UNIVERSITY OF FLORIDA | EXTENSION
Institute of Food and Agricultural Sciences

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Flatwoods Citrus

Vol. 7, No. 9 **September 2004**

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

VERY IMPORTANT!

CITRUS GREENING IS GETTING CLOSER TO FLORIDA

Citrus greening is considered the most serious and devastating citrus disease. Citrus greening may have been in Brazil for several years, but was discovered only a few months ago. This disease is transmitted by the citrus psyllid, which is well established in Florida. All citrus growers, production managers, and nurserymen are invited to attend the seminar program scheduled on ***Thursday, September 16, 2004*** to get an update on the situation in Brazil, listen to an expert who had experience with this disease in Asia, and learn more about this exotic disease, its threat to our industry, effective strategies, and recommendations to keep this disease and other exotic pests and diseases offshore, and how to get prepared in case they get here.

Seminar at the Immokalee IFAS Center

Date & time: Thursday, September 16, 2004, 10:00 AM – 12:00 Noon
Topics: **Citrus Greening and the Citrus Psyllid**
Speakers: Tim Gast and Drs. Ron Brlansky and Phil Stansly
2 CEUs for Pesticide License Renewal, 2 CEUs for Certified Crop Advisors (CCAs)
Sponsor: Rachel Walters**,** Bayer CropScience
Following the seminar, we are planning a free lunch (Compliments of Bayer CropScience). To reserve lunch, call 863 674 4092 no later than Tuesday, 14 Sept. 2004.

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

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

Seminar at the Immokalee IFAS Center

Date & time: Tuesday, October 19, 2004, 9:30 AM – 12:00 Noon
Topics: Maximizing Efficiencies While Minimizing Production Costs
CEUs for Pesticide License Renewal and for Certified Crop Advisors will be offered.

Maximizing Efficiencies While Minimizing Production Costs

The citrus extension agents with the University of Florida's Cooperative Extension Service will be conducting a seminar program during the month of October in 6 locations. **For more information or to register, please read the enclosed sheet and contact the noted Extension Agent.**

Rescheduled Seminar - Hendry County Extension Office, LaBelle

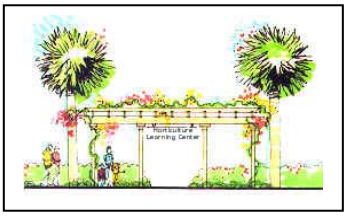
Date & time: Thursday, October 21, 2004, 8:00 AM – 12:00 Noon
Topics: **Harvesting Safety and Compliance Seminar Presented by: GeoAg Solutions** featuring information regarding Harvesting Safety, Agricultural Worker Protection Act (AWPA), Compliance and much more.
Door prices: Several great prizes including a guided fishing trip.
2 CEUs for 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 Tuesday, 19 Oct. 2004.

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

SW Florida 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

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

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FLOODING INJURY

Almost all citrus trees grown in southwest Florida are located on high water table, poorly drained soils. Water management on poorly drained soils is difficult and expensive because during heavy rains in the summer, excess water must be removed from the rootzone and in periods of limited rainfall, irrigation is needed. On these soils, drainage is as important as irrigation. The concept of total water management must be practiced. If either system—irrigation or drainage—is not designed, operated, and maintained properly, then the maximum profit potential of a grove cannot be achieved. Both surface and subsoil drainage is necessary to obtain adequate root systems for the trees.

Roots, like the rest of the tree, require oxygen for respiration and growth. Soils in Florida typically contain 20-21 % oxygen. When flooding occurs, the soil oxygen is replaced by water. This condition causes tremendous changes in the types of organisms present in the soil and in the soil chemistry.

Flooding injury would be expected if the root zone were saturated for 3 days or more during extended summer rains at relatively high soil temperatures (86-95° F). Flooding during the cooler December-March period can be tolerated for several weeks at low soil temperatures (< 60° F). The rate of oxygen loss from the soil is much greater at high vs. low temperatures. The potential for damage to roots is less obvious but equally serious when the water table is just below the surface. Flooding stress is usually less when water is moving than when water is stagnant. The use of observation wells is a very reliable method for evaluating water-saturated zones in sites subject to chronic flooding injury.

Short-term estimates of flooding stress can be obtained by digging into the soil and smelling soil and root samples. Sour odors indicate an oxygen deficient environment. The presence of hydrogen sulfide (a disagreeable rotten egg odor) and sloughing roots indicate that feeder roots are dying. Under flooded conditions, root death is not exclusively associated with oxygen deficiency. Anaerobic bacteria (the kind that can grow only in the absence of oxygen) develop rapidly in flooded soils and contribute to the destruction of citrus roots. Toxic sulfides and nitrites formed by anaerobic sulfate- and nitrate-reducing bacteria are found in poorly drained groves. Sulfate-reducing bacteria require both energy and sulfates in order to change sulfates to sulfides. The best sources of energy have been found to be certain organic acids contained in citrus roots, grass roots, and buried pieces of palmetto. Thus, citrus roots can contribute to their own destruction by being an energy source for these bacteria.

Symptoms of flooding injury may occur within a few days or weeks, but usually show up after the water table has dropped and the roots become stranded in dry soils. Leaf wilting, leaf drop, dieback, and chlorosis patterns may develop and tree death may occur. Trees subjected to chronic flooding damage are stunted with sparse canopies, dull colored, small leaves and produce low yields of small fruit. New flushes of growth will have small, pale leaves due to poor nitrogen uptake by

restricted root systems. Usually, the entire grove is not affected, but most likely smaller more defined areas will exhibit the symptoms. Striking differences in tree condition can appear within short distances associated with only slight changes in rooting depths. Water damage may also be recognized by a marked absence of feeder roots and root bark, which is soft and easily sloughed.

With acute water damage, foliage wilts suddenly followed by heavy leaf drop. Trees may totally defoliate and actually die, but more frequently partial defoliation is followed by some recovery. However, such trees remain in a state of decline and are very susceptible to drought when the dry season arrives because of the shallow, restricted, root systems. Moreover, waterlogged soil conditions, besides debilitating the tree, are conducive to the proliferation of soil-borne fungi such as Phytophthora root and foot rot. These organisms cause extensive tree death especially in poorly drained soils.

Water damage may usually be distinguished from other types of decline by a study of the history of soil water conditions in the affected areas. Areas showing water damage are usually localized and do not increase in size progressively as do areas of spreading decline. Foot or root rot symptoms include a pronounced chlorosis of the leaf veins caused by root damage and girdling of the trunk. Lesions also appear on the trunk usually near the soil level (foot rot) or roots die and slough-off (root rot). Flood damage does not produce lesions. Trees with blight or CTV are usually randomly distributed within the grove and diagnostic tests are available to distinguish them from water-damaged trees.

Citrus trees respond physiologically to flooding long before morphological symptoms or yield reductions appear. Photosynthesis and transpiration decrease within 24 hours of flooding and remain low as flooding persists. Water uptake is also reduced which eventually translates to decreased shoot growth and yields.

It is both difficult and costly to improve drainage in existing groves, so drainage problems should be eliminated when the grove area is prepared for planting by including a system of ditches, beds and/or tiling. Growers should not depend on the slight and often unpredictable differences in rootstock tolerance to waterlogging to enable trees to perform satisfactorily under such conditions. Trees, irrespective of scion and rootstock cultivars, should be planted under the best drainage conditions possible. Drainage ditches should be kept free of obstruction through a good maintenance program including chemical weed control. Tree recovery from temporary flooding is more likely to occur under good drainage structure maintenance conditions.

Do not disk a grove if trees were injured by flooding. Irrigation amounts should be reduced, but frequencies should be increased to adequately provide water to the depleted, shallow root systems. Soil and root conditions should be evaluated after the flooding has subsided. Potential for fungal invasion should be determined through soil sampling and propagule counts. If there is a Phytophthora problem, the use of certain fungicides can improve the situation. The nature of the soil, the rootstock, root condition, duration of flooding, soil and air temperature, soil pH, and the presence of sulfur and organic matter in the soil are all factors that need to be considered when trying to evaluate flooding injury and manage tree recovery.

HURRICANE CHARLEY

Hurricane Charley devastated Florida citrus growers as it made its way through southwest and central Florida on Friday August 13, 2004. Three of the state's largest citrus producing counties - DeSoto, Hardee and Polk - were hit hard by the storm. Growers in these areas have seen their groves, barns, equipment and homes destroyed.

Several reports indicated that damage to trees was of varying degrees. Some trees were uprooted or blown out of the ground. Others have major limbs split off or have major defoliation. Fruit littered the ground in many areas with oranges and specialty fruit suffering moderate losses. Grapefruit suffered the most loss because of the larger size and heavier weight. Fruit will continue to fall. Southwest and east coast growing counties experienced very minor to no damage.

Officials estimate that the storm reduced the overall citrus harvest for the upcoming season by 20% of the total crop, which equates to nearly $150 million in crop loss given crop price levels for the past two seasons. This figure is for fruit only and does not represent tree loss and replanting costs or damage costs associated with barns, equipment, processing and packing facilities. In addition, growers expect more fruit to fall in the coming weeks.

Citrus associations and agencies are communicating with state and federal authorities to ensure that growers will be able to obtain disaster assistance to alleviate their losses.

Tips for Tree Recovery

By **Dr. Jonathan H. Crane**, Tropical Fruit Crop Specialist
University of Florida, IFAS, Tropical Research and Education Center, Homestead

I. Take pictures of all the damage you can. This will be used for USDA-FSA crop and tree damage payment programs.

II. Large trees - that have fallen over

#1. Cover the trunks and major limbs to shade them either by

a) Use detached limbs, tarps
b) Spray sun exposed surfaces with 50/50 mixture of white latex paint
c) Make a mixture of water and mixture of slaked lime [also called calcium hydroxide and hydrated lime = $Ca(OH)_2$]. Formula, 50 lbs slaked lime + 10 lbs/zinc oxide in 100 gallons of water. The idea is to shade the trunk and major limbs so they do not overheat and die.

#2. For large trees that have fallen over but still have some root system in the ground and have leaves - prune back 1/3 to 2/3 of the canopy to reduce the water loss from the tree.

#3. To stand up toppled trees that have part of the root system in the ground you want to reset the trees back to the same level they were before:

a) Pull back soil from the area where the roots came out of the ground
b) You may need to cut off some badly broken roots (but try to leave as much as possible)
c) Cut back the top of the tree (the larger the tree the more you may need to cut in order to reduce the weight and pull the tree up) - also if it has leaves you need to remove some canopy to reduce water loss
d) Pull tree up using a cloth or rope sling (no wire or chains as these may break and be VERY dangerous) and a tractor or backhoe
e) Once the tree is set up place one or more Y-shaped limbs onto the trunk to steady the tree
f) Back fill with soil to cover the roots and
g) Water-in. This should work for most large fruit trees.

Large trees that have leaves and maybe fruit and are still standing – Even though they may have a broken limb here and there and look relatively ok (rainy cloudy weather is good) – the root system has been stressed (broken – especially fibrous roots), you may begin to see drought stress (leaf wilt, drop, stem and limb dieback). Highly recommend that

a) Fruit be removed (we have noted trees with fruit stressed out and many died compared to trees with no fruit, physiologically makes sense)
b) Growers strongly consider removing 1/3 to ½ of the canopy to reduce the water demand on a damaged/reduced root system.

III. Small trees - that have fallen over

#1. If you cannot get to standing them up immediately:

a) If they have leaves, remove 1/3 to 2/3 of the canopy
b) Use the removed branches and foliage to cover the trunk and major limbs
c) If no leaves, try not to remove limbs

#2. Use the same procedure to stand them up as above.

Small trees with leaves and/or fruit and are still standing – what I said for the big trees applies. I'd remove the fruit first, watch carefully then if you have to reduce the canopy.

IV. Watering:

a) Whether trees are standing or have fallen over and only have a few leaves - leave the canopy alone; if the trees has a lot of leaves remove 1/3 to 1/2 to reduce tree water loss.
b) For trees with NO leaves - once the tree has been reset (stood up), water the tree in well. However, after doing this, limit watering the trees with no leaves because over watering may cause rotting of the roots.
c) Trees with a lot of leaves - water normally, with some leaves, reduce the amount of water but water frequently.

V. Fertilizer:

a. Trees still standing with few to no leaves or with some of the leaves cut off by pruning - reduce the amount of fertilizer by the percent canopy not present (e.g., if half the leaves are gone, reduce the rate by 50%). However, as the new leaves begin to come out, use small amounts of fertilizer frequently.
b. Trees still standing with leaves - fertilize normally.
c. Trees that fell over and are now stood up (reset) - if no leaves, wait a few weeks until you see new leaves beginning then fertilize with small amounts frequently.

VI. Bark boring beetles. After Hurricane Andrew we lost thousands of trees to bark boring beetles that honed in on drought stressed trees – they bring along a fungus that then colonizes the tree and it dies. Best remedy is to reduce the chances of water stress on the trees.

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 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 as little as possible and at the recommended rate. At higher rates, adjuvants can cause damage to crops. Let the label be your guide in selecting adjuvants. The use of oils, surfactants, 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.

PHYTOPHTHORA FOOT ROT AND ROOT ROT

Foot rot results from infection of the scion near the ground level, producing bark lesions, which extend down to the budunion on resistant rootstocks.

Crown rot results from infection of the bark below the soil line when susceptible rootstocks are used. Root rot occurs when the cortex of fibrous roots is infected, turns soft and appears water-soaked. Fibrous roots slough their cortex leaving only white thread-like stele.

When managing Phytophthora-induced diseases, consider integration of cultural practices (e.g., disease exclusion through use of Phytophthora-free planting stock, resistant rootstocks, proper irrigation practices) and chemical control methods.

Cultural practices. Field locations not previously planted with citrus are free of citrus-specific *P. nicotianae*. Planting stock should be tested free of Phytophthora in the nursery and inspected for fibrous root rot in the nursery or grove before planting. In groves with a previous history of foot rot, consider use of Swingle citrumelo for replanting. Swingle citrumelo is resistant to foot rot and roots do not support damaging populations once trees are established.

Cleopatra mandarin should be avoided because it is prone to develop foot rot when roots are infected in the nursery or when trees are planted in flatwoods situations with high or fluctuating water tables and fine-textured soils. Trees should be planted with the budunion well-above the soil line and provided with adequate soil drainage. Overwatering, especially of young trees, promotes buildup of populations in the soil and increases risk of foot rot infection. Prolonged wetting of the trunk, especially if tree wraps are used on young trees, should be avoided by using early to midday irrigation schedules. Control of fire ants prevents their nesting under wraps and causing damage to tender bark.

Sampling for *P. nicotianae*. Population densities of the fungus in grove soils should be determined to assist in decisions to treat with fungicides. Soil samples containing fibrous roots should be collected during the spring through fall (March to November) from under-canopy within the tree dripline. Individual small amounts of soil from 20 to 40 locations within a 10-acre area are composited into

one resealable plastic bag to retain soil moisture. Samples must be kept cool but not refrigerated for transport to the analytical laboratory. Currently, populations in excess of 10 to 15 propagules per cm^3 soil are considered damaging. The same soil sample could be tested for populations of nematodes, to assess whether they occur at damaging levels.

Chemical control.

Use of fungicides in young groves should be based on rootstock susceptibility, likelihood of Phytophthora infestation in the nursery, and history of Phytophthora disease problems in the grove. For susceptible rootstocks, such as Cleopatra mandarin and sweet orange, fungicides may be applied to young trees on a preventive basis for foot rot. For other rootstocks, fungicide treatments should commence when foot rot lesions develop. The fungicide program for foot rot should be continued for at least one year for tolerant rootstocks, but may continue beyond for susceptible stocks.

In mature groves, the decision to apply fungicides for root rot control is based on yearly soil sampling to indicate whether damaging populations of *P. nicotianae* occur in successive growing seasons. Time applications to coincide with periods of susceptible root flushes in late spring and late summer or early fall. Soil application methods with fungicides should be targeted to under canopy areas of highest fibrous root density. To avoid leaching from the root zone, soil-applied fungicides should not be followed by excessive irrigation. Aliette and Ridomil are both effective, but alternation of the materials should be practiced to minimize the risk of the development of fungicide resistance.

Foliar spray with Aliette: It is recommended to buffer the spray solution to pH 6 or higher to avoid phytotoxicity when copper has been used prior to or with Aliette. For nonbearing trees, use 5lb/100 gal. For bearing trees, use 5 lb in 100-150 gal/acre. Soil application with Ridomil Gold 4EC: Apply 1quart/treated acre or soil drench by applying 5 gallons of solution (1 quart/100 gal) in water ring. For more details and product selection and rates, get your copy of the 2004 Florida Citrus Pest Management Guide.

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:_____

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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

Maximizing Efficiencies While Minimizing Production Costs

The citrus extension agents with the University of Florida Extension Service will be conducting a program series during October aimed at maximizing efficiencies while minimizing production costs. As fruit prices have decreased, growers need to consider every opportunity to reduce production costs while maintaining good production in an effort to achieve a profit. Reducing costs is not an easy production decision as it may reduce fruit yields, thereby making profitability increasingly difficult. Topics discussed at each location will include:

- Citrus economics, why we are where we are?
- Controlling major citrus pest on a minimum production program
- Increasing efficiency and reducing cost of nutritional programs
- Strategies to consider in minimizing grove floor management costs
- Utilization of FAWN for scheduling cold protection
- Utilization of FAWN for irrigation scheduling
- Cost share options for specific BMP programs
- Cost of minimum production programs

Program speakers include Ron Muraro, Chris Oswalt, Mongi Zekri, Steve Futch, John Jackson, Greg Hartt, and Jack Hebb. Continuing education units (CEUs) will be offered for restricted use pesticide license as well as certified crop advisors. Each program session will begin at 9:30 AM and conclude at 12:00 Noon. **To register for any one of the below listed classes, please contact the noted Extension Agent.**

Maximizing Production Efficiencies While Minimizing Citrus Production Costs					
Date	**Location**	**Address**	**City**	**Contact name**	**Phone #**
Oct.19	Southwest Fla. Res. & Education Center	2686 SR 29 N.	Immokalee	Mongi Zekri	863-674-4092
Oct. 20	Highlands County Agri-Civic Center	4509 W. George Blvd.	Sebring	Greg Hartt	863-402-6540
Oct. 21	Polk County Extension Stuart Center	1710 US Hwy. 17 S.	Bartow	Chris Oswalt	863-519-8677
Oct. 26	Turner Agri-Civic Center Exhibition Hall	2150 NE Roan Ave.	Arcadia	Steve Futch	863-993-4846 or 863-956-1151
Oct. 27	Indian River Research & Education Center	2199 S. Rock Road	Ft. Pierce	Jack Hebb	772-462-1660
Oct. 28	Lake County Extension Service Office	30205 SR 19	Tavares	John Jackson	352-343-4101