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Institute of Food and Agricultural Sciences

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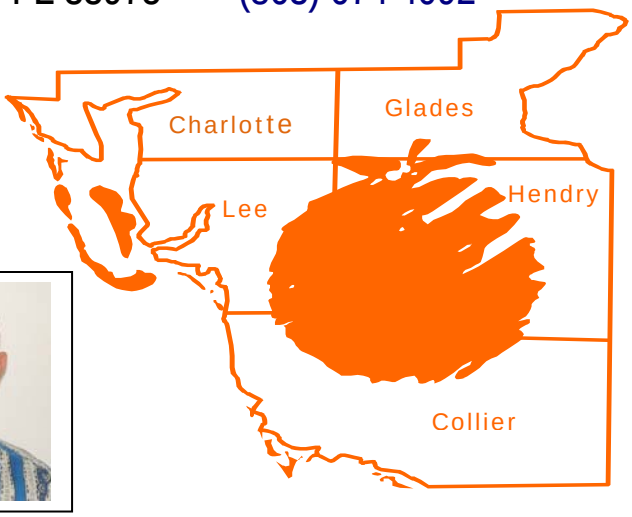
# Flatwoods Citrus




**Vol. 19, No. 9** **September 2016**

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/**

# Workshop

## Use of Compost in Citrus Production

Date: Wednesday, September 14th, 2016
Time: **8:30 AM – 12:30 PM**
Location: Immokalee IFAS Center
Program Coordinator: Dr. Mongi Zekri, UF-IFAS
Program Sponsor: **Environmental Turnkey Solutions, LLC**

## Agenda

8:30-8:45 am Welcome and Introduction, Dr. Mongi Zekri

8:45-9:00 am Pre-test

9:00- 9:30 am How compost can improve soil health in fruit trees? Dr. Monica Ozores-Hampton

9:30-10:00 am Composting technologies, Dr. Monica Ozores-Hampton

10:00-10:30 am Composting feedstocks for citrus production and facilities locations in Florida, Dr. Monica Ozores-Hampton

**10:30-10:45 AM Break**

10:45-11:15 am Update on the evaluation of long term compost application on soil quality, tree growth and leaf tissue of young grapefruit trees, Dr. Monica Ozores-Hampton

11:15-12:15 am Demonstration of compost spreading in citrus production, Dr. Monica Ozores-Hampton

**12:15 pm -12:30 pm Post-test**

12:30 pm Lunch
**Lunch Sponsor: Environmental Turnkey Solutions, LLC**

**3 CEUs for Certified Crop Advisors (CCAs)**

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

# Seminar

## Soil Microbes for Citrus in Relation to Citrus Greening (HLB) and Beneficial Nematodes for Diaprepes Control

Date: Thursday, October 20th, 2016
Time: **10:00 AM – 12:00 Noon**
Location: Immokalee IFAS Center
Program Coordinator: Dr. Mongi Zekri, UF-IFAS
Program Sponsor: Joe Mitchell, BASF Technical Service

### Agenda

10:00 AM – 10:55 AM. **What have we learned about citrus microbiome and its application? Dr. Nian Wang, UF-IFAS Citrus REC**

***--Citrus microbiome and HLB***
***--Beneficial bacteria and its application on disease control***
***--Plant defense inducers on HLB control***
***--Trunk injection of bactericides on HLB control***

**10:55 AM – 11:05 AM Break**

**11:05 AM – 12:00 Noon. Entomopathogenic nematodes as a component of Diaprepes root weevil IPM, Dr. Larry Duncan, UF-IFAS Citrus REC**

Entomopathogenic nematodes as part of a Diaprepes root weevil IPM program meeting, October 20th, 10:00 AM, Immokalee IFAS Center designed specifically to control Diaprepes root weevils using entomopathogenic nematodes (EPNs) have been unavailable since 2011. Because of recent high demand by growers, a product for weevil control in citrus was released last year and a second release is available this summer. To provide practical information about the use of these available EPNs for weevil control, Dr. Larry Duncan, a UF Nematologist at Lake Alfred CREC, will speak on the following topics to address the use of EPNs in Florida citrus groves:

***--How do EPNs work as biological pesticides and as naturally occurring biological control agents in groves?***
***--What levels of control can be expected from using EPNs?***
***--How EPNs are applied and at what rates for optimum control?***
***--What is the best timing of application and how to integrate with other IPM tactics?***
***--What is the cost and how will we know if EPN use is profitable in groves with HLB?***

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

**12:00 Noon, Sponsored Lunch**
Lunch Sponsor: **Joe Mitchell**, **BASF** Technical Service

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

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**Location**: UF/IFAS/Southwest Florida Research and Education Center, Immokalee
**Date**: Wednesday, September 14, 2016, **Time**: 8:30 am to 1:30 pm
3 CEUs for Certified Crop Advisors

Participants will learn the proper use of compost in citrus production. Training will be based on composting principles which promote the improvement of soil quality and root health.

**Agenda**

8:30-8:45 am Welcome and Introduction by Dr. Mongi Zekri and Dr. Monica Ozores-Hampton

8:45-9:00 am Pre-test

9:00- 9:30 am How compost can improve soil health in fruit trees? Dr. Monica Ozores-Hampton

9:30-10:00 am Composting technologies. Dr. Monica Ozores-Hampton

10:00-10:30 am Composting feedstocks for citrus production and facilities locations in Florida. Dr. Monica Ozores-Hampton

**10:30-10:45 AM Break**

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11:15-12:15 am Demonstration of compost spreading in citrus production. Dr. Monica Ozores-Hampton

**12:15 pm -12:25 pm Lunch Sponsor Introduction: Environmental Turnkey Solutions, LLC**

12:25 pm Post-test and lunch

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

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**IFAS Research**
Everglades Research and
Education Center

3200 E. Palm Beach Rd.
Belle Glade, FL 33430
561-993-1500
561-993-1582 Fax
http://erec.ifas.ufl.edu

## Everglades Agricultural Area
## Phosphorus Best Management Practices Training

**Date/Time:** Thursday, September 29, 2016, from 9:00 am to 2:00 pm. Lunch will be provided.

**Location:** Conference Center Building, Everglades Research and Education Center, 3200 E. Palm Beach Road, Belle Glade, FL 33430.

**Target Audience:** Everglades Agricultural Area (EAA) growers and farm personnel, water managers, and pesticide and fertilizer applicators.

**Training Overview:** The goals of the workshop are to review and discuss with participants the operating principles of the EAA Best Management Practices (BMP) program and provide the participants with the latest implementation information. Certified Crop Advisor and Continuing Education Units (CCAs and CEUs) will be offered to workshop participants. Speakers and topics for the training are below:

| | | |
|---|---|---|
| Samira Daroub | - | BMP research update |
| Lyn Gettys | - | Aquatic weed control |
| Luis Girado | - | Selecting optimal BMPs for farms |
| Pepe Lopez | - | Sediment and particulate controls |
| Mabry McCray | - | Nutrient control practices |
| Ximena Pernett | - | Verification and implementation of BMPs |
| SFWMD | - | Blue-green algae info and research |

**Registration:** Please RSVP your participation in the workshop by contacting Tim Lang via email: talang@ufl.edu or by phone: 561-261-2354 by September 26, 2016. For additional BMP training information or if you have specific BMP related questions, please contact Samira Daroub by email: sdaroub@ufl.edu or by phone: 561-993-1593.

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# Farm Labor Supervisor Training Program

## 2016 Fall Training Sites & Dates

***Sept. 20- 21, 2016***

**Fort Pierce**
**UF/IFAS IRREC**
**2199 South Rock Road**
**Fort Pierce, FL 34945**
**Ph: 772-468-3922**
**Register:**
**https://fls2016fortpierce.eventbrite.com**

***Oct. 4 - 5, 2016***

**Homestead**
**Miami-Dade Cty Ext.**
**18710 SW 288th St.**
**Homestead, FL**
**Ph: 305-248-3311**
**Register:**
**https://fls2016homestead.eventbrite.com**

***Oct. 11- 12, 2016***

**Arcadia**
**Family Service Center**
**310 W. Whidden St.**
**Arcadia, FL 34266**
**Ph: 863-956-8644**
**Register:**
**https://fls2016arcadia.eventbrite.com**

***Oct. 25 - 26, 2016***

**Sebring**
**UF/IFAS Highlands Cty Extension**
**4509 George Blvd.**
**Sebring, FL 33875**
**Ph: 863-402-6540**
**Register:**
**https://fls2016sebring.eventbrite.com**

***November 9 – 10, 2016***

**Immokalee**
**Southwest FL REC**
**2685 State Road 29 N**
**Immokalee, FL 34142**
**Ph: 239-658-3400**
**Register:**
**https://fls2016immokalee.eventbrite.com**

**2 DAYS OF TRAINING AT EACH LOCATION**

**DAY 1**

| TIME | CLASSES |
|---|---|
| 8:30 am - 9:00 am | Registration |
| 9:00 am - 10:00 am | FLC Basics |
| 10:15 am - 12:30 pm | Wage & Hour |
| 12:30 pm—1:00 pm | Lunch |
| 1:00 pm—2:30 pm | Rules for Drivers |
| 2:45 pm - 4:00 pm | Safe Driving |

**DAY 2**

| TIME | CLASSES |
|---|---|
| 8:30 am - 9:00 am | Registration |
| 9:00 am - 11:00 am | HR Compliance |
| 11:00 am - 11:30 pm | Lunch |
| 11:30 pm—1:30 pm | Management Communication |
| 1:45 pm - 3:15 pm | Heat Illness |

### Who should take these classes?

Labor Contractors, Crew Leaders, Bus & Van Drivers and Farm Office Staff

**Language:** English or Spanish

### Class information:

**Minimum Class Size:** 10 participants

**Fee:** $50 per person per class

**To register visit:** http://swfrec.ifas.ufl.edu/programs/economics/fls or go directly to the Eventbrite page

**For More Information Contact:**

**Barbara Hyman (239) 658 - 3461 (hymanb@ufl.edu)**

**Carlene Thissen (239) 658 - 3449 (carlene@ufl.edu)**

**O llame a 239-658-3463 para español**

# 2016 Ridge Citrus Production School

UF/IFAS Citrus REC, BHG Hall, Lake Alfred, Florida 9:30 am – 1:00 pm

Register online at https://ridgecitrusproductionschool.eventbrite.com

*The Ridge Citrus School will be a series of educational seminars held at the UF/IFAS Citrus Research and Education Center (700 Experiment Station Road, Lake Alfred, Florida 33850). Each seminar will have speakers from throughout the state of Florida who will provide core concepts and research updates for the Florida citrus industry.*

*If you would like to register for all of the seminars, the cost will be $40.00. To receive the reduced rate, you must register by October 12, 2016.*

*Each seminar will cost $7.00 per participant. If you register for each seminar individually, the deadline to register is the Friday prior to the seminar day.*

*The registration fee will cover the costs of printed materials and refreshments. Lunch will be provided compliments of our sponsors.*

**PRESENTATIONS**

October 18: Horticulture and Engineering
New Technologies in Citrus Disease Detection and Management, Reza Ehsani, UF/IFAS CREC
Corrective Pruning to Rehabilitate HLB Affected Trees, Tripti Vashisth, UF/IFAS CREC
Plant Physiology is Not an Abstract Concept, Christopher Vincent, UF/IFAS CREC

October 25: Plant Pathology
Foliar Fungal Diseases, Megan Dewdney, UF/IFAS CREC
Root Health in Florida Citrus Trees, Evan Johnson, UF/IFAS CREC
Postbloom Fruit Drop, Megan Dewdney, UF/IFAS CREC
Citrus Tristeza Virus and *Candidatus* Liberibacter asiaticus Infection Pathways, Amit Levy, UF/IFAS CREC

November 1: Entomology
Why When and How to Manage Asian Citrus Psyllid, Phil Stansly, UF/IFAS SWFREC
Management of Asian Citrus Psyllid for Organic and Conventional Citrus, Jawwad Qureshi, UF/IFAS IRREC
Using Nematodes and Other Tactics to Manage Root Weevils, Larry Duncan, UF/IFAS CREC
Citrus Leafminer Management Practices in Citrus, Lukasz Stelinski, UF/IFAS CREC
CHMA Performance, Implementation, and Effect on the Ridge, Brandon Page, UF/IFAS CREC

November 8: Handling and Processing
Improvement of Citrus Flavor Using a Flavoromics Platform, Yu Wang, UF/IFAS CREC
Food Safety Update – FSMA's Produce Safety Rule, Michelle Danyluk, UF/IFAS CREC
Effects of Preharvest Factors and Management Practices on Citrus Fruit Quality and the Development of Postharvest Decay and Disorders, Mark Ritenour, UF/IFAS IRREC

November 15: Varieties and Rootstocks
The Importance of Rootstocks for Citrus Production in Florida, Ute Albrecht, UF/IFAS SWFREC
Progress in Developing Rootstocks for the HLB World, Jude Grosser, UF/IFAS CREC
New Scion Varieties from the UF/IFAS CREC for Florida Citrus Production, Fred Gmitter, UF/IFAS CREC

November 22: Alternative Crops
Peach Production in Florida, Tripti Vashisth, UF/IFAS CREC
Considerations for Commercial Blueberry Production in Central Florida, Jeff Williamson, UF Gainesville
Challenges to Peach Production in Florida, Jose Chaparro, UF Gainesville
Economics of Alternative Crops, Ariel Singerman, UF/IFAS CREC

November 29: Citrus Economics
Economics of Citrus: Understanding CHMA Participation Decisions, Ariel Singerman, UF/IFAS CREC
Navigating Wage/Hour Rules with and without H-2A Workers, Fritz Roka, UF/IFAS CREC
Florida Citrus Industry 2016-17 Outlook, Marissa Zansler, FDOC, Gainesville
Development of Florida's Citrus Forecast, Candi Erick, USDA-NASS

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**REGISTRATION FORM**

2016 Ridge Citrus Production School

UF/IFAS Citrus Research and Education Center, 700 Experiment Station Road, Lake Alfred, FL 33850

Submit form to: Sarah McCoy, sarahmccoy@ufl.edu Phone: 863-956-8632 Fax: 863-956-8768

**Register online at https://ridgecitrusproductionschool.eventbrite.com**

Participant Name: _____

Company Name: _____

Phone: _____ Email: _____

**Please select the days attending.**

- ☐ October 18: Horticulture and Engineering
- ☐ October 25: Plant Pathology
- ☐ November 1: Entomology
- ☐ November 8: Handling and Processing
- ☐ November 15: Varieties and Rootstocks
- ☐ November 22: Alternative Crops
- ☐ November 29: Citrus Economics

Please make checks payable to: UF

Registration fee is $7.00 per seminar day.
Payment is due the Friday before each seminar day.

A one time fee for all seminars is $40.00.
Must register by October 12, 2016.

# Citrus Nutrition Day

## Tuesday, October 11, 2016

University of Florida, IFAS, Citrus Research and Education Center
700 Experiment Station Road, Lake Alfred, Florida
Ben Hill Griffin, Jr. Hall

| | |
|---|---|
| 9:00 am | Check-in begins |
| 9:45 am | Welcome and Introductions, Michael Rogers, UF/IFAS CREC |
| 10:00 am | Getting Started with the Diagnosis and Recommendation Integrated System (DRIS) for Citrus Nutrition Decision Support, Arnold Schumann, UF/IFAS CREC |
| 10:20 am | Managing Nutrient Accumulation and Uptake Using Advanced Citrus Production Systems, Davie Kadyampakeni, UF/IFAS CREC |
| 10:50 am | Break and visit with exhibitors |
| 11:10 am | Irrigation Scheduling and pH Management Affect the Health of HLB-Affected Citrus Trees, Kelly Morgan, UF/IFAS SWFREC |
| 11:40 am | Foliar Fertilization for Grapefruit Production in the Indian River Region, Alan Wright, UF/IFAS IRREC |
| 12:00 pm | Lunch and visit with exhibitors |
| 1:00 pm | UF/IFAS Grower Nutrition Trials-Update and New Trials, Tripti Vashisth, UF/IFAS CREC |
| 1:30 pm | A Grower's Perspective on UF/IFAS Grower Nutrition Trials, Vic Story, Story Citrus |
| 1:45 pm | A Grower's Perspective of Nutrition for Fresh Grapefruit, Tom Stopyra, The Packers of Indian River, Ltd. |
| 2:15 pm | Question and Answer; Conclude |

**Registration fee: $30.00 per person**

Complete registration form below and make checks payable to UF

---OR---

Register online at www.citrusnutritionday2016.eventbrite.com

**Pre-registration required by Tuesday, October 4, 2016**
***(Registration fee increases to $45.00 after October 4th)***

**CEUs will be requested for Restricted Use Pesticide and Certified Crop Advisors**

UF IFAS Extension UNIVERSITY of FLORIDA

## REGISTRATION FORM

Citrus Nutrition Day
Tuesday, October 11, 2016

Mail the completed registration form and check (made payable to UF) to:
Sarah McCoy, Citrus REC, 700 Experiment Station Road, Lake Alfred, Florida 33850
sarahmccoy@ufl.edu Phone: 863-956-8632 Fax: 863-956-8768
**Register online at www.citrusnutritionday2016.eventbrite.com**

Participant Name: _____

Company Name: _____

Phone: _____ Fax: _____

Email: _____

Dietary Restrictions (please circle):

Vegetarian Gluten Free Dairy Free Other: _____

***Pre-registration required by Tuesday, October 4, 2016 to avoid late registration fee***

## FDACS Citrus Grove Renovation/Re-establishment Support Program

**$5.5 Million**

**$3.0 M - Specifically for Implementation within the Northern Everglades (NEEPA)**
**$2.5 M - Implementation in Citrus Areas Statewide (outside NEEPA)**
**This program is specifically to assist growers who intend to make the investment to re-establish citrus groves.**
**PURPOSE: To support the citrus industry by providing cost-share on improvements in irrigation and nutrient management for re-planting or re-establishing groves.**

**To qualify:**

--Producer must have history of citrus production since at least 2008

--Producer must be enrolled in the OAWP Citrus BMP program

--Producer must have documentation of purchase of tree seedlings for replanting

--Proposed projects must be a minimum of 10 acres

--Proposed projects must consist of complete replanting in project blocks

--Producer must agree to perform Implementation Assurance evaluation at end of period, including Mobile Irrigation Lab evaluation

--Grove operator must have a DPI Compliance Agreement (grower/caretaker compliance agreement).

--Practices must be designed and installed to NRCS Standards and Specifications, as applicable

--Project must be able to be completed on or before June 30, 2017

--$250,000 cap for cost share portion of projects per producer/property owner

**Cost Share will at 75% reimbursement for eligible practices and improvements. Engineering and design costs will be reimbursed at 100%. Project costs can be split with other programs (WMD programs, EQIP) if available in project area, as long as total combined reimbursement does not exceed 75% of eligible project costs.**

**Example Cost Shared Items:**

--Stormwater management improvements and upgrades, must include tailwater recovery if on flatwoods soils (footprint of ponds can be used as in-kind cost share )

--Treatment system for stormwater/tailwater for FSMA requirements

--Nutrient Management - Fertigation/Acid Systems; variable rate applicators

--Irrigation systems/components necessary for replanting, must include under tree microjets/drip– may include variable rate pumps, automation, weather stations, soil moisture sensors

--Other practices and improvements that can be shown to improve nutrient management and irrigation management and that will meet the goals of the applicable BMAP

Complete proposals must include project plans, timing for implementation, verification of replacement trees on order and 2 quotes for cost share being requested. Standard cost share agreement provisions are applicable to these projects.

**Contact Kayla Nickerson with the Office of Agricultural Water Policy for more information or to submit a proposal. Kayla.Nickerson@freshfromflorida.com, (863) 451-3423**

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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mpseese@aol.com

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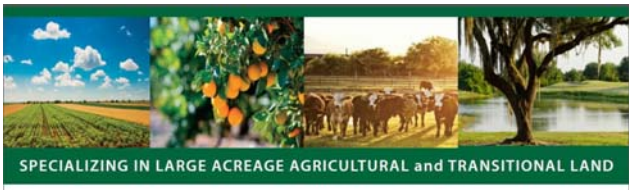


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andrew.j.conroy@monsanto.com

# EL NIÑO/SOUTHERN OSCILLATION (ENSO) DIAGNOSTIC DISCUSSION

## issued by

## CLIMATE PREDICTION CENTER/NCEP/NWS
## and the International Research Institute for Climate and Society
## 11 August 2016

**ENSO Alert System Status: La Niña Watch**

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**Synopsis: La Niña is slightly favored to develop during August - October 2016, with about a 55-60% chance of La Niña during the fall and winter 2016-17.**

ENSO-neutral conditions were observed during the past month, featuring slightly below average sea surface temperatures (SSTs) close to the equator across the eastern tropical Pacific Ocean. While the weekly Niño-1+2 and Niño-4 regions were near average, the Niño-3 and Niño-3.4 indices were slightly below average (approaching -0.5ºC) during July. Although below-average subsurface temperatures continued, they weakened during the past month but remained near the surface in parts of the central and eastern equatorial Pacific. Atmospheric anomalies over the tropical Pacific Ocean also indicated ENSO-neutral conditions. Both the traditional Southern Oscillation index and the equatorial Southern Oscillation index were near average during July, while the upper and lower-level winds also were near average across most of the tropical Pacific. Convection was suppressed over portions of the western and central tropical Pacific and enhanced over part of Indonesia. Overall, the combined ocean and atmosphere system is reflective of ENSO-neutral.

Many models favor La Niña (3-month average Niño-3.4 index less than or equal to -0.5°C) by the beginning of the Northern Hemisphere fall, continuing into winter. Statistical models predict a slightly later onset time (i.e., mid- to late fall) than dynamical models, and also predict a slightly weaker event. The forecaster consensus favors La Niña onset during the August-October season, and predicts a weak event (Niño-3.4 index between -0.5°C and -1.0°C) if La Niña forms. Overall, La Niña is slightly favored to develop during August - October 2016, with about a 55-60% chance of La Niña during the fall and winter 2016-17 (click CPC/IRI consensus forecast for the chance of each outcome for each 3-month period).

This discussion is a consolidated effort of the National Oceanic and Atmospheric Administration (NOAA), NOAA's National Weather Service, and their funded institutions. Oceanic and atmospheric conditions are updated weekly on the Climate Prediction Center web site (El Niño/La Niña Current Conditions and Expert Discussions). Forecasts are also updated monthly in the Forecast Forum of CPC's Climate Diagnostics Bulletin. Additional perspectives and analysis are also available in an ENSO blog. The next ENSO Diagnostics Discussion is scheduled for 8 September 2016. 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.

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

# Quick Overview of the Federal Worker Protection Standard (WPS)

## Key Definitions Relating to WPS

Agricultural establishment --- any farm, forest nursery or greenhouse.
Agricultural employer --- any person who hires or contracts for services of workers/handlers, for any type of compensation, to perform activities related to the production of agricultural plants, or any person who is an owner or responsible for the management or condition of an agricultural establishment that uses workers/handlers.
Agricultural plant --- any plant grown or maintained for commercial or research purposes and includes, but is not limited to, food, feed, and fiber plants; trees; turf grass; flowers; shrubs; ornamentals; and seedlings.
Handler --- any person, including a self employed person, who mixes, loads, transfers, applies, disposes pesticides or pesticide containers, cleans, adjusts, handles or repairs application equipment, acts as a flagger, etc.
Restricted entry interval (REI)--- the time after the completion of a pesticide application during which entry into the treated area is restricted.
Worker --- any person, including a self employed individual, who performs hand labor tasks, including weeding, harvesting, topping, sucker removal, packing produce in the field, thinning, etc.

## What Employers Must Do for Both Workers and Handlers

### Information at a central location

Information must be made available to workers and handlers at a central location where it can be easily accessed during normal business hours and must include the following information:

- EPA WPS Safety Poster
- Name, address and telephone number of the nearest medical facility
- Facts about each pesticide application (from before each application begins to 30 days after the REI)
  - Application list which includes the location and description of the area to be treated.
  - Product name, EPA registration number, and active ingredient(s) of the pesticide.
  - Time and date the pesticide is scheduled to be applied.
  - Restricted entry interval for the pesticide.

### Pesticide Safety Training

Agricultural workers must be trained within the first 5 days of employment. Handlers must be trained before any handling activity is performed. Workers and handlers must each be trained at least once every 5 years. Trainers must:

- Use written and/or audiovisual materials,
- Use EPA approved materials for training,
- Conduct the training orally and/or audiovisually in a manner the employees can understand with an opportunity to answer questions and
- Meet one of the following criteria to perform training:
  - Currently be a certified applicator of Restricted Use Pesticides (RUPs) or
  - Currently be designated by a State, Federal or Tribal agency having jurisdiction, as a trainer of pesticide applicators or
  - Have completed a pesticide safety Train the Trainer program conducted by a State, Federal or Tribal agency having jurisdiction.

### Decontamination Supplies

Employers must establish a decontamination site within 1\4 mile of where workers and handlers are performing their duties. Handlers mixing pesticides must have a decontamination site at the mixing area.
The decontamination site must include:

- Enough water for routine washing and for eyeflushing,
- An adequate supply of soap and single use towels,
- Enough water to wash the entire body (for handlers only) and
- A clean change of clothes such as coveralls (for handlers only).

Employer/Commercial Applicator Information Exchange

Before any application, commercial handler employers must make sure the operator of the agricultural establishment where a pesticide will be applied is aware of:

- Specific location and description of area (s) to be treated,
- Time and date of application,
- Product name, EPA registration number, and active ingredient,
- Restricted entry interval for the pesticide,
- Notification requirements; oral/posting and
- Any other specific requirements for the protection of workers and other persons during or after the application.

Operators of agricultural establishments must make sure any commercial pesticide establishment operator they hire is aware of:

- Specific location and description of all areas on the establishment where pesticides will be applied or where an REI will be in effect while the commercial handler is on the establishment and
- Restrictions on entering those areas.

Emergency Assistance

Agricultural employers must make emergency transportation available for workers and handlers to an emergency medical facility. In the event of a suspected poisoning, they must also provide information to the victim and medical personnel about the pesticide including:

- product name, EPA registration number and active ingredients,
- all first aid and medical information from the label,
- description of how the pesticide was used and
- information about the victim's exposure.



Additional Duties for Handler Employers

- Do not allow handlers to apply a pesticide so that it contacts, either directly or through drift, anyone other than trained and PPE equipped handlers.
- Make sight or voice contact at least every 2 hours with anyone handling pesticides with a skull and crossbones on the label.
- Make sure a trained handler equipped with labeling-specific PPE maintains constant voice or visual contact with any handler in a greenhouse who is doing fumigant-related tasks, such as application or air-level monitoring.
- Before any handling task, inform handlers, in a manner they can understand, of all pesticide labeling instructions for safe use.
- Keep pesticide labeling accessible to each handler during entire handling task.
- Before handlers use any assigned handling equipment, tell them how to use it safely.

Additional Duties for Worker Employers

- During any REI, do not allow workers to enter a treated area and contact anything treated with the pesticide to which an REI applies.

## EFFECT OF WATER pH ON EFFICACY OF PESTICIDES


Successful citrus growers should check the soil pH of their groves yearly and do their best to adjust it for better fertilizer efficiency, tree growth, and fruit production. Soil pH is usually increased by liming and decreased by applying sulfur or acid-forming fertilizers. The pH indicates whether the solution or media is acidic or basic (alkaline). The pH scales goes from 0 to 14, where 7 indicates neutrality. Values less than 7 indicate acidic solutions and values greater than 7 indicate a basic condition. Most of Florida fresh waters have pH values between 7 and 8. Although the pH is the most common measured property or characteristic of a solution or a media, some growers and production managers still ignore to adjust the pH of their water when used for pesticide mixing. For better efficacy, anyone involved in pesticide mixing should use a pH meter. The pH affects the rate at which some herbicides are absorbed by plants. Adjusting the pH of the water allows the user to reduce the rates of herbicides without reducing their efficacy. The effectiveness of spray mixture in the spray tank can be affected by a number of variables. A significant impact on the efficacy of many spray materials is the pH of the water used in the tank. In general, it is desirable to have the pH of the water below 7. Although several chemicals used today are effective at a wide range of pH conditions, many others can be subject to breakdown of the active ingredient at relatively high pH values. With extremely sensitive chemicals, this breakdown can begin between mixing and application. Sevin is among the common pesticides that lose their effectiveness quickly in alkaline (pH values greater than 7) solution. Therefore, it is recommended to reduce the pH of the water in the tank to increase the efficacy of some chemicals. Acidifying agents such as phosphoric acid and citric acid will lower the pH, but can drop it too low. Buffering agents, available from most distributors, will lower the pH to the desired range and help maintain it at that level. It is important to add the buffer to the spray tank water before pesticides are added. **Glyphosate works better when ammonium sulfate is added to the spray tank at rates of 8.5 to 17 pounds for every 100 gallons of spray solution.** Be careful when buffering tank mixes containing copper fungicides. Copper is more soluble in acidic water, and the resulting high concentrations will cause leaf and fruit burn. Aliette makes acid spray. Therefore, do not mix Aliette with copper. **Always read the label of the buffering material as well as the label of the pesticide**. It is also recommended to ask your chemical supplier for up-to-date information on the susceptibility of a material to hydrolysis. A good rule of thumb is to spray pesticide mixtures as soon after mixing as possible, mix only enough to treat the crop and do not allow the mixture to stand for a long period of time or overnight.

# IRRIGATION, NUTRITION AND FRUIT QUALITY

Florida has the highest citrus fruit quality standards in the world. Fruit quality factors include juice content, soluble solids and acid concentrations, soluble solids-acid ratio, fruit size, and color. Florida citrus growers know that quality factors differ for the fresh and processing markets. For example, fruit size, shape, color, and maturity date are most important for fresh fruit, but high juice content and soluble solids are desired for processing fruit. Fruit quality is affected by several factors including cultivar, rootstock, climate, soil, pests, irrigation, and nutrition.

The effects of irrigation and nutrition on fruit quality are very important and should be understood and taken into consideration by citrus growers and production managers to increase their profitability and enhance their sustainability and competitiveness on a worldwide basis. In general, excessive irrigation and nutrition reduce fruit quality. Therefore, balanced nutrition with sound irrigation scheduling based on **IFAS** recommendations should be a high priority management practice for every grower. Citrus trees require a properly designed, operated, and maintained water management system and a balanced nutrition program formulated to provide specific needs for maintenance and for expected yield and fruit quality performance. Irrigation contributes to the efficiency of fertilizer programs. 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 watering or fertilization will result in poor fruit quality. The most important management practices influencing fruit quality are irrigation and nitrogen, phosphorus, potassium, and magnesium nutrition. However, when any nutrient element is severely deficient, fruit yield and fruit quality will be negatively altered. Trends in fruit quality response to high nutrition and irrigation are described and summarized below.

**Nitrogen (N)**

- Increases juice content and color, total soluble solids (TSS), and acid content.
- Increases soluble solids per box and per acre. However, excessive N, particularly with inadequate irrigation, can result in lower yields with lower TSS per acre.
- Decreases fruit size and weight.
- Increases peel thickness and green fruit at harvest.
- Increases incidence of creasing and scab but decreases incidence of peel blemishes such as wind scar, mite russeting, and rind plugging.
- Reduces stem-end rot incidence and green mold of fruit in storage.

**Phosphorus (P)**

- Reduces acid content, which increases soluble solids-acid ratio. Phosphorus rates have no effect on soluble solids per box but may increase soluble solids per acre due to increase in fruit production in soils that are low in P.

- Increases number of green fruit but reduces peel thickness.
- Increases expression of wind scar but reduces that of russeted fruit.

**Potassium (K)**

- Potassium produces mostly negative effects on juice quality except soluble solids per acre. Potassium increases fruit production therefore producing more soluble solids per acre.
- Decreases juice content, soluble solids, ratio, and juice color.
- Increases acid content.
- Increases fruit size, weight, green fruit and peel thickness.
- Reduces incidence of creasing and fruit plugging. In storage, reduces stem-end rot.

**Magnesium (Mg)**

- Slightly increases soluble solids, soluble solids-acid ratio, soluble solids per box and soluble solids per acre.
- Slightly increases fruit size and weight but decreases rind thickness.

**Irrigation**

- Increases juice content and soluble solids-acid ratio.
- Reduces soluble solids and acid contents. Soluble solids per box will decrease, but soluble solids per acre may increase due to yield increase.
- Increases fruit size and weight, increases green fruit at harvest, but decreases rind thickness.
- Increases incidence of blemish from wind scar, scab and *Alternaria* brown spot, but reduces rind plugging.
- Reduces stem-end rot incidence but increases incidence of green mold in storage.

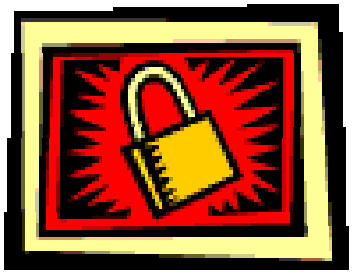
Specific effects on juice and external fruit qualities are summarized in the Table below. This summary is based on numerous field experiments conducted over many years. Most of these effects were consistently observed, but some of them appear to depend on local conditions and growing regions.

**EFFECTS OF MINERAL NUTRITION AND IRRIGATION ON FRUIT QUALITY**

| Variable | N | P | K | Mg | Irrigation |
|---|---|---|---|---|---|
| Juice Quality | | | | | |
| juice content | + | 0 | - | 0 | + |
| soluble solids (SS) | + | 0 | - | + | - |
| acid (A) | + | - | + | 0 | - |
| SS/A ratio | - | + | - | + | + |
| juice color | + | 0 | - | ? | 0 |
| solids/box | + | 0 | - | + | - |
| solids/acre | + | + | + | + | + |
| External Fruit Quality | | | | | |
| size | - | 0 | + | + | + |
| weight | - | 0 | + | + | + |
| green fruit | + | + | + | 0 | + |
| peel thickness | + | - | + | - | - |

Increase (+), Decrease (-), No change (0), No information (?).

# Suggested Facility Security Practices



**Awareness**
- Conduct a security assessment of your facility.
- Use opening and closing security check lists; note any discrepancies or irregularities.
- Initiate or join your local “crime watchers” program.

**Access**
- Escort all customers or visitors in storage yards or near loading docks.
- Establish a uniform or ID badge system to distinguish employees.

**Alarms**
- Install alarms and use a security alarm monitoring service.
- Ensure that phone lines are protected or have a service interruption alarm.
- Locate exterior strobe lights with alarms where neighbors and law enforcement can see them.

**Barriers**
- Construct structural barriers, including steel doors and barred windows.
- Install fencing as a deterrent where appropriate; fencing should be such that law enforcement and passers-by can view the property.
- Install access gates where fencing is not appropriate.
- Install bollards and chains across driveways or block with trucks and other equipment during off-hours.

**Community**
- Establish a process for including neighbors and the community as part of facility security and emergency response planning.

**Inventory Control**
- Know your inventory.
- Establish an ongoing process for inventory control of materials stored at the facility.
- Do not allow unattended, loaded trailers on site.
- Record stored nurse tanks by identification number and weight of remaining product.
- Inspect tanks visually each morning.
- Keep bills of lading, blank forms and all shipping/receiving paperwork secured.

**Law Enforcement**
- Establish and maintain relationships with local law enforcement and emergency responders. Provide them with your emergency plans and keys to locked gates.
- Provide law enforcement dispatchers with current emergency contact information for the facility. Keep this information current.
- Immediately report unusual or suspicious persons, vehicles or activity to local law enforcement.

**Lighting**
- Contact your local power company for a lighting assessment and information on leasing lights for your property.
- Install sufficient exterior lighting for law enforcement and passers-by to see your property.
- Discuss your lighting plan with local law enforcement.

**Locks**
- Establish a procedure and responsibility for locking up at close of business.
- Use high-security locks for doors, enclosures and gates, following local fire code requirements. Keep padlocks locked on hasps while not in use to prevent your lock from being replaced by someone else’s.
- Use deadbolt locks on doors with a minimum of 1.5-inch throw.
- Implement key control for locked containers, equipment, hoppers, vehicles and vessels.

**Signage**
- Post alarm monitoring service signs in highly visible locations. Include signage for:
- No trespassing
- Private property
- Closed circuit TV surveillance
- Patrolled
- No vehicles beyond this point
- All visitors must check-in with front office
- All visitors must be escorted

**Surveillance**
- Install CCTV surveillance cameras to monitor less visible or high-risk areas.

**Training**
- Involve employees in security planning.
- Train employees to spot suspicious individuals and behavior.
- Conduct periodic emergency drills, e.g. fire, evacuation and security, with employees.

**Vendors**
- Know vendors that service your facility.
- Require all vendors to check in.
- Escort vendors.

**Visibility**
- Assure an open area around the facility, unlimited by shrubs, trees, large signs or other barriers to open sight.

## SUGGESTED CUSTOMER TRANSACTION PRACTICES

**Awareness**
- Heighten employee awareness of what constitutes an unusual customer and sales transaction.
- Heighten customer awareness of potential for criminal misuse of agricultural chemicals.
- Advise customers to contact law enforcement immediately with any concerns about unusual persons, vehicles or activities in the vicinity of your facility or theirs.

**Sales Transaction**

- Know your customer.
- Follow all requirements for verification when selling restricted use pesticides.
- For all sales, record customer's name, address, telephone number. If in doubt ask for a driver's license.
- Make deliveries only when the customer or agent is available to take custody and sign for the material.
- Do not deliver tanks or other products to empty fields or other unattended locations.
- Make follow-up calls to verify receipt of materials by customer in quantity ordered.
- Be alert to those who:
  - Pay in cash;
  - Won't take delivery;
  - Behave in an unusual manner;
  - Hesitate when asked for ID to complete the sale;
  - Don't know the product;
  - Insist on certain products, such as ammonium nitrate, and will not consider other suggestions;
  - Ask questions about product manufacturing;
  - Aren't familiar with farming, pesticides or fertilizer products.
- If in doubt:
  - Write down vehicle color, make, license number and state and a physical description of the individual;
  - Retain papers the customer may have touched for fingerprints;
  - Save this information in the event that it needs to be provided to law enforcement.

**Certain agricultural inputs stored at your facility may warrant special security measures, such as anhydrous ammonia, ammonium nitrate, bulk urea and insecticides.**

**Alarms**

- Install alarms near tanks.
- Install explosion-proof alarm systems near combustible material.

**Awareness**

- Be alert to those attempting to buy ammonia if they cannot state a legitimate, agronomic need for the product.
- Inspect tank and bulk storage areas daily.
  - Check for fresh tracks in mud or snow or disturbed ground around tanks and bulk storage areas;
  - Check to see if tank valves are closed tightly;
  - Look for suspicious items near tanks such as duct tape, garden hose, bicycle inner tubes, buckets and coolers;
  - Check for broken or missing wire ties or seals that you may have placed on valve wheels as markers.
- Make customers aware of the potential for theft or tampering with tanks and bulk ag chemicals.
- Remove hoses between tool bars and nurse tanks; relieve pressure with the bleed valves when left overnight. Encourage end-users to do the same.

**Law Enforcement**

- Work with local law enforcement to encourage frequent nighttime patrols.
- Contact local law enforcement immediately if you suspect tampering or theft at your facility or the presence of unusual persons, vehicles or activities.
- Do not disturb a potential crime scene.

**Locks for Tanks**

- Use brightly colored plastic ties or wire seals between the valve wheel and the roll cage to ease visual checks and to identify tampering.
- Use tamper resistant seals and locks.
- Use high-security locks.
- Use specialized tank locks for nurse tanks containing anhydrous ammonia.
- Paint tank locks red so law enforcement can identify anhydrous ammonia tanks.

## Visibility

- Store tanks in well-lit areas with a clear line-of-sight.
- Store tanks with flow valves facing outward to speed visual inspections.
- Do not leave tanks in remote areas.

### SUGGESTIONS FOR PARTNERING WITH YOUR CUSTOMERS ON SECURITY AND SAFETY

- Take delivery of tanks as close to time of application as possible.
- Position tanks in open, visible areas.
- Don't take delivery of tanks to unattended locations.
- Don't store tanks and tool bars inside buildings, near the farmhouse or livestock confinement houses.
- Remove hoses between tool bars and nurse tanks and relieve pressure with the bleed valves if tanks are left overnight. Store hoses and tool bars away from tanks.
- Don't leave tanks unattended for long periods of time.
- Inspect tanks every day, especially after a weekend when most thefts occur.
- Return tanks immediately after use.
- Inspect and record the condition of each nurse tank upon delivery and return.
- Store all agricultural chemicals, e.g. bulk, bagged, in a secured area.
- Where appropriate, use alarm systems to protect secured storage areas and chemicals.
- Be aware of and maintain inventory control.
- Lock any containers, equipment, hoppers, tanks and vessels containing product whenever possible.
- Be aware of signs of theft of anhydrous ammonia, ammonium nitrate or bulk urea.

**Law Enforcement**

- Urge customers to contact local law enforcement immediately if tampering or theft is suspected or suspicious persons or vehicles are seen.
- Do not approach or confront suspicious individuals.
- Do not disturb the area around a possible crime scene.

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# HEDGING, TOPPING, AND SKIRTING CITRUS TREES

Mongi Zekri

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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.

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## 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

☐ 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