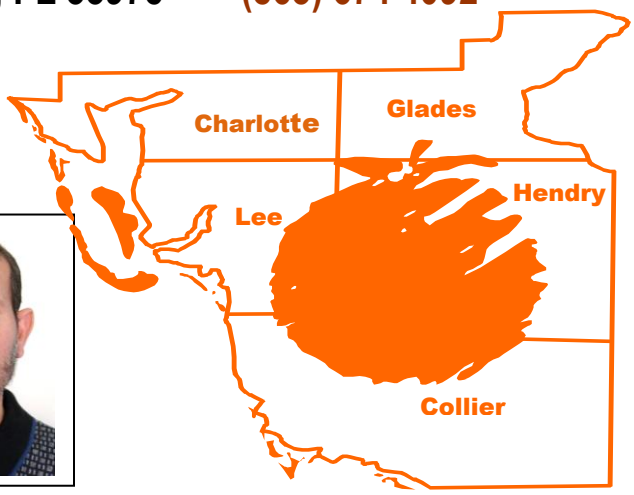
UF UNIVERSITY of FLORIDA
IFAS Extension

EXTENSION

Institute of Food and Agricultural Sciences

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

Flatwoods Citrus



Vol. 11, No. 3 **March 2008**

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

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

FLORIDA CITRUS NUTRITION SEMINAR

Speakers: Drs. Kelly Morgan, Tom Obreza, and Mongi Zekri
Date: Tuesday, March 11, 2008, 10:30 AM – 12:00 Noon
Location: Immokalee IFAS Center
Program Sponsor: Robert Murray, Wedgworth's, Inc.
Hard copies of the newly updated Florida citrus nutrition book will be handed out for free to attendees.
2 CEUs for Certified Crop Advisors
Thanks to Robert Murray! Lunch is free, but **RSVP is required** for planning purposes. To RSVP, call 863 674 4092 or send an e-mail to maz@ifas.ufl.edu

CITRUS GREENING SUMMIT

Date: Tuesday, April 8, 2008, 8:30 AM - 4:30 PM
Location: South Florida Community College, University Center, Avon Park
CEUs for Pesticide License Renewal, CEUs for Certified Crop Advisors
Attendance & lunch are free, but **pre-registration is required**.
Registration is limited to the first 200 participants.

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

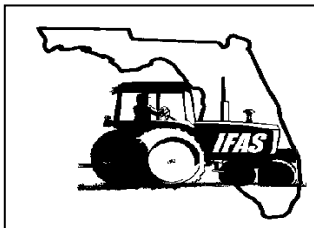
PESTICIDE LICENSE TRAINING/TESTING

CORE, PRIVATE APPLICATOR, Ag TREE CROP, Ag ROW CROP, AQUATIC

Monday, 31 March & Tuesday, 1 April 2008
Location: University of Florida, IFAS, Hendry County Extension Office, LaBelle
For more information and/or registration, call 863 674 4092

MECHANICAL HARVESTING SEMINAR

Date: Tuesday, April 22, 2008, 8:00 AM - 12:00 Noon
Location: Immokalee IFAS Center
Lunch is free, but **RSVP is required** for planning purposes. To RSVP, call Barbara Hyman at (239) 658-3461 or send an e-mail to brh@ifas.ufl.edu



FARM SAFETY DAY

Saturday, June 7, 2008, Immokalee IFAS Center
Coordinator: Mongi Zekri

The HLB Lab at the UF/IFAS Southwest Florida Research and Education Center in Immokalee is accepting suspect-HLB citrus samples for testing.

For instructions on how to collect and submit citrus samples, please review the HLB Sample Submission Form and the sampling and submission procedures that were attached in the February 2008 issue of the Flatwoods Citrus newsletter. Additional information is also posted at: http://swfrec.ifas.ufl.edu/hlb/. Phone: 239-658-3400.

Special Thanks to all the sponsors of the Flatwoods Citrus newsletter for their generous contribution and support. If you would like to be among them, please contact me at 863 674 4092.

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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 though 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

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 ¼ 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 2008 Florida Citrus Pest Management Guide online at:

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

Hard copies of the 2008 Florida Citrus Pest Management Guide are also available (Order form is enclosed here).

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.

LIVING WITH CITRUS CANKER

http://edis.ifas.ufl.edu/CG040

From the 2008 Florida Citrus Pest Management Guide

Biology. The bacterium reproduces in lesions on leaves, stems, and fruit. When there is free moisture on the lesions, the bacteria ooze out and can spread to new growth and other trees. Wind-driven rain is the main dispersal agent, and wind speeds >18 mph aid in the penetration of bacteria through the stomatal pores or wounds made by thorns, insects, and blowing sand. Leaves, stems, and fruit become resistant to infection as they mature. Almost all infections occur on leaves and stems within the first 6 weeks after initiation of growth.

Endemic Canker. Where canker is already endemic, the primary means of control are:
1) planting of windbreaks,
2) protection of fruit and leaves with copper sprays, and
3) control of leafminer.

Windbreaks. Windbreaks are highly effective in reducing the spread of canker, but more importantly, they reduce the severity of the infection in endemic situations. When canker lesions are wetted, millions of bacteria ooze onto the leaf surface. While bacteria can swim very short distances, they have no active means to penetrate the fruit, leaves, or twigs. The vast majority of the infection occurs by wind-blown rains. Winds of 18 to 20 mph are needed to actually force bacteria into the stomates on leaves and fruit.

Windbreaks are the single most effective means of dealing with canker. In our observations in Argentina, the number of canker lesions was ten times greater on the side of the tree exposed to the prevailing winds than on the protected side of the same tree. In tests in nursery situations, artificial windbreaks greatly diminished the distance of spread of canker down the nursery row and reduced disease to only a few scattered lesions.

Windbreaks reduce wind speed for a distance ten times the height of the windbreak. That is, a 30-ft tall windbreak will exert an effect for about 300 ft. To be effective for canker control, windbreaks do not need to be dense. All that is required is to reduce wind speed to less than 20 mph. The need for and the distance between windbreak rows will depend on the destination of the fruit, fresh or processed, and the susceptibility of the variety. With grapefruit for the fresh market in Florida, it is likely that each 5- to 10-acre block will need to be surrounded by a windbreak. In many groves of less susceptible varieties, a windbreak down the row about every 300

ft may be sufficient. In some situations where some protection exists and tolerant varieties are grown for processing, additional windbreaks may be unnecessary. Additionally, not topping outside rows of citrus will also serve as a viable, harvestable windbreak. Currently, the recommendation is that growers plant windbreaks along fence lines, ditches, around wetlands, or wherever they can plant without removing citrus trees. If it becomes obvious that more windbreak protection is needed, rows of citrus or end trees can be removed to accommodate more windbreaks.

For more information on selection of plant species and design, see the CREC website (**www.crec.ifas.ufl.edu**).

Copper sprays. Over the last 30 years, IFAS has evaluated dozens of products for canker control in several projects in Argentina and Brazil. Products such as antibiotics, compounds that induce resistance in plants, and disinfectants provide limited canker control, but no material has proven more effective than copper products.

Copper products are quite effective in preventing infection of fruit, but much less effective for reducing leaf infection. Also, copper has limited value in reducing spread of the disease. Application of copper to young leaves protects against infection, but protection is soon lost due to rapid expansion of the surface area. Fruit grows more slowly and is easier to protect. Orange fruit is susceptible to infection after the stomates open when the fruit is about 3/4 inch in diameter until they develop resistance in mid to late July. Grapefruit is susceptible from the 3/4-inch size to full expansion in late September to mid October. Infection through wounds can occur at any stage of fruit growth. Programs needed for effective control of canker in Florida have not been fully determined. However, we believe that most of the infection of oranges will occur from May to July. With endemic canker, three copper sprays are recommended for early oranges grown for processing applied at 21-day intervals: one in mid-May (fruit at 3/4-inch stage), a second in early to mid-June, and the final one in early July or when fruit reaches about 1-1/2 inch diameter. Two applications at a 21-day interval should be sufficient for Valencias and midseason varieties, in mid-May (fruit at 3/4-inch stage), and in early June. Varieties of early oranges grown for higher color score (Early Gold, Westin, Ruby, Itaborai) are more susceptible than Hamlin and may require additional sprays beyond July.

Programs for fresh fruit are more complex, but many copper sprays are already used on these varieties. For fresh market grapefruit, a low rate of copper should be added to the spray of spring flush for scab. Subsequently, the copper spray program used for melanose control should also control canker, but additional applications will be required every 21 days when the fruit reach 3/4-inch size until fruit are fully grown in October. Copper may need to be added to applications of fungicides or petroleum oil.

Most tangerines are fairly tolerant to canker. Programs used for control of Alternaria should also protect against canker, but copper will have to be used in each spray. Navel oranges are more susceptible to canker and will probably need to be sprayed every 21 days from late April to mid-July. Fallglo is more tolerant and probably three sprays in May, June, and July should suffice. Newly planted trees in canker exposed settings are more susceptible because they produce leaf flushes more often and the flush tissue represents a high proportion of the canopy

volume. The recommendation for the more susceptible varieties (grapefruit and early oranges) is that the trees be sprayed every 3 to 4 weeks to coincide with vegetative flush cycles from spring though the fall.

Spray programs for young and fruiting trees will have to be adjusted as more experience is gained. The rates of copper products depend on the length of protection expected and the weather. As little as 0.5 to 1.0 lb of metallic copper will protect spring flush growth or fruit during the dry spring season. However, in the rainy season, more than 1 lb of metallic copper may be required to protect fruit for 3-week periods.

To the extent possible, copper usage should be minimized since this metal accumulates in soil and may cause phytotoxicity to the fruit peel, or create environmental concerns.

Leafminer control. Leafminers do not spread canker, but extensive invasion of leafminer tunnels by the bacterium greatly increases inoculum levels making the disease difficult to control. Leafminers are not usually a problem on the spring flush and no control is needed at that time. Leafminer control on the first summer flush can reduce disease pressure considerably. If properly timed, applications of petroleum oil, Agri-mek, Micromite, Spintor, or Assail will reduce damage by leafminer. Late summer flushes tend to be erratic and effective control at that time will probably be difficult. (See the 2008 Florida Citrus Pest Management Guide: Asian Citrus Psyllid and Citrus Leafminer at: **http://edis.ifas.ufl.edu/IN686**.)

Recommended Chemical Controls for Citrus Canker

READ THE LABEL.

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 125 gallons of water. Calibrate and arrange nozzles to deliver thorough distribution and treat as many acres as this volume of spray allows.

Pesticide	**FRAC MOA[1]**	**Mature Trees Rate/Acre[2]**
copper fungicide	M9	Use label rate.

[1]Mode of action class for citrus pesticides from the Fungicide Resistance Action Committee (FRAC) 2003. Refer to ENY624, Pesticide Resistance and Resistance Management, in the 2008 Florida Citrus Pest Management Guide for more details.

[2]Lower rates can be used on smaller trees. Do not use less than the minimum label rate.

Hard copies of the 2008 Florida Citrus Pest Management Guide, SP 43, are available for $15.00 plus taxes plus shipping and handling. See attached sheet to order or visit with your Citrus Extension Agent.

CEU Requirements for pesticide licenses

Licensees who renew their licenses with CEUs must earn 4 Core CEUs plus the number of category CEUs as shown in the table below. Only 4 Core CEUs are required per license - not 4 Core CEUs per category. All category CEUs must be approved for the specific category. No substitutions of core/category CEUs are allowed.

CEU Requirements	
Core (required of all licensees)	4
Aerial Application - Agricultural	16
Agricultural Animal Pest Control	4
Agricultural Row Crop Pest Control	8
Agricultural Tree Crop Pest Control	8
Antifouling Paint	4
Aquatic Pest Control	16
Forest Pest Control	8
Chlorine Gas Infusion	4
Demonstration and Research	4
Natural Areas Weed Management	16
Ornamental and Turf Pest Control	12
Private Applicator Agricultural Pest Control	4
Raw Agricultural Commodity Fumigation	4
Regulatory Inspection and Sampling	4
Regulatory Pest Control	12
Right-of-Way Pest Control	8
Seed Treatment	4
Sewer Root Control	4
Soil and Greenhouse Fumigation	4
Wood Treatment	4

Prioritizing Citrus Nutrient Management Decisions

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

By ***Tom Obreza,*** UF-IFAS

Introduction

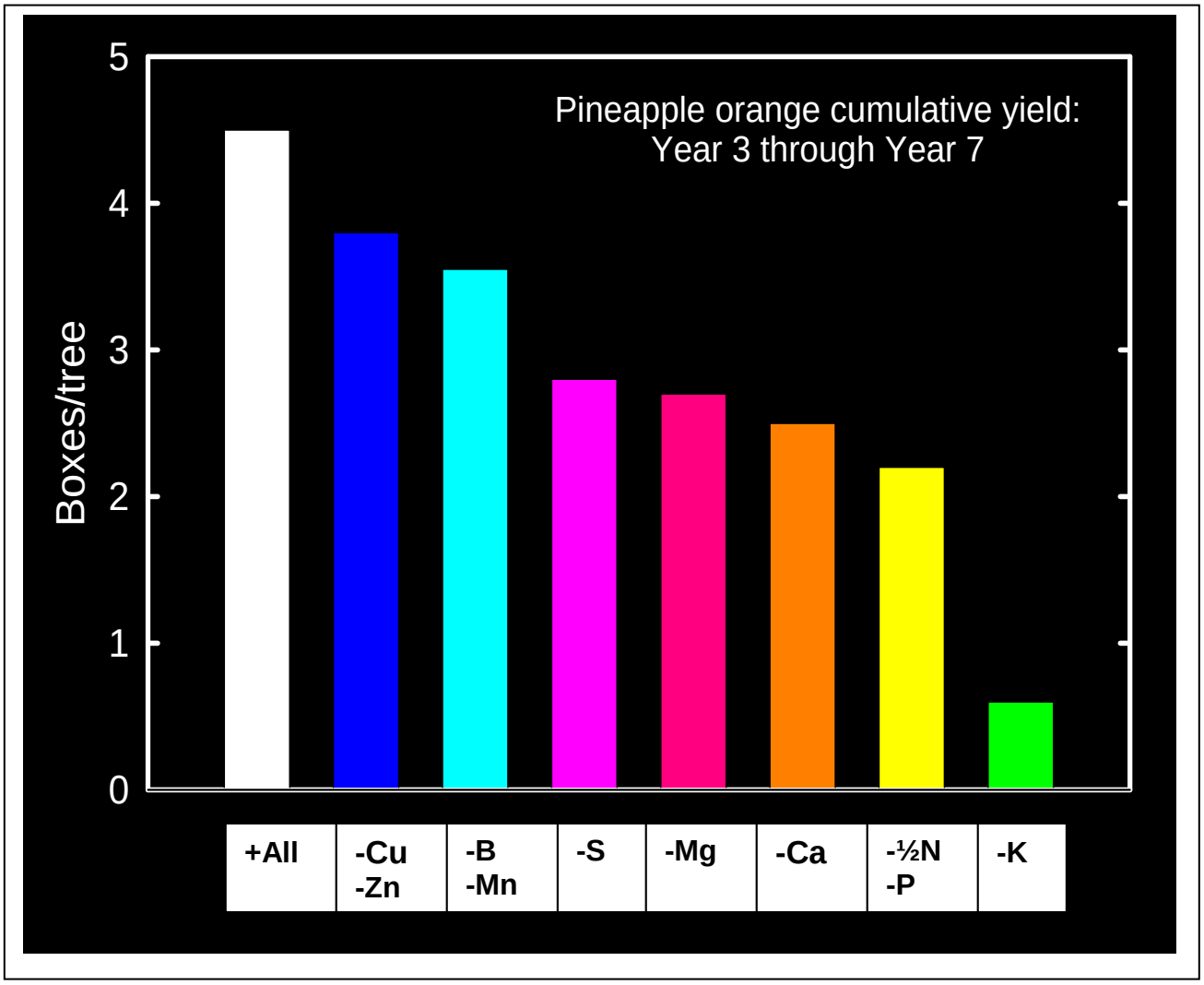
Citrus nutrient management can be divided into four components: Monitoring, program development, application, and evaluation. **Monitoring** can be qualitative (visual observations of tree performance), or quantitative (laboratory analysis of soil and/or leaf tissue samples). In **program development**, 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.



<u>Figure 1.</u> 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 should keep in their mind 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, From the 2008 Florida Citrus Pest Management Guide

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.

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 & Consumer Services
Division of Plant Industry

Citrus Health Response Program (CHRP) Updates
February 2008

The Citrus Health Response Program addresses multiple citrus pests and diseases including citrus canker and citrus greening that continue to challenge Florida's citrus industry. In November 2007, the USDA published the final rule on movement of citrus fruit from Florida. And, in January 2008, the USDA expanded the citrus greening quarantine zone to include the entire state of Florida. Below, is a summary of current regulations related to the citrus industry.

Citrus Growers

• Growers must register by signing compliance agreements. New agreements have been mailed to previously registered growers, and are available by contacting Statewide CHRP offices. Components of the compliance agreements include:

 Submission of a business plan is now required when submitting a compliance agreement. The business plan must describe each grower's plans for decontamination practices, self-survey, and pest management strategies for controlling citrus canker, citrus greening, and the Asian citrus psyllid.

 Decontamination requirements – decontamination is only required when departing a grove. However, growers may require people to decontaminate prior to entering as an added precaution.

• Pre-harvest inspections are no longer required except for fruit destined to European Union (EU) markets.

• Growers who intend to harvest fresh fruit for export to EU markets:

 Submit a fresh fruit *Application for Participation* (DACS #08415) identifying the blocks to be harvested, so that a fresh fruit inspection can be performed within the time frame set out by the receiving country's entry requirements.

 If the inspection finds no canker, grower will be issued a *Citrus Fruit Harvesting Permit* (DACS #08123).

 Harvesting permits for the EU expire on July 1st each year.

Citrus Harvesters

• Harvesters must register by signing and submitting a new compliance agreement and business plan. Packets of the new harvester/ handler forms are available on the web at: **http://www.doacs.state.fl.us/pi/chrp/citrus_harvesters.html**, or you may contact our statewide CHRP field offices **www.doacs.state.fl.us/pi**, or call the helpline at 800-282-5153.

Citrus Processors

• Citrus processors must also register by signing a new compliance agreement. A business plan is required from each processor indicating plans for decontamination of field personnel and equipment entering groves.

Trailers that do not come into contact with citrus trees do not have to be decontaminated, but must be free of citrus debris upon unloading at processing facility.

Citrus Packers

• Citrus packers must sign compliance agreements with USDA that contain fruit sampling, inspection, decontamination and packing requirements. USDA CHRP offices can be found at can be found on the DOACS website at:

http://www.doacs.state.fl.us/pi/chrp/schedules/PPQltdP.pdf

Citrus Health Response Program Updates (continued)

Fresh Fruit Movement

• ***Citrus-Producing States*** **-** Fresh fruit movement to citrus-producing states is prohibited.
• ***Non-Citrus Producing States*** **-** USDA will inspect fresh fruit in packing houses and issue limited permits.
• ***Fresh Fruit Exported to other Countries*** **-** Fruit destined for other countries must meet the receiving country's entry requirements. Europe will accept citrus from Florida if an inspection of the grove block and immediate vicinity are free of citrus canker. Asian countries do not classify citrus canker as a quarantine pest, but the fruit must be free of citrus canker to meet basic phytosanitary requirements. Contact the Department for specific details.
• ***Fruit for Processing or Sale Within Florida*** – There are no restrictions.

Citrus Nursery Stock Producers

• As of January 1, 2007 all new citrus propagations must be conducted on sites and within protective structures that have been approved by the Department.
• As of December 31, 2007, existing citrus nursery stock that was produced before January 1, 2007, but not produced within an approved structure, is no longer eligible for sale or movement in accordance with the new rules.
• All citrus nursery propagators must follow decontamination requirements and be inspected by the Department every 30 days.
• Specific requirements are contained within Rule Chapter 5B-62, Florida Administrative Code.
• In accordance with the Federal Domestic Quarantine on Citrus Greening and Asian Citrus Psyllid dated 1/11/08, the following articles are prohibited from being moved interstate from areas quarantined due to citrus greening: all plants and plant parts, including but not limited to nursery stock, cuttings, budwood, and seed (but excluding fruit), of Citrus spp., Fortunella spp., Murraya spp., etc.

Nursery Environs Survey

• Under the newly approved guidelines, growing citrus within one mile of a commercial citrus nursery is prohibited, unless the nursery location was grandfathered in by the Department.
• Properties (residential and commercial) within one mile of commercial citrus nurseries will be surveyed annually for citrus pests and diseases. Control measures for any detected pests or diseases will be handled on a case by case basis.

Please direct follow up questions to Mark Estes or Tomas Gonzalez at 863-298-7777, or contact our Division of Plant Industry toll-free helpline 800-282-5153.

Visit www.doacs.state.fl.us/pi for more information.

Flatwoods Citrus

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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