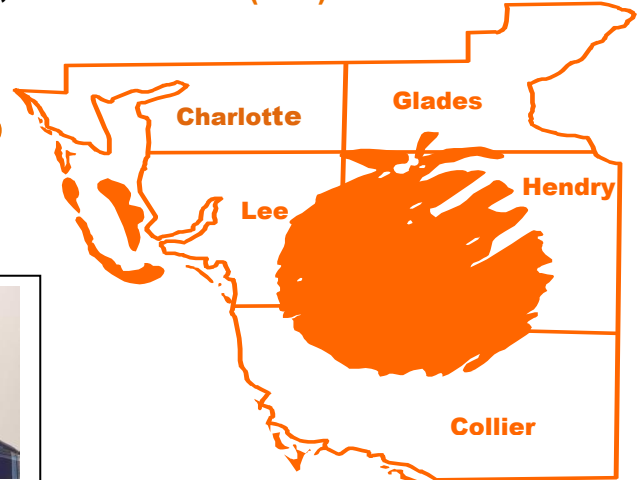


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Flatwoods Citrus



Vol. 13, No. 3

March 2010

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



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U P C O M I N G E V E N T S

March 2010 SQUEEZER SEMINAR

Date: Tuesday, March 16, 2010, Time: 10:00 AM – 12:00 Noon

Location: Southwest Florida REC (Immokalee)

--Dr. Robert Rouse - **The importance of the nutrition program on HLB trees**

--Dr. Kelly Morgan - **Citrus Nutrition & Irrigation (normal vs. after a freeze)**

--Dr. Jude Grosser - **Genetic Engineering Approaches to Solving HLB**

Program Sponsors: Robert Murray, Wedgworth

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

No registration fee and lunch is free Thanks to **Robert Murray with Wedgworth**, but

RSVP is required for planning purposes. Please call 863 674 4092 or send an e-mail to maz@ufl.edu

CERTIFIED PILE BURNER

Training, 7 April 2010,

Immokalee IFAS Center

Class size is limited to 50 people

Pre-registration is required.

See below for registration



Annual Florida Citrus Growers Institute

Date: Tuesday, April 13, 2010

Location: Avon Park Campus of South Florida Community College

For registration, contact Jane Wilson at 863 956 1151 or mjw@crec.ifas.ufl.edu

APRIL 2010 SQUEEZER SEMINAR

Date: Tuesday, April 20, 2010 Time: 10:00 AM – 12:00 Noon

--Mr. Allen Morris – **Economics of HLB management including resetting trees**

--Dr. Michael Rogers – **Psyllid Management, effectiveness of low volume spray**

--Dr. Lukasz Stelinski – **Update on leafminer and psyllid management with considerations of pesticide resistance**

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

Lunch is free Thanks to **Stacey Howell with Bayer CropScience**. **RSVP is required** for planning purposes. Please call 863 674 4092 or send an e-mail to maz@ufl.edu

CITRUS MECHANICAL HARVESTING FIELD DAY AND WORKSHOP

Wednesday, April 21st, 2010, Immokalee IFAS Center (see details)

Special Thanks to the following sponsors (on pages on pages 3, 4, and 5) 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@ifas.ufl.edu

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<http://www.crec.ifas.ufl.edu/extension/lowerbud/index.htm>

By Dr. Gene Albrigo, UF-IFAS, CREC

FLOWER BUD INDUCTION ADVISORY #8 for 2009-2010

Please review Advisory #1 for this year if you have not done so. Besides background, it provides web sites to run the Flowering Monitor System on-line and other related links for weather data. I can be reached by email (see below) if you have an important question.

Freeze damage and flowering - In Lake Alfred, there still does not appear to be very much immediate leaf injury. Remember as a general rule, if leaves are injured and stick on the tree, there is usually twig damage behind those leaves. If damaged leaves easily abscise from the shoot, there is a minimum of wood damage. You can evaluate this within 7 to 10 days. If damaged leaves stick or abscise at the blade, it takes weeks to determine the extent of cambial damage. The trees should have withstood the temperatures and durations reported (see FAWN station reports). Flowering will not be altered, even if many leaves fall off, unless there was twig and bud damage

Current status for 2009-10 Fall-Winter – Yes, according to the ‘flower monitoring system’ we have initiation of differentiation, but the model reports this event from Sebring north, not in the Immokalee or Ft. Pierce areas. Last we guessed that ‘temperature may remain too cool this coming week to initiate bud growth from Lake Alfred north’, so what do I know. I still believe ‘we should have one major bloom’ and the model predicts the **full bloom date will be March 20 to 22, depending on the location**. Again, I think that in 1 to 3 days, the model will say that bud growth has started in the southern areas.

Initiation of differentiation started with 1150 (Sebring) to 1450 (Umatilla) hours of inductive temperatures, very good levels of flower induction. Ft. Pierce and Immokalee are now at 964 and 1136 hours, which are also good.

Next week, we should see that flower bud growth has started in all areas and have predicted bloom dates for the southern areas.

FLOWER BUD INDUCTION ADVISORY #9 for 2009-2010

Current status for 2009-10 Fall-Winter –

According to the ‘flower monitoring system’ citrus trees in all growing areas in Florida have initiated differentiation of flower buds. This initiation occurred after 890 (Ft. Pierce) to 1450 (Umatilla) hours of cool induction. The predicted full bloom dates are March 18 to 20, a 2-day advancement from last week.

About 150 to 200 additional cool hours have accumulated since the initiation of this first flowering wave. With another 100 hours and then a warm period, the model will predict a second wave. I don’t believe a second wave will happen because the first wave should account for most of the available buds. This first wave could be as strong as the 2003 bloom if the trees have fully recovered from their poor flowering responses since the 2004-05 hurricanes. The buds should be advanced enough to see how the bloom is developing by early March. As mentioned a couple of weeks ago, at least a few buds should develop earlier than the main wave, but how many is only a guess based on observations that some trees had a few shoots with bud swell.

If you have further questions, please contact me (albrigo@ufl.edu).



Summarized from
<http://edis.ifas.ufl.edu/pdffiles/AA/AA09200.pdf>

Pollination of Citrus by Honey Bees

By **Malcolm T. Sanford, UF-IFAS**



Pollination in most citrus is not really required.

1. Citrus flowers are perfect, having both sexes on the same blossom so that self-pollination takes place regardless of pollinators. But bees (pollinators) are distributed throughout citrus groves in any case.
2. Female-sterile varieties are not benefited by pollinators.
3. Some seedless varieties may benefit, but evidence is lacking.

This by no means indicates pollination is not necessary in citrus.

1. There is a growing number of citrus varieties which require cross pollination because they are self-incompatible.
2. A positive linear relationship between fruit size and number of seeds per fruit exists.
3. Where cross pollination is required, use of honey bees remains the most consistent, effective and economical means of ensuring adequate yields.

Grapefruit: Although consensus suggests pollination is not required, there is evidence that open pollination benefited at least one variety (Marsh) by setting four times the fruit which had twice the number of seeds.

Pummelo: This variety appears to be grown commercially only in the Orient and is self-incompatible. Evidence suggests that pollinating by bees is important whether the plant is self-fertile or self-sterile.

Lemons: Most studies indicated the value to be minimal. However, there is evidence that seedlessness can result from self pollination, and that seedlessness may contribute to a reduction in fruit set.

Limes: Few studies have been done. One suggests limited pollination benefit from bees on Tahiti lime which is strongly parthenocarpic. Another suggested sweet limes would benefit from pollination by setting up to twenty percent more fruit.

Oranges: A large variation between cultivars exists in oranges making any sort of general statement difficult. Studies on certain varieties, however, have been accomplished:

- **Washington Navel:** Although it has been suggested that cross pollination on Washington Navels is not required to increase yield, there is evidence to show that pollination by bees may contribute to less fruit drop.
- **Valencias:** Most investigators contend that this variety benefits little from pollination by bees. One study, however, indicates fruit size was increased as the seed number increased.
- **Other sweet oranges:** Not much study has been done on these, but there is some indication that pollination is beneficial. It has also been suggested that reduced fruit set in so-called "off

years" may be offset by honey bee pollination.

Mandarin and Mandarin-Hybrid Complex: Many varieties of this complex are self-incompatible and require pollination.

In summary it may be concluded that honey bees are unquestionably important in the pollination of citrus, though some varieties benefit more than others. In addition, there is the belief that ample quantities of bees are always present in groves because of their rich nectar resources.

Summarized from
<http://edis.ifas.ufl.edu/pdffiles/AA/AA14500.pdf> **Protecting bees from pesticides**

Most major bee poisoning incidents occur when plants are in bloom. However, bees can be affected in other circumstances as well. Keep the following suggestions in mind when applying pesticides.

Use pesticides only when needed: Foraging honey bees, other pollinators, and insect predators are a natural resource and their intrinsic value must be taken into consideration. Vegetable, fruit, and seed crop yields in nearby fields can be adversely affected by reducing the population of pollinating insects and beneficial insect predators. It is always a good idea to check the field to be treated for populations of both harmful and beneficial insects.

Do not apply pesticides while crops are in bloom: Insecticide should be applied only while target plants are in the bud stage or just after the petals have dropped.

Apply pesticide when bees are not flying: Bees fly when the air temperature is above 55-60°F and are most active from 8 a.m. to 5 p.m. Always check a field for bee activity

immediately before application. Pesticides hazardous to honey bees must be applied to blooming plants when bees are not working, preferably in the early evening. Evening application allows time for these chemicals to partially or totally decompose during the night.

Do not contaminate water: Bees require water to cool the hive and feed the brood. Never contaminate standing water with pesticides or drain spray tank contents onto the ground, creating puddles.

Use less toxic compounds: Some pest control situations allow the grower-applicator a choice of compounds to use. Those hazardous to honey bees must state so on the label. **Use less toxic formulations:** Not all insecticides have the same effects when prepared in different formulations. Research and experience indicate:

- New microencapsulated insecticides are much more toxic to honey bees than any formulation so far developed. Because of their size, these capsules are carried back to the colony. These insecticides should never be used if there is any chance bees might collect the microcapsules. Always consider using another formulation first.
- Dusts are more hazardous than liquid formulations.
- Emulsifiable concentrates are less hazardous than wettable powders.
- Ultra-low-volume (ULV) formulations are usually more hazardous than other liquid formulations.

Identify attractive blooms: Before treating a field with pesticides, it is a good idea to check for the presence of other blooming plants and weeds which might attract bees.

AFRICANIZED HONEYBEES



Africanized Honeybees (AHB) -- also called "Africanized bees" acquired the name "killer bees" because they will viciously attack people and animals who accidentally stray into their territory, often resulting in serious injury or death.

It is not necessary to disturb the hive itself to initiate an AHB attack. In fact, Africanized bees have been known to

respond viciously to noises or even vibrations from vehicles, equipment and pedestrians.

Though their venom is no more potent than native honeybees, Africanized bees attack in far greater numbers and pursue perceived enemies for greater distances. Once disturbed, colonies may remain agitated for 24 hours, attacking people and animals within a range of a quarter mile from the hive.

Africanized bees are becoming a problem in Florida.

Bee Invasion

Africanized bees proliferate because they are less discriminating in their choice of nests than native bees, utilizing a variety of natural and man-made objects, including hollow trees, walls, porches, sheds, attics, utility boxes, garbage containers and abandoned vehicles. They also tend to swarm more often than other honeybees.

Bee Safety

The best safety advice is to avoid an encounter with unfriendly Africanized Bees. Be alert for danger. Remember that AHB sting to defend their colony, so be on the look out for honeybee swarms and colonies.

- Be alert for bees coming in and out of an opening such as a crack in a wall, or the hole in a utility box.
- Listen for the hum of an active bee colony.
- Look for bees in holes in the ground, holes in trees or cacti, and in sheds.
- Be extra careful when moving junk that has been laying around.
- Be alert for bees that are acting strangely. Quite often bees will display some preliminary defensive behavior before going into a full-fledged attack.
- When you are outdoors, in a rural area, a park or wilderness reserve, be aware of your surroundings and keep an eye out for bees the way you would watch out for snakes and other natural dangers.
- Don't panic at the sight of a few bees foraging in the flowers. Bees are generally very docile as they go about their normal activities.

Be Prepared

- Wear light-colored clothing. Bees tend to attack dark things. Dark clothing, dark hair, any thing dark in color could draw the animus of AHB.
- Bees are sensitive to odors, both pleasant and unpleasant. The smell of newly cut grass has been shown to disturb honeybees. Avoid wearing floral or citrus aftershaves or perfume.
- Check your house and yard at least once a month to see if there are any signs of bees taking up residence. If you do find a swarm or colony, leave it and keep family and pets away. Find a pest control company or a local beekeeper to solve the problem.
- To help prevent honeybees from building a colony in your house or yard, fill all cracks and crevices in walls with steel wool and caulk. Remove piles of refuse, honeybees will nest in an old soda can or an overturned flowerpot. Fill holes in the ground.

Bee Attack

Bees target the head, and nearly all those who suffer serious stinging incidents with Africanized Bees are overcome by stings to the head and face.

The best method of escaping a bee attack is to cover your head and run for shelter.

Any covering for your body, especially for your head and face, will help you escape. A small handkerchief or mosquito net device that fits over the head could easily be carried in a pocket. If you do not have these, grab a blanket, coat, towel, anything that will give you momentary relief while you look for an avenue of escape. If you have nothing else, pull your shirt up over your face. The stings you may get on your chest and abdomen are far less serious than those to the facial area.

- Try to find shelter as soon as possible. Take refuge in a house, tent or a car with the windows and doors closed.
- **DO NOT JUMP INTO WATER! Bees will wait for you to come up for air.**
- Once you are away from the bees, evaluate the situation. If you have been stung more than 15 times, or if you are having any symptoms other than local pain and swelling, seek medical attention immediately.
- If you see someone else being stung or think others are in danger, call 911 immediately.
- Remove stingers as soon as possible to lessen the amount of venom entering the body. Scrape stingers off the skin with a blunt instrument or plastic card. Do not remove bee stingers with fingers or tweezers – this only forces toxins into the victim's body.

AHB Facts

- Are slightly smaller than the European honeybee, but only an expert can tell them apart
- Defend their hive more rapidly than the European honey bee
- Usually sting in greater numbers
- Are less selective about where they nest
- Swarm more often than European honey bees
- Do not have stronger venom than the European honey bee
- Each bee can only sting one time – females die after stinging
- Are not native to the U.S.; they came from Africa

DO NOT FORGET **ALTERNARIA** **BROWN SPOT**



Alternaria fungal disease can cause severe leaf and fruit drop particularly in Minneola (Honeybell) and Orlando tangelos, Dancy tangerine, and Murcott (Honey tangerine). Alternaria must be controlled on these cultivars to obtain high yields of good quality fruit. The spores of this disease are air borne, but require moisture for germination and infection. Leaf tissue is susceptible until it is fully expanded and fruit is susceptible for about 3 months after bloom. When new groves of the above cultivars are planted, only disease-free nursery stock should be used. Trees should be spaced more widely than oranges to promote rapid drying of the canopy. It is best to locate susceptible varieties in high areas where air drainage and ventilation are good so that leaves dry more rapidly. Irrigation, fertilization, hedging, topping, and skirting should be carefully monitored so that excessive vegetative growth is minimized. Copper fungicides, Abound, Gem, Ferbam, Headline, and Trilogy are the materials registered for the control of this disease. The first spray should be applied when the spring flush leaves are ¼-1/2 expanded. In severe cases, another spray should be applied when the leaves are near full expansion to reduce the infection on the

fruit. Another spray should be scheduled shortly after petal fall. Abound, Ferbam, Gem or Headline may be the best choice for one or two applications especially if the grove has problems with both scab and Alternaria. From April through June, spray applications may be needed as often as every 10 days or as infrequently as once a month depending on the frequency and amount of rainfall and the rate of infection in the grove. Copper fungicides can be used from April through May, but can produce fruit blemishes if applied during hot weather. Therefore, Abound, Gem, Ferbam, Headline, and Trilogy may be substituted for copper in June or July applications. Abound, Gem, and Headline are strobilurin fungicides and Alternaria has the potential to develop resistance to these products. Strobilurin should not be used for Alternaria control more than 3 times in a season and never more than 2 applications in a row. Gem is not highly effective for control of Alternaria. Trilogy and Ferbam are less effective for Alternaria control than copper, Abound or Headline.



For more information, get your copy of the 2008 Florida Citrus Pest Management Guide online at:

http://edis.ifas.ufl.edu/TOPIC_BOOK_Florida_Citrus_Pest_Management_Guide

DO NOT FORGET **CITRUS** **SCAB**



This fungal disease affects grapefruit, Temple orange, Murcott, tangelos, and some other tangerine hybrids. If leaves from the previous season are heavily infected by citrus scab, 3 applications should be scheduled to control this disease. The first spray should be applied at about $\frac{1}{4}$ expansion of the spring flush leaves, the second at petal fall and the third about 3 weeks later. Fruit becomes resistant to scab about 2 months after petal fall. Ferbam, Abound, Gem, or Headline are good choices for the first application because they are able to kill the fungus in old lesions and thus reduce the inoculum and protect the foliage. Whichever of these products was not used in the first spray may then be used in the petal fall spray. Copper fungicides, Abound, Gem, or Headline are good choices for the third spray since they will protect fruit from early melanose as well as from scab. On tangelos and Murcott, Alternaria brown spot and scab occur together. Under this circumstance, either copper fungicides, Abound, Gem, or Headline should be selected for the 3 sprays. Ferbam is less effective against Alternaria. If used more than once a year, resistance of the scab

fungus to Abound, Gem, or Headline may develop.

**DO NOT APPLY ABOUND, GEM,
or HEADLINE IN NURSERIES.**

For more information, get your copy of the 2010 Florida Citrus Pest Management Guide online at:

http://edis.ifas.ufl.edu/TOPIC_BOOK_Florida_Citrus_Pest_Management_Guide

Hard copies of the 2010 Florida Citrus Pest Management Guide may also be available (check with your citrus agent).



Timmer's Recommendations

•Spring flush

Abound, Gem, Headline,
Ferbam

•Petal fall

Abound, Gem, Headline,
Ferbam

•3 weeks later

Cu fungicides, Abound,
Gem, Headline

•Do not use Abound, Gem, or Headline more than once.

Prioritizing Citrus Nutrient Management Decisions

<http://edis.ifas.ufl.edu/SS418>

By *Tom Obreza*, UF-IFAS

Introduction

Citrus nutrient management can be divided into four components: Monitoring, program development, application, and evaluation. **Monitoring** can be qualitative (visual observations of tree performance), or quantitative (laboratory analysis of soil and/or leaf tissue samples). In **program development**, the grove manager decides what type of fertilizer sources will be used, and the rate, timing, and frequency at which nutrients will be applied. The **application** phase centers on methods used to place the nutrients (e.g. spreading dry fertilizer, applying suspension fertilizers with a herbicide boom, injecting solution fertilizers into the irrigation system, or spraying soluble nutrients on leaves). Following fertilizer application, the **evaluation** step determines whether the desired crop response was achieved, usually by evaluating tree growth, fruit yield, and fruit quality.

Ideally, a citrus nutrient management plan will provide maximum citrus yield and quality while minimizing the potential for water quality impairment. Nutrient management can become a complex task as a citrus grove manager considers the many factors that affect the choices of nutrient rate, source, placement, form, and application timing.

Citrus Sensitivity to Individual Nutrients

Citrus tree sensitivity to shortages or excesses of individual nutrients differs depending on the nutrient. For example, observations of mature citrus trees in the field tell us that manganese deficiency does not affect production nearly as much as nitrogen deficiency. Similarly, an excess of boron affects fruit quality more than an excess of magnesium.

In the 1960s, Dr. R. C. J. Koo and Dr. R. L. Reese of the UF-IFAS Citrus Research and Education Center in Lake Alfred grew Pineapple orange trees on a previously non-fertilized deep sandy soil and implemented a set of treatments where they omitted single essential mineral nutrients from the fertilizer program. The twelve nutrients they studied were macronutrients nitrogen (N), phosphorus (P), and potassium (K); secondary nutrients calcium (Ca), magnesium (Mg), and sulfur (S); and micronutrients manganese (Mn), zinc (Zn), copper (Cu), boron (B), and molybdenum (Mo). The N omission treatment was not zero N, but was half of full N fertilization. They found that citrus yield was most sensitive to omission of N, P, and K, and least sensitive to omission of micronutrients ([Figure 1](#)). One of the most important aspects of this study was that even on a sandy soil with poor native fertility, it took 7 years for omission of micronutrients to show negative effects.

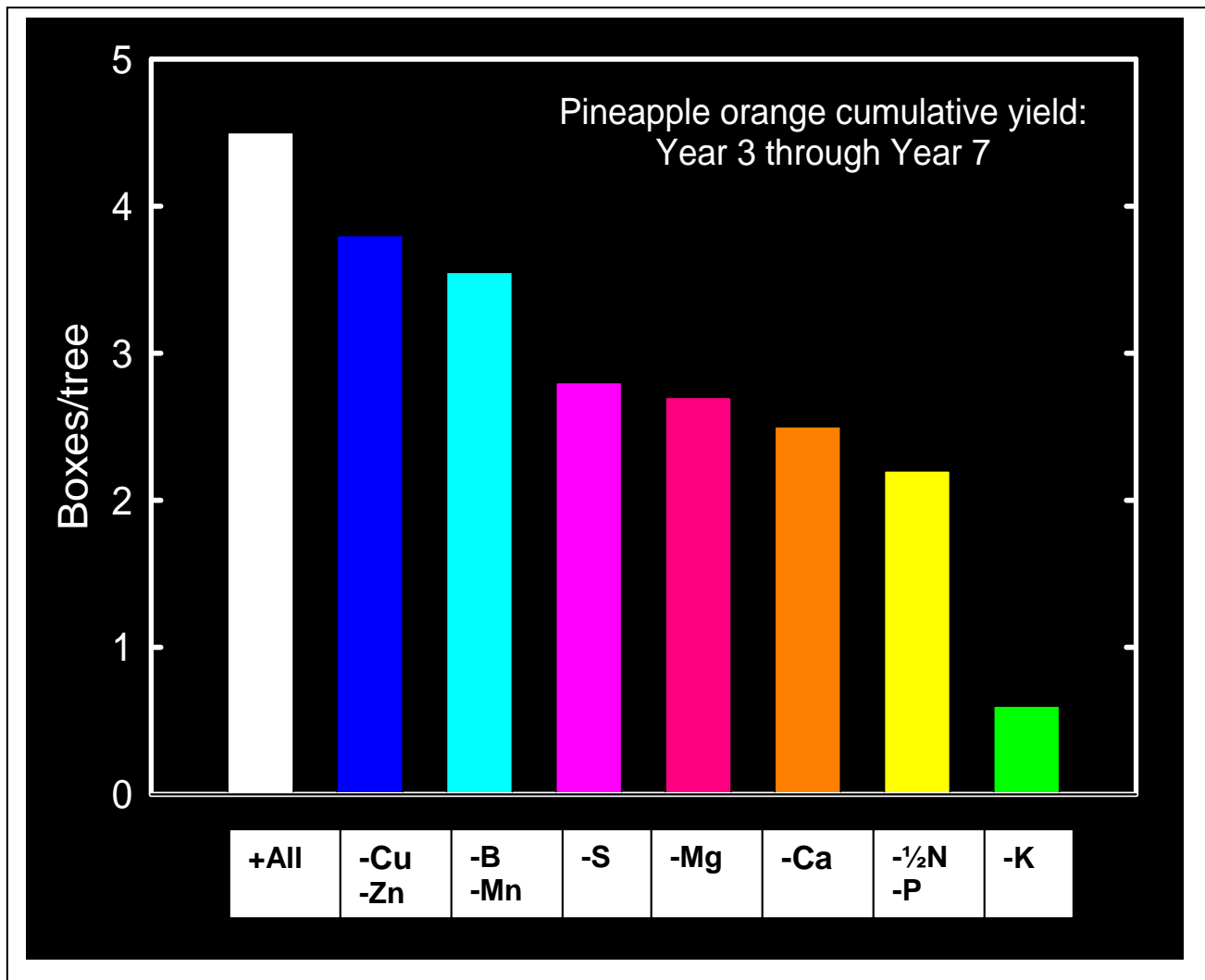


Figure 1. Sensitivity of pineapple orange trees planted on a native ridge sand to omission of single nutrient elements. The "+All" treatment received all essential nutrients; the N omission treatment was half of the N applied in the "+All" treatment. (From Koo and Reese, Proc. Fla. State Hort. Soc., 1971).

Nutrient Accumulation and Loss

As a young citrus grove gets older, some nutrients applied in fertilizers and soil amendments will tend to accumulate in the soil, while others will mostly leach out of the root zone with rain or irrigation water if not taken up by the trees. The extent to which soil nutrient accumulation takes place will depend on the nutrient, its application rate, and the characteristics of the soil. For sandy Florida soils, the following are rules of thumb regarding nutrient accumulation or leaching:

- Cu, Zn, and Mn will accumulate in the root zone as a result of fertilizers applied to the soil or tree foliage. Soil accumulation of Cu resulting from frequent Cu-based fungicide applications can be particularly high.

- Ca and Mg will accumulate in the root zone as a result of calcitic or dolomitic limestone applications, or soil-applied fertilizers.
- As the amount of organic matter or clay in the soil increases, the accumulation of S applied as a component of many fertilizers will increase.
- P will normally accumulate in the root zone unless the soil is extremely sandy and low in organic matter.
- N, K, and B are nutrients that are poorly held by sandy soils and will be leached by rainfall or excessive irrigation. Thus, they usually must be applied as fertilizer every year.

Nutrient accumulation in the soil is one of several factors that determine the availability of nutrients to plants. Just because the concentration of a nutrient has increased in the soil does not mean that its availability has concurrently increased. Other factors including soil pH, water management, and root system health can significantly influence plant nutrient uptake.

Fertilization Experiments in the Flatwoods

During the last decade, fertilization experiments with mature flatwoods citrus trees that were well fertilized in their non-bearing years showed that good water management alone provided about 30% to 40% of maximum yield. When sufficient amounts of N and K fertilizer were combined with good water management, production reached or surpassed 90% of its maximum. Thus, the remaining 10% or less of a grove's yield potential was attributed to the combined effect of the remaining essential elements. It is important to reiterate that the groves where N and K experiments were conducted had lime, P, and micronutrient fertilizers applied to them when the trees were young.

Prioritizing Decision-Making

If citrus is most sensitive to water, N, and K, then nutrient management decisions should concentrate on improving their management before considering other factors. For example, if a grove is watered using a micro-irrigation system, how uniform is the water distribution from emitter to emitter? Are there any plugged sprinklers or drippers? If a grove manager chooses to fertigate a significant portion of the N and K (typically considered as a Best Management Practice for nutrients), it is important to frequently check the irrigation system for water distribution uniformity. The Mobile Irrigation Laboratories operated by the USDA-NRCS can measure irrigation system performance. If the system tests below 80% emission uniformity, corrective action should be implemented to even out and improve the nutrient distribution.

Summary

When prioritizing nutrient management decisions, grove managers should recognize the relative sensitivity of citrus to various nutritional factors in their groves and concentrate on improving the most sensitive ones first. Doing so will allow more time to deal with other citrus management issues.

IRRIGATION



Florida citrus growers and production managers know that they can't grow citrus successfully and competitively without supplemental irrigation. In Florida, through research and field experience, we know that irrigation is necessary because of the non-uniform distribution of the rainfall and the very limited water holding capacity of our sandy soils.

Irrigation is of particular importance during the dry period (February-May), which coincides with the critical stages of leaf expansion, bloom, fruit set, and fruit enlargement.

Proper irrigation scheduling is defined as the application of water when needed and in the amounts needed. Citrus production managers should accurately determine when and for how long to irrigate. With proper irrigation scheduling, tree growth and fruit yield will not be limited by water stress or water excess. Over-watering will waste water and pumping energy, will leach nutrients and other chemicals below the rootzone, and will contribute to contamination of the groundwater.

Because of the high water table in SW Florida, citrus trees have over 90% of their feeder roots within the top foot of soil. For this

situation, irrigating for long duration can lead to loss of water below the rootzone. Therefore, it is recommended to increase the frequency and reduce the length or duration of irrigation. Irrigating every other day is better than irrigating once a week. Research work in Florida has shown the importance of the area wetted by irrigation systems. When managed properly, greater area coverage by irrigation emitters provides higher yield than very limited coverage.

Because of the relatively high annual rainfall in Florida, roots of mature trees are spread throughout the grove and are not restricted to the wetted area by the irrigation system emitters. Roots are commonly found in the middles between tree rows and outside the wetted zone by microirrigation systems. Therefore, it is important to have the irrigation system cover most of the area under the tree canopy and even slightly outside the canopy dripline.

Drip systems may not provide enough water to mature citrus trees in Florida because of the limited horizontal distribution of water on poor fine sands. Irrigating with drip systems for too long will neither provide more coverage nor reduce water stress and wilting, but will drive most of the water below the shallow rootzone. Increasing irrigation frequency rather than duration with microirrigation systems is one of the most important factors improving water use efficiency. Raising the water table in the ditches or water furrows will certainly help the trees recover from water stress.

Good water management practices should include precise irrigation scheduling and well-designed, uniform irrigation systems to minimize waste. Non-uniform irrigation will cause excess water to be applied in some areas while other areas will not get enough. Production managers should not only be aware of the losses resulting from irrigation systems that apply water and chemicals non-uniformly, but should adopt the recommended ways to minimize these losses.

For a free evaluation of your irrigation system, call the Mobile Irrigation Lab in your area. In SW Florida, call 239 455 4100.

SCALE INSECTS ARE BACK

http://edis.ifas.ufl.edu/topic_book_florida_citrus_pest_management_guide

Armored scale pests in Florida include snow scale, Florida red scale, purple scale, Glover's scale, and chaff scale. Important soft scale insects include Caribbean black scale, brown soft scale, and Florida wax scale. Pest management of both armored and soft scale insects in Florida citrus is based on highly successful action of native and introduced natural enemies, including predators, parasites, and pathogens. Thus, scale insects should not be considered key pests. However, there are conditions under which natural enemies may not function well. Factors that are most often responsible for increases in scale populations are: a) weather conditions that disrupt biological control; b) disruption of natural enemies by other practices, **particularly the repeated use of non-selective insecticides during a period when natural enemies are active and exposed.** When these disruptions occur, scale populations can increase to the point where they cause severe damage to leaf, fruit, twig, branch and/or trunks.



Red Scales

In approaching management of scale insects, the first consideration should be to determine if the problem is induced by management practices and, if so, to determine if it can be solved by changing those practices. In particular, if repeated applications of non-selective pesticides are responsible for scale population increase, then the solution is to desist and allow natural enemies to recover. If, on the other hand, seasonal fluctuations have brought about population levels of concern, then

some intervention with insecticides may be required. For effective suppression, most scale species should be in young nymphal stages, since pesticides are not very effective against eggs, large nymphs, or adults.

Treatment, when warranted, should focus on selection of an appropriate material (see Table), but equally important, should be applied with thorough coverage in mind. Since scale insects are immobile, direct contact is essential. Spray volume, ground speed, and nozzle size should all be emphasized to get maximum target coverage. If only a few trees are involved, then spot treatment with a handgun or other focused application equipment will provide the best results. The follow-up to pesticidal applications for scale insects should involve evaluation of **live** scale on the appropriate parts of the tree. Dead scale will not be visibly different from live scale at first. Hatching crawlers will also create the impression that the spray was not effective. Complete elimination of scale insects following a pesticidal spray is neither practical nor necessary, and in fact may be counterproductive.

Brown soft scale. Following mild winters and when populations build within specific groves, treatment, where needed, should be based on scouting for crawlers and young nymphs (still tan in color) during the generation that develops in April-May. Applications at other times are ineffective.

Citrus snow scale. Evidence for the need to treat includes high populations of crawlers showing on patches of bark that have been brushed clean during the previous week, and the association of visible snow scale populations with bark splitting, particularly on young trees that are rapidly increasing in trunk girth. Spot treat wood of heavily infested trees to runoff with a handgun application.

Recommended Chemical Controls for Scale Insects

READ THE LABEL. Some product labels specify rates per acre, while others specify rates per volume delivered (e.g. per 100 gallons). Refer to label for details on how product should be mixed for desired targets.

Rates for pesticides are given as the maximum amount required to treat mature citrus trees unless otherwise noted. To treat smaller trees with commercial application equipment including handguns, mix the per acre rate for mature trees in 250 gallons of water. Calibrate and arrange nozzles to deliver thorough distribution and treat as many acres as this volume of spray allows.

Pesticide	IRAC MOA ²	Mature Trees Rate/Acre ³	Comments	Other Pests Controlled
Dimethoate 2.67 EC	1B	See label	Does not control citrus snow scale or black scale.	Aphids
Dimethoate 4 EC				
Dimethoate 5 EC				
Guthion 2 L	1B	6 pt	Do not use spray solutions above pH 8. Do not use 2 L formulation with oil. May increase citrus red mite and Texas citrus mite.	Whiteflies, mealybugs, adult citrus root weevils
Guthion 50 WP		4 lb		
Azinphos-Methyl		6 pt		
Chlorpyrifos 4 EC	1B	5 pt	May increase spider mite populations. (4 EC is a restricted use pesticide.)	Mealybugs, orangedog, katydids, grasshoppers, aphids, thrips
Chlorpyrifos 50 W		5 lb		
Malathion 5 EC	1B	6 pt	Glover and yellow scale. Does not control chaff or black scale.	Plant bugs, crickets
Malathion 8 EC				
Petroleum Oil 97+% (FC 435-66, FC 455-88, or 470 oil)	NR ⁴	10 gal	Do not apply when temperatures exceed 94°F. 470 weight oil has not been evaluated for effects on fruit coloring or ripening. These oils are more likely to be phytotoxic than lighter oils.	Citrus rust mites, whiteflies, greasy spot, sooty mold
Carbaryl 80 S	1A	3.1 lb	May increase citrus red mite and Texas citrus mite populations. Do not exceed 20 lb a.i./acre/year for all uses.	Adult root weevils, orangedog, crickets, katydids, grasshoppers
Carbaryl 4 F		2.5 qt		
Sevin XLR		2.5 qt		



Florida Department of Agriculture and Consumer Services
CHARLES H. BRONSON, Commissioner
The Capitol • Tallahassee, FL 32399-0800
www.doacs.state.fl.us

CHRP Compliance for 2009-2010

- **2007-2008 Citrus Health Response Program (CHRP) Compliance Agreements and Business Plans have been extended by the Florida Department of Agriculture and Consumer Services, Division of Plant Industry through the 2009–2010 citrus harvesting season**
 - o The following DACS 2007-2008 compliance agreements shall remain in effect until further notice from the Department: Grower / Caretaker Compliance Agreement; Harvester / Handler Compliance Agreement; Processor Compliance Agreement
- **FDACS has initiated a comprehensive plan for the removal and destruction of abandoned citrus groves**
 - o For additional information:
http://www.doacs.state.fl.us/pi/chrp/images/CHRP_abandoned_grove_update.pdf
- **Grower self-survey and disease management are critical for success**
 - o Report findings of grower self-surveys to your local CHRP office
 - o Choose to actively manage citrus greening and canker diseases
 - o Decontaminate to prevent the spread of canker to disease-free groves
- **Harvesting Permits still required for European Union (EU) exports**
 - o The *Application for Participation* is required for growers planning to ship to the EU in 2009-2010 harvesting season:
http://www.doacs.state.fl.us/pi/chrp/images/survey_offer.pdf
- **Grower Compliance Agreement Number (C/A Number) is required on all field trip tickets**
- **All stakeholders are urged to remain engaged in the CHRP**
 - o Stay in touch with DPI and UF-IFAS through newsletters and websites
 - o Report changes in ownership or management of citrus groves
 - o Call your local CHRP Office if you have any questions (See attached list)
- **FDACS/ DPI will continue to provide services to the extent resources permit**
- **We can be reached at the Division of Plant Industry/Pest Eradication and Control/CHRP**
 - o Tel: 863-298-7777 / Fax: 863-291-5219/ Web: <http://www.doacs.state.fl.us/pi/chrp>



Florida Agriculture and Forest Products
Over \$100 Billion for Florida's Economy

INFORMATION RESOURCES

CITRUS HEALTH RESPONSE PROGRAM - COMPLIANCE AGREEMENT ATTACHMENT - SCHEDULE 10
Current information regarding the Citrus Health Response Program (CHRP) may be found at the following local field offices or the FDACS and USDA CHRP Web sites listed below:

Main Regulatory Office

3027 Lake Alfred Road
Winter Haven, FL 33881-5219
TEL: 863-298-7777
FAX: 863-291-5219

Brevard (south of SR 520), St.
Lucie, Indian River, Martin and
Okeechobee

8075 – 20th Street
Vero Beach, FL 32966
TEL: 772-778-5069
FAX: 772-778-5048

Collier, Hendry, Lee, Charlotte,
Broward, Miami-Dade, Monroe,
Sarasota, Palm Beach, Broward
and Glades

424 E Market Road, Unit 10
Immokalee, FL 34142
TEL: 239-658-3684
FAX: 239-658-3692

Highlands, Hardee and De Soto

3397 US Hwy 27 South
Avon Park, FL 33825
TEL: 863-314-5900
FAX: 863-314-5911

Alachua, Brevard, (north of SR
520), Citrus, Flagler, Hernando,
Lake, Marion, Orange, Pasco,
Putnam, Seminole, Sumter,
Volusia and All northern counties)

4129 Country Road 561
Tavares, FL 32778
TEL: 352-253-4547
FAX: 352-253-4549

Polk, Osceola, Pinellas, Manatee
and Hillsborough

3027 Lake Alfred Road
Winter Haven, FL 33881-5219
TEL: 863-298-7777
FAX: 863-291-5219

University of Florida-IFAS, Citrus Research &
Educational Center, Lake Alfred: 863-956-1151

Citrus Health Response Program Help Line:
800-282-5153

USDA-APHIS-PPQ: 301-734-8645

Div. Fruit & Vegetables: 863-291-5820

CHRP Office Locator Web site:
www.doacs.state.fl.us/pi/pec/pec-dist-map.html

FDACS DPI CHRP Web site:
<http://www.doacs.state.fl.us/pi/chrp>

USDA APHIS CHRP Web site:
<http://www.aphis.usda.gov/ppq/pdmp/index.html>

Florida Department of Citrus:
<http://www.floridajuce.com/growers.php>

UF-IFAS Office Locator:
<http://solutionsforyourlife.ufl.edu/map/index.html>

Abbreviations:

CHRP: Citrus Health Response Program

C/A: Compliance Agreement

DPI: Division of Plant Industry

FDACS: Florida Department of Agriculture & Consumer Services

PE&C: Bureau of Pest Eradication & Control

UF-IFAS: University of Florida Institute of Food & Agricultural Sciences

Information for the Certified Pile Burners Course:

The Florida Division of Forestry and University of Florida Cooperative Extension Service will be conducting a Certified Pile Burners Course on Wednesday **7 April 2010**. This course will show you how to burn piles **legally, safely and efficiently**. Most importantly, it could save a life. If you burn piles regularly, don't put off registering for this training. When the weather is dry, certified pile burners will receive priority for authorization to burn. Also, certified pile burners are allowed to burn up to two hours longer per day and get multiple day authorizations. Don't wait. The number of trainings offered and attendance at each training is LIMITED. This training will be held from 8:30 am till 4:30 pm at the South West Florida Research and Education Center located in Immokalee, Florida. Included are a registration form and program agenda. See <http://www.imok.ufl.edu/map.htm> for directions to facility.

Registration is required to attend and class size is limited. To attend please send the following information (see form on next page):

1. Your full name (as wanted on your pile burning certificate).
2. Your mailing address (where you want the certificate mailed).
3. Your Division of Forestry Customer Number (It is the number that you are required to give the DOF when you call in for your burn permits. If you do not know it please call the local DOF office and ask them for it).
4. Your email address (if you have one) and/or contact phone number.
5. A check for **\$50.00** made out to **Hendry County 4-H**.

The first fifty individuals to provide these five requirements will be registered; there will be a 7-day non refundable fee limit. If you do not make the training and did not contact our office at least one week before the class, you will not receive a refund. There will be a test at the end of the session. You must receive a grade of 70% or higher on the exam and demonstrate a proper pile burn with your local DOF office to become certified. Once you are certified it will be noted with your customer number, thus it is important for us to have the proper number. If you do not have a customer number the DOF office will set one up for you. Fill out the registration form on the next page and return as directed.

Sincerely,

Dr. Mongi Zekri
Multi County Citrus Agent
Phone: 863 674 4092
Fax: 863 674 4636
maz@ifas.ufl.edu

Registration Form
Florida's Certified Pile Burner Program
April 7th, 2010
c/o Dr. Mongi Zekri
UF-IFAS Hendry County Extension Office
P.O. Box 68
LaBelle, FL 33975-0068

Please send this form and a check for \$50.00, payable to Hendry County 4-H to:

Dr. Mongi Zekri
University of Florida, IFAS
Hendry County Extension Office
P.O. Box 68
LaBelle, FL 33975-0068

Name

Mailing address

Email address

Phone Number

DOF Customer Number



Citrus Mechanical Harvesting Field Day and Workshop: Overcoming Obstacles and Making the Transition

Wednesday, April 21, 2010

University of Florida, Southwest FL Research and Education Center
2685 State Road 29 North
Immokalee, FL 34142

Agenda

- 7:30** Registration, coffee and refreshments
- 8:00** Welcome and program outline – Dr. John Duncelman (UF/IFAS) and Dr. Fritz Roka, (UF/IFAS)
- 8:10** Update on UF/IFAS MH/Abscission Research & Education Program – Dr. Jackie Burns, (UF/IFAS)
- 8:30** Field trip to grove site to observe Oxbo canopy shaker and other harvesting equipment (*RSVP for field trip must be made by April 14th*)
- Equipment Solutions to Debris** – TBA (Dr. Reza Ehsani)
- Debris Removal Demonstration** – Tom Visser (Circle V Harvesting Co.)
- 10:00** Return to SWFREC-Immokalee for presentations
- 10:45** Workshop Presentations
- Transition Experiences: Hand to Mechanical Harvesting**
Michigan Cherries – George McManus (Grower, MI State Ext. Retired)
Florida Sugar - TBA
- Abscission (CMNP) Trials** – Dr. Bob Ebel (UF/IFAS)
- Abscission (CMNP) Registration** – Taw Richardson (AgroSource, Inc.)
- Costs of Harvesting Debris** – Dr. Fritz Roka (UF/IFAS)
- 12:00** Lunch /Evaluation (Sponsored)



Lunch and Refreshment Sponsors



RSVP for workshop and/or field trip: Barbara Hyman at hymanb@ufl.edu or call (239) 658-3400

KILL ANTS. SAVE CASH!



Fire Ants are here and just in time for the spring season – you can receive a rebate on purchases of **Extinguish®** and/or **Extinguish® Plus**. This program is valid from **January 1, 2010 – May 31, 2010** offering you a **\$0.50 per pound** rebate.

Extinguish® is for your bearing groves. **Extinguish® Professional Fire Ant Bait** disrupts the normal growth and development of the fire ant colonies. When foraging worker ants take **Extinguish®** to the queens, their ability to reproduce stops. When existing worker ants begin to die naturally, there are no new workers to replace them. Thus, the colony collapses.

Use rate: 1–1.5 pounds per acre

Restricted Use Areas: None! **Extinguish®** can be applied wherever ants are found!

Extinguish® Plus is for your non-bearing groves. **Extinguish® Plus Fire Ant Bait** is a dual acting bait where it slowly kills the workers while sterilizing the queens. The two-way action of **Extinguish® Plus** assures complete control of fire ants.

Use rate: 1.5 pounds per acre

Restricted Use Areas: Bearing groves. Approved for non-bearing groves, pastures, turf, home, and more.



KILL FIRE ANTS & SAVE CASH REBATE FORM

Name: _____

Company: _____

Address: _____

City: _____ State: _____ ZIP: _____

Phone: (____) _____ Fax: (____) _____ E-mail: _____

Distributor Name: _____

Number of Acres Applied with **Extinguish®** _____ &/or **Extinguish® Plus** _____

Rebate Calculator: _____ Lbs. (minimum 100 lbs.) X \$0.50 = _____ Grower Rebate

Mail completed form along with a copy of your invoice(s) to:
Extinguish® / Extinguish® Plus Rebate Offer
 Central Life Sciences
 Attn: Mark Taylor
 1501 East Woodfield Rd., Suite 200 West
 Schaumburg, IL 60173
 30050XXXX

All rebate requests must be postmarked by June 30, 2010
 Allow 6 – 8 weeks for processing
 No resellers are eligible
 Open to Florida citrus growers only

Extinguish is a registered trademark of Wellmark International.

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