

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

# Flatwoods Citrus



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**Previous issues of the Flatwoods Citrus newsletter can be found at:**

<http://irrec.ifas.ufl.edu/flcitrus/>

<http://citrusagents.ifas.ufl.edu/agents/zekri/index.htm>

# IMPORTANT EVENTS & NEWS

## ESTATE PLANNING & TRANSFERRING WEALTH

**Date:** Tuesday, September 14<sup>th</sup>, 2010, Time: 11:00 AM – 1:30 PM.

**Location:** Hendry County Extension Office, LaBelle

Lunch is free, but **RSVP is required**. Please call the Gulf Citrus Growers Association at **863 675 2180** or send an e-mail to [gulfcitruserevents@embarqmail.com](mailto:gulfcitruserevents@embarqmail.com)

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## Citrus Management Strategies in a new Disease Era

### PSYLLID, GREENING, AND BLACK SPOT MANAGEMENT

**Date:** Thursday, October 7, 2010, **Time:** 8:30 AM - 12:00 Noon

**Location:** Immokalee IFAS Center

Program Sponsors: [John Taylor & Cody Hoffman](#), Syngenta Crop Protection  
3 CEUs for Pesticide License Renewal, 3 CEUs for Certified Crop Advisors (CCAs)  
Lunch is free, but **RSVP is required** for planning purposes. Please send an e-mail to [maz@ufl.edu](mailto:maz@ufl.edu) or call 863 674 4092.

## CITRUS SPOT BURNER WORKSHOP

**Date and Time:** October 27, 2010, 9:00 AM

**Location:** Hendry County Extension Office, LaBelle

The workshop will explain the requirements for burning and the rules and regulations for burning and smoke management.

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## 2010 Florida Ag Expo

**November 10, 2010 in Balm, Florida**

For more information and registration, go to: [www.FloridaAgExpo.com](http://www.FloridaAgExpo.com)

Complimentary lunch ticket IF registered by November 3, 2010



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**THE CITRUS BLACK SPOT WEBPAGE** is available on the CREC website ([www.crec.ifas.ufl.edu](http://www.crec.ifas.ufl.edu)). It is located underneath the extension section or you may visit it directly at:

[http://www.crec.ifas.ufl.edu/extension/black\\_spot/citrus\\_black\\_spot.htm](http://www.crec.ifas.ufl.edu/extension/black_spot/citrus_black_spot.htm)

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## International Research Conference on Huanglongbing (HLB)

**January 10-14, 2011, Orlando**

Registration starts on Sept. 1, 2010; Registration fee: \$350.

Registration/Abstract Submission: [www.irchlb.org](http://www.irchlb.org)



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## BAYER AGREES TO TERMINATE ALL USES OF ALDICARB (TEMIK)

### Bayer has agreed first to end aldicarb use on citrus and potatoes

**WASHINGTON** – The U.S. Environmental Protection Agency and Bayer CropScience, the manufacturer, have reached an agreement to end use of the pesticide aldicarb in the United States. A new risk assessment conducted by EPA based on recently submitted toxicity data indicates that aldicarb, an N-methyl carbamate insecticide, no longer meets the agency's rigorous food safety standards and may pose unacceptable dietary risks, especially to infants and young children.

To address the most significant risks, Bayer has agreed first to end aldicarb use on citrus and potatoes and will adopt risk mitigation measures for other uses to protect groundwater resources. New measures to protect shallow drinking water wells in vulnerable areas of the southeastern U.S. coastal plain and lower application rates will be immediately added to product labels for use on cotton, soybeans, and peanuts.

The company will voluntarily phase out production of aldicarb by December 31, 2014. All remaining aldicarb uses will end no later than August 2018. Additionally, EPA plans to revoke the tolerances (legal pesticide residues allowed in food) associated with these commodities. EPA did this to ensure we have the safest food supply possible.

Based upon current toxicological studies, aldicarb at levels higher than those typically found in food has the potential to cause various effects such as sweating, nausea, dizziness and blurred vision, abdominal pain, vomiting, and diarrhea.

Aldicarb is registered for use as a systemic insecticide and nematicide on agricultural crops, and is formulated and marketed solely as a granular pesticide under the trade name Temik. During the phase-out, the pesticide will continue to be registered for use on cotton, dry beans, peanuts, soybeans, sugar beets, and sweet potatoes. Aldicarb products are not intended for sale to homeowners or for use in residential settings. A restricted use pesticide, aldicarb may be applied only by trained, certified pesticide applicators.

The memorandum of agreement and the agency's updated dietary risk assessment and supporting materials will be available in the aldicarb reregistration docket, EPA-HQ-OPP-2005-0163, and in the aldicarb Special Review docket, EPA-HQ-OPP-2006-0197, at [regulations.gov](http://regulations.gov).

The U.S. has a safe and abundant food supply, and children and others should continue to eat a variety of foods, as recommended by the federal government and nutritional experts.

#### Citrus/Potatoes

- Bayer has agreed to cancel the registrations for these uses immediately.
- Existing stocks can be used through 2011.

More information:

[http://www.epa.gov/oppsrrd1/REDs/factsheets/aldicarb\\_fs.html](http://www.epa.gov/oppsrrd1/REDs/factsheets/aldicarb_fs.html)

# GET READY FOR CITRUS BLACK SPOT

## History of Citrus Black Spot

Citrus black spot, caused by the fungal pathogen *Guignardia citricarpa* (sexual stage) and *Phyllosticta citricarpa* (asexual stage), was first found in southwest Florida in March 2010. It may be found in additional areas when the new harvest season begins in the fall.

Around the world, black spot can be found in Argentina, Australia, Brazil, China, Ghana, Mozambique, Philippines, South Africa, Sub-Saharan Africa, Taiwan and other regions of South America.



## Fruit Symptoms

Black spot symptoms occur in several forms called hard spot, cracked spot, false melanose and virulent spot which are described below. Hard spot is the most common and diagnostic symptom. The lesions are small, round, sunken with gray centers and brick-red to chocolate brown margins. Green halos are often seen around hard spot lesions. Fungal structures appear as slightly elevated black dots in the center of lesions. They appear as fruit begins to color where light exposure is greatest.

False melanose is observed as numerous small, slightly raised lesions that can be tan to dark brown. It may occur on green fruit and does not have pycnidia (fungal structures). False melanose may become hard spot later in the season.

Cracked spot has large, flat, dark brown lesions with raised cracks on their surface. It is thought to be caused by an interaction between the pathogen and rust mites. It occurs on green as well as mature fruit and can become hard spot later in the season.



Early virulent spot, also known as freckle spot, has small reddish irregularly shaped lesions. It occurs on mature fruit as well as post-harvest in storage. It can develop into either virulent spot or hard spot. Virulent spot is caused by the expansion and/or fusion of other lesions covering most of the fruit surface toward the end of the season. Many fungal structures can be found in these lesions.

Severely affected fruit can drop before harvest causing significant yield loss.

## Leaf and Stem Symptoms

Leaf and stem symptoms are not as common as fruit symptoms, but can occur when there is insufficient disease control on any cultivar. They are most commonly found on lemons, a very susceptible species.

Lesions begin as small reddish brown lesions that are slightly raised. With age they become round sunken necrotic spots with gray centers and prominent margins that are brick-red to chocolate brown.

## Regulations

Stipulations for Movement of Citrus Fruit from EAN Regulated Areas for Citrus Black Spot [PDF](#)

More information will be added as it becomes available. However, for most up-to-date information from regulatory agencies, please contact the [Florida Division of Plant Industry](#) 863-298-7777.

## Spread

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- Wind-borne ascospores are forcibly ejected from fungal fruiting bodies embedded in leaves in the leaf litter under trees and are carried by air currents, approximately 75 feet (25 meters) from leaf litter.
- Rain splash may also move spores from infected fruit (conidia) and/or leaf litter (conidia and ascospores), but moves the spores only a few inches (centimeters).
- Live leaves that have latent infections (infections that are not visible) are common means of long distance spread. These often are moved as trash in loads of fruit.
- Infected nursery stock is another potential means of spread. This can occur very easily since these latent infections cannot be seen in otherwise healthy-looking trees.
- Leaf litter movement may be either by wind or human activities
- Humans are the main form of long distance movement

## Diagnostics

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If you suspect you may have black spot, please contact your local [CHRP office](#) for further diagnostic testing.

## Management

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- Always plant clean, certified nursery stock. Keeping nursery stock clean is much easier with the new covered nursery regulations but black spot is still a threat. This will help prevent movement of black spot and other diseases into newly established grove plantings.
- Increase air flow in grove to reduce leaf wetness where possible. *G. citricarpa* needs 24-48 hours of leaf wetness for spore germination and infection as do many other fungal diseases.
- Reduce leaf litter on grove floor to decrease ascospore load through enhanced microsprinkler irrigation.
- Fungicides registered for citrus in Florida that have been found effective in other countries:
- Copper products (all formulations have been found to be equivalent)
- Strobilurins fungicides currently approved labels are [Abound](#), [Gem](#) and [Headline](#)
- The best fungicide application method is with air blast sprayer. Aerial applications are not likely to

get adequate canopy penetration for control. It is important that the leaves and fruit are covered with fungicide.

- For enhanced coverage, increase the gallons used to 250 gallons/acre for applications to ensure full coverage.

•[Strategies for Effective Eradication of Citrus Black Spot in Collier and Hendry Collier](#)

## Links

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Florida Division of Plant Industry Citrus Black Spot Updates [website](#)

USDA Press Release-English [PDF](#)

USDA Press Release-Spanish [PDF](#)

Florida Division of Plant Industry Pest Alert [PDF](#)

Fungicide resistance: Why it happens and how it may affect you. Citrus Industry, March 2010 [PDF](#)

Citrus black spot. Citrus Industry, January 2010 [PDF](#)

- It is important to get good canopy coverage with fungicides for black spot control. To ensure complete coverage consider using a spray volume of 250 gallons per acre.

- Leaf litter management is also an important tool for black spot management since the primary spores are produced in the litter like greasy spot. The measures described below have shown to effectively reduce greasy spot inoculum, although not enough to eliminate fungicide applications.

- One urea (187 lb/treated acre) or ammonium sulfate (561 lb/acre) application will reduce the number of fungal structures and spore production.

### OR

- Enhanced irrigation with microsprinkler five times a week starting mid-March and continuing until litter is decomposed.

- Dolomite lime (2,226 lb/acre) will also reduce the number of fungal structures and spores.

## Resources

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If you would like to obtain laminated identification sheets or copies of the other various educational materials, please contact Jamie Yates, 863-956-1151 ext. 1302 or [jd Yates@crec.ifas.ufl.edu](mailto:jd Yates@crec.ifas.ufl.edu).

Citrus Black Spot ID Sheet [PDF](#)

Citrus Black Spot Management Timing Schedule [PDF](#)

Citrus Black Spot Poster for Growers (18 x 27) [PDF](#)

Citrus Black Spot Poster for Packinghouses (32 x 26) [PDF](#)



# 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:

Drink plenty of water  
Take breaks in a cool, shady area  
Watch for symptoms of a heat stress, both in yourself and co-workers

#### DON'T:

Ignore symptoms of heat stress  
Try to "keep up" with the rest of the crew, even though you feel ill



# ALGAE



## Algae are in the plant kingdom, but maybe they're not really plants!

In Florida's freshwaters, algae are what make the water green, or even "slimy". However, green water is not necessarily undesirable, and neither are algae. In fact, algae are essential to the ecosystem and to life as we know it, and must be treated with respect.

**Algae are a diverse group of organisms,** which survive in all different types of habitats. They range in size from microscopic to meters in length and in complexity from single-celled to complex organisms that would rival even large plants. Though these organisms may look like the true, "higher", plants, they are anything but, since they do not have roots or true stems and leaves.

**Algae are one of the first steps of the food web.** There are microscopic algae, like phytoplankton, and there are macroalgae, algae that can be seen by the naked eye. Algae occur naturally in all types of systems and may be considered indicators of

ecosystem condition. Even the mere presence of a species can give an indication of the amount and type of nutrients that run through the system. Algae provide food for all types of animals, including fish, insects, mollusks, zooplankton (microscopic animals), and humans.

## What causes an algae bloom?

**At times algae can grow so quickly and densely that they form a "bloom".** Many people don't like the "look" of a bloom, though blooms can be a natural occurrence. Blooms are not necessarily green, though that is the most common color. They can be blue-green, brown, red, and even violet.



Some blooms turn the water a certain color; this is usually a bloom associated with phytoplankton (microscopic algae). Other blooms form clumps or mats that float on top of the water, or that grow attached to the bottom or to plants. Still others can form dense mats that cover the water surface. Algae need nutrients, such as nitrogen and phosphorous, and light to grow. The level of growth or productivity is often dependent on the amount of nutrients in a system. There is a classification for productivity of a system; it ranges from oligotrophic (low productivity and nutrients) to hypereutrophic (very high nutrients). Also, since algae need light to photosynthesize, how far light penetrates the water is also another limiting factor.

Blooms can have far reaching effects on the environment. Some can become so dense



they can ultimately cause a problem with [low oxygen](#) levels. A decrease in oxygen causes hypoxia (low oxygen) or anoxia (no oxygen) and the other organisms in the water that need oxygen to survive, such as fish, become stressed and may die. Other blooms may release toxins that can be harmful to animals.

There is a general consensus that rapidly growing human development, and increased human use and disposal of nutrients over the past few centuries, has increased the frequency and intensity of algal blooms in many regions of the world. This has created a global effort to control harmful blooms.

## Controlling blooms

**The most direct way to control blooms** is to reduce the availability of nutrients. Most water management organizations throughout the world are actively pursuing a variety of nutrient control strategies. However, for some aquatic ecosystems nutrient control is impractical, ineffective or simply too costly. For some cases chemical or biological treatments can be helpful alternatives.

### Chemical Treatments

**Copper sulfate** (bluestone) and **chelated copper compounds** such as Cutrine-Plus, Algae Pro, and K-TEA, as well as Endothall are common chemical treatments used to kill algae. Chemical compounds that shade out the light for algae growth, e.g. Aquashade, are also used to control blooms. Each chemical has its own restrictions and toxicity to animals. Read the directions carefully before application.

### Biological Treatments

The main biological treatment that is employed today is the use of various carp fish species to control submersed and floating algae. **Grass carp** (*Ctenopharyngodon idella*) is mainly used for aquatic weeds and attached submersed algae, such as *Nitella* sp.,

and *Chara* sp. Where they do not prefer filamentous algae to eat, grass carp will eat *Lyngbya*. The **silver carp** (*Hypophthalmichthys molitrix*) has been shown to be an effective treatment for controlling filamentous algae, including blue-green algae.

Both species are non-native species and there are many restrictions to employing them as a means of weed control; some states prohibit their use altogether. When they are allowed, the use is restricted to **triploid carp**. Triploid carp have an extra set of chromosomes that render the fish sterile, therefore prohibiting a population explosion if the fish escapes into an uncontrolled area.

### Physical Treatments

Physical treatments for algae in ponds include [aeration and airlifts](#). While aeration does not kill or remove algae from the water, it oxygenates and stirs the water column, and can create conditions to shift from toxic and smelly blue-green algae to preferred green algae species. The resultant algal population is usually not as dense or as toxic to other organisms in the ponds.

### Mechanical Treatments

Harvesters are sometimes used to skim dense mats of blue-green lyngbya alga from the surface of lakes and rivers. Lyngbya normally grows in dense mats at the bottoms of nutrient enriched lakes. These mats produce gasses during photosynthesis that often causes the mats to rise to the surface. At the surface, winds pile the algal mats against shorelines or in navigation channels; these mats can be several acres in size. Managers have developed a process called "grubbing" whereby harvesting machines lift the mats off of submersed plants such as native eelgrass, without cutting the eelgrass. By removing the blanket of lyngbya from the eelgrass, the plants grow and expand. Eelgrass is an important food source for manatees in the Crystal and Homossassa Rivers.





## WHERE FLORIDA'S WATER COMES FROM?

Please be active in conserving and protecting our waters

Average annual rainfall in Florida is 53 inches, making it one of the wettest states in the nation. The state's differing climate types yield much rainfall variability from region-to-region and from year-to-year. In central and South Florida, most of the rain falls during four summer months and much of the annual amount is "lost" to the natural hydrologic system through evaporation. The region is prone to wide weather extremes of flood and drought.

Nearly two-thirds of Florida's freshwater use is pumped from vast underground reservoirs called aquifers. Of Florida's groundwater sources, the deep Floridan Aquifer, which spans the majority of the state, supplies 62%; the shallower Biscayne Aquifer (underlying most of Miami-Dade and Broward and portions of Palm Beach and Monroe counties), provides 17%; the remaining 21% is supplied by surficial and intermediate unnamed aquifers. The state's remaining freshwater is supplied from surface waters, including lakes and rivers.

In South Florida, approximately 90% of the water used in homes and businesses comes from groundwater sources. The remaining 10% comes from surface waters. Both surface and groundwater supplies are highly dependent on rainfall for replenishment.



At the heart of the South Florida system sits Lake Okeechobee – the largest natural water body in the southeastern United States. It serves as a source of public water supply for the City of Okeechobee (16,000 utility customers) and provides a supplemental source of irrigation water to more than 700,000 acres in agricultural production. In addition, it serves as the back up water supply for more than five million residents. The massive lake also plays a critical environmental and economic role as a sport and commercial fishery, navigation/recreation waterway and natural habitat for fish, wading birds and other wildlife, including a variety of endangered and threatened species.

While heavy rainfall throughout South Florida benefits and recharges underground supplies, the ability to capture and store the rainwater for future use is extremely limited. When floods threaten – even during water shortage situations – the top priority is channeling the excess water away from homes and businesses as quickly as possible. To lower the levels in coastal canals and accommodate direct rainfall and stormwater runoff, freshwater must oftentimes be released to the ocean or gulf.

The demand for water by growing urban populations and agricultural operations in South Florida is expected to increase significantly in the coming decades. Meeting the growing need for water hinges on our efforts to develop region-specific sources that offer an alternative to traditional ground water and surface water. Alternative water sources are important to Florida's future. They also help to make communities less susceptible to the effects of drought.

Developing alternative water sources diversifies our supply while reducing our dependence on fresh water resources. Examples of Alternative Water Supply are:

- saltwater and brackish water
- water reuse
- surface water captured predominately during heavy rainfalls
- sources made available through the addition of new storage capacity
- stormwater (for use by a consumptive use permittee)
- any other source designated as nontraditional in a regional water supply plan

To address the challenge of ensuring the state's current and future water supply, the 2005 Florida Legislature enacted the Water Protection and Sustainability Program. This precedent-setting law encourages cooperation between municipalities, counties and the state's five water management districts to protect and develop water supplies in a sustainable manner. Water management districts are promoting and supporting local government alternative water supply projects that support smart growth and reduce the use of fresh ground and surface water supplies, such as aquifers and lakes for a sustainable future.

Water reuse plays an important role in water resource, wastewater and ecosystem management in Florida. When reclaimed water is used, it eases the demand on traditional, often limited, sources of water. By recycling or reusing water, communities can still grow while minimizing or even reducing their impact on the water resources around them.

Water reuse involves using highly treated domestic wastewater for a new purpose. Reclaimed water systems are continually monitored to ensure the health and welfare of the public and the environment are protected.

Using reclaimed water also reduces discharges to surface waters, recharges ground water and postpones costly capital investments in the development of new, more costly water sources and supplies.

Reclaimed water is an excellent water source for:

- Irrigating golf courses, residences, highway and street medians and other landscaped areas
- Meeting urban demands for water to wash cars, flush toilets and maintain ponds and fountains
- Meeting industrial and commercial demands for water at power plants and for processing needs
- Irrigating food crops, such as citrus, and irrigating other crops and pastures for livestock
- Creating wetlands and enhancing restoration
- Recharging groundwater

## FALL NUTRITION OF CITRUS TREES

To increase fertilizer efficiency, soil and leaf analysis data should be studied and taken into consideration when generating a fertilizer program and selecting a fertilizer formulation. Dry fertilizer application should be split into 3 to 4 applications per year with a **complete balanced fertilizer**. Based on tree demands, 1/4 to 1/3 of the yearly fertilizer amount should be applied in the fall to satisfy vegetative growth demand. However, late fall fertilizer applications may delay fruit color development and fruit maturity for early season tangerine cultivars.

### Boron (B)

Boron is particularly necessary where active cell division is taking place. Boron plays an important role in flowering, pollen-tube growth, fruiting processes, nitrogen (N) metabolism, and hormone activity. Florida sandy soils are low in B, and a deficiency of this element in citrus occasionally occurs under field conditions. The deficiency may be aggravated by severe drought conditions, heavy lime applications, or irrigation with alkaline water. Boron is very mobile in the soil profile of sandy soils and readily leaches by rainfall or excess irrigation.

Boron deficiency is known as “hard fruit” because the fruit is hard, low in juice content, and even dry due to lumps in the rind caused by gum impregnation. The chief fruit symptoms include premature shedding of young fruits. Such fruit have brownish discoloration in the white portion of the rind (albedo), described as gum pockets or impregnations of the tissue with gum and unusually thick albedo. Older fruit are undersized, lumpy, misshaped with an

unusually thick albedo containing gum deposits. Affected fruit is low in sugar content. Seed fails to develop and gum deposits are common around the axis of the fruit.



The first visual symptoms of B deficiency are generally the death of the terminal growing point of the main stem. Further symptoms are a slight thickening of the leaves, a tendency for the leaves to curl downward at right angles to the midrib, and sometimes chlorosis. Young leaves show small water soaked spots or flecks becoming translucent as the leaves mature. Leaves of boron deficient citrus trees exhibit vein corking and enlargement.



Associated with this is a premature shedding of leaves starting in the tops of the trees and soon leaving the tops almost completely defoliated. Fruit symptoms appear to be the most constant and reliable tool for diagnostic purposes.



To treat citrus affected with B deficiency, B compounds can be applied either foliarly or in the fertilizer. As a maintenance program, apply B in the fertilizer at an annual rate equivalent to 1/300 of the N rate. In Florida, foliar spray applications have been found much safer and more efficient than soil application. Soil applications frequently fail to give satisfactory results during dry falls and springs and may result in toxicity problems if made during the summer rainy season. Boron solubility in the soil is reduced at soil pHs below 5 and above 7. Foliar spray may be applied during the dormant period through post bloom, but preferably during early flower development. Treating at this growth stage is important because boron does not move very readily from other parts of the tree to the buds. Applying boron at this time will assist in flower initiation and pollen production, satisfy the needs for pollen tube growth, and enhance fruit set. For maintenance spray application, 0.25 lb/acre of B may be used. Boron levels in the leaf tissue should not drop below 40 ppm or exceed 120 ppm (dry wt basis). Where deficiency symptoms are present, double the amount suggested. Use care not to apply more than the recommended amount because it is easy to go from deficiency to excess.

## MAGNESIUM NUTRITION

In Florida, magnesium (Mg) deficiency is commonly referred to as “bronzing”. Trees with inadequate Mg supply may have no symptoms in the spring growth flush, but leaf symptoms will develop as the leaves age and the fruit expand and mature in the summer and fall. Magnesium deficiency symptoms occur on mature leaves following the removal of Mg to satisfy fruit requirements. During the summer, when a rapid increase in fruit

size occurs, the symptoms appear on leaves close to the developing fruit. Magnesium deficiency symptoms appear as a result of translocation of Mg from the leaves to the developing fruit, although there may also be a translocation from older leaves to young developing leaves on the same shoot.

Disconnected yellow areas or irregular yellow blotches start near the base along the midribs of mature leaves that are close to fruit. They become gradually larger and eventually coalesce to form a large area of yellow tissue on each side of the midrib. This yellow area enlarges until only the tip and the base of the leaf are green, showing an inverted V-shaped area pointed on the midrib.



In acute deficiency, the yellow area may gradually enlarge until the entire leaf becomes yellow or bronze in color.



Leaves that have lost most of their green color due to Mg deficiency drop freely



under unfavorable conditions. Defoliated twigs become weak and usually die by the following spring. Severe defoliation will reduce the average size of individual fruit and cause a general decline in fruit production. In Florida, Mg deficiency in citrus is caused primarily by low levels of Mg on acid light sandy soils and on calcareous soils. Leaching of added Mg is particularly serious and substantially rapid when the soil pH is 4.5 to 5.0. Under such conditions, the use of dolomite to bring the pH to 6.5 will furnish Mg at the same time.

### FIXING Mg DEFICIENCY

Soil application of Mg sulfate or oxide to provide 50-60 lbs of Mg per acre

can be successful in correcting Mg deficiency when the soil pH is adjusted. Under calcareous soils, the amounts of Mg applied must be greater than those applied on soils low in calcium or potassium. Foliar spray applications of Mg nitrate (3-5 gallons/acre) can be effective when applied on the spring and summer flush leaves when they are about fully expanded. Remember that Magnesium should be applied regularly at 1/5 (or 20%) of the N rate unless leaf analysis shows more than 0.50% Mg. If leaf Mg deficiency symptoms occur, Mg should be applied in the fertilizer, and the rate should be increased up to 30% of the N rate until symptoms are no longer present in mature leaves of subsequent flushes.

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**For more information on citrus nutrition, go to the following EDIS publications:**

[Increasing Efficiency and Reducing Costs of Citrus Nutritional Programs](#)

Mongi Zekri, Thomas Obreza and Arnold Schumann [[pdf](#)]

[Irrigation, Nutrition, and Citrus Fruit Quality](#)

Mongi Zekri, Thomas A. Obreza and Robert Koo [[pdf](#)]

[Micronutrient Deficiencies in Citrus: Iron, Zinc, and Manganese](#)

Mongi Zekri and Thomas A. Obreza [[pdf](#)]

[Micronutrient Deficiencies in Citrus: Boron, Copper, and Molybdenum](#)

Mongi Zekri and Thomas A. Obreza [[pdf](#)]

[Macronutrient Deficiencies in Citrus: Calcium, Magnesium, and Sulfur](#)

Mongi Zekri and Thomas A. Obreza [[pdf](#)]

[Macronutrient Deficiencies in Citrus: Nitrogen, Phosphorus, and Potassium](#)

Mongi Zekri and Thomas A. Obreza [[pdf](#)]

[Plant Nutrients for Citrus Trees](#)

Mongi Zekri and Thomas A. Obreza [[pdf](#)]

[Nitrogen Fertilizer Sources: What Does The Future Hold for Citrus Producers?](#)

Tom Obreza, Larry Parsons, and Kelly Morgan [[pdf](#)]

[Controlled-Release Fertilizers for Florida Citrus Production](#)

Tom Obreza and Bob Rouse [[pdf](#)]

[Prioritizing Citrus Nutrient Management Decisions](#)

Thomas A. Obreza [[pdf](#)]

[Managing Phosphorus Fertilization of Citrus using Soil Testing](#)

Thomas A. Obreza [[pdf](#)]

[Effects of P and K Fertilization on Young Citrus Tree Growth](#)

Thomas A. Obreza [[pdf](#)]

[Fertigation Nutrient Sources and Application Considerations for Citrus](#)

Brian Boman and Tom Obreza [[pdf](#)]

## USDA Confirms Citrus Disease in Texas and Louisiana

The U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS) today announced the presence of *Elsinoë australis*, or sweet orange scab, in Texas and Louisiana. This is the first detection in the United States of the fungal pathogen, which poses no risk to human health.

The infected citrus trees were found on residential properties in Harris and Orange counties in Texas, and in Orleans parish, Louisiana.

The detections were found on citrus trees in Texas that were part of the annual citrus commodity survey. The survey is performed under a cooperative agreement through the citrus health response program (CHRP), which is a collaborative effort involving growers, federal and state regulatory officials and researchers to promote the health and marketability of U.S. citrus. The Louisiana detection was identified during a CHRP citrus greening or Huanglongbing sentinel site survey.

“The early detection of this disease clearly demonstrates the effectiveness of the Citrus Health Response Program,” said Rebecca Bech, deputy administrator for APHIS’ plant protection and quarantine program. “We have taken swift action by issuing emergency action notifications requiring that fruit, leaves, branches and other plant parts remain on these properties to prevent the spread of the disease. We are communicating closely with our partners in Texas and Louisiana as we continue to survey to determine the boundaries of the infected areas.”

APHIS has established a technical working group of subject matter experts to discuss survey and control strategies in response to sweet orange scab. The group will continue to meet to address this developing situation and recommend mitigation strategies to enhance APHIS’ regulatory framework.

Sweet orange scab is a fungal pathogen of citrus caused by *Elsinoë australis* that results in unsightly, scab-like lesions developing on fruit rinds and, less often, on leaves and twigs. The damage produced is superficial and does not affect internal fruit quality or taste. Infected fruit are more likely to drop prematurely, and the scabby lesions reduce the fruit’s fresh market value. In addition, the disease may stunt young citrus seedlings. The disease has been found in South America (Argentina, Bolivia, Brazil, Ecuador, Paraguay and Uruguay) and in Oceania (Cook Islands, Fiji, Niue and Samoa).



**For information on the cooperative citrus health response program, please visit [www.aphis.usda.gov/plant\\_health/plant\\_pest\\_info/citrus/index.shtml](http://www.aphis.usda.gov/plant_health/plant_pest_info/citrus/index.shtml)**

# FIRE ANTS



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

## BIOLOGY

Red imported fire ants live in colonies that contain cream-colored to white immature ants, called brood. The brood is comprised

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

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

## CONTROL STRATEGIES AND TECHNIQUES

Numerous methods have been developed to control fire ants. Unfortunately, there are no control methods that will permanently eliminate fire ants. Four strategies are currently being used to control fire ants: broadcast bait applications, individual mound treatments, a combination of

broadcast baiting and individual mound treatments, and barrier/spot treatments.

### **1. Broadcast Bait Applications**

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

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

### **2. Individual Mound Treatments**

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

#### Baits

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

mound treatments may take one to several weeks to eliminate colonies.

#### Dusts

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

#### Aerosols

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

### **3. Combining Broadcast Baiting and Individual Mound Treatments**

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

### **4. Barrier/Spot Treatments**

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



# Citrus Management Strategies in a new Disease Era

A Citrus Extension Agent Fall Mini-Series Program

<http://citrusagents.ifas.ufl.edu>



## Program Agenda

8:30 am	Registration
9:00 am	Citrus Black Spot Management Update
9:40 am	Asian Citrus Psyllid Management
10:20 am	Break
10:40 am	Growing a Young Citrus Tree in the Greening Era
11:20 am	Foliar Feeding and SAR for Citrus Trees
12:00 pm	Sponsored Lunch

*Continuing Education Units (CEUs) will be offered for Certified Pesticide Applicators and Certified Crop Advisors.*



## Speakers

Steve Futch	Chris Oswalt	Gary England
Tim Gaver	Mongi Zekri	Ryan Atwood
Tim Hurner		



## Meeting Dates and Location

September 29 <sup>th</sup>	Lake County Extension Service Office	1951 Woodlea Road, Tavares
September 30 <sup>th</sup>	Bert J. Harris Agricultural Center	4509 George Blvd., Sebring
October 5 <sup>th</sup>	Indian River Research and Education Center	2199 South Rock Road, Ft. Pierce
October 7 <sup>th</sup>	Southwest Florida Research and Education Center	2685 SR 29 North, Immokalee
October 12 <sup>th</sup>	Turner Agri-Civic Center Exhibition Hall	2250 NE Roan Street, Arcadia
October 14 <sup>th</sup>	Polk County Stuart Conference Center	1710 Hwy 17 South, Bartow

*For more information, please contact the local multi-county citrus extension agents.*

### To register for a specific location, please contact:

Tavares	Lake County Extension Service	352-343-4101
Sebring	Highlands County Extension Service	863-402-6540
Ft. Pierce	St. Lucie County Extension Service	772-462-1660
Immokalee	Hendry County Extension Service	863-674-4092
Arcadia	Desoto County Extension Service	863-993-4846
Bartow	Polk County Extension Service	863-519-8677

***Pre-registration is required.***



# 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 e-mail to [maz@ufl.edu](mailto:maz@ufl.edu) or fax to: 863 674 4636. Thank you for your input!!!**

**Please circle your answer**

- |                                                                   |                                    |    |              |
|-------------------------------------------------------------------|------------------------------------|----|--------------|
| 1 Did the information seem 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