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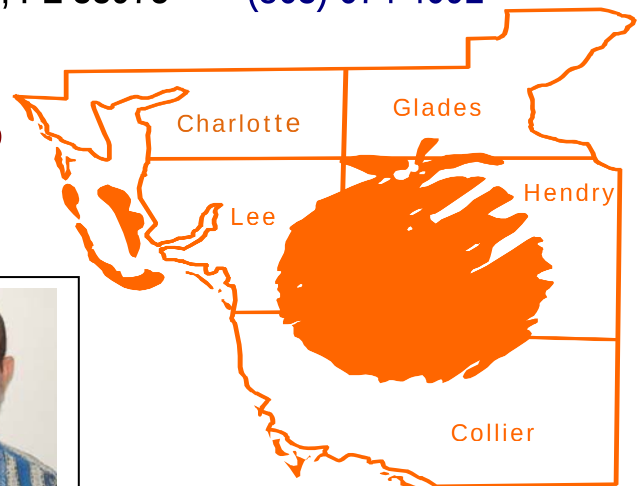
Flatwoods Citrus



Vol. 14, No. 8 **August 2011**

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

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Previous issues of the Flatwoods Citrus newsletter can be found at:
http://citrusagents.ifas.ufl.edu/agents/zekri/index.htm
http://irrec.ifas.ufl.edu/flcitrus/

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

CITRUS EXPO

IN FORT MYERS

Wednesday, August 17 &
Thursday, August 18, 2011

Lee Civic Center

www.CitrusExpo.net

The World's Premier Citrus Expo!

Click here to see the Seminar Program!
http://citrusexpo.net/seminars.html

UF IFAS Extension Pomegranate and Muscadine Field Day, Water Conserv II

Tuesday, August 30, 2011 at 9:30 AM

Dr. Bill Castle, Professor Emeritus CREC
Gary K. England, Multi County Extension Agent

9:30 AM Registration
9:45 AM What we've learned from pomegranate trial plantings
- Cultivar review
- Horticultural aspects
- Pest management

10:30 AM Pomegranate varietal tasting
11:00 AM View new and original pomegranate plantings/Questions
11:30 AM Conserv II muscadine project update
12:00 PM Adjourn
Eventbrite: http://pomegranate-muscadine.eventbrite.com
For RSVP, contact mjarrell@ufl.edu

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

April, 2-4, 2012, Lake Alfred CREC

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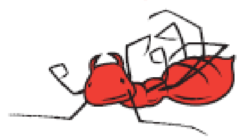

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PRESS RELEASE- Contact Marcela Rice, 239-658-3400 or email mlrice@ufl.edu

FARM LABOR CONTRACTOR CORE TRAINING Offered by University of Florida

Six sessions of Farm Labor Contractor Core (FLC) training will be offered this season by the University of Florida, at UF's Research & Education Centers in Wimauma, Belle Glade and Immokalee.

This training includes 4 units: Administration- regulations about wage & hour, workers' compensation, and inspections; Transportation laws and safety for vehicles that transport farm workers plus Housing regulations and standards; Worker Safety in the fields; and Personnel Management, including human trafficking, discrimination, child labor, and techniques for managing workers.

Each unit takes 4 hours to complete.

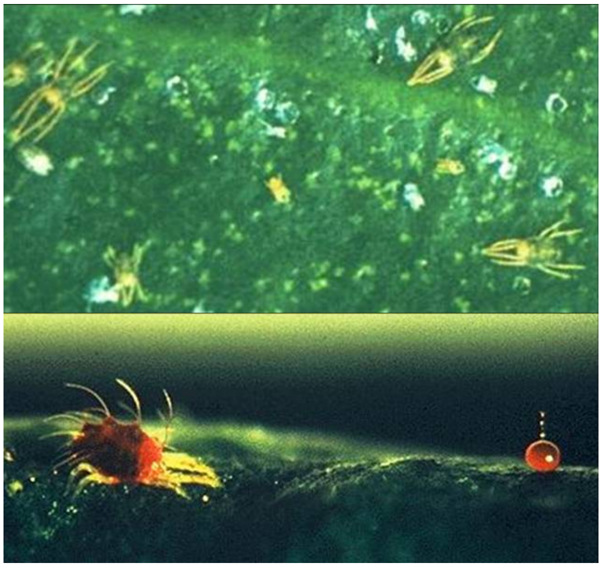
The training program is open to anyone who supervises farm workers, or who is responsible for maintaining compliance with respect to farm labor regulations.
Cost is $ 25 per class, or $ 100 for the four classes that earn a Certificate of Completion of the Farm Labor Contractor Core Training course. A light breakfast, lunch and refreshments will be served.

These classes will be held in three different locations on the following dates:
Wimauma, August 24 and 25- and November 2 and 3
Belle Glade, September 21 and 22- and December 14 and 15
Immokalee, October 5 and 6 –and November 16 and 17
Administration and Transportation/Housing units will be taught on the first day of each session.

Worker Safety and Personnel Management will be offered on the 2nd day.
The training goes from 8:00 a.m. to 5:00 p.m. on all days.
The training will be given in both English and Spanish, simultaneously in two rooms.
Attendees may take the trainings at different locations, as long as they complete one full unit at a time, for a Certificate of Attendance.

To register for any or all of the classes, please contact Marcela Rice, Program Assistant, at 239-658-3400, or email mlrice@ufl.edu

SPIDER MITES



Spider mites are back with vengeance. They are currently found in large populations on the upper leaf surface of the recently mature summer flush, and all stages of the mites orient along the mid-vein.

Stippling caused by spider mite feeding

Spider mites feed primarily on mature leaves and differ from rust mites by feeding beneath the epidermal layer of cells. They are capable of removing cellular contents, causing cell destruction and reducing photosynthesis. Mesophyll collapse and leaf drop can result when trees are stressed by high spider mite infestations alone or in combination with windy conditions. When populations of Texas citrus mite or citrus red mites are high, they will also feed on developing fruit. Spider mites are suppressed to low densities by several species of predacious mites, insects, and entomopathogens in some groves. However, when populations averaging 5 to 10 motile spider mites per leaf develop it would be reasonable to apply a miticide, especially if the trees are stressed. However, infestations comprised predominantly of adults, particularly males, are in decline and would not require control. Adult mites are recognized by their large size relative to immatures and females distinguished by their round shape and shorter legs compared to males.

Need for controlling spider mites is based on temperature and humidity conditions, spider mite population levels, tree vigor, and time of the year. Petroleum oil provides some ovicidal activity against spider mite eggs. None of the other miticides provide ovicidal activity, and their residual activity must be sufficiently long-lasting to kill subsequently emerging larvae.

Selection of a miticide should be based on the target pests to be controlled, avoiding risks of phytotoxicity, products that will be tank mixed, the time of year, treatment to harvest interval, and prior use of a product. All miticides except petroleum oil should be used only once a year to minimize resistance development.

Recommended Chemical Controls.

READ THE LABEL.

Agri-Mek 0.15 EC + Petroleum Oil 97+% (FC 435-66, FC 455-88 or 470 oil)
Comite 6.55 EC
Dicofol
Envidor 2 SC
Kelthane MF
Micromite 80WGS
Movento 240 SC + Petroleum Oil 97+% (FC 435-66, FC 455-88 or 470 oil)
Nexter 75 WP
Petroleum Oil 97+% (FC 435-66, FC 455-88 or 470 oil)
Sulfur
Kumulus 80 DF
Microthiol 80 DF
Thiolux 80 DF
Vendex 50 WP

PESTICIDE RESISTANCE AND RESISTANCE MANAGEMENT

Many pest species, such as mites, are exceptionally well-equipped to respond to environmental stresses because of their short generation time and large reproductive potential. The use of chemical sprays to control insect, mite, and some fungal diseases of citrus pests creates a potent environmental stress. There are now many examples of pests that have responded by developing resistance to one or more pesticides. Pesticide-resistant individuals are those that have developed the ability to tolerate doses of a toxicant that would be lethal to the majority of individuals. The mechanisms of resistance can vary according to pest species and/or the class of chemical to which the pest is exposed. Resistance mechanisms include an increased capacity to detoxify the pesticide once it has entered the pest's body, a decreased sensitivity of the target site that the pesticide acts upon, a decreased penetration of the pesticide through the cuticle, or sequestration of the pesticide within the organism. A single resistance mechanism can sometimes provide defense against different classes of chemicals and this is known as ***cross-resistance***. When more than one resistance mechanism is expressed in the same individual, this individual is said to show ***multiple resistance***.

Because the traits for resistance are passed from one generation to the next, continued stress from a pesticide may, over time, create resistance in the majority of individuals in a population. From an operational perspective, this process would be expressed as a gradual decrease and eventual loss of effectiveness of a chemical. Resistance to a particular chemical may be stable or unstable. When resistance is stable, the pest population does not revert to a susceptible state even if the use of that chemical is discontinued. When resistance is unstable and use of the chemical is temporarily discontinued, the population will eventually return to a susceptible state, at which time the chemical in question could again be used to manage that pest. However, in this situation, previously resistant populations may eventually show resistance again.

Of the factors that affect the development of resistance, which include the pest's biology, ecology and genetics, only the operational factors can be manipulated by the grower. The key operational factor that will delay the onset of pesticidal resistance and prolong the effective life of a compound is to assure the survival of some susceptible individuals to dilute the population of resistant individuals. The following operational procedures should be on a grower's checklist to steward sound pesticidal resistance management for acaricides, insecticides, fungicides, and herbicides:

1. Never rely on a single pesticide class.
2. Integrate chemical control with effective, complementary cultural and biological control practices.
3. Always use pesticides at recommended rates and strive for thorough coverage.
4. When there is more than one generation of pest, alternate different pesticide classes.
5. Do not use tank mixtures of products that have the same mode of action.
6. If control with a pesticide fails, do not re-treat with a chemical that has the same mode of action.

For more information, go to:

2011 Florida Citrus Pest Management Guide: Pesticide Resistance and Resistance Management

at: **http://edis.ifas.ufl.edu/CG026**

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 than at 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 much 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.

DRAINAGE

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

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

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

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

Benefits of Drainage

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

Increased crop yields and improved crop quality result from favorable soil water conditions with good drainage.

FOLIAR FEEDING

Foliar feeding is becoming very common on many horticultural crops including citrus. Economic and environmental considerations require the utilization of more efficient methods for nutrient applications.

It is usually assumed that foliar feeding refers to nutrient applications to the plants' leaves. In fact, it has been shown that all aboveground parts of a plant can absorb nutrients, including twigs, branches, buds, fruit, flowers, and stems. However, since leaves usually represent the largest surface area, they are the most important structures.

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

Foliar applications of other plant nutrients (calcium, magnesium, and sulfur) and micronutrients (zinc, manganese, copper, boron, and molybdenum) have proven for many crops to be an excellent means for supplying the plants' requirements.

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

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

Foliar fertilization is also efficient since it increases the accuracy of fertilizer application. Applications made to the soil can be subject to leaching and volatilization losses and/or being tied up by soil particles in unavailable forms to citrus trees.

While foliar feeding has many advantages, it can burn plants at certain rates under certain environmental conditions. It is important, therefore, to foliar feed within the established guidelines. There are a number of conditions that can increase the chances of causing foliar burn. A plant under stress is more susceptible to damage. Stressful conditions include drying winds, disease infestations, and poor soil conditions. The environmental conditions at the time of application are also important factors. Applications when the weather is warm (above 80^0F) should be avoided. This means that during warm seasons, applications should be made in the morning or evening. Additionally, applications should not be at less than two-week intervals to give the plant sufficient time to metabolize the nutrients and deal with the added osmotic stress.

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

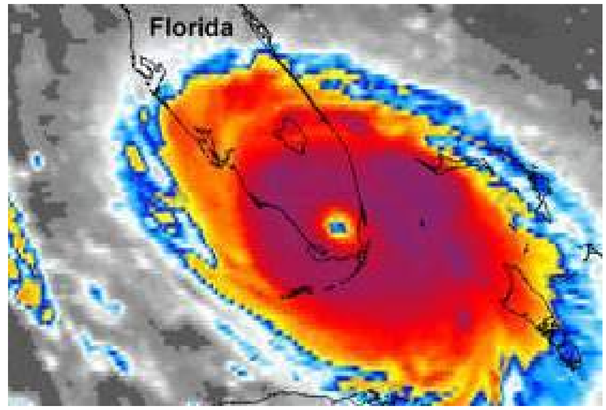
PREPARING FOR A HURRICANE

By Drs. Rouse & Zekri

The coastal regions of the United States have been extraordinarily lucky in recent years, except for the destructive hurricane seasons of 2004-2005. The three hurricanes impacting citrus in 2004 were Charley (August), ripping the Gulf Coast up through central Florida, and Frances and Jeanne (September), which devastated east coast groves. In 2005, Wilma (October) caused fruit loss and some tree loss in south Florida.

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

We have to take steps to protect the people, equipment and supplies that will be needed for the recovery. Below is a checklist for citrus grove managers.



Hurricane Preparation Checklist

Personnel assignments:
1. Make a list of all tasks and make assignments.
2. Update the names on the damage inspection team.
3. Update worker contact list and means for them to call in after the storm.

Safety training:
Train workers in the safe operation of unfamiliar equipment they may have to use. Example: Drivers may have to use chain saws to remove downed trees blocking roads.

Insurance:
Buildings, equipment including tractors, irrigation parts, and supplies may be damaged.

Buildings:
1. Close storm shutters or board up windows.
2. Store loose, light-weight objects such as garbage cans and tools.

Liquid tanks:
1. Fuel, fertilizer and other tanks have to be full so they don't move in the wind.
2. Ensure sufficient fuel is available.

Roads and Ditches:
1. Roads should be cleared and graded and kept well maintained and ditches kept clean and pumped down.
2. Arrange with a flying service for grove manager to survey grove damage.

Emergency equipment:
1. Test run generators, chain saws, torches, air compressors, and other equipment.
2. Have shovels, slings, fuel, paint, and equipment parts available for use.
3. Know where to obtain backhoes, front-end loaders, and other heavy equipment.

Communications equipment:
1. Ensure that radios are in good working order.
2. Have hand-held portable radios with extra charged battery packs available.
3. Direct truck-to-truck radio and cellular phones save valuable time during recovery.

Hazardous materials:
1. Hazardous materials should be secured.
2. Gasoline pumps should be shut down.

Emergency contacts:
1. Have a list of emergency phone numbers, including electric companies, sheriff, and medical.

Cultural Practices:
1. Regular pruning can reduce broken limbs and minimize toppled or uprooted trees.
2. Windbreaks reduce tree damage and spread of citrus canker bacterium.

Hurricane Recovery Checklist

Damage inspection:
Make a visual assessment of the damage and determine priorities and equipment needed.

Prioritize Damage:
A priority plan can quickly determine where and how to begin recovery operations.

Employee call-in:
When safe, call in those needed for damage inspection and grove recovery work.

Clear road access:
Clear roads to where trees must be reset or recovery activities must be conducted.

Water removal:
Remove excess water from tree root zones within 72 hours to avoid root damage.

Tree rehabilitation:
1. Resetting trees to an upright position should be accomplished as soon as possible.
2. Toppled trees should be pruned back to sound wood.
3. Painting exposed trunks and branches with white latex paint helps prevent sunburn.

Irrigation:
Check the irrigation system as rehabilitation is a long process and water is critical.

Fertilizer:
1. The major fertilizer elements should be applied when new growth begins.
2. Reset toppled trees will require less fertilizer due to reduced root system and tree canopy.
3. Reduce N fertilizer to remaining trees proportional to canopy or leaf loss.
4. The following year, trees may require more-than-normal rates to re-establish canopy.
5. Micronutrients should be applied in nutritional sprays to the leaves.

Weeds:
Row middles should be mowed and herbicide applications resumed on a normal schedule.

WEED MANAGEMENT IN CITRUS GROVES

Weeds can reduce the growth, health and survival of young trees, or the time to come into bearing and ultimately fruit production. The more competitive the weeds, the more adversely they alter tree physiology, growth, fruit yield and quality. The attainment of early crop production requires controlling the growth of weeds. Weeds alter economic status by competing with trees, particularly young trees, for water, nutrients and even light in the case of climbing vines, which can easily cover trees if left uncontrolled.

Weeds also have various effects on tree performance including reduced efficacy of low volume irrigation systems, and interception of soil-applied pesticides.

Management Methods

Cultural & mechanical

Cultural methods include off-target irrigation and fertilizer applications. Mechanical methods include cultivation in row middles. However, **constant cultivation results in the destruction of citrus fibrous roots, which normally would grow in the undisturbed portion of the soil.**

Mowing is practiced between the tree rows and away from the trees in combination with herbicide applications in the tree row over the major root zone of trees. It is appropriate where a cover crop is desired in bedded groves to prevent soil erosion. Weeds can also be spread by seed and vegetatively during mowing operations, reinfesting tree rows where herbicides have been applied. **Mowing before seedhead formation is necessary to reduce seed dissemination and reinfestation.**

Chemical mowing

Chemical mowing, utilizing Low Rate Technology (LRT) postemergence herbicide spray applications and wiping in combination with mechanical mowing, is used for the suppression of vegetation in row middles. With the high frequency and cost of mechanical mowing required to maintain vegetation control in row middles, chemical mowing and wiping with low rates of glyphosate has increased. Weed management in Middles by chemical applications results in the elimination of tall growing species and establishment of more manageable sod type species such as Bermuda and Bahia grasses.

Chemical

Generally speaking, all weed species listed as susceptible on the herbicide product label will be controlled by that herbicide at the appropriate rate, time of application and stage of growth. Environmental and plant conditions before, during and following the application are also important including moisture in the form of rainfall and/or irrigation.

Poor control can sometimes be expected from postemergence applications to weeds under stress conditions due to poor uptake and translocation of applied herbicides. Assuming that the appropriate herbicide or herbicide mixtures are selected for the weed species present, failures in the program will usually be due to one of the above factors or to the actual application including calibration and/or equipment design and operation.

Herbicides may be classified as foliar or soil-applied. Foliar applied materials may have systemic or contact activity. Soil applied preemergence herbicides are absorbed through weed root systems, being most effective during germination and early seedling growth stages. Systemic herbicides are those that are absorbed by either roots or aboveground plant parts and are translocated throughout the plant. Contact herbicides act as desiccants, damaging or killing all plant parts actually sprayed with little if any translocation.

For the control of well-established perennial weeds, a postemergence herbicide with systemic metabolic activity should be used with preemergence soil residual products.

Timing and frequency of application are the keys to good vegetation management. **Increased application frequency of lower rates of soil residual herbicides is more effective in young groves where vegetation presence is greater due to more exposure of the grove floor to sunlight and where a greater herbicide safety factor is required**.

Application Technology

Rapid advances in herbicide application technology have resulted in the development of sophisticated equipment. Application equipment is now capable of selective delivery of multiple herbicide products, each directly injected into booms. In a single application, tree rows and row middles may be treated with soil residual and postemergence products with selectivity for tree age, soil type and vegetation species.

Well-maintained, accurately calibrated equipment with good filtration and agitation systems capable of uniform distribution of prescribed spray volumes and droplet size is essential for efficiency, cost-effective vegetation management. Worn nozzle tips result in increased spray delivery rates and distortion of distribution patterns and should be checked regularly. Improved herbicide boom design to reduce tree skirt contact, spray drift and interference of heavy weed cover with nozzle output will reduce tree damage and fruit drop while improving control of target vegetation. Tree skirt pruning and timing of postemergence applications will also reduce boom and spray contact with low hanging limbs and fruit.

Environmental Considerations

In determining management options, herbicide selection should be based not only on species and stage of vegetation development, but product solubility and leaching potential, soil type and rainfall distribution. Objectives are to reduce weed competition and interference through measured vegetation control/suppression with inputs having reduced potential for leaching through over-irrigation, runoff and erosion, chemical drift, or other off-target impacts. CAUTION: Herbicides may move through the soil to groundwater. Several factors influence the rate of this movement. Lower rates applied more frequently combined with sound irrigation management practices will reduce herbicide movement. **The use of bromacil-containing herbicides is prohibited on deep, sandy Ridge-type soils**. For more information and for the list of herbicides registered for citrus in Florida, go to: http://edis.ifas.ufl.edu/CG013

2011 Florida Citrus Pest Management Guide--Weeds.

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* that can result in brown rot infection in the canopy as early as July while fruit are still green. 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 Aliette, Phostrol or ProPhyt before the first signs of brown rot appear in late July 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, Phostrol and ProPhyt are systemic fungicides that protect against postharvest infection and provide 60-90 days control. Copper fungicides are primarily protective but are capable of killing sporangia on the fruit surface and thus reducing inoculum. They may be applied in August before or after brown rot appearance and provide protection for 45-60 days. If the rainy season is prolonged into the fall, a follow-up application of either systemic fungicides at one-half of the label rate, or copper in October may be warranted. With average quality copper products, usually 2-4 lb of metallic copper per acre are needed for control.

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.

Recommended Chemical Controls for Brown Rot of Fruit

Pesticide	FRAC MOA[2]	Mature Trees Rate/Acre[1]
Aliette WDG	13	5 lb
Phostrol	13	4.5 pints
ProPhyt	13	4 pints
copper fungicide	M9	Use label rate.

[1]Lower rates may be used on smaller trees. Do not use less than minimum label rate.
[2]Mode of action class for citrus pesticides from the Fungicide Resistance Action Committee (FRAC) 2003. Refer to ENY624, Pesticide Resistance and Resistance Management, in the 2009 Florida Citrus Pest Management Guide for more details.

Rates for pesticides are given as the maximum amount required to treat mature citrus trees unless otherwise noted. To treat smaller trees with commercial application equipment including handguns, mix the per acre rate for mature trees in 250 gallons of water. Calibrate and arrange nozzles to deliver thorough distribution and treat as many acres as this volume of spray allows.

For more information, go to: **2011 Florida Citrus Pest Management Guide: Brown Rot of Fruit at:** ***http://edis.ifas.ufl.edu/cg022***

United States Department of Agriculture
National Agricultural Statistics Service

CITRUS JULY FORECAST FORECAST COMPONENTS

Cooperating with the Florida Department of Agriculture & Consumer Services
2290 Lucien Way, Suite 300, Maitland, FL 32751
(407) 648-6013 · (407) 648-6029 FAX · www.nass.usda.gov/fl

July 12, 2011

All Orange Production down 1 percent
Non-Valencia Orange Production unchanged
Valencia Orange Production down 1 percent
All Grapefruit Production unchanged
All Tangerine Production unchanged
Tangelo Production unchanged
FCOJ Yield 1.58 gallons per box

The first forecast of the 2011-2012 season will be released at 8:30 a.m. on October 12, 2011.

Citrus Production by Type and State – United States

Crop and State	Production [1]			2010-2011 Forecast	
	2007-2008	2008-2009	2009-2010	June	July
	(1,000 boxes)	(1,000 boxes)	(1,000 boxes)	(1,000 boxes)	(1,000 boxes)
Non-Valencia Oranges [2]					
Florida	**83,500**	**84,600**	**68,600**	**70,000**	**70,000**
California	45,000	34,500	42,500	48,000	48,000
Texas	1,600	1,300	1,360	1,480	1,700
Arizona	230	150	(NA)	(NA)	(NA)
United States	130,330	120,550	112,460	119,480	119,700
Valencia Oranges					
Florida	**86,700**	**77,900**	**65,100**	**70,000**	**69,000**
California	17,000	12,000	15,000	13,000	13,000
Texas	196	159	275	285	249
Arizona	150	100	(NA)	(NA)	(NA)
United States	104,046	90,159	80,375	83,285	82,249
All Oranges					
Florida	**170,200**	**162,500**	**133,700**	**140,000**	**139,000**
California	62,000	46,500	57,500	61,000	61,000
Texas	1,796	1,459	1,635	1,765	1,949
Arizona	380	250	(NA)	(NA)	(NA)
United States	234,376	210,709	192,835	202,765	201,949
Grapefruit					
Florida-All	**26,600**	**21,700**	**20,300**	**19,900**	**19,900**
White	**9,000**	**6,600**	**6,000**	**5,900**	**5,900**
Colored	**17,600**	**15,100**	**14,300**	**14,000**	**14,000**
California	5,200	4,800	4,500	3,500	3,500
Texas	6,000	5,500	5,600	5,900	6,100
Arizona	100	25	(NA)	(NA)	(NA)
United States	37,900	32,025	30,400	29,300	29,500
Lemons					
California	14,800	21,000	21,000	21,000	21,000
Arizona	1,500	3,000	2,200	2,500	2,500
United States	16,300	24,000	23,200	23,500	23,500
Tangelos					
Florida	**1,500**	**1,150**	**900**	**1,150**	**1,150**
Tangerines					
Florida-All	**5,500**	**3,850**	**4,450**	**4,600**	**4,600**
Early [3]	**2,600**	**2,550**	**2,250**	**2,600**	**2,600**
Honey	**2,900**	**1,300**	**2,200**	**2,000**	**2,000**
California [4]	6,700	6,700	9,900	9,600	9,900
Arizona [4]	400	250	350	300	300
United States	12,600	10,800	14,700	14,500	14,800

NA Not available.

[1] Net pounds per box: oranges in California-80 (75 prior to the 2010-2011 crop year), Florida-90, Texas-85; grapefruit in California-80 (67 prior to the 2010-2011 crop year), Florida-85, Texas-80; lemons-80 (76 prior to the 2010-2011 crop year), tangelos-90; tangerines and mandarins in Arizona and California-80 (75 prior to the 2010-2011 crop year), Florida-95.

[2] Navel and miscellaneous varieties in California. Early (including navel) and midseason varieties in Florida and Texas. Small quantities of tangerines in Texas and Temples in Florida.

[3] Fallglo and Sunburst varieties.

[4] Includes tangelos and tangors.

Citrus Summary

The 2010-2011 Florida all orange forecast released today by the USDA Agricultural Statistics Board is reduced to 139.0 million boxes. The total is comprised of 70.0 million boxes of non-Valencia oranges (early, midseason, Navel, and Temple varieties) and 69.0 million boxes of Valencia oranges. The forecast of all grapefruit production remains at 19.9 million boxes. Of the total grapefruit forecast, 5.9 million boxes are white and 14.0 million boxes are the colored varieties. The forecast of all tangerine production remains at 4.6 million boxes. The total is comprised of the early varieties (Fallglo and Sunburst) at 2.6 million boxes and the later maturing Honey tangerines at 2.0 million boxes. The forecast of tangelo production is continued at 1.15 million boxes. The FCOJ yield is lowered to 1.58 gallons per box and the Valencia portion is now projected at 1.66 gallons per box. The early-midseason component is final at 1.522625 gallons per box, as reported by the Florida Department of Citrus (FDOC). Widespread drought conditions were experienced during the month of June with little rainfall recorded throughout most citrus producing areas.

Forecast Components of Production from Objective Surveys – Florida: 2006-2007 through 2010-2011

Fruit type and crop year	Number bearing trees	Sample survey averages		
		Fruit per tree	Percent drop [1]	Fruit per box [1]
	(1,000 trees)	(number)	(percent)	(number)
Early-Midseason Oranges [2 3]				
2006-2007	26,119	690	8	233
2007-2008	25,280	1,058	8	264
2008-2009	24,939	1,082	11	257
2009-2010	24,623	866	8	246
2010-2011	24,093	934	7	280
Navel Oranges				
2006-2007	1,388	337	10	130
2007-2008	1,303	443	10	137
2008-2009	1,233	481	11	136
2009-2010	1,137	366	10	135
2010-2011	1,057	491	7	143
Valencia Oranges				
2006-2007	36,161	426	15	198
2007-2008	34,918	676	15	221
2008-2009	34,374	575	15	219
2009-2010	33,801	480	14	218
2010-2011	33,122	598	16	227
White Seedless Grapefruit				
2006-2007	2,012	469	12	84
2007-2008	1,833	558	18	99
2008-2009	1,620	407	9	85
2009-2010	1,423	431	12	96
2010-2011	1,316	479	11	101
Colored Seedless Grapefruit				
2006-2007	4,232	449	16	91
2007-2008	4,094	499	13	109
2008-2009	3,961	429	12	97
2009-2010	3,725	413	10	109
2010-2011	3,517	449	9	111

[1] Averages at cut-off month—January 1 for early-midseasons, December 1 for Navels, April 1 for Valencias, and February 1 for grapefruit.
[2] Excludes Navels.
[3] Includes Temples.

The above table shows the production components used for the 2010-11 forecast season. Bearing trees are estimated at the beginning of each forecast season using the most recent tree inventory with an allowance for expected attrition. Revisions are made to the historic series where applicable.

Fruit per tree is the weighted average obtained from the annual Limb Count survey and is conducted during a ten-week period from mid-July to mid-September. Survey averages for each tree age group within an area are weighted by the estimated number of bearing trees for each age group.

Fruit size measurements and drop observations are obtained from monthly surveys. The average drop percentages are from the final month used in the forecast model. Average fruit sizes were also obtained from the same survey period and have been converted in the table to estimated number of fruit needed to fill a box.

These four factors are the primary components used in the initial October forecast and in following months up to the "cut-off" for each fruit type. The first two factors have the greatest influence on the forecast.

$$\textbf{Direct Expansion} = \frac{\text{Bearing Trees} \times \text{Fruit per Tree} \times \text{Percent Remaining at Harvest}}{\text{Pieces of Fruit per Box}}$$

Flatwoods Citrus

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Racial-Ethnic Background

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

Gender

__Female __Male