UNIVERSITY OF FLORIDA | EXTENSION
Institute of Food and Agricultural Sciences

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

Flatwoods Citrus

Vol. 7, No. 1 **January 2004**

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

Happy Holiday Season and Joyous and Productive New Year!

UPCOMING EVENTS

Hendry County Extension Office, LaBelle

Pre-registration is required. Registration form is enclosed here again.
Wednesday, January 14, 2004, 9:00 AM – 4:00 PM
Workshop **on scouting for pests and diseases**
Speakers: Drs. Pete Timmer, Steven Rogers, and Phil Stansly
6 CEUs for Pesticide License Renewal, 6 CEUs for Certified Crop Advisors
Sponsor: Shelby Hinrichs, Nufarm Agriculture USA

Immokalee IFAS Center

Tuesday, January 20, 2004, 9:00 AM – 3:00 PM
Workshop **Using organic amendments in citrus production. Agenda is enclosed.**
Speakers: Drs. Jim Ferguson, Tom Obreza, Jim Graham, Monica O. Hampton, and more
2 CEUs for Pesticide License Renewal, 4 CEUs for Certified Crop Advisors
Sponsor: Les Kemp, Synagro, Inc.
To reserve a free lunch, call 863 674 4092 no later than Friday, 16 Jan 2003.

If you want to print a color copy of the Flatwoods Citrus Newsletter, get to the Florida Citrus Resources Site at http://flcitrus.ifas.ufl.edu/ You can also find all you need and all links to the University of Florida Citrus Extension and the Florida Citrus Industry

Lake Alfred CREC

January 21, 2004, 9:00 AM – 4:35 PM
Workshop **Precision Agriculture for Florida Citrus**
For more information, contact William Miller or Monica Lewandowski at 863 956 1151

Mechanical Harvesting Workshop and Field Days

(See enclosed detailed program)

►***February 4, 2004***, Workshop at the Highlands County Extension Office, Sebring

►***February 5, 2004***, Field day in the Immokalee Area

►***February 11, 2004***, Field day in South Polk County Area

To register, call Steve Futch at 863 956 1151.

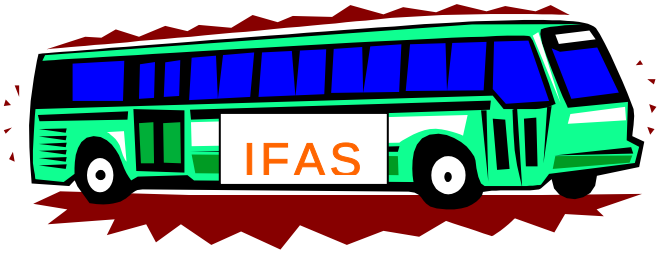
Indian River Citrus Seminar **(Brochure enclosed)**

January 27–28, 2004
For more information call 561 468 3922 or 561 462 1660

INTERNATIONAL SOCIETY OF CITRICULTURE

10th International Citrus Congress
February 15-20, 2004, Agadir, Morocco
http://www.lal.ufl.edu/ISC_Citrus_homepage.htm

COLLIER COUNTY EXTENSION AG TOURS



Wednesday 17 March and Friday 19 March 2004
For more information, call the Collier County Extension Office at 239 353 4244

Special Thanks to the following 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.

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Special Thanks **to the following 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.**

PESTICIDE RESISTANCE

Sometimes when a pesticide is applied to a crop, it fails to control the pest. Control failure may be due to one or a combination of factors including inappropriate chemical, poor spray application, poor sprayer calibration, and unsuitable weather conditions. Control failure may be also due to pesticide resistance (the pest has become resistant to the pesticide).

Pesticide resistance has been recognized to be a problem for over five decades. Pesticide resistance is not limited to insecticides. Many fungal and bacterial diseases, as well as some weeds, have all shown resistance to one or more chemicals.

There are several ways we know how populations of organisms develop resistance to pesticides. Some of them contain proteins that bind up pesticides. Others use enzymes to detoxify them. Genetic variation within a population makes it possible that a few individuals in any given population may contain the needed attributes to start the process towards resistance. Whenever we treat a pest population with a pesticide, there is a chance that a few of the pests contain some ability to escape the given treatment. If they survive with a few others that have a similar ability to cope, we have the beginning of a breeding group that may lead to resistance over time.

Some materials are so effective that growers are attempted to consider them as the only choice in their pest control program. Growers also prefer systemic pesticides with long residual control. The longer the period of control the less they need to spray. However, as the amount of chemical slowly decreases in the plant tissue, it eventually falls to a level that is not lethal to the target pest. The end result is an extended period of time when pests are subject to less than a full dose of the pesticide. Pests with some degree of "built in" genetic resistance may survive contact with the reduced level of pesticide and breed with others that have the same. This is another reason for growers not to use a rate lower than the label rate. Doing so subjects more pests to non-lethal doses and contributes to pesticide resistance. Many products now contain resistance management language on their labels, which must be taken into consideration. The label is the Law.

Chemical companies are reformulating some of their products and releasing materials that are mixtures of two materials with different modes of action. This is an effort by the manufacturer not only to increase the efficiency of their products, but also to extend their useful life. Combination sprays have the advantage of assaulting the pest in two different ways at the same time. It is much harder to develop resistance to two different materials at the same time than it is to develop resistance to one.

Understanding chemical classes represented by the products available to control a certain pest is very important, but not sufficient. Cross-resistance to a certain chemical mode of action is common. Two different classes of chemistry can share a similar mode of action, as is the case with several organo-phosphates and carbamates. All of this makes proper pesticide selection a complicated process.

Once resistance gets started it can move through the entire region. It is essential to adopt strategies that delay resistance even if it means increasing the cost of pest management in the short run to save alternatives for future use. It takes more than ten years and over fifty million dollars to bring a new pesticide to market.

Anyone involved in pesticides and pest management should be concerned about pesticide resistance and should incorporate strategies to delay the development of resistance.

What can a grower do to prevent or delay pesticide resistance?

- Identify correctly the pest problem
- Monitor the pest population. Scouting provides valuable information when making the decision whether or not to apply pesticides. Spraying when pest levels are below reasonable thresholds wastes money and may contribute to pesticide resistance.

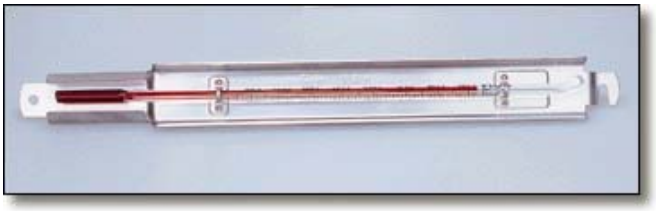
- Use control methods that enhance biological control
- Only apply pesticides when their use can be justified
- Use each pesticide (or one member of a pesticide group) no more than the specified maximum number of times per year or growing season
- Rotate pesticides and chemical classes and use materials with different modes of action
- Mix at-risk materials with materials that have different modes of action
- Time pesticide applications appropriately
- Avoid using low rates with marginal control of the pest
- Get complete coverage so that all parts of the plant receive an effective pesticide dose

SCOUTING FOR PESTS AND DISEASES

Florida citrus industry uses sustainable production practices. Florida citrus growers help preserve environmental quality by using many sound cultural practices including integrated pest management (IPM) strategies. IPM depends on grove scouting and close observations to determine the need and timing for pesticide applications as well as modification of cultural practices to minimize damage.
Scouting for early warnings of pests and diseases is becoming very important in citrus operation. Scouting not only helps growers control pests more efficiently, but also lowers the use of pesticides and the chances of pesticide resistance.
In most cases, there is no way to predict on a seasonal basis the incidence and severity of pests. However, based on grove history and frequent observations, many situations can be reasonably assessed. With most citrus pests, the pressure must be high before economic damage levels on the processing fruit crop are experienced. Pest populations should be suppressed only when high levels of infestation threaten tree vigor and productivity. There are several techniques and procedures for scouting and there are many things to know before scouting. To learn more, you need to attend the workshop on scouting for citrus pests and diseases scheduled on 14 January 2004.

COLD HARDINESS AND COLD PROTECTION

Both citrus fruit and foliage can be damaged if temperature falls below freezing for a prolonged period. However, weather conditions prior to cold temperature, duration of cold, position of the tree in the grove or yard, maturity of the fruit, health and age of the tree can affect tree and fruit hardiness. Citrons, Tahiti and Mexican limes are the most sensitive. True lemons are slightly more cold hardy, followed by grapefruit, tangelo, limequat, sweet orange, most mandarins, and kumquat. Leaves of kumquats are hardy to 20F. The majority of sweet oranges are hardy to 26-27F. Thin-skinned, small-sized fruit or fruit held toward the outside of the canopy are usually more sensitive to cold. Fruit that is mature or close to maturity and has high sugar content can withstand more cold than immature fruit. Trees are more cold hardy when exposed to cooler temperature over several weeks prior to freezes. Sudden cold snaps can be particularly damaging to citrus. Cold tolerance develops most readily when trees are not flushing. Warm temperatures at any time during the winter may cause citrus trees to resume growth and reduce their cold tolerance. Ice formation in citrus tissues - not low temperature- kills or damages citrus trees and fruit. One hour below 28F may kill tender growth and citrus flowers. New flush growth and bloom buds will experience minimal damage at 28F when exposed for 30 minutes, but will be killed at 26F for the same period of time. Fruit damage occurs when the temperature falls below 28F for at least 4 hours. Frozen fruit can be salvaged for juice. Mature citrus leaves can generally withstand 4 hours of 23-24F with minimal damage. Four hours at 20F can kill 3/8-inch or smaller wood and temperatures below 28F for 12 continuous hours may kill larger limbs and possibly the entire tree. A clean, hard-packed 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. Addition of water to the cleanly cultivated area prior to a freeze further improves heat accumulation during the day. Therefore, keep the area around the trees free of weeds and apply water to the soil prior to cold weather. Water should also be pumped high in the ditches the day before and during the time of freezing weather. But water has to be removed within 2-3 days after the freeze to avoid root damage. As the water cools, it releases heat, increasing air temperature around the trees. Young trees are more vulnerable to cold damage. It is more of a problem in open, solid-set plantings than resets in mature groves. Minimum-reading thermometers should be installed in the coldest locations of the groves. They should be placed at a height of 42 inches (4.5 ft) on a stand sheltered at the top and facing north.



Use of microsprinkler for cold protection is very important. Turn on the water early when the air temperature reaches 36F. Remember that in cold pockets, the ground surface can be below 32F when it is 36F at the thermometer location. You have to keep running the system all night. The irrigation system can be turned off in the morning when the air temperature rises to 40F.

COLD PROTECTION

As a means of cold protection, overhead, high-volume sprinklers have been used successfully in citrus nurseries and low-volume microsprinklers have been used to protect young trees in groves. However, success can vary with the type of system, application rates, type of freeze (advective vs. radiative), and severity of the freeze. An advective or windy freeze occurs when a cold air mass moves into an area bringing freezing temperatures. A radiation frost occurs when a clear sky and calm conditions allow an inversion to develop and temperatures near the surface drop below freezing. Inversion occurs on a clear night during which heat continues to radiate out into the space. The temperature drops significantly and cool air collects at the surface. The temperature increases with altitude (height), which is the inverse of normal conditions.

Water protects young trees by transferring heat to the tree and the environment. The heat is provided 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. In fact, some artesian wells may provide water of 80°F or more. As the water is sprayed into the air, it releases this stored (sensible) heat. However, by the time the water reaches the tree it has lost most of its energy, particularly for low volume microsprinkler systems. Consequently, the major source of heat from irrigation is provided when the water 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.

The major problems in the use of irrigation for cold protection occur when inadequate amounts of water are applied or under windy (advective) conditions. Evaporative cooling, which removes 7.5 times the energy added by heat of fusion, may cause severe reductions in temperature under windy conditions, particularly when inadequate amounts of water are used. It should be kept in mind that most irrigation systems will not protect the upper portion of tree canopies. Because water can provide protection in one situation and cause damage in another, it is important to know what principles are involved and understand the dew point and what can happen when using water during a freeze.

What's the "Dew Point?" It is the temperature at which dew begins to form or the temperature at which water vapor condenses to liquid water. It is also the temperature at which air reaches water vapor saturation. A common example of condensation is the water that forms on the outside of a glass of ice water. This happens because the temperature of the glass surface is lower than the dew point temperature of the ambient air in the room. Hence, some of the water vapor in the surrounding air condenses on the outside of the cold glass. When referring to cold protection, the dew point is one of the better ways to describe the humidity or

amount of water vapor in the air. When the dew point is below 32°F, it is often called the frost point because frost can form when the temperature is below freezing. The dew point is important on freeze nights because water vapor in the air can slow the rate of temperature fall. With a relatively high dew point on a cool night, radiant heat losses from a grove are reduced, and the temperature may be expected to fall slowly. But if the dew point is quite low, the temperature may be expected to fall rapidly. Water vapor absorbs infrared radiation. Water droplets or fog are an even more effective radiation absorber than water vapor. Hence, fog can reduce the rate of temperature drop on a frost night. Dew point temperatures are commonly higher on the coasts than they are inland. In addition to affecting the rate of radiation loss, the dew point is often a "basement" temperature, and the air temperature will not go much below it unless drier air moves in. The reason for this is that when dew condenses or ice forms, heat is given off.

A sling psychrometer is a convenient portable gauge for measuring relative humidity and dew point. It is an important tool to determine when to stop irrigating during freezing conditions. This instrument compares the temperatures of a dry bulb thermometer and a wet bulb thermometer. The psychrometer is spun around rapidly for a few minutes and readings are taken for the dry and wet bulb temperatures. The scale on the back of the unit and the chart that comes with the unit allow deriving the dew point and relative humidity. In the morning, when the temperature warms up, it is not necessary to wait until the ice has melted before turning off the system. When the wet bulb temperature is above 33° or when the air temperature is 40°, the system can be turned off safely.

It is generally advisable to place the emitter northwest of the tree, about 1 to 2 feet away from the trunk. Emitters should be attached to risers for greatest tree trunk protection. Improper placement or inadequate spray coverage will greatly lessen the effectiveness of the irrigation. A 90° to 180° spray pattern, which concentrates the water on the trunk and lower limbs, gives more protection than a 360° pattern. Inverted cone sprinklers positioned above the wrap in the tree also give adequate protection. The volume of water applied depends on the amount of cold protection required. Generally, 10 gallons per hour applied directly to the trunk in a 90° pattern will provide adequate protection during most freezes.

It is very important to know the critical temperature at which freezes can damage the grown crop. Minimum-temperature-indicating thermometers are not expensive and are a wise investment for any grower concerned with freeze/frost protection. Several thermometers should be placed in several blocks. Placement and number of thermometers should depend on the area and grower's interest. Some factors to be considered include elevation, scion/rootstock cultivars, tree size, and irrigation systems. Some growers place one thermometer in the coldest spot and organize their protection strategy around the worst possible case. This is acceptable, but most of the area will receive more protection than it needs which will waste water and fuel and cost the grower money.

FOR INFORMATION:

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mcelrot@doacs.state.fl.us

Tony Fendrick
(850) 488-4366
fendrit@doacs.state.fl.us

REFERENDUM SET FOR CITRUS RESEARCH MARKETING ORDER

TALLAHASSEE - Florida Agriculture Commissioner Charles H. Bronson today announced that a referendum for citrus growers will be held in January to determine whether the Citrus Production Marketing Order will be renewed for another six years.

Implemented following a similar referendum in November 1991 and renewed in 1997, the marketing order generates funds for citrus research through an assessment on each box of fruit produced.

The Florida Department of Agriculture and Consumer Services will mail ballots in early January to those who produce and market citrus. The ballots must be returned to the Department no later than January 31, 2004.

"I urge all Florida citrus growers to carefully consider this marketing order and to participate in the referendum," Bronson said. "This has important implications for the future of the citrus industry."

Under Chapter 573, Florida Statutes, the referendum must win approval by a majority of the growers voting -- who also represent a majority of the acreage of those voting -- for the marketing order to be renewed.

The initial order set the assessment fee at one-half cent per box. The current fee is three-fourths cents per box, and by law cannot exceed one cent per box. In the past 12 years, the program has generated more than $18 million, which has been used on research to eradicate citrus pests and diseases, and improve varieties and management practices, among other research projects. The marketing order is administered by the 14-member Florida Citrus Production Research Advisory Council, which consists of Florida citrus growers appointed by the Commissioner of Agriculture to recommend the annual assessment fee and determine which research projects are funded.

For more information about the referendum, call the Department at (850) 488-4366.

Scouting for Citrus Pests & Diseases Workshop

Location: Hendry County Extension Office, LaBelle
Date: *Wednesday, January 14, 2004*
6 CEUs for Pesticide License Renewal
6 CEUs for Certified Crop Advisors

Diseases (9:00 AM - 11:00 AM)
By ***Dr. Pete Timmer***

Scouting Tips, Techniques, and Models
Foliar and Fruit Production Diseases
- Alternaria Brown Spot
- Greasy Spot
- Citrus Scab
- Melanose
- Postbloom Fruit Drop
- *Phytophthora* Brown Rot
- *Phytophthora* foot and root rot
- Citrus Canker

"MSI: Mite Scene Investigations" (11:00 AM -12:00 Noon)
By ***Dr. Steven Rogers***

Mites & Insect Pests (1:00 PM - 4:00 PM)
By ***Dr. Phil Stansly***

Principals of Entomology and IPM
Mite Pests of Citrus
Sucking Insect Pests of Citrus
Soil Inhabiting Pests
Citrus Leafminer and Misc. Insects

12:00 Noon - 1:00 PM: Lunch

Program Sponsored by Nufarm Agriculture USA – Shelby Hinrichs

********** DETACH**********

REGISTRATION FORM
(Registration is required)

Registration Deadline: Extended to Friday, January 9, 2004

Name: .....

Company: .....

Address: .....

Phone: .....

Mail completed registration form and check for $10.00* per person to:
Dr. Mongi Zekri, Hendry County Extension Office, P.O. Box 68, LaBelle, FL 33975-0068. Checks should be made payable to: Citrus Advisory Committee.

*****The registration fee of $10.00 includes refreshments, lunch, and handouts.
Registration fee at the door, the day of the meeting, is $15.00.

UNIVERSITY OF FLORIDA
Institute of Food and Agricultural Sciences

USING ORGANIC AMENDMENTS IN CITRUS PRODUCTION

Date: Tuesday, January 20, 2004
Location: Immokalee IFAS Center, 2686 State Rd. 29 North
2 CEUs for Pesticide License Renewal
4 CEUs for Certified Crop Advisors

Morning Section

9:00 - 9:30 Registration and coffee

9:30 - 9:45 Opening remarks and introduction. ***Dr. Mongi Zekri*** *(Multi-County Citrus Agent University of Florida, IFAS Hendry County Extension Office)*

9:45 - 10:15 The benefits of organic amendments in citrus production and environment. ***Dr. Monica Ozores-Hampton*** *(University of Florida/IFAS/SWFREC)*

10:15 - 10:30 Break

10:30 - 11:00 Nutrient management considerations when applying organic soil amendments to citrus. ***Dr. Tom Obreza*** *(University of Florida/IFAS/*Soil & Water Science *Department, Gainesville)*

11:00 - 11:30 Mulches of composted wastes improve tolerance of citrus to marginal soils. ***Dr Jim Graham*** *(University of Florida/IFAS/Citrus REC-Lake Alfred)*

11:30 - 12:00 Questions & Answers

12:00 - 1:00 Lunch ***(sponsored by Synagro, Inc.).***
Call 863 674 4092 to register and reserve lunch

Afternoon Section

1:00 - 1:30 Guidelines for organic citrus production. ***Dr. Jim Ferguson*** *(University of Florida/IFAS/Horticultural Sciences Department, Gainesville)*

1:30 - 2:00 How to handle organic materials in citrus production. ***Mr. Mike Ziegler*** *(Agricultural Resource Management, Inc.*)

2:00 - 2:30 Biosolids management Services. ***Mr. Les Kemp*** (Regional Vice President Business Development, Synagro, Inc.)

2:30 - 3:00 Questions & Answer

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Southwest Florida Research & Education Center
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http://www.imok.ufl.edu

POSITION ANNOUNCEMENT
TEAMS POSITION #917000

TITLE:	Biological Scientist
LOCATION:	Southwest Florida Research And Education Center 2686 SR 29 N. Immokalee, FL 34142-9515
APPLICATION DEADLINE:	January 15, 2004
SALARY:	Minimum $30,000.00 annually. Other benefits include vacation, sick leave, and medical insurance
SHIFT:	Normal hours 8:00 a.m. to 5:00 p.m. Monday – Friday, 40 hours per week
MINIMUM QUALIFICATIONS:	Bachelor's degree in an appropriate area of specialization and one year of appropriate experience
DUTIES AND RESPONSIBILITIES:	Contribute to research/extension activities related to the biology, physiology and nutrition of citrus as well as soil/water/plant relations, fertility, young tree care, weed control, growth regulators, pruning and tree spacing. Conduct evaluations of scion and rootstock varieties, perform and record laboratory procedures, evaluate and revise procedures and standards for compilation of data, perform basic computer tasks for data management, and assist in preparing written reports and publications, and perform other related duties as required.
WHERE TO APPLY:	Submit a formal University of Florida Application for Employment to: SWFREC 2686 SR 29 N Immokalee, FL 34145-9515 Attn: Dr. Robert E. Rouse

If there is a need for an accommodation to apply for this position please call 239-658-3400.

FLATWOODS CITRUS NEWSLETTER

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

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

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

Subscriber's Name:_____

Company:_____

Address:_____

City:_____State:_____Zip:_____

Phone:_____

Fax:_____

E-mail:_____

Racial-Ethnic Background

__American Indian or native Alaskan
__Asian American
__Hispanic
__White, non-Hispanic
__Black, non-Hispanic

Gender

__Female __Male