November - mid-February)**

**Broad-spectrum foliar sprays targeting adults are most effective when used prior to the presence of new flush. Once psyllids begin reproducing on new flush, it becomes increasingly difficult to gain control of rapidly increasing populations with these products. Psyllid management programs should begin by first targeting overwintering adult psyllids when the trees are not producing flush. By eliminating these overwintering adults, psyllid populations will be greatly reduced on the following spring flushes. Targeting psyllids early in the year this should provide enough suppression in psyllid populations to reduce the need for psyllid sprays during bloom when pollinators are present and most pesticide products cannot be applied. Additional sprays for psyllids should be made when observing an increase in adult populations in a grove.**

#### **Biological Control**

Foliar insecticide applications should only be used when needed to minimize

the impact on natural enemies that maintain psyllids and other pests at lower levels later in the year. While a single female psyllid can lay as many as 800 eggs, studies in Florida and Puerto Rico have shown that over 90% of psyllids that hatch in the field do not survive to become adults. Many are consumed by predaceous insects such as ladybeetles.

The parasitic wasp, *Tamarixia radiata*, has become established throughout Florida and also contributes some mortality especially in fall. Additionally, there are many potential pests such as scales, mealybugs, whiteflies, etc. that are currently maintained at low levels in Florida citrus due to biological control. Excessive sprays could result in resurgence of these pests.

#### **Other Management Considerations**

Management practices used within a grove can affect psyllid populations, especially those practices that promote new flush such as hedging and topping and fertilization. Trees should always be sprayed with a broad spectrum insecticide prior to or just after hedging and topping before any flush develops. Management strategies that reduce or limit the duration of flush, may help to keep psyllid populations at low levels and reduce the need for additional pesticide applications. Alternate host plants such as orange jasmine (*Murraya paniculata*) and box orange (*Severinia buxifolia*), in the vicinity of the grove can serve as sources of psyllids for infestation. When possible, both of these plant species should be removed from areas surrounding commercial citrus groves. For more detailed information and for recommended chemicals, go to: <http://www.crec.ifas.ufl.edu/extension/pest/PDF/2015/ACP%20and%20Leafminer.pdf>

## 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.





**NOCTURNA**  
AVIATION

**German Mejia**  
Class of 1982 UF Agricultural Engineer  
**Agricultural Air Services**  
**(754) 366-0795**

**Jeff Summersill**  
THOMAS R. SUMMERSILL, INC.  
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Ground Application  
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**Steve Fletcher**  
**Fletcher Flying  
Service, Inc.**  
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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° F, citrus plant growth slows. As temperatures remain below 55° 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° 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° F will damage fully mature, harden-off leaves that have not received any acclimation. Minimum temperatures of 30° F can significantly damage unhardened new flush leaves. Leaves that have received extensive acclimation have been shown to survive temperatures as low as 20° 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°F.

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.



## FAWN (Florida Automated Weather Network)

Go to <http://fawn.ifas.ufl.edu/>

Click on Tools, then click on Cold Protection Toolkit or go directly to

<http://fawn.ifas.ufl.edu/tools/coldp/>

Then Select a Tool.

**New! [Graphic Forecast data for FAWN sites](#)**

National Weather Service (NWS) forecast data for next 96 hours. Updated hourly.

**[Fruit Frost Station Forecasts](#)**

With the demise of the NWS agricultural program in April of 1996 the minimum temperature forecast and winter summaries went away. An opportunity now exists to once again provide temperature forecasts for the old Fruit Frost locations with the development of the Point forecast by NWS.

**[Minimum Overnight Temperature](#)**

Estimates based on the Brunt equation and the air & dew point temperatures at sunset.

**[Forecast Tracker for FAWN sites](#)**

Plots the actual temperature and forecasted temperature for the previous twenty four (24) hours and the forecasted temperature for the next twenty four (24) hours in order to show how well the forecast is tracking the actual temperature. The Forecast Tracker is easy to use with a drop down menu to select the desired FAWN site.

FAWN does not make weather forecasts, but utilizes the National Weather Service products, especially the pin point forecasts. For more information see **JETSTREAM, an online weather school, Pinpoint Forecasts.**

**[Evaporative cooling potential](#)**

Determining the risk of using irrigation for cold protection, and see the risk calculated at FAWN stations.

There is always a risk when using water systems, micro-sprinkler or conventional sprinkler, for cold and/or frost protection. Low humidity and wind can produce evaporative cooling which can chill plant surfaces to the wet bulb temperature. Dry and windy conditions can result in wet bulb temperatures 5F to 6F degrees lower than air temperature. Therefore, wetted plant surfaces that experience evaporation would be 5F to 6F degrees cooler than air temperature. Evaporative cooling may result in plant damage when water is used for cold protection during dry windy conditions. Evaporative cooling should always be taken into consideration.

It is possible that, on nights when temperatures are close to critical levels, introduction of water could produce more damage than would result if no action was taken!

**[Wet-Bulb Based Irrigation Cutoff Temperature](#)**

The safe cutoff temperature based on current FAWN conditions.



## Gulf Citrus Growers Association Scholarship Foundation, Inc.

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P. O. Box 1319, LaBelle, Florida 33975 (863) 675-2180 / Fax: (863) 675-8087 / Email: [gulfcitrus@embarqmail.com](mailto:gulfcitrus@embarqmail.com)

### *About the Gulf Citrus Growers Association*

The citrus growers of southwest Florida are committed to supporting education as a long-term investment in the future of our industry. The first Gulf Citrus scholarship was awarded in 1992 through the Gulf Citrus Growers Association, a trade organization representing growers in Charlotte, Collier, Glades, Hendry and Lee Counties.

The Gulf Citrus Growers Association Scholarship Foundation was established in 2000 as a non-profit entity to oversee the distribution of these awards. Scholarship applications are accepted throughout the year and are reviewed semi-annually by a Scholarship Selection Committee comprised of academic and industry members. The number and amount of awards vary depending upon the number of applications received and available funds.

Applicants who are not selected may submit a new application for consideration in the next selection cycle. Previous award winners may also reapply.

### *Scholarship Criteria*

Preferred requirements for scholarships are as follows:

#### **AA, BS, MS and PhD Degrees:**

- Completion of all placement testing and a **declared major** in agriculture or related major.
- Completion of **12 credit hours** towards agriculture or related degree.
- Minimum overall grade point average of **2.5** for a BS degree; **3.0** for MS and PhD degrees.
- A demonstrated **commitment** to complete the degree at a state college, community college or university.

Applicants must complete the attached application, which includes a statement of release giving the selection committee permission to verify information submitted.

**\*\*\*APPLICATION DEADLINES ARE DECEMBER 31 AND JULY 31\*\*\***



# Gulf Citrus Growers Association Scholarship Foundation, Inc.

P. O. Box 1319, LaBelle, Florida 33975 (863) 675-2180 / Fax: (863) 675-8087 / Email: [gulfcitrus@embarqmail.com](mailto:gulfcitrus@embarqmail.com)

## Scholarship Application

### Personal Data

Name: \_\_\_\_\_ Student ID: \_\_\_\_\_

Home Address: \_\_\_\_\_

City/State: \_\_\_\_\_ Zip: \_\_\_\_\_ Phone: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

City/State: \_\_\_\_\_ Zip: \_\_\_\_\_ Phone: \_\_\_\_\_

E-mail: \_\_\_\_\_

Employer: \_\_\_\_\_

Address: \_\_\_\_\_

City/State: \_\_\_\_\_ Zip: \_\_\_\_\_ Phone: \_\_\_\_\_

Does your employer reimburse you for tuition or other expenses incurred toward your degree?  
Yes \_\_\_\_ No \_\_\_\_

### Educational Information

College or University in which you are enrolled: \_\_\_\_\_

Department / Degree Program: \_\_\_\_\_

I am working toward the following: AA \_\_\_\_ BS \_\_\_\_ MS \_\_\_\_ PhD \_\_\_\_ Other \_\_\_\_

Courses Taken in Major (completed):

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Courses (in which you are currently enrolled):

\_\_\_\_\_  
\_\_\_\_\_

Total Credit Hours Toward Degree: \_\_\_\_\_ Cumulative Grade Point Average (GPA): \_\_\_\_\_

Expected Date of Graduation: \_\_\_\_\_

Please answer the following questions in complete sentences with as much detail as possible.

**What are your career goals?** \_\_\_\_\_

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**What is the potential value of your education to the citrus industry *in southwest Florida*?**

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I authorize the release of this application and any relevant supporting information to persons involved in the selection of recipients for Gulf Citrus Growers Association scholarships.

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Applicant's Signature

Date

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**\*\*\*APPLICATION DEADLINES ARE DECEMBER 31 AND JULY 31\*\*\***

Please return this application with your [official transcripts](#) to:

Gulf Citrus Growers Association Scholarship Foundation, Inc.

**Dr. Mongi Zekri, Application Coordinator**

Hendry County Extension Office

P. O. Box 68

LaBelle, FL 33975

Phone: (863) 674-4092 / Fax: (863) 674-4636

E-mail: [maz@ifas.ufl.edu](mailto:maz@ifas.ufl.edu)



**EXTENSION**  
Institute of Food and Agricultural Sciences

Hendry County Extension • P.O. Box 68 • LaBelle, Florida 33975-0068 • (941) 674-4092

**Flatwoods Citrus**



**TOPICS DISCUSSED IN  
THE FLATWOODS  
CITRUS NEWSLETTER  
-YEAR 2015-**

<b>January</b>	Importance of Scouting for Pests; Citrus Health Management Areas (CHMAs); Spray Options for Citrus Pest Management; El Niño/Southern Oscillation (Enso) Diagnostic Discussion; Water Watch
<b>February</b>	Fungicide Effectiveness; Postbloom Fruit Drop; Citrus Black Spot; Citrus Scab; Nutrition of Citrus Trees; Importance of Fertilizer Spreader Calibration and Maintenance; Foliar Feeding; Boron (B); Microsprinkler Irrigation & Fertigation; Mobile Irrigation Lab
<b>March</b>	Drought; Plant Growth Regulators; Spider Mites; Pollination of Citrus by Honey Bees; El Niño/Southern Oscillation (Enso) Diagnostic Discussion; Water Watch;
<b>April</b>	Foliar Feeding; Pesticide Recordkeeping Benefits & Requirements; Importance of Sprayer Calibration; Importance of Fertilizer Spreader Calibration and Maintenance; Citrus Canker; Precision Agriculture; El Niño/Southern Oscillation (Enso) Diagnostic Discussion; Forecasters Predict Historically Weak Atlantic Hurricane Season
<b>May</b>	Living with Lovebugs; Tree Assistance Program for Florida Citrus Greening; Citrus Rust Mites; Greasy Spot Fungal Disease; Water Quality: Alkalinity and Hardness; Neutralizing Excess Bicarbonates from Irrigation Water in Florida
<b>June</b>	Hurricane Season; Hedging, Topping, and Skirting Citrus Trees; Field Identification of Citrus Blight; Causes and Prevention of Emitter Plugging in Microirrigation Systems; High Bicarbonates in Irrigation Waters; Fertigation Practical Example
<b>July</b>	Resetting in Citrus Groves; 2015 Atlantic Hurricane Season Outlook; Preparation for the Hurricane Season; Flooding Injury and Importance of Drainage; Weed Management in Citrus Groves; Gulf Citrus Growers Association Scholarship Foundation, Inc.
<b>August</b>	El Niño/Southern Oscillation (Enso); Phytophthora; Brown Rot Management; Leaf Tissue and Soil Sampling and Testing; Foliar Fertilization in Citriculture; Danger of Heat Stress; Managing Heat Stress; How to Reduce Spray Drift of Pesticides?
<b>September</b>	ENSO Alert System Status: El Niño Advisory; Algae ; Where Florida's Water Comes From? Fall Nutrition of Citrus Trees; Irrigation, Nutrition and Fruit Quality; Citrus Canker is Still A Devastating Problem; Citrus Black Spot Quarantine Area Keeps Expanding
<b>October</b>	El Niño/Southern Oscillation (Enso) Diagnostic Discussion; Water Watch; 2015 Most Popular Cultivars and Rootstocks; Dormant Sprays Key to CHMA Success; Certified Pile Burners Course; Winter Weather Watch
<b>November</b>	El Niño/Southern Oscillation (Enso) Diagnostic Discussion; Fire Ants; Benefits of Orange Juice; El Niño is Back in the Tropical Pacific Ocean; Flower Bud Induction Overview and Advisory; <i>Hedging, Topping, and Skirting Citrus Trees</i> ; HLB Escape Trees
<b>December</b>	El Niño/Southern Oscillation (ENSO) Diagnostic Discussion; Water Watch; Flower Bud Induction; What, When, How Often and What to Spray for Asian Citrus Psyllid Control; Asian Citrus Psyllid; Aerial Application of Pesticides; Cold Hardiness and Cold Protection; FAWN; Gulf Citrus Growers Association Scholarship Foundation, Inc.

# 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

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Subscriber's Name: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Phone: \_\_\_\_\_

Fax: \_\_\_\_\_

E-mail: \_\_\_\_\_

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## **Racial-Ethnic Background**

American Indian or native Alaskan

Asian American

Hispanic

White, non-Hispanic

Black, non-Hispanic

## **Gender**

Female

Male