

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

Flatwoods Citrus



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



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

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

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

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

Annual Certified Pile Burners Course in SW Florida

Date & Time: Tuesday, 21 February 2012, 8:00 AM – 5:00 PM

Location: Southwest Florida Research and Education, Immokalee, Florida

The class is full.

-- [Workshop](#) on CITRUS BLACK SPOT

Speakers: Megan Dewdney, Paul Mears, Ricke Kress, Jim Snively, Paul Meador

Date: Tuesday, March 13, 2012, Time: 9:00 AM – 12:00 Noon

Location: Southwest Florida REC (Immokalee).

No registration fee and lunch is free, but **pre-registration is required.**

3 CEUs for Pesticide License Renewal; 3 CEUs for Certified Crop Advisors (CCAs)

Lunch Sponsor: Stacey Howell, Bayer

-- [Field day](#) in LAKE PLACID GROVE

Date: Wednesday, March 7, 2012, Time: 9:45 AM – 12:00 Noon

Location: Lake Placid

Pre-registration is required. See page 10 for registration and more details

International Symposium on Mechanical Harvesting & Handling Systems of Fruits & Nuts

April, 2-4, 2012, Lake Alfred CREC

For more details and registration, go to:

<http://conference.ifas.ufl.edu/harvest/>

ANNUAL FLORIDA CITRUS GROWERS' INSTITUTE

Date & Time: Tuesday, 10 April 2012, 8:00 AM – 3:30 PM

Location: Avon Park Campus of South Florida Community College

CERTIFIED CROP ADVISER training

Educational Seminar and CEU Sessions

Wednesday, April 11, 2012, 7:30 AM to 5:30 PM

IMPORTANT WEBSITES

Citrus Extension: <http://www.crec.ifas.ufl.edu/extension/>

Citrus Health Management Areas (CHMAs):

http://www.crec.ifas.ufl.edu/extension/chmas/chma_overview.shtml

Florida Citrus Extension Agents:

http://citrusagents.ifas.ufl.edu/Citrus_Agents_Home_Page/Citrus_Agents_Home.html

Southwest Florida Research and Education Center (SWFREC):
<http://swfrec.ifas.ufl.edu/>

Citrus Research & Education Center:
<http://www.crec.ifas.ufl.edu/>

Florida Citrus Resources: <http://irrec.ifas.ufl.edu/flcitrus/>

Florida Citrus Pest Management Guide:

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

Citrus Greening (Huanglongbing)

<http://www.crec.ifas.ufl.edu/extension/greening/index.shtml>

[History](#) | [Regulations](#) | [Transmission](#) | [Pathogen](#) | [Alternate Hosts](#) | [Symptoms](#) | [Nutrient Deficiencies Compared to Citrus Greening](#) | [Diagnostics](#) | [Management](#) | [Photo Gallery](#) | [Links](#) | [Contacts](#)

Citrus Canker

<http://www.crec.ifas.ufl.edu/extension/canker/index.shtml>

[History](#) | [Eradication](#) | [Decontamination](#) | [Pathogen](#) | [Symptoms & Susceptibility](#) | [Diseases Commonly Mistaken for Citrus Canker](#) | [Spread](#) | [Management](#) | [Links](#) | [Contacts](#)

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

Susan S. Thayer



**8400 Lake Trask Rd.
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1505 Paloma Dr., Fort Myers, FL 33901

**Mobile: 321 436 2591
Fax: 239 479 6279
cody.hoffman@syngenta.com**



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Jack Kilgore, II
Regional Representative
Florida and South Georgia

Cell 239-707-7677
Nextel 158*17*24422
Fax 239-481-3498
g8trmanjek@comcast.net

Office Address:
7150 E. Brentwood Road
Ft. Meyers, FL 33919



ward.gunter@iclsfa.com

Cell: (772) 473-3987



Lester Clark

Vice President

Tel 239-896-1821

Fax 239-896-1819

lester.clark@wellsfargo.com

Donald Allen

AGLIME SALES, INC.

1375 Thornburg Road

Babson Park, FL 33827-9549

Mobile: 863 287 2925

Agnel # 52925

donald.allen@aglimesales.com

Nufarm Agriculture USA

Craig Noll

Office-239 549 2494

Mobile-239 691 8060

craig.noll@us.nufarm.com

Gary Simmons

Phone: 772 260 1058

MONSANTO

Jack Conroy

Phone: 863 318 1486

Fax: 886 318 8617

Mobile: 863 559 4468

Andrew.j.conroy@monsanto.com



FMC Corporation APG

Ronald Palumbo

Cell: 305 304-7491

Nextel Agnet: 14772

ronald.palumbo@fmc.com

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Jeff Summersill
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Ground Application
Mobile 561-722-4502, Agnet # 33169
trsummersill@msn.com

Stacey Howell
BAYER CropScience
239-272-8575 (mobile)
239-353-6491 (office/fax)
stacey.howell@bayercropscience.com

Garry Gibson
BASF Corporation
1502 53rd Avenue
Vero Beach, FL 32966
Cell: 772 473 1726
Fax: 772 567 2644
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CURRENT FLOWER BUD INDUCTION ADVISORY #4 for 2011-2012-01/11/12

[L. Gene Albrigo](#), Horticulturist Emeritus
Citrus Research & Education Center, Lake Alfred, FL



This is a service to our citrus growers posted on the CREC website. The internet Expert System on intensity and time of bloom can be accessed anytime:

<http://orb.at.ufl.edu/DISC/bloom>

Current Status: Mother Nature has not been friendly, but the weather has lived up to a La Niña year. The Flowering Monitor Model indicates that a first wave of flower buds was initiated to grow between December 3rd and 12th depending on the location, earliest initiation was in mid-Florida. The inductive cool hours had reached 620 to 640 in southern areas and 650 to 800 in central and northern areas of Florida's citrus industry. The full bloom dates for this first wave of flower buds is about February 7 to 17. After another 200 to 250 cool hours accumulated a second wave of flower buds was initiated to grow with accumulated hours of 830 to 1000 from South to North in the citrus belt. The projected full bloom dates for these buds is February 25th to 31st. Finally, a third wave of flowering is projected for Immokalee and the Central Florida area with growth initiated after 1000 to 1150 hours of cool inductive temperatures. The bloom from this flower bud initiation should be weak and peak about March 10th to 14th. A computer model anomaly in all of this year's flowering projections is the lack of a prediction of flower bud growth initiation in response to weather conditions in Ft. Pierce, where 750 hours of temperatures of 68 degrees F or lower have

accumulated and warm weather periods have presumably occurred. The Flowering Monitor System does not show the initiation of any flower bud growth for this Indian River area. Induction levels are now adequate for all citrus areas, but the flowering will be very spread out from two or more bloom peaks.

In southern and central locations where irrigation was continued into December, many trees reportedly are now flushing with light flowering. I don't see any extensive flowering in any of our nearby trees, but the occasional bud with popcorn flowers can be seen. A few terminal buds are swelling.

Some growers may still want to apply urea or phosphorous acid to boost flowering, but most bud development has probably already started and the value of these sprays now is questionable.

Remember that freezing temperatures can still occur until late January and frost damage is a slight possibility at bloom time, particularly since the first and second bloom waves will be earlier than normal.

To summarize our current status, we have 2 or 3 waves of flower buds now differentiating with full bloom predictions from mid-February to mid-March. The combination should provide an economic level of flowering but bloom should be very spread out making ideal timing of production practices difficult. The best procedure is probably to schedule for the largest bloom.

Growers that kept trees under drought stress in early December will probably avoid the early February bloom and should have a good bloom about the end of February. Now we can wait and see what really happens.

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

EL NIÑO/SOUTHERN OSCILLATION (ENSO) DIAGNOSTIC DISCUSSION

issued by

CLIMATE PREDICTION CENTER/NCEP/NWS
and the International Research Institute for Climate and Society
9 February 2012

ENSO Alert System Status: [La Niña Advisory](#)

Synopsis: [La Niña is likely to transition to ENSO-neutral conditions during March-May 2012.](#)

A mature La Niña continued during January 2012, as below-average sea surface temperatures (SST) persisted across the equatorial Pacific Ocean (Fig. 1). The weekly SST indices remained near -1.0°C in the Niño-3.4 and Niño-4 regions (Fig. 2). However, the negative SST anomalies weakened in the far eastern Pacific, indicated by warming in the Niño-1+2 and Niño-3 regions. The oceanic heat content (average temperature in the upper 300m of the ocean) anomalies also weakened slightly (Fig. 3), but continued to reflect an extensive area of below-average subsurface temperatures east of the Date Line (Fig. 4). Also, anomalous low-level easterly and upper-level westerly winds persisted over the central and west-central Pacific. Convection remained suppressed in the western and central Pacific, and enhanced over Indonesia (Fig. 5). Collectively, the oceanic and atmospheric patterns reflect a weak-to-moderate strength La Niña.

A majority of models predict La Niña to weaken through the rest of the Northern Hemisphere winter 2011-12, and then to dissipate during the spring 2012 (Fig. 6). Also, there is evidence of a downwelling phase of an eastward-propagating oceanic Kelvin wave (red shading, Fig. 4), which may increase temperatures across the Pacific in the next couple of months. The combination of a weakening subsurface temperature anomaly, the historical seasonal evolution, and forecaster preference for the average dynamical model prediction favors a return to ENSO-neutral conditions during the Northern Hemisphere spring, which are likely to continue into the summer. Therefore La Niña is likely to transition to ENSO-neutral conditions during March-May 2012 (see [CPC/IRI consensus forecast](#)).

Because the strength of impacts in the United States is not necessarily related to the exact strength of La Niña in the tropical Pacific, we expect La Niña impacts to continue even as the episode weakens. Over the U.S. during February - April 2012, there is an increased chance of above-average temperatures across the south-central and southeastern U.S., and below-average temperatures in the northwestern U.S. Also, above-average precipitation is favored across most of the northern tier of states (except the north-central U.S.) and in the Ohio and Tennessee Valleys, and drier-than-average conditions are more likely across the southern tier of the U.S. (see [3-month seasonal outlook](#) released on 19 January 2012).

This discussion is a consolidated effort of the National Oceanic and Atmospheric Administration (NOAA), NOAA's National Weather Service, and their funded institutions. Oceanic and atmospheric conditions are updated weekly on the Climate Prediction Center web site ([El Niño/La Niña Current Conditions and Expert Discussions](#)). Forecasts for the evolution of El Niño/La Niña are updated monthly in the [Forecast Forum](#) section of CPC's Climate Diagnostics Bulletin. The next ENSO Diagnostics Discussion is scheduled for 8 March 2012. To receive an e-mail notification when the monthly ENSO Diagnostic Discussions are released, please send an e-mail message to: ncep.list.enso-update@noaa.gov.

Climate Prediction Center
National Centers for Environmental Prediction
NOAA/National Weather Service
Camp Springs, MD 20746-4304

Citrus Research and Education Foundation

Field Day

Hosted by: UF-IFAS-CREC and CREC

Sponsored by: USDA/SCRI block grant and GP Solutions

Wednesday, March 7, 2012

Lake Placid Grove



SCHEDULE

Please arrive by 9:45 am for registration, the program will start promptly at 10:00 am.

- 10:00 am Introduction
Jackie Burns, CREC
- 10:10 am Leafminer Research Update
Lukasz Stelinski, CREC
- 10:30 am CHMA Coordinated Area Sprays
Tim Hurner, Highlands County Extension
- 10:50 am Windbreaks
Bill Castle, CREC
- 11:10 am Advanced Citrus Production Systems
Arnold Schumann, CREC
- 11:30 am HLB
Tim Spann, CREC
- 12:00 pm Adjourn



DIRECTIONS

From US Highway 27 North: In Lake Placid, turn left (East) on County Road 621, turn left on Hallmark Avenue (changes to Royce Ranch Avenue) and go 4.25 miles. The grove will be on your right.

From US Highway 27 South: In Lake Placid, turn right (East) on County Road 621, turn left on Hallmark Avenue (changes to Royce Ranch Avenue) and go 4.25 miles. The grove will be on your right.

Directions on mapquest: <http://www.mapquest.com/?version=1.0&hk=1-gBw1Nlx4>



**Pre-
registration
required
Limited to
the first 80
people**

Pre-registration is required. Please RSVP by Monday, March 5, 2012. Contact Mrs. Jane Wilson (wilsonmj@ufl.edu or 863-956-8643) to register.

NUTRITION OF CITRUS TREES

Fertilizer management should include calibration and adjustment of fertilizer spreaders, booms, pumps, or irrigation systems to accurately deliver fertilizer rates and place fertilizers within the tree rootzone. To increase fertilizer efficiency, soil and leaf analysis data should be studied and taken into consideration when generating a fertilizer program and selecting a fertilizer formulation. Dry fertilizer application should be split into 3 to 4 applications per year with a complete balanced fertilizer. For mature trees, the highest nutrient requirement extends from late winter through early summer. This coincides with flowering, heavy spring flush, fruit set, and fruit development and expansion. For best fresh fruit quality, nutritional requirements, particularly nitrogen (N), should decrease late in the summer and fall. Based on tree demands, 2/3 to 3/4 of the yearly fertilizer amount should be applied between February and June. In warm areas such as southwest Florida where tree growth can continue certain years during the winter, fertilizer applications should also be made in the fall to satisfy vegetative growth demand. However, fall fertilizer applications may sometimes delay fruit color development and fruit maturity for early and mid-season cultivars. For more information, go to **“Nutrition of Florida Citrus Trees, 2nd Edition”** By Thomas A. Obreza and Kelly T. Morgan <http://edis.ifas.ufl.edu/pdffiles/SS/SS47800.pdf>

IFAS fertilizer guidelines for nonbearing citrus trees

Year in grove	Lb N/tree/year (range)	Lbs Fertilizer/tree/year (range)		Lower limit of application frequency	
		6-6-6	8-8-8	Dry	Fertigation
1	0.15 – 0.30	2.5-5.0	1.9-3.8	6	10
2	0.30 – 0.60	5.0-10.0	3.8-7.5	5	10
3	0.45 – 0.90	7.5-15.0	5.6-11.3	4	10

IFAS fertilizer guidelines for bearing citrus trees (4 years and older)

Oranges	Grapefruit	Other varieties	Lower limit of application frequency	
Lbs N/acre/year (range)			Dry	Fertigation
120 - 200	120 - 160	120 - 200	3	10

Rates up to 240 lbs/acre may be considered for orange groves producing over 700 boxes/acre and up to 180 lbs/acre for grapefruit groves producing over 800 boxes/acre. Young trees planted on previously uncropped soils should receive fertilizer containing the following ratio of elements: nitrogen-1, phosphorus-1, potassium-1, magnesium-1/5, manganese-1/20, copper-1/40, and boron-1/300.

IMPORTANCE OF FERTILIZER SPREADER CALIBRATION AND MAINTENANCE

Properly calibrated and maintained equipment ensures a more uniform distribution of nutrients. This, combined with other conservation practices, reduces production costs, soil surface runoff, and nutrient movement to nearby surface waters. Spreaders that have not been properly maintained and calibrated will have problems delivering accurate rates and evenly distributed fertilizer amounts to the grown crop.

Calibration

Calibration is the process used to help ensure that the equipment applies proper rates of the selected product. Proper calibration is the key to successful fertilizer use efficiency. Failure to calibrate equipment can result in ineffective applications. Applying too much is costly, unlawful and may cause crop injury. Applying too little can result in poor crop growth and production. It is important to calibrate equipment on a regular basis to compensate for variations. The equipment will become worn or damaged with use and result in inaccurate output and spread pattern.

Two items must be considered when calibrating a spreader. The first is the distribution pattern of the spreader. The second is the product application rate, which is the amount of product applied per acre. There are many factors that affect the distribution pattern of a rotary spreader and some of them relate directly to the product. For this reason, it is recommended that the spreader be calibrated separately for every product to be applied. Spreader calibration should be checked more often when the spreader is used frequently.

Product & application

Choose a product according to the need of the crop. Before applying the product, read the spreader manual. The spreader manual will usually indicate proper settings for various application rates. However, calibration still needs to be performed to ensure the settings are accurate and to compensate for wear and variations in equipment. Be sure that the proper procedures and application rates are followed. Check the 'spread pattern' and amount being applied. The physical properties of dry fertilizer can vary widely. Since larger particles are thrown further than small particles, a product of uniform size should be used to achieve a consistent application pattern. It is essential to maintain a constant speed when using a rotary spreader to obtain uniform and accurate distribution.

Maintenance and Cleaning

Proper care and maintenance will help retain precise applications and prolong the life of spreaders. Manufacturer's directions on cleaning and lubricating should be followed. With the shutter or gate wide open, remove all granules from the spreader at the end of each application. Then, the spreader should be thoroughly washed and allowed to dry. Hot water may help break loose fertilizer which is caked on. Finally, lubricate the spreader according to instructions. Spreaders should be stored in a clean, dry place out of direct sunlight.



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

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

Mongi Zekri, Thomas Obreza and Arnold Schumann

<http://edis.ifas.ufl.edu/SS442> [[pdf](#)]

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

Mongi Zekri, Thomas A. Obreza and Robert Koo

<http://edis.ifas.ufl.edu/SS426> [[pdf](#)]

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

Mongi Zekri and Thomas A. Obreza

<http://edis.ifas.ufl.edu/SS423> [[pdf](#)]

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

Mongi Zekri and Thomas A. Obreza

<http://edis.ifas.ufl.edu/SS422> [[pdf](#)]

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

Mongi Zekri and Thomas A. Obreza

<http://edis.ifas.ufl.edu/SS421> [[pdf](#)]

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

Mongi Zekri and Thomas A. Obreza

<http://edis.ifas.ufl.edu/SS420> [[pdf](#)]

[Plant Nutrients for Citrus Trees](#)

Mongi Zekri and Thomas A. Obreza

<http://edis.ifas.ufl.edu/SS419> [[pdf](#)]

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

Tom Obreza, Larry Parsons, and Kelly Morgan

<http://edis.ifas.ufl.edu/SS457> [[pdf](#)]

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

Tom Obreza and Bob Rouse

<http://edis.ifas.ufl.edu/SS433> [[pdf](#)]

[Prioritizing Citrus Nutrient Management Decisions](#)

Thomas A. Obreza

<http://edis.ifas.ufl.edu/SS418> [[pdf](#)]

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

Thomas A. Obreza

<http://edis.ifas.ufl.edu/SS332> [[pdf](#)]

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

Thomas A. Obreza

<http://edis.ifas.ufl.edu/SS331> [[pdf](#)]

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

Brian Boman and Tom Obreza

<http://edis.ifas.ufl.edu/CH185> [[pdf](#)]

[Citrus Fertilizer Management on Calcareous Soils](#)

Thomas A. Obreza, Ashok K. Alva, and David V. Calvert

<http://edis.ifas.ufl.edu/CH086> [[pdf](#)]

Boron (B)

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

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



The first visual symptoms of B deficiency are generally the death of the

terminal growing point of the main stem. Further symptoms are a slight thickening of the leaves, a tendency for the leaves to curl downward at right angles to the midrib, and sometimes chlorosis. Young leaves show small water soaked spots or flecks becoming translucent as the leaves mature. Associated with this is a premature shedding of leaves starting in the tops of the trees and soon leaving the tops almost completely defoliated. Fruit symptoms appear to be the most constant and reliable tool for diagnostic purposes.

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

FOLIAR FEEDING

Foliar feeding is not intended to completely replace soil-applied fertilization of the macronutrients (nitrogen, potassium, and phosphorous). However, macronutrients can be foliarly applied in sufficient quantities to influence both fruit yield and quality. Some crops, such as citrus, can have a large part of the nitrogen, potassium, and phosphorous requirements met through foliar applications.

Foliar applications of other plant nutrients (calcium, magnesium, and sulfur) and micronutrients (zinc, manganese, copper, boron, and molybdenum) have proven for many crops to be an excellent means for supplying the plants' requirements. Soil application of magnesium, manganese, zinc, boron, and molybdenum is not as economical and not as effective as foliar application to supply those nutrients to citrus trees. Applications made to the soil can be subject to leaching, volatilization, and/or being tied up by soil particles in unavailable forms to plants.

Foliar feeding should be used as an integral part of the annual nutritional program. It can be used in other situations to help plants through short, but critical periods of nutrient demand, such as fruit set and bud differentiation. Foliar nutrition may also prove to be useful at times of soil or environmentally induced nutritional shortages. Foliar application of nutrients is of significant importance when the root system is unable to keep up with crop demand or when the soil has a history of problems that inhibit normal growth.

Foliar feeding is proven to be useful under prolonged spells of wet soil conditions, dry soil conditions, calcareous soil, cold weather, or any other condition that decreases the tree's ability to take up nutrients when there is a demand. Foliar feeding may be utilized effectively when a nutritional deficiency is diagnosed. A foliar application is the quickest method of getting the most nutrients into plants. However, if the deficiency can be seen, the crop might have already lost some potential yield.

Several Florida citrus growers and production managers are using foliar nutritional sprays, mainly micronutrients, to slow down tree decline and maintain adequate fruit productivity of citrus greening-infected trees. Supplemental, balanced foliar nutrition has positive effects on plant diseases by inducing naturally occurring plant resistance mechanisms. It is always important to maintain the balance between nutrients because having one nutrient significantly out of balance can be as bad as a deficiency.

While foliar feeding has many advantages, it can burn plants at certain rates under certain environmental conditions. It is important, therefore, to foliar feed within the established guidelines. There are a number of conditions that can increase the chances of causing foliar burn. A plant under stress is more susceptible to damage. Stressful conditions include drying winds, disease infestations, and poor soil conditions. The environmental conditions at the time of application are also important factors. Applications when the weather is warm (above 80°F) should be avoided. This means that during warm seasons, applications should be made in the morning or evening. Additionally, applications should not be at less than two-week intervals to give the plant sufficient time to metabolize the nutrients and deal with the added osmotic stress.

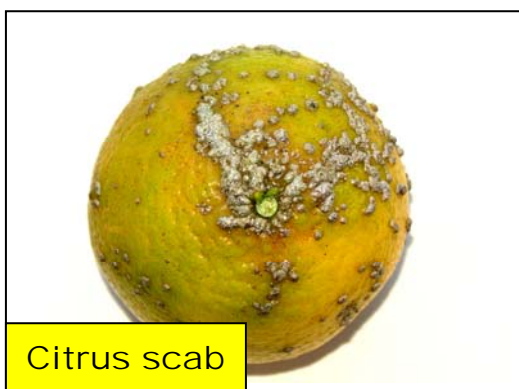
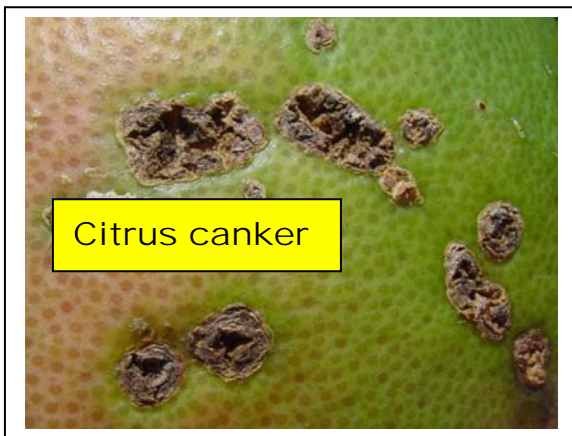
Another important factor when applying nutrient foliarly is to ensure that the pH of the material is in the proper range. The pH range of the spray solution should be between 6 and 7. Attention should be paid to the pH of the final spray solution. This is significant in areas where water quality is poor.

Post-bloom foliar applications (applied in April when the spring flush leaves are about fully expanded) of potassium nitrate or mono-potassium phosphate have been found to increase fruit yield and size.

- **8 lb K₂O per acre per application**
- **Foliar applications are not a substitute for a good soil nutritional program.**

Fungicide effectiveness

	<u>Canker</u>	<u>Greasy Spot</u>	<u>Alternaria</u>	<u>Scab</u>	<u>Melanose</u>
Copper	Good	Excellent	Good	Moderate	Excellent
Oil	None	Good	None	None	None
Ferbam	None	Weak	Moderate	Good	Weak
Headline	None	Good	Very good	Excellent	Good
Abound	None	Good	Very good	Excellent	Good
Gem	None	Good	Good	Excellent	Good
Enable	None	Excellent	Poor	Good	Weak



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Open to Florida citrus growers only.
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__ Asian American

__ Hispanic

__ White, non-Hispanic

__ Black, non-Hispanic

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__ Female

__ Male