UNIVERSITY OF FLORIDA | IFAS EXTENSION

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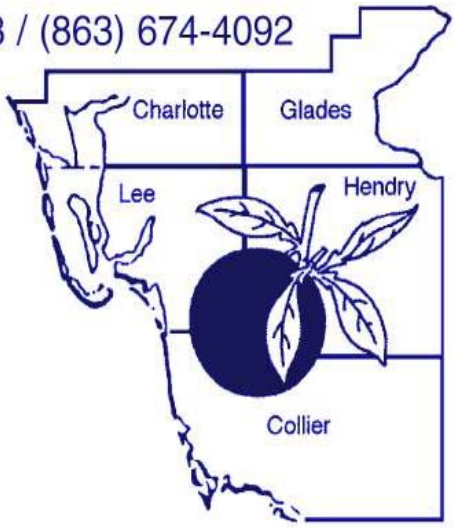
Flatwoods Citrus



Vol. 9, No. 2 **February 2006**

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

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

What you need to know about greening and canker

Training on citrus greening

Location: **Immokalee IFAS Center**
Date: Wednesday, February 15, 2006
Time: 9:00 AM – 12:00 Noon
Speakers: **Pete Timmer, Phil Stansly, Holly Chamberlain, Jim Graham, Ron Brlansky**
3 CEUs for Pesticide License Renewal, 3 CCAs
Sponsor: **Rachel M. Walters, Bayer CropScience**

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

SUMMARY OF 2004-2005 CITRUS BUDGETS

Ronald P. Muraro, Extension Economist
University of Florida, IFAS, CREC, Lake Alfred, FL

Annually, citrus budgets are tabulated for the Central, Southwest and Indian River citrus production regions of Florida. The attached budget costs are for the example grove situation described in the expanded citrus budget series titled: "Budgeting Costs and Returns for the Southwest Florida" region. The budget costs may not represent your particular grove situation. However, they represent the most current comparative cost estimates for Florida citrus. The budget costs items for **Southwest Florida** are more representative of an **owner-managed operation**.

The 2004-2005 comparative budgets are presented in three scenarios: 1) Low Cost Processed Cultural Program Alternative; 2) Processed/Reduced Fresh Cost Cultural Program; and 3) Typical/Historical Fresh Cultural Program.

Scenario one represents a low cost alternative that would allow growers to provide a maintenance cultural program in a low on-tree price situation. Scenario two represents a typical processed orange cultural program and/or reduced cost fresh fruit program. The third scenario represents typical costs of grove practices, which have been performed for citrus grown for the fresh fruit market.

The 2004-2005 budgets reflect major cost increases in all production inputs: fuel averaged 22% increase; fertilizer products increased 15%; chemicals an 8% increase; and equipment operation costs increased 7%. Along with the increased costs, three major hurricanes (storms) during August and September 2004 resulted in wide tree damage and fruit loss. The Indian River region experienced fruit loss of 70% to 80% on red and white grapefruit, respectively. Hamlin orange losses in the Central Florida (ridge) region were 30% to 40% with Valencia orange losses between 20% and 30%. The only citrus growing region that was not majorly affected by the three storms
was the Southwest Florida citrus region. As a result of the excessive fruit loss, the unit per box, per pound solid and per carton costs for the Indian River and Central (ridge) growing regions were substantially higher than in recent years.

Budget analysis provides the basis for many grower decisions. Budget analysis can be used to calculate potential profits from an operation, determine cash requirements for an operation and determine break-even prices. The budget costs presented will serve as a format for growers to analyze costs from their own individual records. The cost data was developed by surveying custom operators, suppliers, growers, colleagues with UF/IFAS and County Extension Citrus Agents in each production region.

Budgeting and cost analysis for can be obtained by contacting the author or going to this website:

http://www.crec.ifas.ufl.edu/extensiontab.htm

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.

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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.

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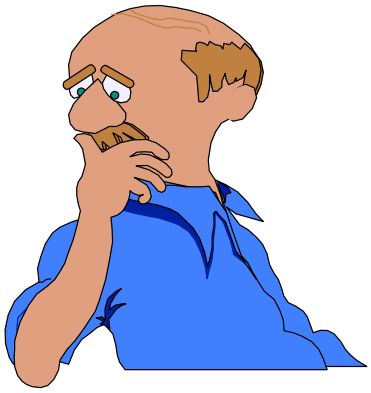
FROM **FLORIDA CITRUS MUTUAL**
P.O. Box 89 • Lakeland, FL 33802 •
Phone (863) 682-1111 • Fax (863) 682-1074 • www.flcitrusmutual.com

We realize that there are many questions out in the field from growers regarding the future of the canker eradication program. The Florida Citrus Mutual field staff provided the attached questions that they are hearing, and we, with input from USDA, have answered these questions as best we can at this time.
As we get additional questions, we will compile them and distribute them back to the growers as quickly as possible.
If you have questions, please contact the Mutual field staff or call the office at (863) 682-1111.

CANKER QUESTIONS FROM THE FIELD



Citrus Health Response Plan Development

Q: How do I participate in the planning stages for the new canker suppression program?
A: The USDA is providing leadership and is working with FDACS and UF/IFAS, in consultation with industry, to develop the framework for a Citrus Health Response Plan for the industry. We anticipate a draft of the program will be presented to the industry for input this spring (March/April).

Q: Are we going to have to remove diseased trees?
A: While the Citrus Health Response Plan is being developed, the USDA and FDACS have jointly determined that infected trees will be removed in the interim.

Q: What role will USDA play in the coming months?
A: The USDA recognizes that the Florida citrus industry is a priority and they are very much involved in leading the efforts to develop the Citrus Health Response Plan. They will be instrumental in developing a new regulatory response plan to address canker, greening and other pests and diseases of regulatory significance.

Q: What is the time frame on the new program?
A: It is expected that a draft plan will be delivered to the industry for review in the March/April time period.

Q: Will there be a statewide quarantine for fresh fruit?
A: Right now, the current quarantine protocol remains in place with no changes.
Current Protocol

Q: Is the current protocol still in force except for the 1,900-ft burning radius?
A: Yes, all aspects of the current program such as decontamination, surveying your grove, complying with the compliance agreement, tarping, etc. remain in place. The only change to the program at this point is the cessation of cutting the 1,900 foot exposed radius.

Q: Whom do I call if I have questions regarding my pending IFO or other related questions?
A: The Florida Dept. of Agriculture's Division of Plant Industry at (800) 282-5153.
Compensation

Q: Will I be compensated for trees pushed and burned?
A: Compensation funds have to be appropriated through Congress, and Florida Citrus Mutual is working through this process. USDA cautions that there is no compensation currently available to provide to growers whose trees are removed in the future. Existing compensation funds will only cover some of the pending claims before those funds are exhausted.

Q: Is there any chance for future compensation for trees removed after Jan. 11?
A: This will be discussed when the overall management plan is reviewed.
Insurance

Q: What about the canker insurance I have paid for?
A: For the current crop year, for growers with crop insurance, all trees removed due to an IFO due to canker should be reported as a loss to their crop insurance company. There is no minimum loss requirement for losses due to canker, and each loss is paid on a per tree basis based on coverage level.
Tree insurance policies remain in force for coverage of other perils (wind, freezes, excess water). Future coverage of citrus canker will be dependent on the final protocol established for the management and suppression of citrus canker, which is expected to be completed by April.

The following information has been developed as part of the Decision Information System for Citrus

L. Gene Albrigo, Horticulturist, Citrus Research & Education Center, Lake Alfred, FL

ARCHIVED ADVISORIES: 1/12/06

FLOWER BUD INDUCTION ADVISORY #6 for 2005-2006

http://www.lal.ufl.edu/flowerbud/1_12_6.htm

Please review the background information in the first advisory if you have not already done so.

Current status:

Accumulated cool weather reached 810 to 1250 hr < 68 degrees F. from southern to northern citrus districts, respectively, before the first warm period triggered differentiation of some flower buds starting about 22-27 December, depending on the citrus district. An additional 250 hours of cool weather accumulated before the second warm period that we are now experiencing. **The NOAA 8-day forecast predicts cooler weather this weekend and then warming again next week. This should solidify the beginning of differentiation of most flower buds. Evidence of their swelling should be readily visible in the next two weeks, particularly terminal buds.** To view specific FAWN data for a location near you, use (www.crec.ifas.ufl.edu) and click on FAWN, or for NOAA's 8-day forecast go to Weather Links on our CREC homepage and then 8-day forecast.

Full bloom is predicted to be the first week of March, with a second wave of flowers by mid-March if most available buds were not induced by the Christmas warm period. If two flowering cohorts do occur, they probably will appear as a prolonged bloom over this two week period. Actual bloom date may change if abnormally warm (earlier bloom date) or cool (later bloom date) weather occurs.

On all healthy, non-hurricane damaged trees, flowering levels should be very good. Too many flowers in seedless cultivars (navels), hybrid blocks with a moderate to light crop and some strains of Rhode Red Valencia that set poorly results in too much flower competition

and poor set (navels and some Rhode Reds). On the other hand, too many flowers usually results in excessive set and poor fruit size in seedy mandarin hybrids. A GA 3 spray is advised in these cases by early next week. GA 3 sprays (20 oz per acre) should reduce the amount of flowering and increase the leaves in each inflorescence.

Some growers may still be successfully managing soil moisture and have gotten through the Christmas and current warm periods with their trees under drought stress. When the 8-day forecast looks favorable for no freeze chance through January 25th, it will be a good time to start irrigation and then to apply the first ground fertilizer for the year.

This is an El Niño Neutral year, which increases the likelihood of a freeze. Generally, a hard freeze is most likely until we get pasted January 15th to 20th. If a warm period occurs before that date, some or all of cold hardiness will be lost as the buds start to swell and grow. Being able to create drought stress is one way to prevent loss of cold hardiness.

The Web based Citrus Flowering Monitor System is now posted. The link to this tool is:
http://orb.at.ufl.edu/DISC/bloom
When the Window comes up, click on Run Model, fill in the site and other information and then click on the run model tab below this information. You should see a graph with a black line indicating accumulated induction hours and a red line extension for the projected additional induction hours from the NOAA 8-day forecast. The black to blue line moving downward with time indicates the progress of flower bud differentiation and bud development to a full bloom date on the x axis. You can evaluate any site where FAWN has a weather station (The first pull down information window), by going back one step to refresh the Run Model Window.

Please email or phone if you have any questions (albrigo@crec.ifas.ufl.edu), 863-956-1151.

For more information, go to:
http://www.lal.ufl.edu/flowerbud/1_12_6.htm

Books for sale at the Hendry County Extension Office **($3.00/copy)**

☼ **140-page book entitled *"WORKER PROTECTION STANDARD FOR AGRICULTURAL PESTICIDES – HOW TO COMPLY"***

NUTRITION OF CITRUS TREES

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

IFAS fertilizer guidelines for nonbearing citrus trees

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

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

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

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

NUTRITION OF CITRUS TREES

Nitrogen (N): Nitrogen is the key element in citrus fertilization and has more influence on tree growth and appearance, and fruit production and quality than any other nutrient element. Nitrogen appears to be of particular importance to the tree at bloom time. During this period, migration of N from leaves to flowers takes place. Trees grown with limited supplies of N won't set a good crop. They bloom sparsely, flush irregularly, and produce very limited twig and leaf growth. Weak and old trees deficient in N can be improved by supplying up to two times the recommended rate at more frequent applications. Foliar spray is a very efficient and rapid way to supply and correct N deficiency. For bearing citrus trees, there should be adequate N in the trees just before flower initiation and at the time of flowering and fruit set. For young trees, adequate N should be supplied throughout the year to promote continuous rapid vegetative growth.

Phosphorus (P): Phosphorus is particularly concentrated in the younger parts of the plant, in the flowers, and in the seeds. Phosphorus is also important for cell division. Growth is reduced when the supply of P is too low. Trees will exhibit limited flower development with reduced fruit set and fruit yield. Usually, the roots are stunted and poorly branched. Phosphorus deficiency can be corrected by applying superphosphate or any readily available source of P after confirmation of P deficiency by leaf and soil analysis.

Potassium (K): Citrus fruit remove large amounts of K as compared with other nutrients. Potassium enhances fruit size, flavor, and color. Potassium works with P to stimulate and maintain rapid root growth. Shortage of K can result in lost crop yield and quality. In Florida, low K fertilization will cause a slowing down in growth, small leaves, reduction in fruit size, very thin peel of smooth texture, premature shedding of fruit, and lower acid levels in the fruit. Under most soil conditions, K deficiency can be corrected by applying sulfate or muriate of potash to the soil. However, under fine textured soils, saline conditions or soils containing high calcium (Ca) and magnesium (Mg) in the exchange complex, K applications to the soil are sometimes ineffective or slow to correct K deficiency. Foliar application of potassium nitrate or monopotassium phosphate can be very effective and rapid for correcting K deficiency.

Magnesium (Mg): Magnesium deficiency can result in a great reduction in fruit yield. In Florida, Mg deficiency is particularly severe on acid light sandy soil from which Mg readily leaches. 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 above 6.0 will furnish Mg at the same time. Soil application of Mg sulfate or oxide can be successful in correcting Mg deficiency when the soil pH is adjusted. Magnesium deficiency can also be attributed to calcareous soils relatively low in Mg or to unbalanced conditions in the soil due to excessive Ca. Foliar spray of Mg nitrate can be very effective when applied on the spring flush leaves when they are two-third to fully expanded but not hardened off.

PESTICIDE SPRAY COVERAGE FOR CITRUS TREES

Obtaining the proper distribution of a spray or coverage is essential for efficient management of citrus pests. Sprayer air deflectors, nozzle orientation and number of nozzles should be adjusted to match the size and shape of the canopy in order to minimize spray wastage. Recommended coverage varies from pest to pest. For example, an outside coverage spray is sufficient for aphids, citrus leafminers, and citrus psyllid that are found mostly on the periphery of the tree, whereas rust mites, greasy spot, and relatively immobile pests such as scales will need a more thorough coverage. Obtaining the proper coverage can be difficult because of the dense canopy of citrus trees and involves a balance of varying droplet size, amount of spray, and ground speed.

Aircraft applications typically use 20 to 5 gallons of water per acre. Low volume ground applications generally use 100 to 20 gallons of water per acre. To be effective and avoid phytotoxicity with oils and other chemicals, low-volume applications must be delivered in small droplets. Small droplet size can be obtained by providing high air velocities at the discharge outlet or by utilizing high spray pressure. Low-volume applications use between 75 and 100% of the amount of pesticide that would be applied per acre as a dilute spray. In order to achieve proper coverage, apply low-volume treatments only when it is relatively calm. It is not recommended to apply low-volume applications if wind speeds exceed 5 mph. In addition, extra precautions must be taken to protect handlers and applicators because of the high concentrations of chemicals used in low-volume applications.

Outside coverage applications use 50 to 150 gallons of water per acre to achieve thorough distribution of the spray to the outside or peripheral parts of the tree only. Larger trees and/or high-density plantings require the higher gallonage per acre. Relatively small trees can be sprayed with the same concentration of agrichemical, but using few nozzles. This should provide spray deposition approximately comparable to that of mature trees, with lower spray volume and active ingredient per acre. Because the spray distribution requirements are less stringent with outside coverage, ground speeds may increase up to 3 mph and the amount of spray/acre decreases, thus reducing the cost per acre.

Tips to Help Minimize Pesticide Spray Drift

Pesticide spray drift is the movement of pesticides away from the target area. Whether you do your own spraying or you contract somebody to do it for you, it is important to pay close attention to drift and to understand the serious problems it can cause. Pesticide spray drift is expensive, dangerous and illegal. It can result in increased insurance premiums, wasted product, increased production costs, claims, costly legal fees, and fines from government inspectors. The single most important step a grower can take to avoid pesticide drift is to make sure all ground and aerial applicators are skilled, careful, and fully trained.

Environmental conditions contributing to drift

Environmental conditions are one of the factors contributing to pesticide spray drift. Wind speed and direction, relative humidity, temperature and atmospheric stability affect drift. High wind speeds can carry pesticide particles out of the target area. High temperature and low relative humidity decrease particle size and increase drift potential. Spraying when it is too windy or when the wind is blowing toward a sensitive off-target area can cause serious problems. This is where having a skilled, well-trained applicator and monitoring conditions come into play. Be sure to check the wind speed and direction to ensure they are within the recommendations on the pesticide label. It is important that wind direction always be checked, even at very low wind speeds. A buffer should always be left between the spray application and sensitive off-target areas to allow for some drift downwind into the buffer.

Importance of the right droplet size

In the past, trees were drenched with high volumes and coarse droplets at 250–500 gallons per acre, resulting in trees dripping with excess pesticide. The belief that too much is better than too little is wrong. Dripping trees lead to environmental pollution such as soil contamination, and an excessive number of tank loads per acre results in poor time management and extra expense. Lower volumes must be used, which may result in smaller droplets, although there is a limit to droplet size because of concerns about drift. Droplets need to be small enough to cover the area, but not too small that the drift potential increases. When given a choice, always choose larger drops within the range that will give complete control as specified on the pesticide label. Droplets that are too small can be avoided by choosing appropriate nozzle types and/or orifice (opening) size, by adding recommended adjuvants to increase viscosity, by running sprayers at the lowest recommended pressure, and by avoiding high temperature conditions that can cause droplets to evaporate in mid-air, thus becoming smaller and prone to drift.

Importance of proper sprayer design and height

It is important that the height of sprayers is adjusted properly. The greater the distance between spray nozzles and target foliage, the greater the opportunity for air movement to carry droplets away. Wind speeds are higher with increasing height above the ground, so any increase in height causes an even greater increase in drift distance. In some cases, the pesticide label may give recommended heights. Otherwise, spray as close as possible to reduce drift but far enough away to still get proper coverage. Sprayers can be fitted with ultrasonic or laser canopy sensors. The sensors also detect the shape of a tree and adjust the spray pattern accordingly. The advantages include reduced drift, ground deposition, and reduced pesticide use. Herbicide drift from weed control practices should not be ignored. Shielded herbicide sprayers should be used to prevent drift from damaging citrus trees.

Importance of sprayer calibration and timing

Applying the correct product to the correct target at the correct time with the correct equipment is the key to good spraying. Correct calibration will ensure that all the nozzles are discharging the correct amount of liquid at the correct distance and angle to the target and at the correct forward speed. Operators must set the air deflectors correctly to confine airflow, spray and disturbance to the tree canopy. Choose the correct size sprayer with good backup support to ensure that spraying is done in a timely manner. Far too often, growers are racing around the clock in an attempt to apply pesticides. Planning in advance is the key to good management. Continuing development of spray application techniques will improve the efficiency of spraying. Investment in modern technology must be maintained if the grower is to remain competitive.

Importance of written records

Be sure to keep accurate, written records to remember exactly what was done the last time you or your applicator sprayed. Some items that are useful to include may or may not be required by law: the date (of the pesticide spray), accurate start and end times, weather conditions (temperature, humidity, wind speed and direction), materials and amounts applied (including adjuvants), and target pests. Also, be sure to keep maintenance records (including the dates of calibration, and nozzle and tip replacement) on all sprays.

MANAGEMENT STRATEGIES TO REDUCE DRIFT

1. Train the operator to use the sprayer correctly in your grove under your conditions.
2. Don't dismiss the importance of well-trained, skilled pesticide applicators.
3. Plan in advance the spraying operation.
4. Read and follow the pesticide label thoroughly.
5. Select the correct nozzle for the target. Adjust the position of the nozzles to achieve proper coverage.
6. Check that air deflectors are set properly to confine disturbance to the target.
7. Calibrate the sprayer with water to ensure that everything is working correctly.
8. Consider spray additives to reduce drift.
9. Only spray when weather conditions are ideal; avoid spraying on days when conditions are favorable for atmospheric inversion or wind drift and keep monitoring environmental conditions.
10. Ensure the spray is not drifting on non-target areas and watch for changes in wind speed and direction.
11. Run sprayers at the lowest recommended pressure and ensure an accurate gauge is used.
12. Maintain a constant speed and pressure.
13. Keep accurate written records.

For more information on citrus nutrition

The EDIS website is http://edis.ifas.ufl.edu

Increasing Efficiency and Reducing Costs of Citrus Nutritional Programs
Mongi Zekri, Thomas Obreza and Arnold Schumann
http://edis.ifas.ufl.edu/SS442 [view pdf]

Irrigation, Nutrition, and Citrus Fruit Quality
Mongi Zekri, Thomas A. Obreza and Robert Koo
http://edis.ifas.ufl.edu/SS426 [view pdf]

Micronutrient Deficiencies in Citrus: Iron, Zinc, and Manganese
Mongi Zekri and Thomas A. Obreza
http://edis.ifas.ufl.edu/SS423 [view pdf]

Micronutrient Deficiencies in Citrus: Boron, Copper, and Molybdenum
Mongi Zekri and Thomas A. Obreza
http://edis.ifas.ufl.edu/SS422 [view pdf]

Macronutrient Deficiencies in Citrus: Calcium, Magnesium, and Sulfur
Mongi Zekri and Thomas A. Obreza
http://edis.ifas.ufl.edu/SS421 [view pdf]

Macronutrient Deficiencies in Citrus: Nitrogen, Phosphorus, and Potassium
Mongi Zekri and Thomas A. Obreza
http://edis.ifas.ufl.edu/SS420 [view pdf]

Plant Nutrients for Citrus Trees
Mongi Zekri and Thomas A. Obreza
http://edis.ifas.ufl.edu/SS419 [view pdf]

To get financial help due to Hurricane Wilma damage to agricultural crop, contact

USDA Farm Service Agency County Farm Service Agency Offices, **http://www.fsa.usda.gov**

Charlotte & Lee Counties FSA
LEE COUNTY FARM SERVICE AGENCY, 3434 HANCOCK BRIDGE PKWY
FT MYERS, FL 33903-7094 Phone (239) 997-7331, Fax (239) 997-7557

Hendry, Glades & Collier Counties FSA
HENDRY COUNTY FARM SERVICE AGENCY, 622 W SUGARLAND HWY
CLEWISTON, FL 33440-3022 Phone (863) 983-7250, Fax (863) 983-8709

FROM THE FLORIDA CITRUS PEST MANAGEMENT GUIDE

MANAGEMENT OPTIONS FOR CITRUS GROWERS

Fresh vs. processed fruit

Citrus growers must maximize profits and reduce expenses to stay competitive. Basic horticultural input to increase production efficiency includes optimization of fertilization, irrigation, weed control and pest management. A fundamental working assumption to maximizing grower profits is that the cost of any input should be matched by an increased return of greater value.

Florida citrus is marketed either for the fresh market or processed market. Irrigation, fertilizer and pest management strategies employed by growers for fruit destined for these different markets must differ considerably. It is a waste of money to seek to achieve fresh market fruit quality in a processing fruit production operation.

In the production of fresh market fruit, good fruit size and a high level of control of external blemishes are needed to achieve maximum profitability. A great input of pesticides and a high level of pest scouting can be economically justified. If pest or windscar damage occurs early in the season, the grove can be switched to a processing program without suffering severe economic loss.

Grapefruit, navel oranges, tangerines, and tangerine hybrids have high values as fresh fruit and relatively low value for processing. These varieties are also more severely affected by diseases such as scab, melanose, Alternaria brown spot, and greasy spot rind blotch than are round orange cultivars. They must be monitored very closely and timely applications of chemicals must be made to control rust mites and fruit blemishing fungal diseases. If a high degree of control is not achieved and the fruit must be processed, the producer will almost always experience a net loss.

In the production of fruit for processing, yields and internal quality must be maintained with minimal input. Irrigation, fertilizer, and weed control should be maintained but control of foliar diseases and arthropod pests should be reduced or omitted. When the protection of foliage and fruit are considered, only a few diseases and pests are of primary importance, namely greasy spot fungus on foliage and citrus rust mite on fruit. High mite populations over time can lead to reduced fruit size and productivity. Root weevils and Phytophthora should be monitored and controlled when population levels dictate because they can noticeably reduce tree vigor and fruit productivity.

In most cases, there is no way to predict on a seasonal basis the incidence and severity of pests. However, based on grove history and some within-season observations, you can reasonably assess the situation and look at available options. In the final economic evaluation, net savings in pest management can be considered as profit to the extent that they do not cause loss through fruit drop, reduced fruit size, and lower internal quality. With most citrus pests, the pressure must be extremely high before economic damage levels on the processing fruit crop are experienced. Thus, there is considerable latitude in taking measures to suppress most pests. Close observations, informed decision-making, and pesticide application only on an as-needed basis should reduce the level of input and associated costs in most seasons.

Bearing vs. non-bearing trees

Managing pests on non-bearing citrus trees (< 4 yr old), either as a new planting or as resets, is essential to the subsequent development of a healthy, highly productive, mature grove. Young tree care differs somewhat from mature grove care, in that, management expenditures should focus on maximizing the protection of rapidly produced foliage and roots; fruit is not a factor. Therefore, a citrus grower's goal should be to maximize the production of leaves and roots of young trees through the optimization of fertilization, irrigation, weed control, and management of various foliar and root pests.

The various foliar and root pests, comprised of insects, mites, nematodes and diseases, that infest nonbearing citrus trees differ widely in distribution and abundance compared to those found on mature trees. Differences in tree size and canopy density alone result in changes in microclimate that will affect pest and natural enemy population dynamics and injury thresholds for various pests. Frequent leaf and root flushing patterns typical of young trees supply a continuous source of food that stimulates rapid pest development and injury. Foliar insects such as aphids, citrus leafminer, citrus psyllid, orangedog, grasshoppers and the little leaf notcher weevil can severely damage new leaf flushes regularly without appropriate control while these same insects are incidental pests of mature trees. By contrast, greasy spot, a major economic disease of mature trees, is of much less importance in nonbearing citrus groves. Rust mites and spider mites, important defoliators or fruit pests of mature trees, can also be damaging to nonbearing trees, particularly those trees with open canopy. Judicious use of pesticides is highly recommended for young tree care, even though the need for pesticides can be greater than for mature groves. Scouting should be intensified on young trees and treatments applied only when necessary. Spot treatment is encouraged when pests are localized within the grove.

Postbloom fruit drop (PFD) fungal disease is more of a problem on Navels and Valencias. The fungus attacks flowers and causes the fruitlets to drop leaving persistent calices or buttons. Once the bloom begins, groves with a history of PFD or with buttons from previous years should be inspected twice weekly. Topsin (2 lb/acre) is very effective in controlling the disease. A model has been developed and is being improved to assist growers and production managers to determine the need and timing of fungicide applications. **For more information, call the toll-free hotline sponsored by Syngenta Crop Protection (1-866-365-3017) for the latest reports on the disease.** Dr. "Pete" Timmer, Extension Plant Pathologist at the University of Florida/IFAS Citrus Research and Education Center, will provide current information on recent outbreaks, the status of the bloom and other relevant news. Information on PFD and other foliar fungal diseases is available on Timmer's citrus pathology website (http://www.crec.ifas.ufl.edu/timmer/), Remember that it is advisable to remove weak and declining trees and put resets to maintain good yield per acre. Furthermore, the off-season bloom from declining trees within a block can provide a site for fungal spore buildup and can be a major contributor to PFD.

This coming season, EPA most likely will grant Florida section 18 for Topsin (Cerexagri, Inc.) fungicide on citrus. Citrus growers must have the EPA exemption letter or Cerexagri's Sec. 18 Use Directions in their possession at the time of application.

Fungicide effectiveness (By Dr. Timmer)

	Greasy Spot	Alternaria	Scab	Melanose	PFD
Copper	Excellent	Good	Moderate	Excellent	Poor
Topsin	?	None	Excellent	?	Good
Ferbam	Weak	Moderate	Good	Weak	Moderate
Enable	Excellent	Poor	Good	Weak	?
Abound	Good	Very good	Excellent	Moderate	Moderate
Gem	Good	Good	Excellent	Moderate	Moderate
Headline	Good	Very good	Excellent	Moderate	Moderate
Trilogy	Weak	Moderate	None	None	None

FLOWERING, YIELD, AND FRUIT QUALITY OF CITRUS TREES

During the winter months in subtropical regions, the temperature normally falls below 70 °F for several months. This causes growth to cease and the tree to become dormant for about 3 months. This dormancy, among other things, induces flowering when warmer temperatures in the early spring cause resumption of vegetative growth.

Effect of vegetative growth

It is well known that vegetative growth is competitive with fruit growth for available nutrients such as sugars and minerals. Flushes of heavy vegetative growth will reduce the solids available to developing fruit, while a period of dormancy will increase the solids available. This competition for nutrients between vegetative growth and fruit development is one of the reasons reducing solids concentration often found in oranges produced in the tropics as compared with those produced in subtropical regions. Similarly, in some seasons, through its tendency to stimulate vegetative growth, irrigation in the dry fall and winter in Florida may reduce soluble solids in the fruit.

Effect of climate

Fruit quality is affected by climatic conditions and production practices. Within fairly broad parameters of adequate soil and good cultural practices, climate is the most important component of the climate-soil-culture complex causing differences in yield and fruit quality among citrus producing areas.

Effect of water and temperature

Rainfall and irrigation are necessary at reasonable levels to assure good soluble solids accumulation, but excessive amounts of water results in oversize fruit with diluted soluble solids content. Year to year variation in temperatures and rainfall can result in up to 2 lbs soluble solids per box for Valencia orange. In a tropical climate, juice content and soluble solids accumulate fast, while acidity declines much more rapidly. Under such conditions, there is insufficient time for the fruit to accumulate high soluble solids levels and acidity declines so rapidly that the fruit quickly become insipid and dry out as they become senescent.

Effect of rootstock

Rootstock effects on fruit quality are well documented. Rootstock effects sometimes vary from year to year, from area to area, and with cultural practices.

Fruit crop. It is well established that shoots with fruit do not flower the following year. Thus, heavy crops are often followed by lighter ones. This can be overcome by pruning back a portion of the fruiting shoots during the heavy crop year during the bloom, after fruit set, or late in the spring. Holding crops of grapefruit and oranges on the tree long after their maturity is reached can reduce the subsequent crop.

Shade. Even though citrus trees can tolerate shade and still flower and fruit, maximum flowering occurs when leaves are fully exposed to the sun. Therefore, topping and hedging are extremely important for optimum flowering.

Tree vigor. Excessive vegetative vigor can reduce flowering. It is unlikely that excessive vigor results from well-scheduled and well-adjusted programs. However, excessive fertilizer and water may slightly delay fruiting of young trees. Excessive levels of leaf nitrogen (N) in particular for young trees can induce excess vigor and promote a vegetative rather than flowering tree. In contrast, low leaf N levels promote extensive flowering but fruit set and yields are poor. Therefore, it is important to maintain N levels in the optimum range.

Leaf loss. Leaves produce the food and the energy source for the trees. Excessive leaf loss will noticeably reduce flowering. The primary causes of leaf loss are freeze and hurricane injury, salt and water stress problems including drought stress and flooding injuries, mites, greasy spot, herbicides and pesticide phytotoxicities. Loss of leaves can reduce flowering the following spring and fruit production. Excessive leaf loss in late summer, in the fall, and in early winter is the worst thing that can happen to citrus trees. It will reduce flowering and fruiting.

FLATWOODS CITRUS NEWSLETTER

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Racial-Ethnic Background

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

Gender

__Female
__Male