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Institute of Food and Agricultural Sciences

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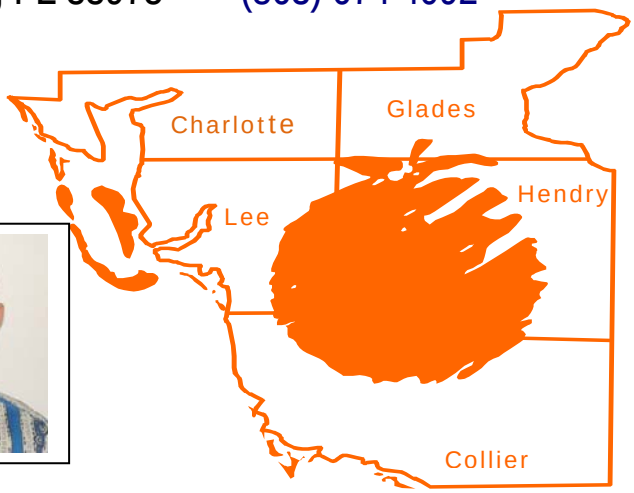
Flatwoods Citrus



Vol. 17, No. 8 **August 2014**

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

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

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

Seminar – Foliar Nutrition in the Age of Greening

Date & time: Thursday, August 28, 2014, **10:00 AM – 12:00 Noon**
Location: UF-IFAS Southwest Florida Research and Education Center
Program Coordinators: Mongi Zekri and Heath Prescott

-DR. HAMED DOOSTDAR

HLB Infection and its Effect on Tree Health and Production
* Effects Nutrition on Mitigating HLB symptoms
* Spray Timing and Tank Mixes
* Common myths and misconceptions

-HEATH PRESCOTT

*PFD overview
* Product improvements
* New Product developments (Roots/Motivate)

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

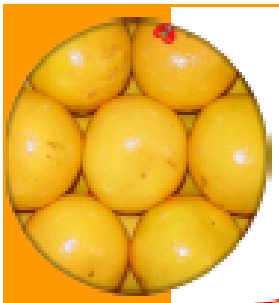
Pre-registration is required. No registration fee and lunch is free Thanks to Heath Prescott with KeyPlex. To reserve a seat, call 863 674 4092, or send an e-mail to Dr. Mongi Zekri at: maz@ufl.edu **No RSVP = No lunch**

2015 International Research Conference on Huanglongbing (HLB)

Mark your calendar and plan to attend the 4th International Research Conference on HLB in Orlando, Florida USA
February 9-13, 2015
Visit the IRCHLB website for more information - Click here for IRCHLB website

Registration Information

Early Registration: $495 by September 30, 2014
Late Registration: $595 after September 30, 2014
http://flcitrusmutual.com/hlb-conference/register.aspx



2014 Packinghouse Day

New Location!

2014 Program

Packinghouse Day

When: Thursday, August 21st, 2014

NEW LOCATION: Indian River Research and Education Center, 2199 S. Rock Rd, Fort Pierce, FL 34945

Time: Registration opens at 8:30 A.M., Program starts at 9:30 A.M.

Members of Florida Citrus Packers will hold their annual organizational and business meeting following lunch

Lunch Sponsor: JBT FoodTech

Exhibitors: Representatives from a variety of companies will be on hand to provide valuable information for your business

No pre-registration required

The morning educational program is packed full of the latest information about issues impacting Florida's fresh citrus industry. Topics will include:

- Maintaining Trade Markets via a Citrus Black Spot Probabilistic Risk Model
- Regulatory Update
- Packaging Innovation in the Produce Industry
- Revised Tangerine/Mandarin Classifications
- Potential New Food Safety Tools for Packingline Sanitation
- Fruit contact water under FSMA's Produce Safety Rule – What's new for Florida Citrus
- HLB Impacts on Preharvest Fruit Drop, Quality, and Decay
- Presentation of the annual John T Leslie award

Packinghouse Day will rotate location each year between the Indian River Research and Education Center in Fort Pierce, and the Citrus Research and Education Center in Lake Alfred, FL. This year we are in Ft. Pierce!

For questions and the latest details, contact Mark Ritenour at 772-468-3922, ext. 167 (ritenour@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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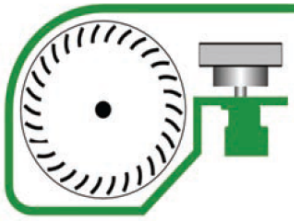

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EL NIÑO/SOUTHERN OSCILLATION (ENSO) DIAGNOSTIC DISCUSSION

issued by

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

10 July 2014

ENSO Alert System Status: El Niño Watch

Synopsis: The chance of El Niño is about 70% during the Northern Hemisphere summer and is close to 80% during the fall and early winter.

During June 2014, above-average sea surface temperatures (SST) were most prominent in the eastern equatorial Pacific, with weakening evident near the International Date Line. This weakening was reflected in a decrease to +0.3°C in the Niño-4 index. The Niño-3.4 index remained around +0.5°C throughout the month, while the easternmost Niño-3 and Niño-1+2 indices are +1.0°C or greater. Subsurface heat content anomalies (averaged between 180º-100ºW) have decreased substantially since late March 2014 and are now near average. However, above-average subsurface temperatures remain prevalent near the surface (down to 100m depth) in the eastern half of the Pacific. The upper-level and low-level winds over the tropical Pacific remained near average, except for low-level westerly anomalies over the eastern Pacific. Convection was enhanced near and just west of the Date Line and over portions of Indonesia. Still, the lack of a clear and consistent atmospheric response to the positive SSTs indicates ENSO-neutral.

Over the last month, no significant change was evident in the model forecasts of ENSO, with the majority of models indicating El Niño onset within June-August and continuing into early 2015. The chance of a strong El Niño is not favored in any of the ensemble averages for Niño-3.4. At this time, the forecasters anticipate El Niño will peak at weak-to-moderate strength during the late fall and early winter (3-month values of the Niño-3.4 index between 0.5°C and 1.4°C). The chance of El Niño is about 70% during the Northern Hemisphere summer and is close to 80% during the fall and early winter (click CPC/IRI consensus forecast for the chance of each outcome).

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 7 August 2014. To receive an e-mail notification when the monthly ENSO Diagnostic Discussions are released, please send an e-mail message to: ncep.list.enso-update@noaa.gov.

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

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

WATER WATCH

Keeping an Eye on Water Resources

District-Wide Conditions for July 18, 2014

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

Wet season rains have continued to fill South Florida's aquifers, lakes, canals and conservation areas in the past seven days. An estimated 2.1 inches average of rainfall fell across 16 counties, with a focus on areas around and west of Lake Okeechobee.

Early July through mid-August is a typically hotter and often drier period of the wet season. An unusual mid-July weather pattern, however, has helped prolong the typically heavier rainfall that marks the beginning of the wet season into this drier period.

Water Levels in Key Locations (July 18)		
Location	Today's level	Water Supply Floor
WCA-1	16.26 feet	14.00 feet
WCA-2A	12.18 feet	10.50 feet
WCA-3A	9.30 feet	7.50 feet

Water Conservation

- South Florida is under the District's Year-Round Landscape Irrigation Rule that 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.
- 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.
- For tips and information about water conservation, visit www.savewaterfl.com.

Lake Okeechobee Operations

- The U.S. Army Corps of Engineers manages Lake Okeechobee water levels based on its regulation schedule and the best available science and data provided by its staff and a variety of partners, including SFWMD.
  - SFWMD makes an operational recommendation each week based on conditions. The most recent Operational Position Statement is available at www.sfwmd.gov/opsreports.

Lake Okeechobee Levels	
Today (July 18)	13.58 feet
Historical Average for Today	13.62 feet
This Date One Year Ago	15.15 feet

# # #

Media inquiries can be directed to:
Gabe Margasak
South Florida Water Management District
Office: (561) 682-2800 or Cell: (561) 670-1245

Danger of Heat Stress

Be alert to early warnings of heat stress, both in yourself and in your co-workers.

Heat stress needs to be taken seriously.

Working in a hot environment puts stress on the body's cooling system. When heat is combined with other stresses like hard physical work, loss of fluids, or fatigue it may lead to heat-related illness. Individuals over 40 years of age need to take extra care when the weather is hot because their ability to sweat declines as they age. However, heat stress can also affect individuals who are young and fit.

POINTS TO EMPHASIZE:

- Drink plenty of water to keep body fluid levels up
- Get out of the heat occasionally

Water is crucial to help the body adjust to high temperatures. The rate of water intake must be equal to the rate of water loss by perspiration to keep body temperature normal. **When it's hot, drink plenty of water!**

Your body must work even harder to get rid of excess heat when conditions are both hot and humid. Unfortunately, water can't evaporate as readily under muggy conditions. The process is easier if the surrounding air is moving. That's why we welcome a cool breeze, or turn on a fan when the air is "sticky".

Sickness and accident rates increase when heavy work is done at temperatures above 86 F.

Don't push yourself beyond your limits. It could be harmful to your health, and could put you at increased risk of having an accident.

Heat stress hazards

1. **Heat cramps:** Heavy sweating drains the body of salt, which cannot be replaced by simply drinking water. Painful cramps occur in the arms, legs, or stomach while on the job, or later at home. Move to a cool area at once if cramping is experienced. Loosen clothing and drink cool, commercial fluid replacement beverage. Seek medical aid if the cramps are severe, or don't go away.

2. Heat exhaustion: Inadequate water and salt intake causes the body's cooling system to break down. Symptoms include heavy sweating, cool, moist skin, body temperature over 100 F, weak pulse, and normal or low blood pressure. The victim is likely to be tired, weak, clumsy, upset, or confused. He will be very thirsty, and will breathe rapidly. His vision may be blurred. **Get medical help immediately!** Heat exhaustion can lead to heat stroke, which can kill. Move the person to a cool, shaded area. Loosen or remove excess clothing. Provide cool, lightly-salted water. Fan and spray the victim with cool water.

3. **Heat stroke can kill a person quickly!** Once the body uses up all its water and salt, sweating ceases. Temperature can rise quickly. You can assume a person is suffering from heat stroke if their body temperature is over 105 F, and any of the following symptoms are present:

- ●weakness, confusion, distress, strange behavior
- ●hot, dry, red skin
- ●rapid pulse
- ●headache or dizziness
- ●In later stages of a heat stroke, a victim may pass out and have convulsions

Call an ambulance immediately if heat stroke is suspected. The victim's life may be on the line! Until help arrives, move the victim to a cool area and remove excess clothing. Fan and spray them with cool water. Offer sips of water if the victim is conscious.

Heatwave guidelines

The following measures should help prevent the development of heat-related illnesses.

- ●Slow down in hot weather. Your body's temperature regulating system faces a much greater workload when temperature and humidity are high.
- ●Heed early warnings of heat stress, such as headache, heavy perspiration, high pulse rate, and shallow breathing. Take a break immediately and get to a cooler location. **Watch for heat stress signs among your co-workers.**
- ●Dress for hot weather. Lightweight, light-colored clothing reflects heat.
- ●**Drink plenty of water.** Don't let yourself "dry out".
- ●Try to get used to warm weather gradually. Take it easy for those first three hot days. Your body will have a better chance to adjust if you take it slow.
- ●Get out of the heat occasionally. Physical stress increases with time in hot weather. Take breaks in a cool, shady location.
- ●Wear a hat and long-sleeved shirt to prevent burning (which can increase the risk of skin cancer.)

"Do's" and "Don'ts" of preventing heat-related illnesses

DO:	**DON'T:**
Drink plenty of water Take breaks in a cool, shady area Watch for symptoms of a heat stress, both in yourself and co-workers	Ignore symptoms of heat stress Try to "keep up" with the rest of the crew, even though you feel ill

MANAGING HEAT STRESS

By Dr. Norman Nesheim, UF-IFAS

Heat stress is caused by working in hot conditions and when the body builds up more heat than it can cope with. Several factors work together to cause heat stress. Before beginning a task, think about whether any of these factors are likely to be a problem. Consider making adjustments in the task itself or in the workplace conditions, including: heat factors--temperature, humidity, air movement, and sunlight; workload--the amount of effort a task takes; drinking water intake; and scheduling.

High temperatures, high humidity, and sunlight increase the likelihood of heat stress. Air movement, from wind or from fans, may provide cooling. Because hard work causes the body to produce heat, a person is more likely to develop heat stress when working on foot than when driving a vehicle. Lifting or carrying heavy containers or equipment also increases the likelihood of overheating. Use fans, ventilation systems (indoors), and shade whenever possible. A work area or vehicle sometime can be shaded by a tarp or canopy or provided with fans or air conditioners. Consider wearing cooling clothes that help keep the body cool.

People who have become used to working in the heat are less likely to be affected by heat stress. To become adjusted to hot work environments, do about two hours of light work per day in the heat for several days in a row; then gradually increase the work period and the workload for the next several days. An adjustment period of at least seven days is recommended. If the warm weather occurs gradually, workers may adjust naturally to working in hot conditions.

Whenever it is practical, choose coveralls that allow air to pass through. Woven fabrics (cotton, or cotton-polyester blends) allow air to pass through fairly easily. Rubberized or plastic fabrics and fabrics coated with chemical-resistant barrier layers allow almost no air to pass through.

Perspiration or evaporation of sweat cools the body. Under the conditions that lead to heat stress, the body produces a large amount of sweat. Unless the water lost in sweat is replaced, body temperature will rise. Drink plenty of water before, during, and after work during heat stress conditions. Do not rely on thirst alone to guide you. A person can lose a dangerous amount of water before feeling thirsty, and the feeling of thirst may stop long before fluids are replaced. Be sure to keep body weight fairly constant. All weight lost because of sweating should be regained every day.

When the combination of temperature, sunlight, humidity, and workload is likely to lead to overheating, use scheduling to avoid heat stress. Schedule tasks requiring the heaviest workload during the coolest part of the day. When heat stress risk is high, schedule frequent breaks to allow the body to cool. Anyone who gets dangerously hot should stop work immediately and cool down. If necessary, shorten the time between breaks.

The above steps will prevent most heat stress problems. But under extremely hot conditions when cooling devices cannot be used, it may be necessary to stop work until conditions improve.

Signs and Symptoms of Heat Stress

Heat stress, even mild heat stress, makes people feel ill and impairs their ability to do a good job. They may get tired quickly, feel weak, be less alert, and less able to use good judgment.

Severe heat stress (heat stroke) is a serious illness. Unless victims are cooled quickly, they can die. Severe heat stress is fatal to more than 10 percent of its victims--even young, healthy adults. Victims may remain sensitive to heat for months and be unable to return to the same work.

Learn the signs and symptoms of heat stress and take immediate action to cool down if you observe:

- fatigue (exhaustion, muscle weakness),
- headache, nausea, and chills,
- dizziness and fainting,
- loss of coordination,
- severe thirst and dry mouth,
- altered behavior (confusion, slurred speech, quarrelsome or irrational attitude).

Heat cramps can be painful. These are muscle spasms in the legs, arms, or stomach caused by loss of body salts through heavy sweating. To relieve cramps, drink cool water or "sports drinks." Stretching or kneading the muscles may temporarily relieve the cramps.

First Aid for Heat Stress

It is not always easy to tell the difference between heat stress illness and pesticide poisoning. The signs and symptoms are similar. **Don't waste time trying to decide what is causing the illness. Get medical help right away.**

- Get the victim into a shaded or cool area.
- Cool victim as rapidly as possible by sponging or splashing skin, especially face, neck, hands, and forearms, with cool water or, when possible, immersing in cool water.
- Carefully remove clothing that may be making the victim hot,
- Have the victim, if conscious, drink as much cool water as possible.
- Keep the victim quiet until help arrives.
- **Severe heat stress (heat stroke) is a medical emergency! Cool victim immediately. Brain damage and death may result if treatment is delayed**.

SPRAY DRIFT OF PESTICIDES

What Is Pesticide Spray Drift?

EPA defines pesticide spray drift as the physical movement of a pesticide through air at the time of application or soon thereafter, to any site other than that intended for application (often referred to as off target).

How Does Spray Drift Occur?

When pesticide solutions are sprayed by ground spray equipment or aircraft, droplets are produced by the nozzles of the equipment. Many of these droplets can be so small that they stay suspended in air and are carried by air currents until they contact a surface or drop to the ground. A number of factors influence drift, including weather conditions, topography, the crop or area being sprayed, application equipment and methods, and decisions by the supervisor or applicator.

What Are the Impacts of Spray Drift?

Off-target spray can damage other crops and affect human health and the environment. Drift results in a waste of product and reduces the effectiveness of pesticide application.

How Pesticides Drift?

There are two basic ways in which pesticides move downwind:

Vapor drift. When pesticide molecules volatilize (evaporate into the air), they can move downwind as a vapor. This form of drift is related to the product, not to the type of application method used.

Particle drift. This is the movement of spray particles, or droplets, formed during application. Several key factors determine if a spray droplet will hit its target or drift downwind: (1) the droplet size; (2) the equipment and method of application; (3) the wind speed and (4) other climatic conditions.

1. Droplet Size. "Atomizing" the spray solution into very small droplets will increase coverage, but will also increase the potential for evaporation and drift. The smaller the droplet, the greater is the risk of drift. Droplets over 150 microns in size resist evaporation much more than smaller droplets because of their large surface area. Therefore, the potential for drift rapidly decreases when the diameter of droplets is increased to about 150 microns.

2. Equipment and Application Methods.

a) ***Lower spray height.*** You can reduce drift by mounting the spray boom closer to the ground (without sacrificing the uniformity of

the spray pattern). That is because wind speed increases with height. The correct spray height for each nozzle is determined by the nozzle spacing and the spray angle. Wide-angle nozzles can be placed closer to the ground than narrow-angle nozzles. However, wide-angle nozzles also produce smaller droplets, offsetting the advantage of a lower boom height to some extent.

b) ***Use the lower end of the pressure range.*** Higher pressures generate many more small droplets (less than 100 microns). For this reason, refrain from using pressures that exceed 40 to 45 psi.

c) ***Spray volume and pressure for foliar herbicides.*** Many applicators are reducing the spray volume of foliar herbicides from the commonly used 10-20 GPA to 5-10 GPA. When you reduce spray volume, the herbicide concentration will increase to maintain the same dose of active ingredient. But as spray volume is reduced, the droplet size will decrease, and this means greater drift potential. Research has also shown that control of some broadleaf weeds with contact herbicides is reduced when you cut back on spray volume. However, reduced volumes have little effect on weed control with most translocated herbicides, as long as the chemical is applied properly. To compensate for the reduced spray volume, some applicators will increase spray pressure from a normal 30-40 psi to 60-120 psi. Increasing pressure should not be used as a substitute for spray volume. It is recommended to maintain pressure below 45 psi.

3. Wind speed. Wind speed and direction, temperature, relative humidity, and atmospheric stability all affect spray drift. Wind speed, however, is usually the most critical meteorological condition. The greater the wind speed, the farther off-target small droplets will be carried. Although there is no maximum wind speed to serve as a guideline in all situations, try to spray when the wind speed is less than 10 miles per hour. To minimize the damage done by drift, it is also important to determine the wind direction relative to sensitive crops (something that is often overlooked). To greatly reduce damage to sensitive plants, leave a buffer zone at the downwind edge of the spray area. After the wind has died down or changed direction, you can then safely spray the buffer zone.

4. Temperature and inversions. Temperature and humidity affect the amount of drift that occurs through evaporation of spray particles. Although some spray is lost through evaporation under all atmospheric conditions, the losses are less likely in cool, damp conditions. Temperature also influences atmospheric stability, as well as the presence of air turbulence and "inversions." An inversion can occur when the air is very calm with very little air mixing. This condition makes it easier for spray to move slowly downwind. In other words, extremely calm conditions can also pose the risk of drift. Inversions generally occur in early morning or near bodies of water. You can recognize an inversion by observing a column of smoke. If the smoke does not dissipate, or if it moves downwind without mixing vertically, conditions are not good for spraying.

How to reduce drift?

- Avoid high spray pressure, which create finer droplets. Use as coarse a spray as possible and still obtain good coverage and control. Droplet size is one of the most important factors affecting drift, however, addressing droplet size alone is not sufficient to reduce the probability of drift and potential damage.
- Don't apply pesticides under windy or gusty conditions; don't apply at wind speeds over 10 mph. Read the label for specific instructions.
- Maintain adequate buffer zones to insure that drift does not occur off the target area.
- Be careful with all pesticides. Insecticides and fungicides usually require smaller droplet sizes for good coverage and control than herbicides; however, herbicides have a greater potential for non-target crop damage.
- Choose an application method and a formulation that is less likely to cause drift. After considering the drift potential of a product/formulation/application method, it may become necessary to use a different product to reduce the chance of drift.
- Use drift reduction nozzles.
- Use wide-angle nozzles, lower spray boom heights, and keep spray boom stable.
- Use drift control/drift reduction agents. These materials are designed to minimize the formation of droplets smaller than 150 microns. They help produce a more consistent spray pattern and aid in deposition. Drift control additives do not eliminate drift. Therefore, common sense is still required.
- Apply pesticides early in the morning or late in the evening; the air is often more still than during the rest of the day.
- Don't spray during thermal inversions, when air closest to the ground is warmer than the air above it. When possible, avoid spraying at temperatures above 90°-95° F.
- Know your surroundings! You must determine the location of sensitive areas near the application site. Some crops are particularly sensitive to herbicides, which move off-site.
- Be sure you are getting the spray deposition pattern you think you are; service and calibrate your equipment regularly.
- Whenever possible, cut off the spray for missing trees in the row. Spray that does not enter the tree canopy is wasted and contributes significantly to drift problems.
- Keep good records and evaluate pesticide spray results.

Remember, ALWAYS read and follow label directions.

Certifying and Training Applicators

EPA works with the USDA and the Florida Department of Agriculture and Consumer services (FDACS) to carry out certification and training programs for pesticide applicators. States have primary responsibility for ensuring that pesticide applicators are licensed and certified, as required by Federal and state laws, to apply pesticides in an appropriate manner. Part of the program for certification includes training about how to protect people and the environment from off-target spray drift. In Florida, the certification exams for restricted use pesticide applicator licenses are administered by the **University of Florida/IFAS Cooperative Extension Service** in local county offices statewide. Individuals who need to take the exams should check with local extension office(s) for training and exam schedules **http://sfyl.ifas.ufl.edu/map/**

Aquatic Weeds in Flatwoods Citrus Groves

Aquatic plants are necessary for maintaining the balance of nature and offering food, protection, oxygen, and shelter to aquatic species. However, one reality of growing citrus in Florida flatwoods areas is that nearly every citrus grower will sooner or later experience aquatic weed problems. Aquatic vegetation in ditches and canals not only reduce the cross-sectional area of the channel, but also reduce the velocity of water flow. As a result, aquatic vegetation in waterways may dramatically increase the time required to drain a specific storm compared to clean ditches that allow free-flow of runoff water.

Biological Controls

1. Insects and Diseases

Some exotic plant species have been controlled by introduction of biological control agents. The alligator weed flea beetle was introduced into the United States from South America in 1964. This beetle has done a remarkable job of reducing the problems with alligator weed. In fact, alligator weed is not considered a major aquatic problem in most areas of the state. Various biological control agents have been tested on water hyacinths throughout the years. Of these predator introductions, the most effective have been two types of water hyacinth weevil and the water hyacinth mite. In addition, the fungus, *Cercospona rodmanii,* has been imported and found to have some effect on the water hyacinth.

2. Triploid Grass Carp

Triploid grass carp feed upon aquatic vegetation. Triploid grass carp are non-native fish with 3 sets of chromosomes, rather than the normal 2 sets, making them essentially sterile. Their introduction into water bodies requires permitting from the Florida Fish and Wildlife Conservation Commission in Tallahassee. Usually, the permitting requires a fish barrier retention structure on outfall structures to contain the grass carp. Grass carp are generally appropriate for control of submerged aquatic species such as hydrilla, elodea, and certain types of algae. Biological control measures with herbivorous fish are long-term measures that must have aquatic weed hosts available at all times. Herbivorous fish are not quick-source eradicants of a massive weed problem. Most fish are host selective in nature, and prefer to feed on only a few weed species. Therefore, under a biological control program using grass carp, some groups of plants may seem to proliferate.

Chemical Control

The objective of an aquatic herbicide program is to control aquatic weeds within grove drainage ditches. In the past, citrus growers have relied extensively on chemical control for effective reduction of invasive weed species in and along waterways. Chemical control of aquatic weed species is normally accomplished using various types of herbicides.

Aquatic Herbicides

There are several herbicides that can be used for aquatic weed control. Each material has advantages and disadvantages. The selection of the most appropriate material should be based on the target species, alternate control measures, and the effects on other aquatic organisms.

For more details on aquatic weed management, go to Aquatic Weed Management in Citrus Canals and Ditches at: http://edis.ifas.ufl.edu/ch181

WEED MANAGEMENT IN CITRUS GROVES

Weeds can reduce the growth, health and survival of young trees, or the time to come into bearing and ultimately fruit production. The more competitive the weeds, the more adversely they alter tree physiology, growth, fruit yield and quality. The attainment of early crop production requires controlling the growth of weeds. Weeds alter economic status by competing with trees, particularly young trees, for water, nutrients and even light in the case of climbing vines, which can easily cover trees if left uncontrolled.

Weeds also have various effects on tree performance including reduced efficacy of low volume irrigation systems, and interception of soil-applied pesticides.

Management Methods

Cultural & mechanical

Cultural methods include off-target irrigation and fertilizer applications. Mechanical methods include cultivation in row middles. However, **constant cultivation results in the destruction of citrus fibrous roots, which normally would grow in the undisturbed portion of the soil.**

Mowing is practiced between the tree rows and away from the trees in combination with herbicide applications in the tree row over the major root zone of trees. It is appropriate where a cover crop is desired in bedded groves to prevent soil erosion. Weeds can also be spread by seed and vegetatively during mowing operations, reinfesting tree rows where herbicides have been applied. **Mowing before seedhead formation is necessary to reduce seed dissemination and reinfestation.**

Chemical mowing

Chemical mowing, utilizing Low Rate Technology (LRT) postemergence herbicide spray applications and wiping in combination with mechanical mowing, is used for the suppression of vegetation in row middles. With the high frequency and cost of mechanical mowing required to maintain vegetation control in row middles, chemical mowing and wiping with low rates of glyphosate has increased. Weed management in Middles by chemical applications results in the elimination of tall growing species and establishment of more manageable sod type species such as Bermuda and Bahia grasses.

Chemical

Generally speaking, all weed species listed as susceptible on the herbicide product label will be controlled by that herbicide at the appropriate rate, time of application and stage of growth. Environmental and plant conditions before, during and following the application are also important including moisture in the form of rainfall and/or irrigation.

Poor control can sometimes be expected from postemergence applications to weeds under stress conditions due to poor uptake and translocation of applied herbicides. Assuming that the appropriate herbicide or herbicide mixtures are selected for the weed species present, failures in the program will usually be due to one of the above factors or to the actual application including calibration and/or equipment design and operation.

Herbicides may be classified as foliar or soil-applied. Foliar applied materials may

have systemic or contact activity. Soil applied preemergence herbicides are absorbed through weed root systems, being most effective during germination and early seedling growth stages. Systemic herbicides are those that are absorbed by either roots or aboveground plant parts and are translocated throughout the plant. Contact herbicides act as desiccants, damaging or killing all plant parts actually sprayed with little if any translocation.

For the control of well-established perennial weeds, a postemergence herbicide with systemic metabolic activity should be used with preemergence soil residual products.

Timing and frequency of application are the keys to good vegetation management. **Increased application frequency of lower rates of soil residual herbicides is more effective in young groves where vegetation presence is greater due to more exposure of the grove floor to sunlight and where a greater herbicide safety factor is required**.

Application Technology

Rapid advances in herbicide application technology have resulted in the development of sophisticated equipment. Application equipment is now capable of selective delivery of multiple herbicide products, each directly injected into booms. In a single application, tree rows and row middles may be treated with soil residual and postemergence products with selectivity for tree age, soil type and vegetation species.

Well-maintained, accurately calibrated equipment with good filtration and agitation systems capable of uniform distribution of prescribed spray volumes and droplet size is essential for efficiency, cost-effective vegetation management. Worn nozzle tips result in increased spray delivery rates and distortion of distribution patterns and should be checked regularly. Improved herbicide boom design to reduce tree skirt contact, spray drift and interference of heavy weed cover with nozzle output will reduce tree damage and fruit drop while improving control of target vegetation. Tree skirt pruning and timing of postemergence applications will also reduce boom and spray contact with low hanging limbs and fruit.

Environmental Considerations

In determining management options, herbicide selection should be based not only on species and stage of vegetation development, but product solubility and leaching potential, soil type and rainfall distribution. Objectives are to reduce weed competition and interference through measured vegetation control/suppression with inputs having reduced potential for leaching through over-irrigation, runoff and erosion, chemical drift, or other off-target impacts. CAUTION: Herbicides may move through the soil to groundwater. Several factors influence the rate of this movement. Lower rates applied more frequently combined with sound irrigation management practices will reduce herbicide movement. **The use of bromacil-containing herbicides is prohibited on deep, sandy Ridge-type soils**. For more information and for the list of herbicides registered for citrus in Florida, go to: http://edis.ifas.ufl.edu/CG013
2014 Florida Citrus Pest Management Guide--Weeds.

PHYTOPHTHORA

Foot rot results from infection of the scion near the ground level, producing bark lesions, which extend down to the budunion on resistant rootstocks.

Crown rot results from infection of the bark below the soil line when susceptible rootstocks are used. Root rot occurs when the cortex of fibrous roots is infected, turns soft and appears water-soaked. Fibrous roots slough their cortex leaving only white thread-like stele.

When managing Phytophthora-induced diseases, consider integration of cultural practices (e.g., disease exclusion through use of Phytophthora-free planting stock, resistant rootstocks, proper irrigation practices) and chemical control methods.

Cultural practices. Field locations not previously planted with citrus are free of citrus-specific *P. nicotianae*. Planting stock should be tested free of Phytophthora in the nursery and inspected for fibrous root rot in the nursery or grove before planting. In groves with a previous history of foot rot, consider use of Swingle citrumelo for replanting. Swingle citrumelo is resistant to foot rot and roots do not support damaging populations once trees are established.

Cleopatra mandarin should be avoided because it is prone to develop foot rot when roots are infected in the nursery or when trees are planted in flatwoods situations with high or fluctuating water tables and fine-textured soils. Trees should be planted with the budunion well-above the soil line and provided with adequate soil drainage. Overwatering, especially of young trees, promotes buildup of populations in the soil and increases risk of foot rot infection. Prolonged wetting of the trunk, especially if tree wraps are used on young trees, should be avoided by using early to midday irrigation schedules. Control of fire ants prevents their nesting under wraps and causing damage to tender bark.

Sampling for *P. nicotianae*. Population densities of the fungus in grove soils should be determined to assist in decisions to treat with fungicides. Soil samples containing fibrous roots should be collected during the spring through fall (March to November) from under-canopy within the tree dripline. Individual small amounts of soil from 20 to 40 locations within a 10-acre area are composited into

one resealable plastic bag to retain soil moisture. Samples must be kept cool but not refrigerated for transport to the analytical laboratory. Currently, populations in excess of 10 to 15 propagules per cm^3 soil are considered damaging. The same soil sample could be tested for populations of nematodes, to assess whether they occur at damaging levels.

Chemical control.

Use of fungicides in young groves should be based on rootstock susceptibility, likelihood of Phytophthora infestation in the nursery, and history of Phytophthora disease problems in the grove. For susceptible rootstocks, such as Cleopatra mandarin and sweet orange, fungicides may be applied to young trees on a preventive basis for foot rot. For other rootstocks, fungicide treatments should commence when foot rot lesions develop. The fungicide program for foot rot should be continued for at least one year for tolerant rootstocks, but may continue beyond for susceptible stocks.

In mature groves, the decision to apply fungicides for root rot control is based on yearly soil sampling to indicate whether damaging populations of *P. nicotianae* occur in successive growing seasons. Time applications to coincide with periods of susceptible root flushes in late spring and late summer or early fall.

Soil application methods with fungicides should be targeted to under canopy areas of highest fibrous root density. To avoid leaching from the root zone, soil-applied fungicides should not be followed by excessive irrigation.

Recommended Chemical Controls for Phytophthora Foot Rot and Root Rot include Aliette, Phostrol, ProPhyt, Ridomil, UltraFlourish, and Copper.

For more details, go to:
http://edis.ifas.ufl.edu/CG009

Farm Safety Day Survey

For the past few years, we have not been able to accommodate everyone wishing to attend our annual Farm Safety Day.
This event has been held on the third Saturday in May for the last 24 years at the Southwest Florida Research and Education Center in Immokalee.

The UF-IFAS Extension team in SW Florida has put together a short survey to assess your thoughts about the Farm Safety Day. Your input will be valuable to us. Please take a few minutes to answer the following questions so that we can serve you better. Thank you in advance for your participation!

Please circle your response and/or fill in the blank where necessary.

1. Should we hold multiple Farm Safety Days? Y/N
2. Should they be held at different times of the year? Y/N
3. What is the best time of the year for your operation? _____
4. What is the best day of the week? M T W Th F S
5. Would you prefer consecutive weekends in May? Y/N
6. Would you prefer consecutive days for example Friday/Sat. Y/N
7. Should we offer the Farm Safety Day in multiple locations around South Florida? Y/N If yes, where _____
8. How many employees would you be likely to enroll if we could accommodate your needs? _____
9. Should lunch be provided? Y/N

Please write down suggestions for topics that you would like us to present

_____

_____

_____

Please feel free to write down any comments and/or suggestions

_____

_____

_____

Thank 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

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