



UNIVERSITY OF
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EXTENSION

Institute of Food and Agricultural Sciences

Hendry County Extension • P.O. Box 68 • LaBelle, Florida 33975-0068 • (941) 674-4092

Flatwoods Citrus



Vol. 7, No. 8

August 2004

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

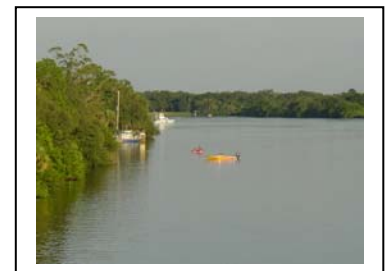


UPCOMING EVENTS

OVERALL SW Florida BMPs Meeting

Hendry County Extension

Office, LaBelle, ◀ August 11, 2004, 10:30 AM



CITRUS EXPO

IN FORT MYERS

Wednesday, August 25 &
Thursday, August 26, 2004

See Brochure and Updated Schedule



Packinghouse Day, September 2, 2004. CREC Lake Alfred

Indian River Postharvest Workshop, September 9, 2004. IRREC Fort Pierce

Detailed information and registration forms are enclosed.

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**

Seminar at the Hendry County Extension Office, LaBelle

Date & time: Tuesday, September 14, 2004, 8:00 AM – 12:00 Noon

Topics: **Harvesting Safety and Compliance Seminar Presented by: GeoAg Solutions** featuring information regarding Harvesting Safety, Agricultural Worker Protection Act (AWPA), Compliance and much more.

Door prices: Several great prizes including a guided fishing trip.

2 CEUs for Pesticide License Renewal

2 CEUs for Certified Crop Advisors (CCAs)

Following the seminar, we are planning a free BBQ lunch for only who call 863 441 1200 or e-mail dsummers@geoagsolutions.com no later than Friday, 10 Sept 2004.

Annual Conference of Extension Professionals (FAEP)

Date: September 19-23

Location: Cocoa Beach, Florida

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

50th Annual Meeting of the InterAmerican Society for Tropical Horticulture (ISTH)

Date: October 24-29, 2004

Location: Universidad EARTH, San Jose, Costa Rica, <http://www.earth.ac.cr>

For more information, contact Dr. Richard Campbell at

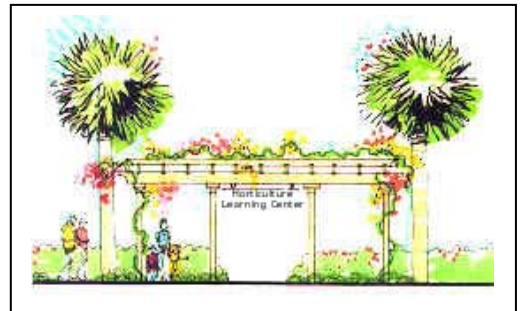
rcampbell@fairchildgarden.org

Yard & Garden Show

November 13 & 14, 2004

Saturday - 9:00 AM to 4:00 PM

Sunday - 10 AM to 4:00 PM



**Location: SW Florida Horticulture Learning Center
Collier County University Extension Education & Training Center
14700 Immokalee Road, Naples, FL
For information, call (239) 353-4244**

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CITRUS GREENING MIGHT BE GETTING CLOSER TO FLORIDA

The citrus psyllid and citrus greening

In June 1998, the Asian citrus psyllid *Diaphorina citri* was found for the first time in southeastern Florida. It is now very widespread in Florida. The citrus psyllid is a serious pest of citrus. The good news was that greening disease was not brought into Florida with the citrus psyllid. ***Citrus greening may have been in Brazil for several years.***



Eradication efforts for the psyllid were not attempted in Florida, because the pest was found to be widely distributed and abundant. Furthermore, the tools available for eradication are very limited for this pest.

Diaphorina citri is an efficient vector of greening disease, which is considered the most serious citrus disease in Asia.

Although the psyllids in Florida don't have the disease at this time, a future introduction of the pathogen would result in effective transmission of the disease by the psyllids that are now well established.

This citrus bacterial disease transmitted by *D. citri* is called various names, including "greening", "leaf mottling", or "die back". The bacterium invades conducting tissues causing a decline of citrus trees rendering them unproductive. Greening symptoms are characterized by yellowing of normal-sized leaves along the veins and sometimes by the development of a blotchy-mottle. The leaves are small, upright, and show a variety of chlorotic patterns resembling those induced by zinc and iron deficiencies. Infected trees or branches suffer heavy leaf drop followed by out-of-season flushing and flowering, with dieback occurring in severe cases. Infected fruit are small, lopsided, and have a bitter taste and unpleasant flavor in the juice, probably because of higher acidity and lower sugars. Many fruit fall prematurely, while those remaining on the tree do not color properly, staying green on the shaded side, hence the name of the disease "greening." Root systems are poorly developed with relatively few fibrous roots, possibly because of root starvation. New root growth is suppressed and the roots often start decaying from the rootlets.



Greening can infect all citrus species. Greening seems to be primarily a disease of sweet oranges with Valencias showing more pronounced leaf symptoms than Navels. It is also particularly severe on mandarins and tangelos but less so on grapefruit and lemon. The least affected is lime, pummelo, and trifoliate orange.



Spread of greening disease is by infected budwood or nursery plants, as well as by the psyllid. The association of prokaryotic organisms with greening prompted investigations into the use of antibiotics. Foliar sprays of tetracycline hydrochloride were found to suppress leaf symptoms. Injection of various tetracyclines into the trunks of greening-infected citrus trees showed that tetracycline hydrochloride significantly reduced fruit symptoms in the next crop. Other antibiotics have also been tested and used.

The use of insecticides to control the vector is widely adapted in several countries. Because the psyllid is a sap feeder, systemic insecticides might be the most effective ones to control it. Biological control of the psyllid using *Tamarixia radiata*, a parasitic wasp, had virtually eliminated the psylla from commercial orchards in several countries

and the incidence of citrus greening has consequently been reduced in some areas. 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.



Once a tree has been infected with citrus greening, it cannot be 'cured'. Where the disease exists, management strategies rely on preventing its spread into uninfected areas. A variety of measures are being employed, including regulation of the movement of propagating material, destruction of infected trees, and control of insect vectors.

Certified clean budwood or nursery stock will have to be made available if the disease is found in Florida. Integrated control will be the most effective. Combination of introducing parasites, treating trees with antibiotics, shoot-tip grafting of infected budwood, and raising new trees free of infection has had success in few countries.

AGRICULTURE OFFICIALS INTENSIFY INSPECTION EFFORTS IN RESPONSE TO INTERNATIONAL CITRUS BUDWOOD SMUGGLING ACTIVITIES

Florida Department of Agriculture
& Consumers Services (FDACS)
Press Release

23 July 2004

Liz Compton, FDACS
850-488-3022

Michael Shannon, USDA
352- 331-3990

TALLAHASSEE - Florida Agriculture Commissioner Charles H. Bronson announced today that a high alert is in effect related to recently detected, international citrus budwood smuggling activities. Budwood is a portion of a stem or branch with a vegetative bud(s) used in propagation for budding or grafting.

The Florida Department of Agriculture & Consumers Services is working in cooperation with the U.S. Department of Agriculture and the Department of Homeland Security to intensify inspection and interdiction efforts to prevent the introduction of infected citrus plant material or the insects that carry diseases, and to solicit the

support of the public in identifying any potential smuggling activities. To date, Florida has not been impacted by these smuggling activities.



“We are deeply concerned about recent smuggling activities,” said Commissioner Bronson. “We are currently winning the battle against citrus canker in Florida, but to see the state’s \$9 billion citrus industry again put at risk because of unlawful activities is very disconcerting.”

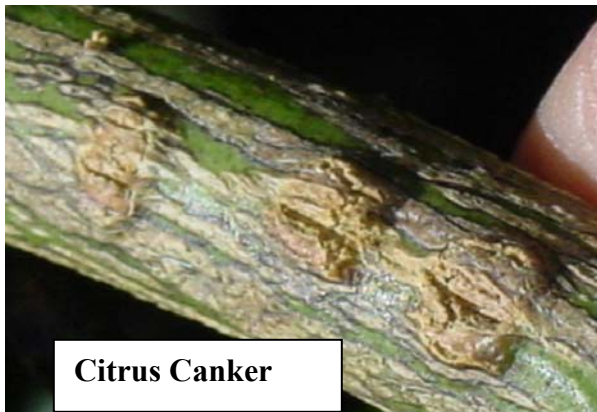
U.S. Department of Homeland Security officials recently intercepted two shipments containing 350 cuttings of citrus budwood from Japan at a postal facility in Daly City, California. The intercepted boxes were manifested as ‘candy and chocolates,’ and ‘books and chocolates.’ One of the budwood cuttings was found to be positive for citrus canker, and was destroyed.

USDA’s Safeguarding, Intervention and Trade Compliance program investigated and determined that the budwood was to be delivered to a Southern California property with existing citrus trees, some of which had been previously grafted with budwood

illegally received from Japan. Extensive sampling was done and all samples were negative for citrus canker. The property owner admitted that the budwood came from Japan and was then grafted on to domestic rootstock. All citrus on that property was voluntarily destroyed. The investigation is continuing and the USDA is working to assess the maximum penalties.

USDA State Plant Health Director, Michael Shannon states, “This illegal and irresponsible conduct must be stopped if it is occurring here in Florida.”

The importation of citrus budwood into the U.S. is restricted. All citrus propagation material must enter the U.S. through regulatory channels and certified citrus introduction programs. In addition to the threat of introducing citrus canker, foreign citrus budwood may also harbor injurious plant viruses and citrus greening disease. These exotic citrus disorders could greatly harm the health and well being of Florida citrus production, both commercial and residential.

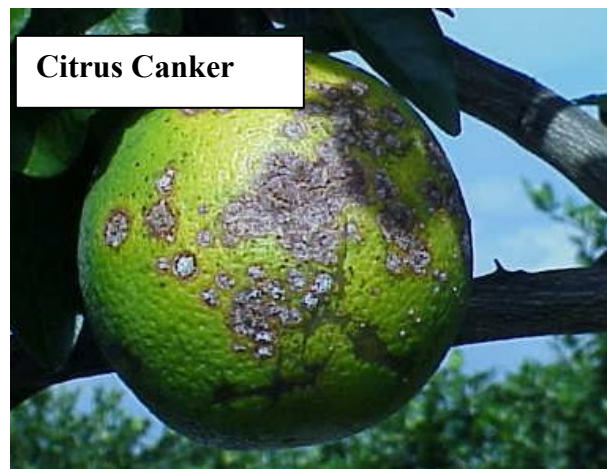


Another recent outbreak of citrus canker in Australia has also been linked

to smuggling. That investigation is in the early stages. Over 13,000,000 passengers travel each year through Florida’s 11 international ports of entry. State and federal agricultural officials face the daunting task of trying to prevent the intentional or unintentional entry of material containing pests and diseases that can threaten Florida’s natural environment and the billion dollar plant and nursery industries.

Citizens who have any information on any illegal citrus budwood introduction activity or believe they may know someone they suspect is involved in any plant smuggling activities is urged to call the Department’s toll-free helpline number at 888-397-1517. All reports will be followed up with discretion and top priority. The public’s support is a critical component in the effort to stop the importation of dangerous pests and diseases into Florida.

Information on state and federal agricultural programs is available at www.doacs.state.fl.us/pi or <http://aphisweb.aphis.usda.gov>



THE CITRUS EXPO



The 2004 Citrus Expo will be held on August 25 & 26 at Fort Myers Lee Civic Center. The Citrus Expo has become an outstanding agricultural event for the Florida citrus industry because of its trade show, seminar program, and banquet. The success of the program has been the three-way partnership of the Florida citrus growers through the Gulf Citrus Growers Association, the University of Florida Extension Service, and the trade show organized by the Citrus Industry Magazine. The Expo is the largest seminar and trade show event dedicated exclusively to citrus. *Enclosed, you will find a brochure for the Citrus Expo and an Updated Schedule sheet including a pre-registration form, which can be xeroxed if needed and mailed or faxed.*

Gulf Citrus Growers Association Scholarship Foundation, Inc.

Membership:

Membership in the Scholarship Foundation is open to all Gulf Citrus Growers Association (GCGA) members for just \$25 per year. Members are able to vote for and serve on the Board of Directors for the Foundation.

Pre-register before August 15 and receive a free gift when you pick up your registration packet at Lee Civic Center. There is no registration fee. Admission and parking are free. The theme of this year's Expo seminar program is "**Creating Value for Citrus Beyond the 'Commodity.'**" Concepts of Environmental Values of Agriculture Land will be addressed on Wednesday morning, Aug. 25th. On Wednesday afternoon, Cultivating Green Payment\$\$\$ will be thoroughly discussed. Thursday program will focus on Promotion, Politics, perspectives, and Hot Grower Topics. The program is approved for CEUs for Certified Public Accountant (CPA), Certified Crop Advisors (CCA), and pesticide license renewal. The trade show opens at 8:00 AM on Wednesday and Thursday with a free continental breakfast and drawings for great prizes (\$1,000 cash on Wednesday and a grand prize on Thursday). Don't miss the Gulf Citrus Growers Association Reception and Banquet, which will be held on Wednesday evening (6:00 PM) at Harborside Convention Hall in downtown Ft. Myers. For reservation, call the association at 863 675 2180.

Donations:

Donations are a crucial source of funding for scholarship awards and may be made to the Foundation at any time during the year in any denomination, regardless of membership status. Checks should be made payable to the Foundation. For more details, please call the GCGA office at 863 675 2180.

The GCGA Scholarship Foundation is a non-profit corporation operating under Section 501 © (3) of the Internal Revenue Code. Contributions are tax deductible as allowed by law.

Oranges Good for Your Eyes

By Shelley Preston

The Ledger

shelley.preston@theledger.com



Despite what your mother may have told you, it isn't just carrots that will keep your peepers in working order: You can also nibble on oranges. A recent study found that eating fruit, especially oranges and bananas, can reduce the risk of age related macular degeneration. The fruits were most effective with a form of the disease developed when tiny blood vessels behind the eyes bleed, causing fluid build-up and scarring. More than 10 million Americans are believed to suffer from macular degeneration, according to the American Macular Degeneration Foundation. The study, which was conducted by five Boston-area doctors, was published in the Archives of Ophthalmology journal in June. Nicole LeBeau, a spokeswoman for the Florida Department of Citrus in Lakeland, said she wasn't aware of the study but applauds it for confirming what the Department has been telling the public for years. "We definitely recommend 100 percent orange juice as a part of a healthy diet, and this study is a good example of that," LeBeau said. "It makes sense," says Dr. Kevin Dorsett, an ophthalmologist at the Lakeland Eye Clinic. "A diet high in antioxidants may be beneficial because other research has shown that taking a multivitamin with antioxidants may be beneficial." And fruit just isn't good for the eyes. Research about other chronic diseases have suggested fruit slows the effects of serious ailments. The National Cancer Institute, for example, says a diverse and convincing body of evidence of eating five or more servings of fruits and vegetables is nothing but good for the

body. A recent study from the Institute says higher consumption of fruit lowers rates of cancer and heart diseases. Compounds in citrus are also being studied for their potential medicinal properties. Recent tests include using the antioxidant compounds found in oranges and grapefruit to treat Parkinson's disease and multiple sclerosis.



Tangeretin, a flavonoid found in the tangerine, has been proven to reduce tumors in breast cancer patients, scientists say. Besides those who eat ample servings of fruit, scientists say non-smokers with a low-fat diet who engage in regular exercise are also at a lower risk of developing macular degeneration and other chronic diseases. Shelley Preston can be reached at 863-802-7517 or shelley.preston@theledger.com.

TRISTEZA

Citrus tristeza virus (CTV) is a well-known citrus viral disease causing tree losses and crop reduction in most citrus-growing areas of the world. Tristeza means sadness in Spanish. CTV was first reported in Florida in the early 1950s, but serious losses were not experienced until the 1980s after the widespread of the sour orange decline strains. In Florida, CTV is known primarily to cause tree decline and stunting of trees budded on sour orange and *Citrus macrophylla* rootstocks.

CTV is transmitted by aphids. The aphid can acquire the virus within minutes of feeding on an infected tree and transmit it to healthy trees within minutes after feeding. Aphids lose the ability to transmit the virus within 24-48 hours after leaving an infected tree.



The brown citrus aphid (*Toxoptera citricida*), which is the most efficient vector of CTV, was first detected in south Florida in the fall of 1995 and rapidly spread in 1996 throughout the Florida citrus growing areas. The cotton or melon aphid (*Aphis gossypii*) is a less efficient but effective vector. The green citrus or spirea aphid (*Aphis spiraecola*) and *Toxoptera aurantii* are relatively inefficient. The establishment of

Toxoptera citricida in Florida has resulted in more rapid spread of decline-inducing isolates of tristeza. In Florida, 6 to 7 years ago, 18 to 20 million trees (20%) of the producing citrus trees were on sour orange rootstock. Over 12 years ago, propagation on sour orange rootstock was discontinued in Florida. In southwest Florida, a sharp increase in the decline rate of trees on sour orange rootstock has been experienced since the spring of 1998.

Initially, affected trees have small leaves and twig dieback. Diseased trees often produce a crop of very small size fruit. Eventually, large limbs die back and the tree gradually declines. In some cases, trees may suffer from quick decline and wilt and die in a matter of weeks.



CTV causes an incompatibility at the budunion. It blocks the phloem (conducting tissue located in the bark through which sugars produced in the leaves by photosynthesis are moved to roots) and girdles the tree. Death of the phloem at the bud union results in overgrowth of the scion at the bud union, destruction of feeder roots, stunting, leaf chlorosis, wilting, reduced fruit size, poor growth, dieback, and tree death.



Declining trees often show pitting consisting of small holes (honeycombing) on the inside face of a flap of bark of the rootstock removed across the budunion. Quick decline trees may only have a yellow-brown stain at the budunion. Sweet oranges are usually more affected than grapefruit. Lemons on sour orange rootstock are not affected by tristeza.

Citrus tristeza virus has a wide range of isolates of varying severities. Mild isolates do not usually cause decline of sweet orange on sour orange rootstock. More severe, decline-inducing isolates have gradually increased and groves on sour orange are declining rapidly. In some countries, CTV isolates can also cause stem-pitting in citrus scions regardless of the rootstock used. Grooves and pits appear in the wood of the trunk, branches, and twigs. Externally, branches may be twisted, ropy, and twigs may become brittle. Trees affected by stem-pitting grow poorly and have low yields and small fruit. Limes and grapefruit are most commonly affected by stem-pitting. Tangerines are generally tolerant. Isolates which cause decline of sweet orange on sour orange may also cause stem-pitting, but many decline isolates produce no stem-pitting in grapefruit or oranges. Stem-pitting has not been found in commercial citrus in Florida to date.

Currently, all budwood used for propagation must be free of MCA-13 positive strains. However, MCA-13 positive strains are spreading rapidly in the state, and it may not be possible to continue using field-produced budwood. The key to preventing problems with stem-pitting in Florida is to avoid propagation of stem-pitting isolates.

Recommended practices

Once tristeza-affected trees on sour orange rootstock begin to decline, there is no treatment that will reverse the decline or prevent multiplication of the virus.

Individual diseased trees should be replaced with certified trees on tolerant rootstocks as the yields decline to uneconomical levels. However, if blocks on sour orange rootstock are planted on an inappropriate row spacing, are not properly bedded, or are in need of drainage or other structural work, or the scion variety is not the preferred one, it may be desirable to allow the trees to decline to uneconomical levels and replace the entire block.



Although the brown citrus aphid is spreading decline-inducing strains of tristeza virus rapidly in some areas of the state, chemical or biological control of the aphid in groves is unlikely to reduce the spread of the disease. Transmission of the virus by the aphid is usually so rapid that it occurs before the aphid is killed by an insecticide. However, rigorous aphid control in nurseries and on budwood source trees could reduce infection rates.

Cross protection, which is the inoculation of trees with mild strains to protect them from the effects of severe strains, has been effective at extending the economic production against grapefruit and sweet orange stem-pitting strains in several countries. Cross protection against tristeza decline on sour orange rootstock has not been widely used in Florida. Results were not consistent. Considerable time is required to establish mild strains in trees, and trees must be inoculated well in advance of infection with severe strains.

FERTIGATION

It is the application of soluble fertilizers through irrigation systems.

Some advantages of fertigation:

- ◆ Fertilizer is placed in the wetted area where feeder roots are extensive,
- ◆ Fertilizer may be applied more frequently in small amounts so that it is available when the tree needs it,
- ◆ Increased fertilizer application frequency can increase fertilizer efficiency and reduce leaching,
- ◆ Application cost is much lower than that of dry or foliar fertilizer application.

For microirrigation to be most effective, water and nutrients should be applied simultaneously.

Fertilizer efficiency and fertilizer cost savings of fertigation are greatest for young trees.

Fertigation is not recommended for non-uniform, poorly designed irrigation systems.

It should be kept in mind that fertilizer and water is wasted when fertigating a very wet soil to keep up with a programmed fertigation schedule. Water and nutrient uptake are drastically reduced under waterlogged soil conditions.

It is essential that backflow prevention devices be used to prevent fertilizers to contaminate the water supply.

It is very important to determine how long it takes for the fertilizer to travel to the farthest emitter because the system has to be flushed for at least that length of time.

Some disadvantages of fertigation:

- ◆ Extra equipment (filter, injection device, tank, backflow prevention system) must be added to the irrigation system,
- ◆ Soluble fertilizers are more expensive than granular fertilizers,
- ◆ Fertilizer application uniformity and coverage depend on the proper design and accuracy of the irrigation system,
- ◆ Fertilizers injected into an irrigation system may contribute to its plugging.

Caution should be taken when applying solutions containing phosphorus. Phosphorus can combine with dissolved calcium and magnesium in the irrigation water to form insoluble precipitates that clog the irrigation lines.

To avoid emitter plugging, a properly designed microirrigation system should include:

- ◆ A method of filtering irrigation water,
- ◆ A means of injecting chemicals into the water,
- ◆ Equipment for flushing the system,
- ◆ And in some cases a settling basin to allow aeration and the removal of solids.



MICROIRRIGATION AND FERTIGATION

Microirrigation

Microirrigation is an important component of citrus production systems in Florida. Microirrigation is more desirable than other irrigation methods for several reasons. Three important advantages are: (1) water conservation, (2) the potential for significantly improving fertilizer management and (3) for cold protection.

Research has shown that when properly managed (no overirrigation), water savings with microirrigation systems can amount to as much as 80% compared to subirrigation and 50% compared to overhead sprinkler irrigation.



Microirrigation provides for precise timing and application of fertilizer nutrients in citrus production. Fertilizer can be prescription-applied during the season in amounts that the tree needs and at particular times when those nutrients are needed. This capability helps growers increase the efficiency of fertilizer application and should result in reduced fertilizer applications for citrus production. Research has also shown the important advantage of microsprinklers for freeze protection of citrus.

Fertigation

Fertigation is the timely application of small amounts of fertilizer through irrigation systems directly to the root zone. Compared to conventional ground application, fertigation improves fertilizer efficiency. Subsequently, comparable or better yields and quality can be produced with less fertilizer. To effectively fertigate crops, growers must properly maintain microirrigation systems to apply water and fertilizer uniformly. In addition, growers must determine:

- (1) which fertilizer formulations are most suitable for injection,
- (2) the most appropriate fertilizer analysis for different age trees and specific stages of growth,
- (3) the amount to apply during a given fertigation event, and
- (4) the timing and frequency of applications.

Properly managed applications of plant nutrients through irrigation systems significantly enhance fertilizer efficiency while maintaining or increasing yield. On the other hand, poorly managed fertigation may result in substantial yield losses. Fertilizers are available in different forms and concentrations. Formulations usually contain two or more nutrients and the solubility of various formulations vary significantly. Fertigation involves deciding which and how much nutrients to apply, selecting the most effective formulations, properly preparing solutions for injection, and scheduling injections to ensure that essential nutrients are available as needed.

Many sources of nitrogen and potassium are suitable for injection through microirrigation systems. They include ammonium nitrate, ammonium sulfate, urea-ammonium nitrate, urea, calcium nitrate, potassium chloride, and potassium nitrate. When using phosphorus (P),

magnesium (Mg) cannot be used because Mg-P compounds will precipitate. The use of P can also be a problem when high levels of calcium (Ca), Mg, or iron (Fe) are in the irrigation water.

Solubility of Fertilizer Formulations

Solubility indicates the relative degree to which a substance dissolves in water. Solubility of fertilizer is a critical factor when preparing stock solutions for fertigation, especially when preparing fertilizer solutions from dry fertilizers.

<u>Fertilizer Formulation</u>	<u>Solubility (lb/gal)</u>
Ammonium nitrate	9.8
Calcium nitrate	8.5
Potassium chloride	2.3
Potassium nitrate	1.1

Hot water increases solubility and makes dissolving fertilizer easier and quicker. Hot water may be especially helpful when dissolving a fertilizer such as potassium nitrate, which actually cools the solution as it dissolves. Because solubility is reduced when water cools, it is not a good practice to heat water in order to dissolve "extra" fertilizer (more than is soluble at normal temperatures). As the solution cools, this extra fertilizer will come out of solution (precipitate or "salt out") and possibly clog emitters.

A solution of 50 percent urea by weight results in 23-0-0 and has a salting-out temperature of 60 degrees F. In order to store and handle liquid urea during cooler temperatures, the nitrogen concentration must be lowered to reduce salting problems.

<u>Crystallization (salt out) temperatures for liquid urea</u>	60⁰F @ 23%N
	43⁰F @ 20%N
	32⁰F @ 18%N
	19⁰F @ 16%N

Liquid Fertilizer Formulations

Preparation of nutrient stock solutions from dry fertilizers may require considerable time and effort and can generate sediments. Therefore, commercially prepared liquid fertilizer solutions (true solutions, not suspensions) that are completely water-soluble should be used. Liquid fertilizers are available in a variety of formulations (8-0-8, 8-2-8, etc.). Liquid formulations are very convenient, because they can be injected directly (without mixing in water) with a variable rate injection pump. Although transportation costs make liquid formulations a little more expensive, they save time and labor and help prevent problems associated with poorly made "home mixes." Also, they eliminate the problems caused by insoluble materials found in some dry fertilizers. Even with liquid formulations, again, be careful when injecting fertilizers containing phosphorus or sulfur (S) into microirrigation systems. Phosphorus and S may react with calcium and/or magnesium in the irrigation water to form mineral precipitates that could clog emitters.

Injection Duration

A minimum injection time of 45 to 60 minutes is recommended. This time is sufficient for uniform distribution of nutrients throughout the fertigation zone. Limit injection time to prevent the application of too much water, because excessive water leaches plant nutrients below the root zone. In addition, too much water saturates the soil, causing damage to roots. The maximum injection time depends on soil type, nutrients, and water requirements of the crop. However, as a general rule, a "reasonable" maximum duration of injection should not exceed two hours per zone.

Forty-Third Annual Citrus Packinghouse Day	Indian River Postharvest Workshop
Thursday, September 2, 2004 Citrus Research and Education Center 700 Experiment Station Road, Lake Alfred, FL 33850	Thursday, September 9, 2004 Indian River Research and Education Center 2199 S. Rock Rd. Ft. Pierce, FL 34945
Lunch Sponsor: DECCO/Cerexagri Includes exhibits by more than 30 companies	Lunch Sponsor: FMC FoodTech No exhibitors

Mark your calendars for the Citrus Packinghouse Day on September 2nd, and the Indian River Postharvest Workshop on September 9th. Both programs begin at 9:30 AM. Presentations at each event will **not** be identical.

Packinghouse Day program will include presentations on:

- How to pass a 3rd party food safety audit, with brief information about EurepGap and BRC (British Retail Consortium) requirements. (Keynote speaker **Juan Muniz** with **Primus Labs.**)
- Packinghouse biosecurity.
- Prospects for good fruit quality this year.
- Use of color separation before degreening.
- Prospects and progress for robotic harvesting of fresh Florida citrus.
- New developments in the use of Radio Frequency Identification (RFID) tags.
- Prevention of physiological disorders of fresh citrus this season.

Indian River Postharvest Workshop program will include the latest information on packinghouse biosecurity issues (Renée Goodrich), and 1.5 hours of presentation by Juan Muniz (Primus Labs.) covering:

- How to pass a 3rd party food safety audit.
- EurepGap Food Safety Requirements.
- BRC (British Retail Consortium) Food Safety Requirements.

Both programs will offer the same supplemental training sessions covering:

- Food Safety - Worker Health and Hygiene.
- Forklift Driving Safety.
- Packinghouse Postharvest Treatments - Biocides, Waxes, Recordkeeping, Hygiene, and Environmental Safety for Citrus Operations.

A Certificate of Completion will be awarded to each person completing the training. **Pre-registration is free, but required** for both programs. To register, simply fill out the form below and mail or fax to Jane Wilson 700 Experiment Station Rd. Lake Alfred FL 33850; 863-956-4631; mjw@crec.ifas.ufl.edu. Visit the UF Postharvest Website (<http://postharvest.ifas.ufl.edu>) for more information (including program details) or contact Dr. Mark Ritenour at (772) 468-3922, ext. 167 (mritenour@ifas.ufl.edu).

Registration Form

I will be attending:

Packinghouse Day

September 2, 2004. CREC Lake Alfred, FL

Indian River Postharvest Workshop

September 9, 2004. IRREC Fort Pierce, FL



Admission - Admission is free. Please return registration form by August 27, 2004.

Seminars – Seminars will focus on important issues currently faced by citrus packers such as packinghouse food safety and biosecurity.

Workshops – workshops will offer training in food safety, forklift safety, and postharvest chemical handling and application.

Lunch will be provided by our industry sponsors:

Decco/Cerexagri – Packinghouse Day

FMC FoodTech – Indian River Postharvest Workshop

Name _____ **Company** _____

Address _____

Phone _____ **Fax** _____ **E-mail** _____

Please indicate sessions you plan on attending:

Main Session – Seminars 9:30am - 12:00pm

Workshops (please choose up to 2 from the list below) - 2 hours each, may be concurrent with seminars (or tradeshow at Packinghouse Day).

Food Safety - Worker Health and Hygiene

Forklift Safety

Packinghouse Postharvest Treatment Training – Biocides, Waxes, Recordkeeping, Hygiene, and environmental safety for Citrus Operations

Mail or fax completed forms to Jane Wilson 700 Experiment Station Rd. Lake Alfred FL 33850; Fax: (863) 956-4631; Tel: (863) 956-1151, ext. 1309; mjw@crec.ifas.ufl.edu.