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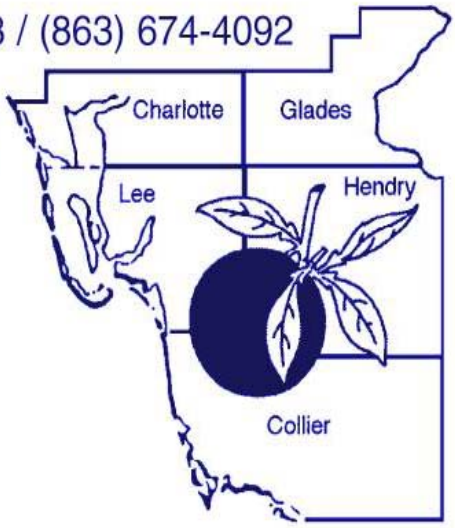
Flatwoods Citrus



Vol. 9, No. 7 **July 2006**

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

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

CITRUS EXPO
IN FORT MYERS

Wednesday, August 23 &
Thursday, August 24, 2006

FRESH CITRUS FRUITS, Second Edition

Edited by Wilfred F. Wardowski, William M. Miller, David J. Hall and William Grierson
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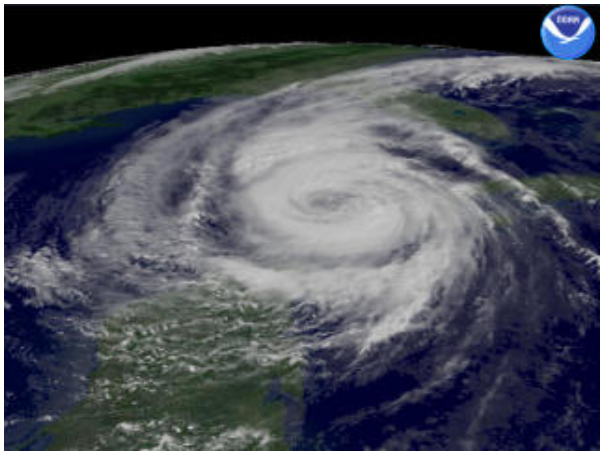
See pages 17 & 18 for details.

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

PREPARING FOR A HURRICANE

Richard Buker, Citrus Research and Education Center, UF/IFAS



Hurricane season is upon us once again. While hurricanes may develop any time during the June to November hurricane season, they are most likely to occur between August and October. In order to best protect yourself and your groves or nursery, it is essential to develop a hurricane plan and prepare in advance.

Although there is not much that can be done to prevent damage to trees and fruit from the wind, rain has the potential to cause the most severe and longest lasting damage to citrus. There are precautions that can be taken to help minimize damage and protect your grove or nursery.

Be "Water Wise"

- Clean and pump down ditches and grade areas to help maximize drainage and water removal efforts after the storm.
- Irrigate trees and remove water from reservoirs. Dismantle irrigation risers.
- Provide for portable water storage.
- Fill additional fuel tanks, sprayers and portable containers with water.
- Turn off water, natural and propane gas and electricity.

Non-Water Preparations

- Make sure all emergency equipment is on hand and in good, working condition. This includes generators, chain saws, torches and air compressors.
- Ensure radios are in working order. Have hand-held portable radios with extra batteries, or direct truck-to-truck radio communication available in case of downed phone lines.
- Secure all hazardous materials.
- Fill fuel, fertilizer and other liquid material tanks so they won't move in the wind and rain, and to ensure sufficient fuel is available for the recovery process.
- Establish personnel assignments. Make a list of all tasks that will need to be performed and whose responsibility they will be following the storm so there are no last-minute surprises. Keep an updated list of contact information for workers at their place of safety so that you can communicate with them following the storm.
- Keep a list of emergency contact information for agencies that you may need assistance from during or after the storm.

Emergency Contact Phone Numbers and Websites

Florida Emergency Information Line - 800-342-3557
FEMA Disaster Assistance - 800-621-3362
FDACS - 800-435-7352
National Hurricane Center - www.nhc.noaa.gov
National Weather Service - www.nws.noaa.gov/oh/index.html
Florida Hurricane Reports - http://iwin.nws.noaa.gov/iwin/fl/hurricane.html

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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LEAF AND SOIL SAMPLING AND ANALYSES TO ADJUST FERTILIZER PROGRAMS

Optimum growth and yield of high quality fruit cannot be obtained without adequate nutrition. The most successful fertilizer program should be based on tissue analysis, knowledge of soil nutrient status through soil analysis combined with university recommendations. The deficiency or excess of an element will cause disturbance in plant metabolism and lead to poor performance.

Plant analysis

Used in conjunction with other data and observations, tissue analysis aids in evaluating the nutrient elements of the soil-plant system. It has proven useful in confirming nutritional deficiencies, toxicities or imbalances, identifying "hidden" toxicities and deficiencies where visible symptoms are not manifested, and evaluating the effectiveness of fertilizer programs.

Leaf Sampling

For reliable results and useful interpretation of lab analysis reports, citrus growers, production managers, and consultants must follow the proper procedures for leaf sampling and sample handling because improperly collected leaf samples will provide misleading information about the nutritional status of the trees and the fertilizer programs.

Considerable care is needed in taking samples. Chemical analysis values can only be useful if the samples obtained are representative of the blocks they were taken from. The proper sampling, preparation and handling would affect the reliability of the chemical analysis, data interpretation, nutritional recommendations, and adjustment of fertilizer programs.

Leaf samples must also be taken at the proper time because nutrient levels within leaves are continually changing. However, leaf mineral concentrations of most nutrients are relatively stable within 4 to 6 months after emergence of the spring flush. Therefore, for mature tree blocks, the best time would be in July and August to collect four- to six-month-old spring flush leaves. If taken later in the season, the summer flush would probably be confused with the spring flush.

Each leaf sample should consist of about 100 leaves taken from non-fruiting twigs of 15- 20 uniform trees of the same variety and rootstock, and under the same fertilizer program. Clean brown paper bag should be used. Information sheets from the testing lab should be completed for each sample as this information helps when interpreting the results. The sample bag and the corresponding information sheet should each be carefully labeled with the same identity so that samples and sheets can be matched in the laboratory.

Sampling techniques for leaves

♦ Immature leaves should be avoided because of their rapidly changing composition.

♦ Abnormal-appearing trees, trees at the edge of the block and trees at the end of rows should not be sampled because they may be coated with soil particles and dust or have other problems.

♦ Do not include diseased, insect damaged, or dead leaves in a sample. Use good judgment.

♦ Select only one leaf from a shoot and remove it with its petiole (leaf stem).

Diagnosing growth disorders

♦ Collect samples from both affected trees as well as normal trees.

♦ Trees selected for sampling should be at similar stage of development and age.

♦ Whenever possible, confine the sampling area to trees in close proximity to each other.

Handling of leaf samples

♦ Samples should be collected in clean paper bags and clearly identified.

♦ They should be protected from heat and kept dry and cool (stored in portable ice chests), and placed in a refrigerator for overnight storage if they cannot be washed and oven dried the same day of collection.

♦ For macronutrient analysis, leaves usually do not need to be washed.

♦ Leaves should be dried in a ventilated oven at 60-70^{o}C.

Preparation for analysis

♦ Leaves that have been recently sprayed with micronutrients for fungicidal (Cu) or nutritional (Mn, Zn) purposes should not be analyzed for those micronutrients because it is unlikely to remove all surface contamination from sprayed leaves.

♦ For accurate Fe and B or other micronutrient determination, samples would require hand washing, which is best done when leaves are still in a fresh condition.

Soil analysis

Soil analysis is an important method for gaining basic information regarding the chemical status of the soil. Soil analysis is particularly useful when conducted over several years so that trends can be seen.

Unlike leaf analysis, there are various methods and analytical procedures of soil analysis used by laboratories. In Florida, soil tests for the relatively mobile and readily leached elements such as N and K are of no value. Soil tests are mainly important for pH, P, Mg, Ca, and Cu. For Florida sandy soils, using the Mehlich-1 or double acid (hydrochloric acid + sulfuric acid) extraction procedure adopted by the University of Florida analytical lab, 40-60 lbs/acre (20-30 ppm) of P, 70-120 lbs/acre (35-60 ppm) of Mg, 500-800 lbs/acre (250-400 ppm) of Ca, and 5-10 lbs/acre (2.5-5 ppm) of Cu are considered adequate for citrus. A Ca:Mg ratio of 7:1 seems desirable and ratios of higher than 10 may induce Mg deficiency problems. Copper levels higher than 50 lbs/acre may be toxic to citrus trees if the soil pH is below 6.

Soil sampling

The accuracy of a fertilizer recommendation depends or how well the soil sample on which the recommendation was based represents the area of the grove. In Florida, if soil samples were to be collected once a year, the best time would be at the end of the summer rainy season and prior to fall fertilization, usually during September and October. However, soil sampling may be conducted at the same time as leaf sampling to save time and reduce cost.

Standard procedures for proper sampling, preparation and analysis have to be followed for meaningful interpretations of the test results and accurate recommendations. Each soil sample should consist of 15-20 soil cores taken at the dripline of 15-20 trees within the area wetted by the irrigation system to a depth of 6 inches. The area sampled should be uniform in terms of soil and tree characteristics and correspond to the area from which the leaf sample was taken. Individual cores should be mixed thoroughly in a plastic bucket to form a composite sample. Subsample of appropriate size should be taken from the composite mixture and put into labeled paper bags supplied by the lab. Soil

samples should be air-dried but not oven-dried before shipping to the testing laboratory for analysis.

Conclusion

Tissue and soil analyses are a powerful tool for confirming nutrient deficiencies, toxicities and imbalances, identifying "hidden hunger," evaluating fertilizer programs, studying nutrient interactions. However, if initial plant and soil sampling, handling, and analysis of the sample were faulty, the results would be misleading.

If properly done, tissue and soil analyses can point the way toward more economical and efficient use of fertilizer materials, avoiding excessive or inadequate application rates.

Standard Table for Assessing Nutritional Status and Adjusting Fertilizer Programs for Citrus

Leaf analysis standard for assessing current nutrient status of citrus trees based on concentration of mineral elements in 4- to 6-month-old-spring-cycle leaves from non-fruiting terminals.

Element	Deficient less than	Low	Satisfactory	High	Excess more than
Nitrogen (N) (%)	2.2	2.2-2.4	2.5-2.8	2.9-3.2	3.3
Phosphorus (P) (%)	0.09	0.09-0.11	0.12-0.17	0.18-0.29	0.30
Potassium (K) (%)	0.7	0.7-1.1	1.2-1.7	1.8-2.3	2.4
Calcium (Ca) (%)	1.5	1.5-2.9	3.0-5.0	5.1-6.9	7.0
Magnesium (Mg) (%)	0.20	0.20-0.29	0.30-0.50	0.51-0.70	0.80
Sulfur (S) (%)	0.14	0.14-0.19	0.20-0.40	0.41-0.60	0.60
Chlorine (Cl) (%)	------	------	less than 0.5	0.5-0.7	0.7
Sodium (Na) (%)	------	------	less than 0.2	0.2-0.5	0.5
Iron (Fe) (ppm)	35	35-59	60-120	121-200	250
Boron (B) (ppm)	20	20-35	36-100	101-200	250
Manganese (Mn) (ppm)	18	18-24	25-100	101-300	500
Zinc (Zn) (ppm)	18	18-24	25-100	101-300	300
Copper (Cu) (ppm)	4	4-5	6-16	17-20	20
Molybdenum (Mo) (ppm)	0.06	0.06-0.09	0.1-1.0	2-50	50

DRAINAGE

In certain areas, several factors make drainage a necessity for agricultural production. These factors include slow soil permeability, flat or depressional topography, restrictive geologic layers underlying the soil profile, and periods of excess precipitation. Texture affects permeability or the ability of soils to drain water. Slowly permeable soils contain relatively high percentages of clay- and silt-sized particles, which hold water well but do not drain well. The permeability of the soil is also affected by soil structure. A granular soil structure promotes the movement of water through the soil while a massive structure with little or no granular components decreases the movement of water.

In the coastal Flatwoods areas of Florida during the rainy season, drainage of excess water is important since citrus root damage may occur under prolonged conditions of high water table.

Both surface and subsurface drainage are generally required for citrus grown in Flatwoods areas. Drainage systems in Flatwoods groves consist of systems of canals, retention/detention areas, open ditches, subsurface drains, beds, water furrows, swales, and pumps. These systems require continued good maintenance in order to minimize the chances of root damage from prolonged exposure to waterlogged soils following high precipitations.

Observation wells are good tools for observing soil-water dynamics. They are very reliable for evaluating water-saturated zones in sites subject to chronic flooding injury. These wells can also be used to measure the rate of water table drawdown, which is the key to how long roots can tolerate flooding. Observation wells constructed with float indicators allow water tables to be visually observed while driving by the well site.

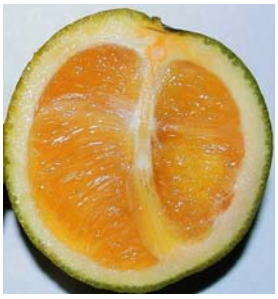
Benefits of Drainage

1. Better soil aeration results from good drainage. This permits deeper and more extensive root development and a more favorable environment for beneficial soil microorganisms.
2. An increased supply of nitrogen can be obtained from the soil where water tables are lowered by a drainage system. This can reduce nitrogen fertilizer application.
3. Certain toxic substances and disease organisms are removed from the soil due to better drainage and better aeration.
4. Soil erosion can be reduced on a well-drained soil by increasing its capacity to hold rainwater, resulting in less runoff.
5. High water tables in the summer due to poor drainage and high precipitations cause shallow root development and a smaller soil volume from which trees can obtain water and nutrients.
6. Increased crop yields and improved crop quality result from favorable soil water conditions with good drainage.

CITRUS GREENING

Citrus greening or Huanglongbing (yellow dragon disease) was first detected in Florida in late August 2005. It is caused by systemic phloem-inhabiting bacterium, *Candidatus* liberobacter. There are three forms of citrus greening. Each form has a similar host range but they differ in the temperature under which they express strongest symptoms. The African form, *Candidatus* L. africanus causes symptoms under cool conditions while the Asian form, *Candidatus* L. asiaticus causes symptoms under warm conditions. The third form (*Candidatus* Liberibacter americanus) was found in Brazil in March 2004. The bacterium infects all citrus species, cultivars and hybrids and some citrus relatives. Symptoms of Asian form are leaf chlorosis with a blotchy mottle.

Blotchy mottle



Lopsided fruit

Twig dieback occurs, and the affected trees decline to a non-productive state. Fruit is small, lopsided, with the basal end often remaining green, and the seeds are usually aborted. The fruit has a bitter, salty taste. Citrus greening is graft transmissible. The distribution of the bacterium within an infected tree can be irregular so not all buds contain the bacterium or transmit the disease. Citrus greening bacteria are transmitted by the citrus psyllid. The Asian citrus psyllids, *Diaphorina citri*, is adapted to warm humid climates and occurs in many areas including Florida. The bacterium is transmitted in a persistent manner with a latent period occurring after the psyllid acquires the bacterium. The bacterium multiplies in the psyllid. Because of the latent period, most psyllids capable of transmitting citrus greening are either late-stage nymphs or adults. The psyllids remain capable of transmitting the disease for the duration of their life once the bacterium has been acquired. Citrus species is the primary host for feeding of the psyllids. The psyllids prefer to feed on young flush tissue. Hosts, which are vigorous and always flushing, such as lemon and lime, are ideal hosts for the psyllid. The best control for citrus greening is exclusion. It may take awhile before citrus greening infections are noticed. Bacterium may be undetectable in tissues without symptoms and incubation time may be long. After infection, it may take more than 3 years for the visual symptoms to show up. In areas where citrus greening has been established, management to reduce losses includes propagation of citrus greening-free trees for planting, reduction of the psyllid populations, and by removing infected trees. The use of parasites to control the psyllids population has been successful in many areas.

Citrus greening is one of the most destructive diseases of citrus. Citrus greening can rapidly destroy productive citrus plantings. If trees are infected while young, they often have no fruit production.

Replanting with healthy plants, introducing parasites and spraying against psylla showed that citrus production is still feasible in areas with citrus greening.

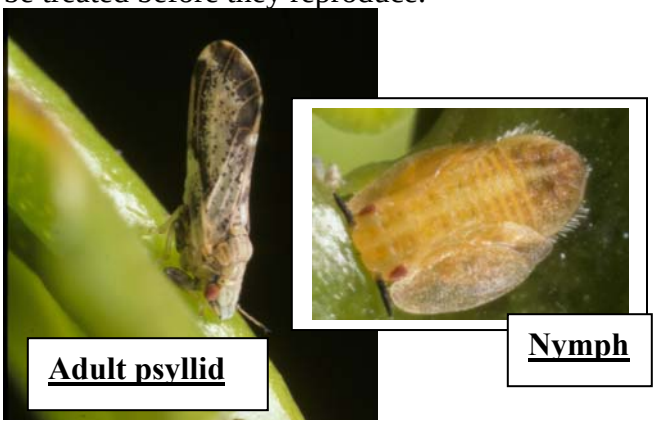
For more information,

http://flcitrus.ifas.ufl.edu/
http://spdn.ifas.ufl.edu/Citrus%20_Greening.htm
http://www.doacs.state.fl.us/pi/enpp/ento/citrusgreening.html
http://www.aphis.usda.gov/ppq/ep/citrus_greening/index.html

Report high suspects to the Greening hotline:
1 800 850 3781
1 800 282 5153

THE CITRUS PSYLLID

The Asian citrus psylla or psyllid, ***Diaphorina citri*** can be a serious pest of citrus. The citrus psyllid is similar to aphids and the citrus leafminer in requiring young leaves for reproduction. However, unlike aphids and the citrus leafminer, adult psyllids can survive on hardened leaves and move to new flush as it becomes available. Young trees should be monitored early in flush cycles to detect aggregations of adults on expanding terminals. High populations of adults should be treated before they reproduce.



Immature psyllid feeding on growing citrus terminals cause permanent damage to young leaves and shoots. They cause leaf distortion and curling of tender growth (flush).

Badly-damaged leaves will die and fall off. Control of the citrus psyllid should be taken seriously. The citrus psyllid breeds exclusively on young flush and has a very high reproductive rate. Multiple, overlapping generations can lead to very high populations. Eggs are laid in the late winter and spring on young leaves in the buds or in leaf axils. The egg stalk is forced into the leaf tissue by the ovipositor of the female. Each female may lay up to 800 eggs during her two-month lifespan. The life cycle takes about 20 days and there may be up to 30 overlapping generations per year. Adults are about the size of aphids (2.5 mm).

The citrus psyllid is an efficient vector of greening disease, which is considered the most serious citrus disease. Infected trees or branches with the greening disease will suffer heavy leaf drop, out-of-season flushing and flowering, reduced yield, and dieback. Fruit on infected trees will be small in size and low in juice quality. Many fruit will fall prematurely, while those that remain on the tree will not color properly, but will remain green on the shaded side, hence the name of the disease “greening”. Root systems including feeder roots will poorly develop. The psyllid also attacks landscape plants (jasmine orange, *Murraya paniculata*). Generalist predators such as lacewings, syrphid flies, lady beetles, and spiders attack psyllids. These native natural enemies are not expected to suppress the pest populations to a non-economic level. Two parasitoids, *Diaphorencyrtus aligarhensis* and *Tamarixia radiata* of the pest have been imported in Florida and are being released in a classical biological control program. The use of oil is less disruptive and should be used. Petroleum oil at the concentration of 5% should provide adequate control.

Tests with petroleum oil sprays against citrus psylla indicated that oil was most toxic to first and second instar nymphs and provided good control if applied frequently. Insects do not develop resistance to oil, oil has a low toxicity to vertebrates, and oil breaks down readily in the environment.

For young citrus trees, use of systemic pesticides, such as imidacloprid (Admire), are very effective for suppressing psyllid populations. Foliar sprays can also be used for psyllid control. Some of the products that can be used are Lorsban, Danitol, Provado, and Malathion. Read the label and use the label rate.

For a complete list of pesticides, get to the 2006 Florida Citrus Pest Management Guide: Soft-Bodied Insects Attacking Foliage and Fruit at **http://edis.ifas.ufl.edu/CG004**

MUTUAL COMMENDS ANNOUNCEMENT OF CANKER COMPENSATION FOR GROWERS AND NURSERYMEN

On June 7, U.S. Secretary of Agriculture Mike Johanns reaffirmed his recognition of the importance of the Florida citrus industry to the state's economy by announcing the availability of $100 million to compensate Florida citrus growers and commercial citrus nursery growers for losses incurred as a result of the citrus canker eradication program. The announcement that funds will be immediately available to compensate citrus nursery growers will set the stage for a vital citrus nursery industry to begin to reestablish its ability to provide replacement trees to citrus growers. The nursery industry has lost more than 60 percent of its stock to the eradication program, severely hampering growers' ability to keep production at an economically viable level. These funds will also allow the industry to continue to recover from the acreage losses incurred during the attempt to eradicate citrus canker, and will be a business-saving event for some growers. The announcement will cover a significant portion of those remaining growers awaiting compensation for trees destroyed prior to the decision on January 10, 2006 to abandon the eradication program. "This announcement further illustrates Secretary Johanns' commitment to supporting the Florida citrus industry, our growers and nurserymen," said Jay Clark, Florida Citrus Mutual's interim executive vice president/CEO. "We are extremely grateful to have the Secretary and the Administration behind us as we continue to rebound from the effects of citrus canker and the eradication program."

USDA IMPOSES STATEWIDE QUARANTINE

The U.S. Department of Agriculture informed interested stakeholders on June 6 that a statewide quarantine would be imposed on the shipment of fresh Florida citrus fruit to other citrus-producing states next season. While this quarantine may prove devastating for some Florida citrus companies whose primary markets are other citrus-producing states, the Florida citrus industry recognizes the USDA and Secretary of Agriculture Mike Johanns' efforts to find a solution to the quarantine, which will allow the continued shipment of fresh fruit to non-citrus producing states and other countries under certain restrictions. Florida Citrus Mutual also recognizes Florida Commissioner of Agriculture and Consumer Services Charlie Bronson for his efforts on this issue and his commitment to finding methods to re-open these markets in future seasons. "Secretary Johanns has shown tremendous support for the Florida citrus industry during his tenure with the USDA," said Jay Clark, Florida Citrus Mutual interim executive vice president/CEO. "We are confident that the USDA will continue rule-making procedures to allow us to once again ship to all of our trade partners." The rules governing the quarantine are expected to be published by the end of this summer. Citrus-producing states currently represent approximately five percent of Florida's domestic fresh fruit market, and approximately 2.5 percent of the overall fresh fruit market.

MAGNESIUM NUTRITION

Magnesium (Mg) deficiency is a problem in Florida. Trees with inadequate Mg supply have no symptoms in the new spring flush, but leaf symptoms will develop as the leaves age and the fruit expand and mature in the summer and fall. 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 very 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. If both potassium (K) and Mg status are low, sulfate of potash-magnesia (SPM), which contains both K and Mg in the sulfate form is a very good option.

IMPROVING Mg and K NUTRITION UNDER HIGH SOIL pH

It is often difficult to increase Mg and K uptake with fertilizer applied to calcareous soils. High Ca levels suppress Mg and K uptake by citrus trees through the competition of Ca, Mg, and K. In cases where soil-applied fertilizer is ineffective, the only means of increasing leaf Mg or K concentration is through foliar application of water-soluble fertilizers, such as magnesium nitrate, potassium nitrate (KNO_3), or monopotassium phosphate. A solution of 20 lbs KNO_3 per 100 gallons of water has been shown to raise leaf K, especially if applied several times during the year. For citrus on noncalcareous soils, nitrogen and potassium fertilizer applications with a 1:1 ratio of N to K_2O are recommended. If leaf testing on calcareous soils reveals that high levels of soil Ca may be limiting K uptake, the K_2O rate should be increased by 25% to have a N:K_2O ratio of 1:1.25.

Citrus canker

Citrus canker, caused by a bacterial pathogen ***Xanthomonas axonopodis***, is a serious disease of most citrus varieties. The disease causes necrotic lesions on leaves, stems, and fruit. Severe infestation can cause defoliation, premature fruit drop, twig dieback, general tree decline, and very bad blemishes on fruit. The earliest symptoms on leaves appear as slightly raised tiny blister-like lesions. As the lesions age, they turn tan to brown and water soaked margin appears surrounded by a yellow halo. The center of the lesion becomes raised and corky. Lesions are usually visible on both sides of the leaf. Defoliation becomes a problem as the disease intensifies on the tree. Symptoms of bacterial citrus canker on twigs and fruit are similar and consisted of raised corky lesions surrounded by an oily or water-soaked margin. As the lesions on the fruit mature, they appear scablike or corky. The lesions on the leaves sometimes fall out, leaving round holes.

Citrus canker was first introduced in Florida in 1910 through citrus trees coming from Japan. It was eradicated in 1927. In June 1986, citrus canker was detected in residential citrus in Hillsborough, Pinellas, Sarasota and Manatee counties and was also found in commercial citrus groves in Manatee County. This second eradication program concluded with the last detection in January 1992. The official declaration of eradication was made 2 years later.

In late September 1995, citrus canker was discovered for the third time in Florida in a residential area near Miami International Airport. Even with an extensive eradication effort, the disease has spread northward from Dade into Broward County. In May 1997, citrus canker was rediscovered in Manatee County in both commercial groves and residential areas. In June 1998, citrus canker was discovered in a commercial grove in Collier County and in February 1999, it was found in a commercial grove in Hendry County. In November 1999, canker was detected in residential areas in Hillsborough and Palm Beach counties. In September and October 2001, citrus canker was found in commercial groves in Martin and DeSoto counties, respectively. In January 2002, citrus canker was found in a residential area in Brevard County and in May 2002, it was found in a commercial grove in Highlands County. In July 2002, it was found in a residential area in Orange County and in August 2002, it was found in a residential area in Lee County. In October 2004, it was found in a commercial grove and a residential area in Charlotte County. In August 2005, it was found in Glades County.

Through the eradication program, about one million citrus trees have been destroyed in residential areas and about 12 million trees have been destroyed in commercial nurseries and groves. Although eradication efforts have been very extensive to eradicate the disease in Florida from 1995 through 2005, citrus canker kept spreading due to many things including the 2004 and 2005 hurricanes.

Citrus canker is highly contagious and can be spread rapidly by wind-driven rain, unusual storm events such as tornadoes and tropical storms, flooding, equipment, insects, and human movement within groves. Overhead irrigation may also play a role in spreading the bacteria. Movement of infected or exposed trees, seedlings, propagative material, and fruit is the primary means of spreading the canker pathogen over long distances. Contaminated clothing, tools, ladders, containers and fruit boxes, and other items associated with harvesting and postharvest handling of fruit are also potential sources of infection.

Citrus canker is most severe on grapefruit, Key limes, trifoliate orange and their hybrids. Calamondin, kumquat, and citron are considered resistant. To reduce the spread of citrus canker, it is essential that equipment and personnel working near or contacting any citrus material be decontaminated with an approved chemical such as quaternary ammonium.

To the present time, there is no cure for citrus canker. However, the following practices can reduce canker spread and severity:

- **Frequent inspection**
- **Removal of diseased trees**
- **Selective elimination of infected leaves and branches**
- **Removal of exposed trees, chemical defoliation or buckhorning of exposed trees**
- **Copper sprays**
- **Windbreaks are necessary for susceptible varieties and essential for fresh fruit production**
- **Leafminer control with systemic insecticides, spray oils and/or other insecticides, especially on young trees (up to 4 years)**
- **Sanitation is very important. Quaternary ammonium disinfectants are available for use on equipment, clothing, and even bare skin.**

For more information on citrus canker visit these Web Sites:

http://doacs.state.fl.us/canker
http://doacs.state.fl.us/~pi/canker/index.htm
http://www.aphis.usda.gov/lpa/issues/ccanker/citruscanker.html
http://edis.ifas.ufl.edu//pdffiles/PP/PP11600.pdf
http://edis.ifas.ufl.edu/CG040
http://www.biotech.ufl.edu/PlantContainment/canker.htm
http://www.imok.ufl.edu/plant/diseases/cankerid.htm

THE SIXTEENTH ANNUAL FARM SAFETY DAY HELD ON SATURDAY 3 JUNE 2006 WAS A BIG SUCCESS.

Over the past few years, The Farm Safety Day has been proven to be a very effective way in providing an educational opportunity for farm equipment operators and workers.

Certificates of appreciation were sent to the
2006 Farm Safety Day Committee Members, Helpers, Speakers & Sponsors

Platinum Sponsors: >$200

Jay Hallaron, ***Chemtura***

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Rachel Walters, ***Bayer CropScience***
Jack Paul, ***Bob Paul, Inc.***
Mark Creel, ***Creel Tractor Company***
Farm Credit of SW Florida
David Wheeler, ***Wheeler Farms, Inc.***

Congratulations to the winners of the 2006 equipment operators contest and to their respective companies!

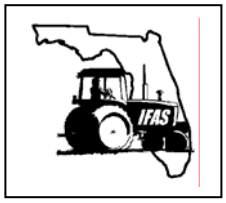
First: Pedro Miguel-Ruiz, Immokalee Tomato Growers

Second: Jose Torres, Six L's Farm-OP. #2

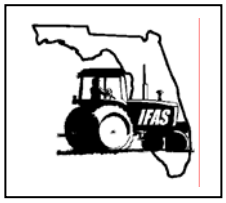
Third: Darwin Mauricio, Wheeler Farms

Trophies were given to the winners.
Engraved plaques were given to their respective companies.
The big trophy will stay for one year at the company that has the 1st place winner.

Sixteenth Annual Farm Safety Day



Saturday, June 3, 2006



Committee Assignment

Mongi Zekri, Overall Coordinator (Treasurer, sponsorship, program evaluation, food service, CEUs, CCAs)

Julie Carson, Coordinator Assistant (Hats, badges, trophies, plaques, door prices)

Gene McAvoy Morning Program Coordinator
*Assisting **Buddy Walker** (Audio & visual aid equipment)
Cesar Asuaje (Program assistance)
Ralph Mitchell (Program assistance)
Leslie Baucum (Program assistance)
Julie Carson (Program assistance)

Fritz Roka Afternoon Program Coordinator
1. **Steve Taylor** Rodeo Course Design/Set-up, Outdoors facilities, Parking
2. **Fritz Roka** Rodeo Rules, Judges & Judging
*Assisting **Mickey Pena**
Ann Summeralls
3. **Cesar Asuaje & Gene McAvoy** Rodeo Master of Ceremonies (Awards & sponsor recognition)

Bob Rouse/Barbara Hyman/Mickey Pena Registration Coordinators (Registration & program materials, duplication, distribution & mail out)

*Assisting **Debbie Spencer** Registration the day of the meeting
Ralph Mitchell
Holly Shackelford
Doug Caldwell

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FRESH CITRUS FRUITS, Second Edition

Edited by Wilfred F. Wardowski, William M. Miller, David J. Hall and William Grierson

September 2006, hardcover
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$110.00 Other countries
ISBN 0-944961-08-8

FRESH CITRUS FRUITS, Second Edition, is a comprehensive treatise on citrus fruits destined for fresh markets. From grove-to-packinghouse-to-market may appear as a simple path of delivery of citrus fruits to consumers, but there are many obstacles and important problems which are discussed here in depth. Fresh Citrus Fruits, Second Edition should be of considerable interest to growers, handlers, packinghouse workers, exporters, produce buyers, citrus scientists, students and consumers.

The First Edition of this book was published 20 years ago. New chapters are included in this second edition of Fresh Citrus Fruits, such as Food Safety Program, and Organic Fresh Fruit. Likewise, much of the material under old chapter headings has been updated or is completely new.

Color plates have been added to the book for the identification of postharvest diseases, physiological disorders, citrus canker, Mediterranean Fruit Fly and a fruit color-add test. Having these color illustrations in the book will aid readers in identifying problems.

The presence of Citrus Canker in Florida and Australia made the Plant Pest Regulations a difficult chapter to complete. Likewise, the Pesticide Tolerances chapter addresses a constantly changing subject. Internet addresses in these and other chapters provide sources of continually updated information.

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__Black, non-Hispanic

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__Male