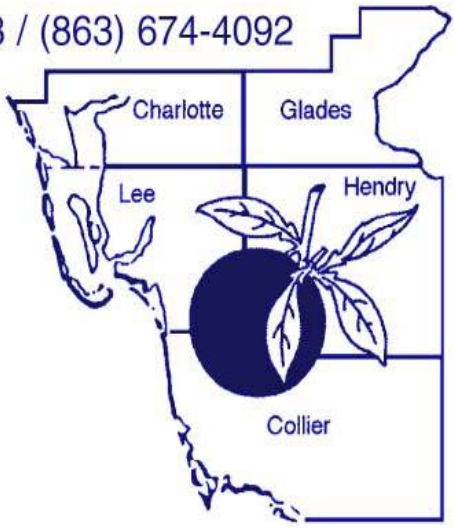
UNIVERSITY OF FLORIDA | IFAS EXTENSION

Hendry County Extension / P.O. Box 68 / LaBelle, Florida 33875-0068 / (863) 674-4092

Flatwoods Citrus



Vol. 8, No. 8 **August 2005**

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

E-mail: maz@ifas.ufl.edu

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

CITRUS EXPO IN FORT MYERS

Wednesday, August 24 & *Thursday, August 25, 2005*

CITRUS EXPO

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

Annual Conference of Extension Professionals (FAEP)

Date: September 12-15, 2005
Location: HYATT Sarasota on Sarasota Bay, FL
http://faep.ifas.ufl.edu/

7th International Congress of Citrus Nurserymen (ICCN)

Date: **September 17-21, 2005**
Location: **Cairo, EGYPT** **http://www.iccncongress.gov.eg/**

Contact E-mail: **iocd_far@yahoo.com**

51st Annual Meeting of the InterAmerican Society for Tropical Horticulture (ISTH), Date: October 10-14, 2005

Location: Hotel Hamaca Coral Hilton, at Boca Chica ten minutes from Santa Domingo International Airport, The Dominican Republic,
http://www.cedaf.org.do/eventos/ISTH2005/index.htm
For more information, contact Dr. Richard Campbell at
rcampbell@fairchildgarden.org

WEATHER SCHOOL, 2005

9:30 AM - 12:30 PM

Mark your calendar for the location near you

Dates & Locations:

Oct. 25 – Sebring
Nov. 3 – Bartow
Nov. 8 – Tavares
Nov. 9 – Ft. Pierce
Nov. 15 – Immokalee
Nov. 16 – Arcadia

Topics:

- Climate outlook (prediction for the winter)
- Principals of cold protection (include cultural practices)
- The FAWN cold protection tool kit
- Critical temperatures for citrus and other crops
- Agricultural forecasts
- Heat of fusion & evaporative cooling
- Starting and stopping your system (wet bulb shut off tool)
- Other FAWN information for cold nights

Following the program, we are planning a free lunch for all attendees.

Special Thanks to 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.

Susan S. Thayer

Maxijet
"The Standard of Quality in Low-Volume Irrigation"

8400 Lake Trask Rd.
P.O. Box 1849, Dundee, FL 33838
Phone: 800 881 6994

David Courtney

Creel Tractor Company

3771 Palm Beach Blvd
Fort Myers, FL 33916
Phone: 1 800 282 7949
Fax: 239 694 6059

Dan Brunetti

The KeyPlex People

Morse Enterprises Limited, Inc.
Phone: 800 433 7017
Fax: 305 577 0692
keyplex@keyplex.com

Donald Allen

AGLIME SALES, INC.
1375 Thornburg Road
Babson Park, FL 33827-9549
Mobile: 863 287 2925
Agnet # 52925

Wayne Simmons

SIMMONS CITRUS NURSERY
1600 Hwy 29 South
LaBelle, FL 33935
Phone: 863 675 4319
Fax: 863 675 6963

Ed Early

DuPont Ag. Products
5100 S. Cleveland Ave., Suite 318-368
Fort Myers, FL 33907
Phone: 239 332 1467
Fax: 239 332 1707

Robert F. Gregg

SYNGENTA
11051 Championship Drive
Fort Myers, FL 33913
Phone: 239 561 8568
Fax: 239 561 8569

FIRST BANK

P.O. Box 697
LaBelle, FL 33975
Phone: 863 675 4242
Fax: 863 675 1099
Moore Haven: 863 946 1515

GeoAg Solutions

David Summers (863) 441 1200
dsummers@geoagsolutions.com

Neal Horrom (239) 369 9806
nhorrom@geoagsolutions.com
www.geoagsolutions.com

Special Thanks **to 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.**

Bart Hoopingarner
Cerexagri, Inc.
6312 US Hwy 301 North #167
Ellenton, FL 34222
Phone: 941 737 7444
Fax: 941 776 1844

Nufarm Agriculture USA
Craig Noll
Office-239 549 2494
Mobile-239 691 8060
craig.noll@us.nufarm.com
Gary Simmons
Phone: 772 260 1058

Jay Hallaron
Crompton Crop Protection
Phone: 407 256 4667
Fax: 407 523 1097
jay.hallaron@cromptoncorp.com

MONSANTO
Mike Prescott
Phone: 863 773 5103
Nextel Agnet: 886
Thad G. Boatwright
Phone: 561 478 4970
Nextel Agnet: 10556

Van Donnan
CitriBlen®
The Scotts Company
Phone: 407 340 2166
Van.Donnan@scotts.com

Robert M. Bancroft
Citrus Hedging, Inc.
P.O. Box 1366
LaBelle, FL 33975
Phone: 863 675 2190
Fax: 863 675 2104

FARM CREDIT SOUTHWEST FLORIDA
330 N. Brevard Ave.
Arcadia, FL 34266
Phone: 800 307 5677
Fax: 941 494 6460

Rachel M. Walters
***BAYER* CropScience**
Phone & Fax: 239 278 9078
Mobile: 239 707 1198
E-mail:
rachel.walters@bayercropscience.com

Gaylon D. Pfeiffer
BASF Corporation
11806 Marblehead Drive
Tampa, FL 33626
Phone: 813 967 0024
Fax: 813 818 8694
pfeiffg@basf-corp.com

THE CITRUS EXPO

The 2005 Citrus Expo will be held on August 24 & 25 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 including a pre-registration form, which can be xeroxed if needed and mailed or faxed.

Pre-register before August 15 and 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 **"Building Value for Citrus Beyond the 'Commodity.'"** Environmental Enhancement of Agricultural Land will be addressed on Wednesday morning, Aug. 24th. On Wednesday afternoon, Cultivating Green Payment$ will be thoroughly discussed. Thursday program will focus on Promotion, Production, and Perspectives, and Canker and Other "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 $1,000 cash door price. 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***.

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.

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.

GULF CITRUS GROWERS ASSOCIATION
2005-2006

Directors

Charlotte County
Emmett Evans, III – Evans Properties, Inc.

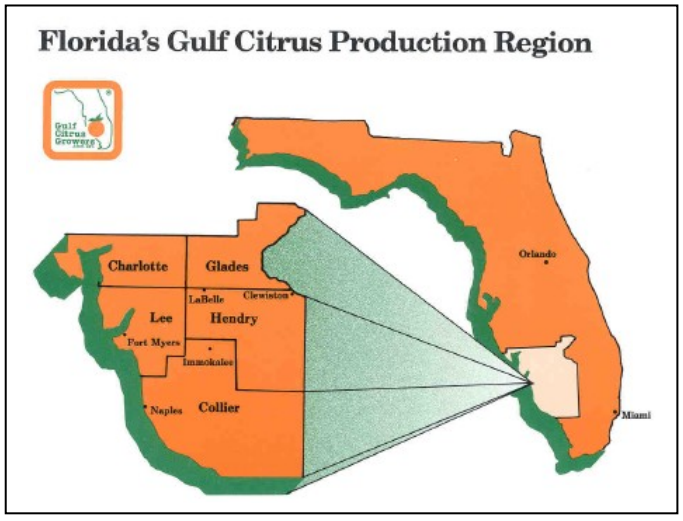
Collier County
John Hoffman – Barron Collier Partnership
Mike Murphy – Cooperative Producers, Inc.

Glades County
Miller Couse – Gram & Couse Farms

Hendry County
Mark Colbert – A.Duda & Sons, Inc.
Stephan Gardinier – Gardinier Florida Citrus
Steve Smith – Alico, Inc.
Wade Timpner – P. Jackson Citrus
Dallas Townsend – Dorlas Ranch
David Wheeler – Wheeler Farms, Inc.

Lee County
Elvie Engle – Farm Op, Inc.

At-Large Directors
Billy Heller – Pacific Tomato Growers
Callie Walker – HUPA, Inc.



Officers

President, David Wheeler
Vice President, Mark Colbert
Secretary, Wade Timpner
Treasurer, Miller Couse

Executive Vice President, Ron Hamel

Citrus Blight is a wilt and decline disease of citrus whose cause has not been determined. The first symptoms are usually a mild wilt and grayish cast to the foliage often accompanied by zinc deficiency symptoms.

Trees rapidly decline with extensive twig dieback, off-season flowering, and small fruit. Blight trees reach a stage of chronic decline, but seldom die.

The disease affects only bearing trees and usually first appears when the grove is 6-8 years old. The first affected trees in a grove are usually randomly distributed, but groups of blighted trees may eventually occur, either as clusters or down the row. The disease has been transmitted by root grafts, but not by limb grafts or with budwood. The means of spread, other than by root grafts, is not known.

Blight symptoms can be confused with other decline diseases and accurate diagnosis is important in order to follow proper practices. Citrus blight is characterized by failure to absorb water injected into the trunk. The best procedure for diagnosis of individual trees in the field is to test water uptake into the trunk using a battery-powered drill and a plastic syringe without a needle. Healthy trees or trees declining from Phytophthora root rot, nematodes, water damage, or tristeza will usually take up about 10 ml of water in 30 sec. Trees affected by citrus blight take up no water regardless of the amount of pressure applied. For confirmation, an accurate serological test is available at the University of Florida.

Trees on all rootstocks are susceptible, but significant differences between stocks exist. The rootstocks which are the most severely affected by blight are rough lemon, Volkamer lemon, Rangpur lime, trifoliate orange, and Carrizo citrange. Those most tolerant to blight are sweet orange, sour orange, Cleopatra mandarin, and Swingle citrumelo. Sweet orange and sour orange are not recommended because of problems with Phytophthora root rot and tristeza, respectively.

Recommended Practices

There is no known cure for citrus blight. Once trees begin to decline, they never recover. Severe pruning of blighted trees will result in temporary vegetative recovery, but trees decline again once they come back into production. The only procedures recommended are: (1) Remove trees promptly once yield of affected trees has declined to uneconomic levels. (2) Plant or replace trees with trees on rootstocks such as Cleopatra mandarin or Swingle citrumelo which do not develop blight at an early age. (3) Plant trees on vigorous, productive rootstocks such as Carrizo citrange or Volkamer lemon which develop blight at an early age and replace trees that decline as soon as they become unproductive. Production can be maintained at relatively high levels in spite of blight with these rootstocks.

SOME OBSERVATIONS ON CITRUS BLIGHT

Dr. Ken Derrick, University of Florida, IFAS, Citrus Research & Education Center

1. The cause of citrus blight (CB) is not known. It has been transmitted through root grafting, which suggests an infectious agent.

2. CB occurs in hot, humid areas, and is more severe in areas of high year around temperatures. In Venezuela and Northern Brazil trees are usually dead within six months of initial symptoms. In more temperate areas, trees with CB seldom die.

3. CB has not been observed under Mediterranean climates.

4. Symptoms of CB are a general decline that is not diagnostic. Trees with CB have a xylem dysfunction that restricts water flow resulting in drought symptoms.

5. Trees with CB have a significant loss of fibrous roots.

6. Symptoms of CB are not seen on young trees, but are seen on bearing trees approximately four or more years old.

7. The first trees to be seen with CB in a grove are randomly distributed.

8. Trees adjacent to trees with CB are at high risk for getting CB, resulting in clustering of diseased trees, but random single tree infections will continue to be observed throughout the grove.

9. Budded trees on all rootstocks are susceptible to CB. Seedling trees are also susceptible to CB.

10. The age at which trees develop CB varies greatly with rootstock: Rangpur lime, lemon types and Carrizo - 5 years; Swingle 5-12 years; Cleopatra - 15 years; sour orange - 25 years; and sweet orange - 30 years.

11. There are blocks on rough lemon that are 50 to 75 years old that have lost very few trees. These trees were propagated using old-line budwood.

12. Trees with CB can be identified by zinc accumulation in the wood, reduced water uptake and serological assays.

13. Trees with CB express several pathogenesis related proteins. Serological detection of one of these, p12, can be used to distinguish trees with CB from those with other declines.

14. Leaves from propagations using limbs from trees with blight by rooting or side grafting are p12 negative.

15. In assays of root-sprouts, around and attached to trees with CB, for p12 only about 5% will be positive.

16. Failure to transmit CB using bark patch inoculations or through limbs suggest that the pathogen that causes CB is restricted to the xylem of roots.

17. In some cases, CB appears to be associated with high pH soils.

18. The most vigorous trees in a grove will frequently be the first ones to have CB.

19. In a replicated experiment, replacing the soil around healthy trees with soil, taken from under a tree with CB, did not induce CB on the healthy trees.

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 BROWN ROT

Management of brown rot, caused by *Phytophthora nicotianae* or *P. palmivora*, is needed on both processing and fresh market fruit. While the disease can affect all citrus types, it is usually most severe on Hamlin and other early maturing sweet orange cultivars. Phytophthora brown rot is a localized problem usually associated with restricted air and/or water drainage. It commonly appears from mid-August through October following periods of extended high rainfall. It can be confused with fruit drop due to other causes at that time of the year. If caused by *P. nicotianae*, brown rot is limited to the lower third of the canopy because the fungus is splashed onto fruit from the soil. *P. palmivora* produces airborne sporangia and can affect fruit throughout the canopy. Early season inoculum production and spread of Phytophthora spp. are minimized with key modifications in cultural practices.

Skirting of the trees reduces the opportunity for soil-borne inoculum to contact fruit in the canopy. The edge of the herbicide strip should be maintained just inside of the dripline of the tree to minimize the exposure of bare soil to direct impact by rain. This will limit rain splash of soil onto the lower canopy. Boom application of herbicides and other operations dislodge low-hanging fruit. Fruit on the ground becomes infected and produces inoculum of *P. palmivora*, which can result in brown rot infection in the canopy as early as July while fruit are still green. The decay initially occurs as a light brown discoloration of the rind at any location on the fruit surface. The affected area is firm and leathery, and it retains the same degree of firmness and elevation as the adjacent healthy rind. At a later stage, a delicate white mycelium will form on the lesion surface. Fruit with brown rot have a characteristic pungent, rancid odor, which distinguishes the disease from the stem-end rots.

The beginning stages of the epidemic are very difficult to detect before the fruit are colored and showing typical symptoms. Application of residual herbicides earlier in the summer may reduce the need for post-emergence materials later and minimize fruit drop throughout this early stage of inoculum production from fallen fruit.

Usually a single application of a copper fungicide or Aliette late in August is sufficient to protect fruit through most of the normal infection period. No more than 20 lb/acre/year of Aliette should be applied for the control of all Phytophthora diseases. Aliette, a systemic fungicide at the rate of 5 lbs/acre protects against postharvest infection and provides 60-90 days control. Copper fungicides are only protective but are capable of killing sporangia on the fruit surface and thus reducing inoculum. They provide protection for 45-60 days. Use the label rate. With average quality copper products, usually 3-4 lb of metallic copper per acre are needed for the control of brown rot. When the disease has already spread, do not apply Aliette; spray copper only. Precautions should be taken during harvesting not to include brown rot-affected fruit in the field containers as this could result in rejection at the processing or packing facility.

SPRAY DRIFT OF PESTICIDES

What Is Pesticide Spray Drift?

EPA defines pesticide spray drift as the physical movement of a pesticide through air at the time of application or soon thereafter, to any site other than that intended for application (often referred to as off target).

How Does Spray Drift Occur?

When pesticide solutions are sprayed by ground spray equipment or aircraft, droplets are produced by the nozzles of the equipment. Many of these droplets can be so small that they stay suspended in air and are carried by air currents until they contact a surface or drop to the ground. A number of factors influence drift, including weather conditions, topography, the crop or area being sprayed, application equipment and methods, and decisions by the supervisor or applicator.

What Are the Impacts of Spray Drift?

Off-target spray can damage other crops and affect human health and the environment. Drift results in a waste of product and reduces the effectiveness of pesticide application.

How Pesticides Drift?

There are two basic ways in which pesticides move downwind:

Vapor drift. When pesticide molecules volatilize (evaporate into the air), they can move downwind as a vapor. This form of drift is related to the product, not to the type of application method used.

Particle drift. This is the movement of spray particles, or droplets, formed during application. Several key factors determine if a spray droplet will hit its target or drift downwind: (1) the droplet size; (2) the equipment and method of application; (3) the wind speed and (4) other climatic conditions.

1. Droplet Size. "Atomizing" the spray solution into very small droplets will increase coverage, but will also increase the potential for evaporation and drift. The smaller the droplet, the greater is the risk of drift. Droplets over 150 microns in size resist evaporation much more than smaller droplets because of their large surface area. Therefore, the potential for drift rapidly decreases when the diameter of droplets is increased to about 150 microns.

2. Equipment and Application Methods.

a) ***Lower spray height.*** You can reduce drift by mounting the spray boom closer to the ground (without sacrificing the uniformity of the spray pattern). That is because wind speed

increases with height. The correct spray height for each nozzle is determined by the nozzle spacing and the spray angle. Wide-angle nozzles can be placed closer to the ground than narrow-angle nozzles. However, wide-angle nozzles also produce smaller droplets, offsetting the advantage of a lower boom height to some extent.

b) ***Use the lower end of the pressure range.*** Higher pressures generate many more small droplets (less than 100 microns). For this reason, refrain from using pressures that exceed 40 to 45 psi.

c) ***Spray volume and pressure for foliar herbicides.*** Many applicators are reducing the spray volume of foliar herbicides from the commonly used 10-20 GPA to 5-10 GPA. When you reduce spray volume, the herbicide concentration will increase to maintain the same dose of active ingredient. But as spray volume is reduced, the droplet size will decrease, and this means greater drift potential. Research has also shown that control of some broadleaf weeds with contact herbicides is reduced when you cut back on spray volume. However, reduced volumes have little effect on weed control with most translocated herbicides, as long as the chemical is applied properly. To compensate for the reduced spray volume, some applicators will increase spray pressure from a normal 30-40 psi to 60-120 psi. Increasing pressure should not be used as a substitute for spray volume. It is recommended to maintain pressure below 45 psi.

3. Wind speed. Wind speed and direction, temperature, relative humidity, and atmospheric stability all affect spray drift. Wind speed, however, is usually the most critical meteorological condition. The greater the wind speed, the farther off-target small droplets will be carried. Although there is no maximum wind speed to serve as a guideline in all situations, try to spray when the wind speed is less than 10 miles per hour. To minimize the damage done by drift, it is also important to determine the wind direction relative to sensitive crops (something that is often overlooked). To greatly reduce damage to sensitive plants, leave a buffer zone at the downwind edge of the spray area. After the wind has died down or changed direction, you can then safely spray the buffer zone.

4. Temperature and inversions. Temperature and humidity affect the amount of drift that occurs through evaporation of spray particles. Although some spray is lost through evaporation under all atmospheric conditions, the losses are less likely in cool, damp conditions. Temperature also influences atmospheric stability, as well as the presence of air turbulence and “inversions.” An inversion can occur when the air is very calm with very little air mixing. This condition makes it easier for spray to move slowly downwind. In other words, extremely calm conditions can also pose the risk of drift. Inversions generally occur in early morning or near bodies of water. You can recognize an inversion by observing a column of smoke. If the smoke does not dissipate, or if it moves downwind without mixing vertically, conditions are not good for spraying.

How to reduce drift?

- Avoid high spray pressure, which create finer droplets. Use as coarse a spray as possible and still obtain good coverage and control. Droplet size is one of the most important factors affecting drift, however, addressing droplet size alone is not sufficient to reduce the probability of drift and potential damage.
- Don't apply pesticides under windy or gusty conditions; don't apply at wind speeds over 10 mph. Read the label for specific instructions.
- Maintain adequate buffer zones to insure that drift does not occur off the target area.
- Be careful with all pesticides. Insecticides and fungicides usually require smaller droplet sizes for good coverage and control than herbicides; however, herbicides have a greater potential for non-target crop damage.
- Choose an application method and a formulation that is less likely to cause drift. After considering the drift potential of a product/formulation/application method, it may become necessary to use a different product to reduce the chance of drift.
- Use drift reduction nozzles.
- Use wide-angle nozzles, lower spray boom heights, and keep spray boom stable.
- Use drift control/drift reduction agents. These materials are designed to minimize the formation of droplets smaller than 150 microns. They help produce a more consistent spray pattern and aid in deposition. Drift control additives do not eliminate drift. Therefore, common sense is still required.
- Apply pesticides early in the morning or late in the evening; the air is often more still than during the rest of the day.
- Don't spray during thermal inversions, when air closest to the ground is warmer than the air above it. When possible, avoid spraying at temperatures above 90°-95° F.
- Know your surroundings! You must determine the location of sensitive areas near the application site. Some crops are particularly sensitive to herbicides, which move off-site.
- Be sure you are getting the spray deposition pattern you think you are; service and calibrate your equipment regularly.
- Whenever possible, cut off the spray for missing trees in the row. Spray that does not enter the tree canopy is wasted and contributes significantly to drift problems.
- Keep good records and evaluate pesticide spray results.

Remember, ALWAYS read and follow label directions.

Certifying and Training Applicators

EPA works with the USDA and the Florida Department of Agriculture and Consumer services (FDACS) to carry out certification and training programs for pesticide applicators. States have primary responsibility for ensuring that pesticide applicators are licensed and certified, as required by Federal and state laws, to apply pesticides in an appropriate manner. Part of the program for certification includes training about how to protect people and the environment from off-target spray drift. In Florida, the certification exams for restricted use pesticide applicator licenses are administered by the **University of Florida/IFAS Cooperative Extension Service** in local county offices statewide. Individuals who need to take the exams should check with local extension office(s) for training and exam schedules **http://www.ifas.ufl.edu/extension/cesmap.htm**

SPRAY TANK MIXING

Tank mixing allows the grower to reduce the number of times spray machinery is used. The benefits include fewer trips, which reduces cost, soil compaction, and crop damage. Tank mixing is a complex issue. Some tank mixes are beneficial, but others cause problems. The types of chemicals that are used in a sprayer include water, pesticides, adjuvants, and fertilizers. As the number of ingredients increases in a tank mix, chances for incompatibility and phytotoxicity increase, particularly at lower spray volumes. Well water is better than ditch and pond water because it is cleaner. Ditch and pond water can plug up screens, pumps, and nozzles and be a source of inoculum for plant diseases. However, well water is alkaline, and it is believed that as the pH of the final spray mix increases, the effectiveness of some chemicals is significantly reduced. Loading the spray materials into the spray tank should be done after the tank is at least half full with water. The agitation system should be operating to attain thorough mixing. This minimizes the risk for physical and chemical incompatibilities. Loading should be away from surface water. The handler should wear the required protection as indicated on the label. Remember that the more chemicals are used in the same mix, the more likely that an adverse effect on the crop will occur. Unless the pesticide labeling states, add pesticides to the water using the W-A-L-E plan: Dry formulations should be added to the tank first followed by the liquid formulations. To the water, first add **W**ettable powders, prills [(DF's, DG's, water-dispersible granules (WDG's)] and soluble powders. Second, **A**gitate thoroughly and add the remaining quantity of water. Third, add the **L**iquid products such as solutions, flowables, and adjuvants. Finally, add **E**mulsifiable concentrates (EC's) and oils last. Tank mixing is a necessity. However, success with tank mixing is based upon slowly acquired experience. It is not possible to test the thousands of combinations that exist with tank mixing. Do the testing on a small scale and get information from reliable sources on tank mixing.

THE USE OF ADJUVANTS

Adjuvants are non-pesticidal chemicals, that when added to a spray mix, are supposed to enhance and improve its effect. Surfactants, spreaders, stickers, buffers, drift retardants, penetrants, and foam busters are examples of adjuvants. All surfactants are adjuvants, but not all adjuvants are surfactants. The importance on inclusion of an adjuvant in herbicide formulations has become an almost universal practice. The key to success with adjuvants is to use them at the recommended rate and as little as possible. At higher rates, adjuvants can cause damage to crops. Let the label be your guide in selecting adjuvants. The use of surfactants, oils, emulsifiers and fertilizer salts can enhance the activity of foliar-applied herbicides. The addition of ammonium sulfate to spray mixtures of certain foliar-applied herbicides enhances herbicide efficacy, including glyphosate. Surfactants enhance spray retention and penetration due to a number of surface properties, including reduction in surface tension and contact angle of spray droplet. Therefore, they may enhance cuticle retention, wetting and spreading on the leaf surface.

GRAPEFRUIT HEALS STOMACH ULCERS

Grapefruit extract can help to heal stomach ulcers, research suggests.

Polish researchers used an extract of the fruit's seed to reduce the size of stomach ulcers in rats. They found the extract had strong antibacterial and antioxidant properties, which calm the gastric tract and aid the healing process.

Details of research, by Jagiellonian University, were presented at Digestive Disease Week - a conference of leading digestive experts in Chicago.

The researchers induced gastric ulcers in rats, and applied graded doses of the fruit extract to measure its effect.

In particular, they looked at levels of gastric secretion - one of the major causes of gastric ulcers.

Rats treated with GSE at 10 mg/kg experienced a 50% reduction in gastric acid secretion, and a progressive decrease in the area of their ulcer. The treatment also prompted a significant rise in blood flow at the ulcer sites - another phenomenon that can aid healing.

The beneficial effects, however, were diminished in the presence of drugs, which inhibit two enzymes, COX-1 and COX-2, which play a key role in maintaining the health of the stomach lining.

The researchers believe that the grapefruit extract somehow joins forces with these enzymes to promote healing.

Lead researcher Dr Thomas Brzozowski said: "Because grapefruit is acidic in nature, people with ulcers might assume that they should not include the fruit in their diet. "However, this research suggests the exact opposite."

Dr Lee Kaplan, of Massachusetts General Hospital, said: "Incorporating healthy eating habits and lifestyle choices can directly benefit digestive and overall health over the long term."

However, Dr John Bennett, chairman of Core, the UK charity fighting gut and liver disease, said the findings were of limited practical value, as powerful drugs were available both to treat, and minimize the risk of a stomach ulcer.

"I suppose this might potentially provide an alternative to patients who do not want to take anti-secretory drugs," he said.

Grapefruit juice can interact with some drugs, including cholesterol-reducing statins, and calcium channel blockers, given to heart patients.

<u>Source</u>: American Gastroenterological Association

UF/IFAS: A Brief Overview

The University of Florida Institute of Food and Agricultural Sciences (IFAS) is a federal, state, and local government partnership dedicated to education, research, and extension.

Education - UF/IFAS can trace its roots to the Morrill Act of 1862, which established the Land Grant university system. On July 2, 1862, President Abraham Lincoln signed into law what is generally referred to as the Land Grant Act. The new piece of legislation introduced by U.S. Representative Justin Smith Morrill of Vermont granted to each state 30,000 acres of public land for each Senator and Representative under apportionment based on the 1860 census. Proceeds from the sale of these lands were to be invested in a perpetual endowment fund, which would provide support for colleges of agriculture and mechanical arts in each of the states. The establishment of Florida Agricultural College at Lake City in 1884 under the Morrill Act marked the beginning of what became the College of Agriculture of the University of Florida in 1906.

Research - Through approval of the Hatch Act of 1887, congress provided for the establishment of an agricultural experiment station at each of the land grant colleges. The Florida Agricultural Experiment Station was established in 1888 as a part of the Florida Agricultural College at Lake City. In 1906, the East Florida Seminary combined with the Florida Agricultural College and was moved to Gainesville. The renamed University of Florida was now the land grant college in Florida and the Agricultural Experiment Station became a unit of the College of Agriculture at UF. Today the Florida Agricultural Experiment Station operates research and education programs at 22 locations throughout Florida.

Extension - The third arm of the land grant system was provided by the Smith-Lever Act in 1914. This Act established the Cooperative Extension Service and specified that the service would be associated with a land grant college. The Act also stipulated that Federal funds be matched with local funds. Florida Cooperative Extension is a partnership between UF/IFAS, United States Department of Agriculture, and county governments in Florida to provide scientific knowledge and expertise to the public through non-resident educational programs. Operating as part of IFAS, Extension serves each of the state's 67 counties by providing information and conducting educational programs on issues such as sustainable agriculture, competitiveness in world markets, natural resource conservation, energy conservation, food safety, child and family development, consumer credit counseling, and youth development.

Florida Agricultural Experiment Station (UF/IFAS)

Citrus Research and Education Center (Lake Alfred)
Everglades Research and Education Center (Belle Glade)
Fort Lauderdale Research and Education Center
Gulf Coast Research and Education Center (Bradenton)
Gulf Coast Research and Education Center (Dove
Indian River Research and Education Center, Ft. Pierce
Range Cattle Research and Education Center (Ona)
Tropical Research and Education Center (Homestead)
West Florida Research and Education Center (Jay, Milton)
Mid-Florida Research and Education Center (Apopka, Plant City)
North Florida Research and Education Center (Marianna, Monticello, Quincy)
North Florida Research and Education Center - Suwannee Valley (Live Oak)
Southwest Florida Research and Education Center (Immokalee)

Florida Medical Entomology Laboratory (Vero Beach)
Tropical Aquaculture Laboratory Research and Demonstration Site (Ruskin)

Forty-Fourth Annual Citrus Packinghouse Day	Indian River Postharvest Workshop
Thursday, September 1, 2005 Citrus Research and Education Center 700 Experiment Station Road, Lake Alfred, FL 33850 Lunch Sponsor: DECCO/Cerexagri Includes exhibits by more than 30 companies	Thursday, September 8, 2005 Indian River Research and Education Center 2199 S. Rock Rd. Ft. Pierce, FL 34945 Lunch Sponsor: FMC FoodTech No exhibitors

Mark your calendars for the Citrus Packinghouse Day on September 1st, and the Indian River Postharvest Workshop on September 8th. 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.**)
- Fruit and Packingline Sanitation
- Packinghouse biosecurity.
- Citrus Canker Eradication Progress.
- Use of color separation before degreening.
- Prospects and progress for robotic harvesting of fresh Florida citrus.
- Prospects for good fruit quality this year.

Indian River Postharvest Workshop program will include the latest information on citrus canker eradication (Tim Schubert), packinghouse biosecurity issues (Renée Goodrich), and presentations 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:

- Canker decontamination (certification from the Division of Plant Industry).
- Packinghouse Postharvest Treatments - Biocides, Waxes, Recordkeeping, Worker Hygiene, and Environmental Safety for Citrus Operations.
- Forklift Driving Safety.

A Certificate of Completion will be awarded to each person completing the training. **Registration is free** 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 1, 2005. CREC Lake Alfred, FL

❑**Indian River Postharvest Workshop**
September 8, 2005. IRREC Fort Pierce, FL

UNIVERSITY OF FLORIDA
IFAS EXTENSION

Admission - Admission is free. Please return registration form by August 25, 2005 so that we have an idea of the number of persons for each session.

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

Workshops – workshops will offer training in citrus canker decontamination, forklift safety, and postharvest chemical handling and worker hygiene.

Lunch is **FREE** and 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 – about 2 hours each, may be concurrent with seminars (or tradeshow at Packinghouse Day).
- ❑ Canker Decontamination Certification
- ❑ Packinghouse Postharvest Treatments - Biocides, Waxes, Recordkeeping, Worker Hygiene, and Environmental Safety for Citrus Operations.
- ❑ Forklift Safety

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.

FLATWOODS CITRUS NEWSLETTER

☐ If you did not receive the ***Flatwoods Citrus*** newsletter and would like to be on our mailing list, please check this box and complete the information requested below.

☐ If you wish to be removed from our mailing list, please check this box and complete the information requested below.

Please send: Dr. Mongi Zekri
Multi-County Citrus Agent
Hendry County Extension Office
P.O. Box 68
LaBelle, FL 33975

Subscriber's Name:_____

Company:_____

Address:_____

City:_____State:_____Zip:_____

Phone:_____

Fax:_____

E-mail:_____

Racial-Ethnic Background

__American Indian or native Alaskan
__Asian American
__Hispanic
__White, non-Hispanic
__Black, non-Hispanic

Gender

__Female __Male