

Citruslines

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Fall 2007
October, November, &
December

UF UNIVERSITY of
FLORIDA
IFAS Extension
Lake County Extension



Upcoming Events

New DOT Regulations for Hauling Agricultural Equipment	Tavares	October 9th
OJ-Agricultural Labor Issues & H2A Program for small businesses	Tavares	October 16th
Farm Safety Day	Tavares	October 24th
Citrus Greening Identification & Worker Survey Training	Tavares	October 24th
Pesticide Applicator CEU Day	Kissimmee	November 8th
OJ-Fall & Winter Production Practices for Greening Management	Tavares	November 13th
OJ-FAWN Update & Winter Weather Prediction	Tavares	December 11th
Private Applicator Agricultural License Review and Exam	Tavares	December 12th

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Thoughts and Insights from a trip to Brazil

This past July I had the opportunity to travel to the state of Sao Paolo, Brazil with a citrus grower group. This group was headed up by Dr. Stephen Futch a multi county citrus agent. The purpose of the trip was to learn about what Brazilian growers are doing to combat greening disease. The greening bacterium was found in Brazil in early 2004 approximately a year and a half before the disease was identified in Florida. As most of you are aware, Brazil is the largest producer of citrus in the world. Citrus production is important to Brazil and they have been trying to combat greening disease for the past few years.

In speaking with the Brazilian growers they stressed the importance of early action. Their advice was not wait until you have found the disease to decide what you are going to take, but to be proactive have a greening plan in place. A plan of action, just like you hopefully have for your family in case of a natural disaster is recommended. Hopefully your grove never gets greening, but being proactive is a key component to surviving this current challenge.

What is proactive? First you need to be scouting your groves looking for the disease. If you are not actively looking for the disease you will not find it in a timely manner. The earlier you detect the disease, the earlier you can remove the inoculum source (diseased tree) from your grove, and hopefully limit the spread of the bacteria. If you have not started a survey program in your grove for greening I advise you to begin immediately.

Some interesting data that the Brazilians shared was the effectiveness of surveying on the ground versus surveying from above the tree on a platform. You more than double your chances of finding greening symptoms when surveying from a raised platform. Many companies in Florida are beginning to move towards surveying their groves regularly with platforms. Does this mean a ground survey is worthless? No. Ground surveying is still better than no action, but surveying with a platform is more effective. Also the number of trees surveyed per person from the ground was 500 trees/day whereas a four man crew riding on a platform mounted tractor could cover 1100 trees/day. Twice the number of trees surveyed with twice as many infected trees located, platform surveying is superior.

Another concept, in which some data was provided was disease incidence in groves adjacent to neighbors who were proactive versus inactive referred to as good and bad neighbors. Good neighbors were proactively surveying their groves, removing infected trees, and spraying for psyl-





lids, whereas bad neighbors were doing nothing to control the disease. As you might imagine the areas adjacent to bad neighbors had a much higher incidence of greening present when compared with the areas adjacent to good neighbors. Another interesting development is the idea of neighboring farmers working together on timing their pesticide applications for psyllid control. They are making psyllid control a cooperative effort; spraying at the same time in order to reduce the population levels over a boarder area. Working with your neighbor could be advantageous.

When looking at the greening incident map there are currently 26 counties in Florida where they have found the disease. Greening was recently discovered in Polk County, which leaves Lake County as the only citrus producing county where greening has yet to be found. Does that mean we do not have the disease? Probably not, most likely we have just not found the disease here yet. The movement from infected counties from South Florida north to Central Florida has been relatively quick. However if you look at the current incidence levels it is only one or two finds in the more northern counties, many of which have been dooryard citrus. It is still the early for the disease incidence here in Central Florida, we have the opportunity to be proactive by scouting for diseased trees, removing them from our groves, and controlling the psyllid populations. We have an opportunity to learn from the experience of the Brazilian growers; and their advice to you is don't wait to you have the disease in your groves, become proactive.

“Some of the citrus owners I consult for started surveying for greening late. Once they began surveying they immediately found symptoms, however the owners could not come to an agreement on what action to take. Once we started to remove trees it was to late, greening was all throughout the grove.”

-Jose Silva

Right:Picture of the grove in which trees were removed.



New DOT Regulations for Hauling Agricultural Equipment

Oct. 9th 9-11 AM

On October 9th from 9 am to 11 am in Tavares at the agricultural center there will be an informational seminar on the new Department of Transportation (DOT) regulations.

Topics include:

- New licensing requirements
- Distance travel limitations
- Exemptions
- Width and weight limitations
- Hauling what and where

Please call Maggie Jarrell, Martha Thomas, or Ryan Atwood to register at 352-343-4101.

Agricultural Labor Issues & H2A

Oct. 16th 9-11 AM

Have you gotten a social security mismatch letter in the mail concerning one of your employees? There is a renewed emphasis by immigration officials to enforce the current laws and fine those who are not in compliance. Please join us to learn about and discuss recent agricultural labor issues and the potential of the H2A program for small businesses on Oct. 16th from 9-11 AM.

Invited speakers include Walter Kates from the Florida Fruit and Vegetable Association, Mike Nobles from h2ausa, and Mark Garrand from Immigration and Customs Enforcement. This is our OJ meeting, we will also be including those in the ornamental nursery business, as the topic is also of interest to them.

Farm Safety Day

Oct. 24th 8:45-12:30

The annual farm safety day will be held October 24th from 8:45 to 12:30 in Tavares at the Agricultural Center. Topics include:

- Avoiding Heat Stroke and Heat Related Illness
- Killer Bees and other Dangerous Farm Pests
- Canker Decontamination Certification
- CPR Basics for Farm Workers
- Tractor and Equipment Safety

Lunch is available from 12:30-1:30 there is a \$15 charge for lunch. Please call Maggie Jarrell or Ryan Atwood to register at 352-343-4101.

Citrus Greening Identification and worker survey training


Oct. 24th 1:30-4:00

During the month of October there will be citrus greening identification and worker survey training class held around the state. We will be conducting this training in Tavares on Oct. 24th from 1:30 to 4:00. Lunch is available from 12:30-1:30, there is a \$15 charge. Please call Maggie Jarrell or Ryan Atwood at 352-343-4101 to register. Pesticide applicator CEU's available.

Topics include:

- Distribution of Citrus Greening & Citrus Psyllid Management
- Scouting Recommendations & Employee Safety Issues
- Citrus Greening Symptom Identification
- Hands-on Citrus Greening Identification Training

Be sure to mention if you are planning to attend just the safety day or greening program or both programs; also if you will be joining us for lunch.



Weather Watch 2007-2008 starts November 5th

We will be starting up the Weather Watch program on November 5th. For those that have not participated in the past the Weather Watch program has been in operation for the past 35 years. The program gives the general weather outlook during warm periods and gives three to four daily updates during freeze events. Fred Crosby brings 40+ years of agricultural weather forecast experience to our advisories.

The outlook can be accessed 24/7 with dedicated phone lines. John Jackson has also agreed to continue to assist during freeze events. The cost of this program is \$100.00 for the season. If you would like to sign up please fill out the flyer in the back of the newsletter and fax or mail it to the Lake County Extension

CEU DAY Nov. 11th 8:30-4:00

For pesticide applicators who are needing CEU's there will be a CEU day held on November 8th in Kissimmee at the Osceola County extension office. If you only need a few you can register for just part of the day. See flyer for more information. To register call the Osceola County extension office at 321-697-3000.

Fall & Winter Production Practices for Greening Management.

Nov. 13th 9:30-11:00

We will have an OJ meeting on November 13th in Tavares from 9:30-11:00 am. Dr. Timothy Spann from the Citrus Research and Education Center will be our speaker. Dr. Spann will be teaching us practical production techniques for managing our groves in these greening challenged times.

FAWN Update and Winter Weather Prediction

Dec. 11th 9:30-11:00 AM

We will have an OJ meeting on December 11th from 9:30 to 11:30 am. Rick Lusher the new coordinator of the Florida Automated Weather Network (FAWN) will be informing us on the latest happenings with the FAWN project. Rick is looking forward to visiting the birth place of the FAWN project. Also, from the University of Florida will be Clyde Frassie to tell us what type of winter weather we can be expecting this coming winter.

Private Agricultural License Review & Exam Dec. 12th 8:30-4:00

A pesticide license is required by any persons who apply or supervise the application of restricted use pesticides for agricultural production. This certification requires a passing grade of 70% on the General Standards and Private exam. This certification must be renewed ever 4 years either by testing or by 8 CEU's. There will be a review and exam in Tavares on December 12th. The review starts at 8:30 AM. There is a \$20 charge for the class.

It is advisable to purchase the "Applying pesticides correctly" and "The private applicator training manual" from the IFAS bookstore online at www.ifasbooks.ufl.edu or by calling 800-226-1764. The private agricultural license itself cost \$60 which does not have to be paid until after you pass the exam. To register please call Maggie Jarrell at 352-343-4101.



Citrus Expo “Managing Today’s Risks for Tomorrow’s Profits”

Day two of the 2007 citrus expo was titled “Managing Today’s Risks for Tomorrow’s Profits”. The discussion centered on advanced production systems and intensive management technologies as pathways to higher yields, harvesting and production efficiencies, and diseases management. I found the second days talks very interesting. The guest speakers presented on how advanced production systems have been successfully implemented for citrus production in other parts of the world.

Speakers from Florida spoke on the principles of orchard design, plant water and nutrient use, citrus root systems and open hydroponic system, economics of planting density, etc. The term open hydroponic system has been used a lot to describe one form of advanced production systems. Its basic premise is an intensive fertilization and irrigation scheduling which optimizes plant growth and fruit production. The financial benefit of this system was demonstrated and comparisons were made for differing trees per acre and differing rates of tree removal as maybe required due to

greening.

Open hydroponic system/Advance production systems (OHS/APS) involve more trees per acre, which will lead to earlier production and prolong the productive life of the grove. Profitability can be achieved sooner leading to less uncertainty and OHS/APS can increase internal and external fruit quality. Another advantage is the use of soil applied systemic insecticides on young trees by using the fertigation system.

Some critics of OHS question the effectiveness of this system under Florida weather conditions. Pete Spyke of Arapaho Citrus planted ten acres of citrus this past spring which he has grown using OHS/APS techniques. Pete is using the ten acres to compare different scion/rootstock combinations planted at 6 and 8 feet in the row and 20 feet between the rows. While most of the acreage is under drip irrigation, micro irrigation is also included for comparison.

Pete reported the most vigorous scion/rootstock combinations as being six feet tall with four feet canopy diameters. The preliminary results appear promising. I plan on scheduling a site visit in the spring for anyone who is interested in learning more on this production approach.

2007-2008 Orange Forecast

The official USDA crop estimate will be released on Oct. 12th. Already two private companies have come out with estimates for the 2007-08 season of 198 boxes (Elizabeth Steger) and 180 boxes (Louis Dreyfus Citrus Inc.). The three main components of the crop estimate are number of commercial trees, the average number of fruit per tree, and the size of the fruit.

The three seasons since the 2004 hurricanes the citrus crop has averaged 142 million boxes. The USDA recently completed a special census of seven counties. Tree losses during the one-year





Citrus Hall of Fame

The Florida Citrus Hall of Fame has 151 honorees and has been in existence for forty five years. This year a major effort is being made to secure qualified nominees for consideration for the 2008 class. Your help is vital to make this possible. The Selection Committee is seeking qualified candidates. Honorees must have made significant contributions to the industry. The committee is looking for someone that has been a leader, innovator, advocate, giver of time and gone beyond the assigned "job" to make this industry stronger and better.

Nomination Forms can be obtained from Florida Citrus Showcase or the Selection Committee. We encourage nominations to be made electronically. Email addresses are provided below.

Nominations are due no later than December 1, 2007. A well prepared application needs some thought and effort; however, it does not need to be a "term paper". The nomination should contain some basic background information and a description of the nominee's citrus activities. Most importantly, tell how these actions have impacted the citrus industry.

If you have any questions or need an application contact:

John Jackson
Chairman – Selection Committee
Citrus Hall of Fame
jackson71344@yahoo.com

Bobby Fuqua
Executive Director
Florida Citrus Showcase
Bobby@CitrusShowcase.com

Current Spray Program for Psyllid Management in CREC Groves

Below is the current spray program being utilized by the Citrus Research and Education Program grove crew. This recommendations were shared with growers at the Citrus Expo.

January -Aldicarb 33 lbs/A (e.g. Temik)

February -Fenpropathrin (e.g. Danitol)

March -Bloom period=no sprays

April -Post bloom spray=carbaryl 4F 2 Qts/A

May/June -1st oil spray + imidacloprid (e.g. Admire) foliar spray 16oz A

July/Aug. -2nd oil spray + chlorpyrifos (e.g. Lorsban)

September -No sprays unless high psyllid Populations observed

October -carbaryl 4F 2 Qts/A

Nov./Dec. -No sprays unless high psyllid Populations observed



AN IODINE-BASED STARCH TEST TO ASSIST IN SELECTING LEAVES FOR HLB TESTING

ED ETXEBERRIA, PEDRO GONZALEZ, WILLIAM DAWSON, AND TIM SPANN

DISCLAIMER: This is **not** a test for HLB/greening, rather it is a method to assist you in selecting leaves to submit for PCR testing. Starch is a natural product of photosynthesis and may accumulate in leaves for a variety of reasons, not just because of HLB infection. For example, the following conditions may induce higher than average starch accumulation in leaves and may result in dark staining when HLB/greening is not present:

- Cultivar – some cultivars have naturally abundant levels of starch in their leaves (e.g. Murcott)
- Branch damage – a brake, girdling, insect damage or any other physical condition that limits movement of photosynthates in the phloem will result in elevated starch levels
- Disease infection other than HLB/greening – *Phytophthora* or blight for example will lead to elevated starch levels as well
- Containerized trees – a tree growing in a pot will have higher levels of starch accumulation than a tree in the ground

SELECTING LEAVES FOR IODINE TESTING

Choosing a leaf is a crucial process. As mentioned above, several conditions may cause leaves to accumulate higher than normal starch levels. Thus, we recommend that leaves be selected carefully. The following is a list of criteria to help guide you:

1. Select symptomatic leaves – blotchy mottle leaves are best if present,
2. Make sure the branch supporting the leaf is not damaged, broken, or partially girdled,
3. Sun exposed leaves are best,
4. Avoid physically damaged leaves, e.g. obvious insect damage,
5. Test multiple leaves.

IODINE SOLUTION

There are several iodine solutions available at pharmacies and drugstores. For this test, you will need to purchase products labeled “tincture of iodine” or “iodine tincture.” These products contain iodine and/or sodium iodide dissolved in alcohol and water. Products labeled “iodine solution” often contain surfactants and other ingredients (e.g. citric acid, disodium phosphate, glycerin, nonoxynol-9, sodium hydroxide) and will **not** react with starch. Iodine tinctures come as 2% solutions. A solution of 0.2% iodine is optimal for this test, so you will need to make a 1 to 10 dilution with water (one part iodine tincture solution plus 9 equal parts of water). Store the diluted solution in a dark tinted or opaque container (you can cover a clear container with aluminum foil). The solution should last a few weeks when properly stored.

PERFORMING THE TEST

The steps for performing the test are illustrated on the other side of this page. You should cut a longitudinal (lengthwise) section of the leaf **through the area showing symptoms**. Immerse the cut section in the prepared iodine solution for 2 minutes. Rinse the soaked section with clear water and inspect the cut surface for staining using a magnifying glass or hand lens.

WHAT DOES A “POSITIVE” STARCH TEST MEAN?

A darkly stained leaf from an undamaged branch indicates above normal starch accumulation, it **does not** indicate that the leaf is positive for HLB/greening. This test should be used to assist you in selecting leaves that should be tested further. It is a useful tool to help you to avoid submitting nutrient deficient leaves or other leaves that may superficially resemble HLB/greening but are not. It may also help you to find leaves in which some condition, that would not cause starch accumulation (e.g. extreme nutrient deficiency) is masking HLB/greening symptoms. This test should be thought of as a pre-screening tool only. IFAS **does not** recommend making any decisions to remove or otherwise destroy trees without a PCR positive test.

AN IODINE-BASED STARCH TEST TO ASSIST IN SELECTING LEAVES FOR HLB TESTING

Ed Etxeberria, Pedro Gonzalez, William Dawson and Timothy Spann

SUMMARY

Leaves on HLB infected trees (or branches) appear to accumulate above normal levels of starch. When starch is mixed with iodine in water, an intensely colored starch/iodine complex is formed. Therefore, elevated starch levels can be easily visualized. We have prepared an easy method for the detection of starch in citrus leaves that may assist in the selection of leaves for further HLB testing. However, starch is a natural product and can accumulate in leaves under a variety of other circumstances. The following preconditions may induce higher than average starch accumulation in leaves and may result in false positive signals: potted trees, cultivar (e.g. Murcott has naturally high starch), phytophthora infection, branch damage.

RESULTS

MATERIALS AND METHODS

1. Select leaves with suspicious greening symptoms.
2. Cut the tip off as illustrated in Fig 1.
3. Cut a longitudinal section of the leaf blade.
4. Immerse both sections in iodine solution (1.2 - 2.0% iodine) for 2 minutes.
5. Rinse leaf segments in water and observe using a magnifying glass.



FIGURE 1. Properly sectioned leaf showing the removed tip and longitudinal section.

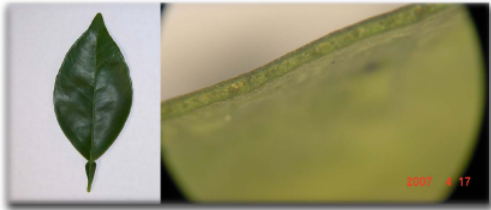


FIGURE 2.

A healthy leaf showing no starch accumulation (left) and normal, low starch accumulation (right).

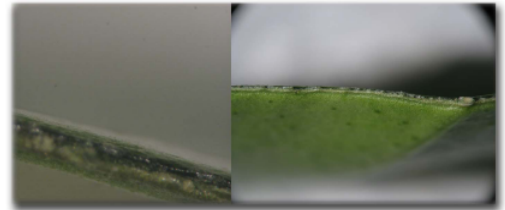


FIGURE 3. Leaves showing blotchy mottle greening symptoms (left) and their respective high levels of starch accumulation (middle, right).



FIGURE 4. Nutrient deficient leaves (left) show no abnormal starch accumulation (right).



Fall 2007

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As fall approaches greening symptoms become more visible. The number of blotchy model leaves increase as we move into the fall and winter months both in the outer and inner canopy. Another symptom is abnormal fruit shape that is smaller and lopsided when compared to healthy fruit. When in doubt send a sample to the lab to get it tested.

The Vision for the University of Florida's Institute of Food and Agricultural Sciences (UF/IFAS) is to increase and strengthen the knowledge base and technology for:

- Expanding the profitability of global competitiveness and sustainability of the food, fiber, and agricultural industries of Florida.
- Protecting and sustaining natural resource and environmental systems.
- Enhancing the development of human resources.
- Improving the quality of human life.



Abnormal fruit shape. Infected Valencia orange (left) and healthy Valencia orange (right)



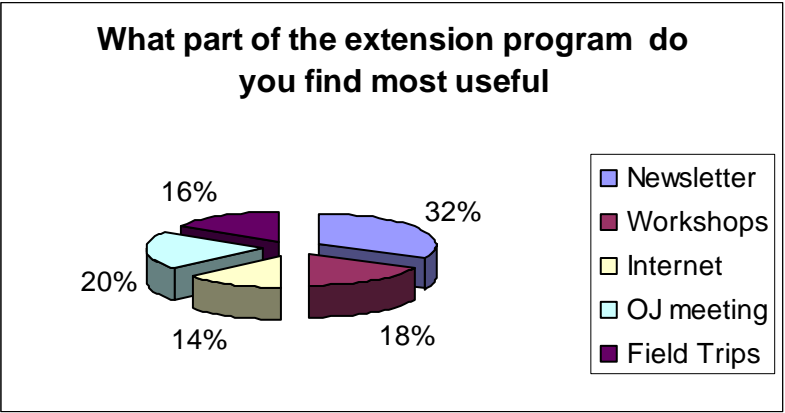
Blotchy mottled leaves with yellow veins



2007 Survey Results

Thanks to those who replied to the 2007 Survey. I found the feedback helpful and interesting. Congratulations to Lee Bird of Brevard County on winning a free subscription to the Weather Watch program! Those that responded represent less than one percent of the mailing list. However, I think the information provided can be applied to the area. Most that replied have attended at least one extension program this past year, with the average 3.2 programs per respondent. To the right is a list of what you think are the most interesting topics for extension programming and a graph of what you find most useful.

- | | |
|--------------------------|-----------------------|
| 1. Greening/HLB | 7. Nutrition |
| 2. Weed Management | 8. Economics |
| 3. Canker | 9. Farm Safety |
| 4. Pest Management | 10. Other fruit crops |
| 5. Exotic Diseases | 11. Small Farm |
| 6. Weather/Cold Protect. | 12. Taxes |
| | 13. Organic |





Summary of 2005-2006 Citrus Budget for the Central Florida (Ridge) Production Region

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 Central 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 **Central Florida** represent a **custom managed operation**.

The 2005-2006 summary comparative budgets are shown in Table 1 and 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 2005-2006 budgets reflect major price increases in all production inputs over the 2004-2005 season: fuel increased 8.5% to 12.5%; fertilizer products increased 10% to 13.5%; fungicides increased 3.5% to 5.0%; and spray oil increased 60%. Due to generic products, insecticides, nematicides and herbicides price changes were mixed; some products have increased 7% to 14% while others remained the same or decreased. Citrus trees were still recovering from the affects of the 2004 and 2005 hurricanes that crossed the Florida citrus production regions. The 2005-2006 Indian River region's citrus production was only 65% of typical average per acre yields with Central Florida yields for the same season about 85% of typical average production. Southwest Florida had the largest reduction in yields due to Hurricane Wilma in October 2005. Yields decreased 40% to 60% for most varieties in the Southwest Florida citrus production region. As a result of the decreased yields per acre for all citrus production regions, the unit per box, per pound solids and per carton costs were 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.

Each budget shown in Table 1 lists the cost of individual grove care practices normally performed in a citrus grove. These costs are categorized into cumulative sub-totals of irrigated processed and irrigated fresh fruit program and reflecting current grove practices being used by growers. The estimated costs are for a mature grove (10+ years old); the grove care costs for a specific grove site may differ depending upon the tree age, tree density and the grove practices performed. For example, extensive tree loss due to blight or tristeza could at least double, if not increase more, the tree replacement and care costs. Also, travel and set-up costs may

vary due to the size of a citrus grove and the distance from the grove equipment barn. The mandatory decontamination requirements to control the spread of citrus canker add to the total operational costs. These costs are shown in the expanded “delivered-in” cost table.

The comparative budget costs are shown as an expanded “**delivered-in**” cost format in Table 2 for Central Florida Valencia oranges. The “delivered-in” costs represent cultural programs for both the processed juice fruit and fresh fruit markets. The estimated delivered-in costs include total cultural/production, management, regulatory and harvesting costs.

With the introduction of citrus greening in 2005, Florida citrus growers have had to develop new management strategies to identify infected trees to be removed along with a new spray program to control the insect vector, Asian citrus psyllid, which transmits the citrus greening disease. Likewise, with the discontinuation of the citrus canker eradication program in 2006, new management strategies are being implemented to assure fruit grown for the fresh market can be certified “canker free” for shipments to the U.S. domestic and European markets. Table 3 presents estimated costs required to manage citrus greening and canker that would be in addition to the costs shown in Tables 1 and 2. Since Florida’s citrus industry is in “beginning learning stages” for management of citrus greening and canker, at this time these costs are presented separately.

Additional information on budgeting and cost analysis can be obtained by contacting the author or your County Extension Agent or going to the Extension or Economics section of the EDIS website: <http://edis.ifas.ufl.edu> or UF/IFAS CREC website: <http://www.crec.ifas.ufl.edu> then click on **Extension** and then **Economics**.

Table 1. A listing of estimated comparative Central Florida (Ridge) citrus production costs per acre for oranges, 2005-2006^z

Costs represent a mature (10+ years old) Central Florida (Ridge) Orange Grove.	Low Cost Processed Cultural Program One-Year Alternative	Processed and Reduced Fresh Cost Cultural Program	Typical/Historical Fresh Fruit Cultural Program
PRODUCTION/CULTURAL COSTS:^y			
Weed Management/Control:			
Discing (2 times per year)	\$ 20.64	\$ 20.64	\$ 20.64
Mechanical Mow Middles (4 times per year)	47.36	47.36	47.36
General Grove Work (2 labor hours per acre)	29.32	29.32	29.32
Herbicide (1/2 tree acre treated):			
Application (4 glyphosate or 2 residual applications)	\$58.88	\$29.44	\$29.44
Material	23.72	71.82	71.82
Spot Treatment (Material/application)	—	<u>14.72</u>	<u>14.72</u>
Total Herbicide Cost	82.60	115.98	115.98
Spray:			
Summer Oil #1 (Processed @ 125 GPA) or Post Bloom (Fresh @ 250 GPA):			
Application	—	26.98	30.63
Material	—	<u>55.85</u>	<u>46.44</u>
Total Summer Oil #1 or Post Bloom Cost	—	82.83	77.07
Summer Oil #2: Application (PTO – 125 GPA; 250 GPA)			
Application (PTO – 125 GPA; 250 GPA)	26.98	26.98	30.63
Material	<u>67.59^w</u>	<u>46.09</u>	<u>86.35</u>
Total Summer Oil #2 Cost	94.57	73.07	116.98
Supplemental Fall Miticide:			
Application (PTO – 125 GPA)	—	—	26.98
Material	—	—	<u>12.59</u>
Total Supplemental Fall Miticide Cost	—	—	39.57
Fertilizer (Bulk): 4 Applications			
Material (16-0-16-4 MgO @ 204 lbs N per acre)	37.64	37.64	37.64
Total Fertilizer Cost	<u>186.15</u>	<u>186.15</u>	<u>186.15</u>
Dolomite (one ton applied every 4 years)			
Material/Application	12.34	11.36	11.36
Pruning: Topping (\$37.50/A ÷ 2.5 yrs)^v			
Hedging (\$34.17/A ÷ 2 yrs) ^v	14.92	14.92	14.92
Chop/Mow Brush after Hedging (\$10.62/A ÷ 2 yrs) ^v	17.09	17.09	17.09
Total Pruning Cost	<u>5.31</u>	<u>5.31</u>	<u>5.31</u>
Tree Replacement--1 thru 3 years of age: (3 trees/acre)			
Remove Trees: Pull, Stack & Burn 3 Trees with Front-end Loader	18.27	18.27	18.27
Prepare Site & Plant Tree (Includes 3 reset trees)	40.11	40.11	40.11
Supplemental Fertilizer, Tree Wraps Maintenance, Sprout, Etc. (Trees 1-3 years old)	<u>38.27</u>	<u>38.27</u>	<u>38.27</u>
Total Tree Replacement Cost	96.65	96.65	96.65
Irrigation: Microsprinkler System ^u	<u>175.97</u>	<u>175.97</u>	175.97
IRRIGATED PROCESSED FRUIT PRODUCTION COSTS	<u>\$820.56</u>	<u>\$914.29</u>	
Fall Miticide: Application (125 GPA)			
Material		26.98	26.98
Total Fall Miticide Cost		<u>32.52</u>	<u>32.52</u>
IRRIGATED FRESH FRUIT PRODUCTION COSTS		<u>\$973.79</u>	<u>\$1,051.51</u>

^zThe listed estimated comparative costs are for the example grove situation described in the Economic Information Report Series entitled: "Budgeting Costs and Returns for Central Florida Citrus Production" and may not represent your particular grove situation in Central Florida.

SOURCE: Ronald P. Muraro, University of Florida-IFAS, Citrus Research and Education Center, Lake Alfred, FL, December 2006.

^yCentral Florida production area refers to Polk and Highlands counties. However, the costs presented in this report are applicable to other counties such as Hardee, Hillsborough, Lake-Orange, Osceola and Pasco counties.

Where **equipment use** or **application** is listed (discing, hedging, spray application, etc.), an **average custom charge** (cost) is used which includes a charge for equipment repairs, maintenance, labor and overhead management charges/costs. A **management charge** for equipment supervision and fruit marketing is not included. Management charges/costs could be based on a monthly charge (\$3 to \$6/acre) or percentage of gross sales. In addition to these charges, a harvesting supervision cost (10¢ to 20¢/box) for overseeing and coordinating harvesting may be charged. Other cost items which are not included in the budget are ad valorem taxes and interest on grove investment. In addition to these cost items, overhead and administrative costs, such as water drainage/district taxes, crop insurance, and other grower assessments, can add up to 12 percent to the total grove care costs. These costs vary from grove to grove depending on age, location, and time of purchase or establishment.

Included in the materials expense is a supervision (or handling) charge of 10% of cost/price of the materials.

The budget cost items have been revised to reflect current grove practices being used by growers--e.g., chemical mowing, different spray materials, and rates of fertilization, microsprinkler irrigation, more reset trees, hedging and topping practices, etc. Therefore, the revised costs for each grove practice shown may be higher, or lower, than previously reported.

Although the estimated annual per acre grove costs listed are representative for a mature citrus grove (10+ years old), the grove care costs for a specific grove site may differ depending upon the tree age, tree density and the grove practices performed; e.g., spot herbicide for grass/brush regrowth under trees could add an additional \$14.18 per acre; Diaprepes control could add \$93.18 per acre for each foliar application; extensive tree loss due to blight or tristeza could substantially increase the tree replacement and care costs; spray applications to control citrus leafminer and nematicide applications of such as Temik (\$117.23/acre) could increase the total cultural costs per acre above the average costs shown in the comparative budgets; travel and set-up costs may vary due to size of the citrus grove and distance from grove equipment barn and could add \$36.08 per acre; etc.

^xSpray materials include copper (Cu), oil, miticide and nutritional.

^wSpray materials include copper (Cu), oil and nutritional.

^vPer acre costs shown in parenthesis are for 2006.

^uIrrigation Expense includes the following:

	<u>Microsprinkler</u>
Variable Operating Expense (Diesel)*	\$ 65.98
Fixed-Variable Expense (annual maintenance repairs to system)	<u>53.43</u>
Total Cash Expenses	\$119.41
Fixed-Depreciation Expense	<u>56.56</u>
Total Cash and Fixed Expense	<u>\$155.04</u>

*Reflects the higher fuels costs.

Source: Ronald P. Muraro, Extension Farm Management Economist, University of Florida, IFAS, CREC, Lake Alfred, Florida, December 2006.

Table 2. Estimated total delivered-in cost for Central Florida (Ridge) Valencia oranges grown for the processed market under three cultural cost programs, 2005-06

Represents a mature (10+ years old) Central Florida (Ridge) Orange Grove	Processed Valencia Orange Low Cost Cultural Program			Processed Valencia Orange Cultural Program			Fresh/Processed Valencia Orange Historical Cost Cultural Program		
	\$/Acre	\$/Box	\$/P.S.	\$/Acre	\$/Box	\$/P.S.	\$/Acre	\$/Box	\$/P.S.
Total Production/Cultural Costs	\$ 820.56	\$2.126	\$0.3126	\$ 914.29	\$2.369	\$0.3483	\$973.79	\$2.523	\$0.3710
Interest on Operating (Cultural) Costs	22.57	0.058	0.0086	25.14	0.065	0.0096	26.78	0.069	0.0102
Management Costs	48.00	0.124	0.0183	48.00	0.124	0.0183	48.00	0.124	0.0183
Taxes/Regulatory Costs:									
Property Tax and Water Management Tax	64.96	0.168	0.0247	61.87	0.160	0.0236	61.87	0.160	0.0236
Canker Decontamination Costs	<u>8.25</u>	<u>0.021</u>	<u>0.0031</u>	<u>8.25</u>	<u>0.021</u>	<u>0.0031</u>	<u>8.25</u>	<u>0.021</u>	<u>0.0031</u>
Total Direct Grower Costs	\$ 964.34	\$2.498	\$0.3674	\$1,057.55	\$2.740	\$0.4029	\$1,118.69	\$2.898	\$0.4262
Interest on Average Capital Investment Costs	<u>321.22</u>	<u>0.832</u>	<u>\$0.1224</u>	<u>321.22</u>	<u>0.962</u>	<u>0.1435</u>	<u>321.22</u>	<u>0.962</u>	<u>0.1435</u>
Total Grower Costs	\$1,285.55	\$3.330	\$0.4898	\$1,378.76	\$3.701	\$0.5464	\$1,439.90	\$3.860	\$0.5697
Harvesting and Assessment Costs:									
Pick/Spot Pick, Roadside & Haul and Canker Decontamination Costs	1,042.20	2.700	0.3971	1,042.20	2.700	0.4030	1,042.20	2.700	0.4030
DOC Assessment	<u>71.41</u>	<u>0.185</u>	<u>0.0272</u>	<u>71.41</u>	<u>0.185</u>	<u>0.0276</u>	<u>71.41</u>	<u>0.185</u>	<u>0.0276</u>
Total Harvesting and Assessment Costs	1,113.61	2.885	0.4243	1,113.61	2.885	0.4306	1,113.61	2.885	0.4306
Total Delivered-In Cost	<u>\$2,399.16</u>	<u>\$6.215</u>	<u>\$0.9140</u>	<u>\$2,492.37</u>	<u>\$6.586</u>	<u>\$0.9770</u>	<u>\$2,553.51</u>	<u>\$6.745</u>	<u>\$1.0003</u>
P.S. = Pound Solids	Refer to cultural program shown in Table 1.			Refer to cultural program shown in Table 1.			Refer to cultural program shown in Table 1.		
Yield: 386 boxes/acre @ 6.8 P.S. per box 120 trees per acre	Only summer oil sprays with oil, copper and Agri-mek & Nutritionals.			Refer to cultural program shown in Table 1.			A Fall Miticide Spray added to the cultural program shown in Table 1.		

Source: Ronald P. Muraro, Extension Farm Management Economist, University of Florida, IFAS, CREC, Lake Alfred, Florida, December 2006.

Table 3. Additional costs for managing Citrus Canker and Citrus Greening, 2005-2006

	Hamlin Oranges and Grapefruit for Juice Processing	Valencia Oranges for Juice Processing	Grapefruit for Fresh Market
	\$/Acre	\$/Acre	\$/Acre
<u>Citrus Canker</u>			
Spray Costs (Application & Materials)	118.54	65.40	53.14
Grove Inspections for Managing Canker for Fresh Fruit Market	—	—	39.15 ^a (2 inspections)
Total Additional Costs for Citrus Canker	118.54	65.40	92.29
<u>Citrus Greening (control psyllia)</u>			
Temik (Application & Materials)	117.23	117.23	117.23
Spray Costs (Application & Materials)	47.98	47.98	— ^b
Field Inspections for Identifying Trees with Greening	58.72 (3 inspections)	58.72 (3 inspections)	58.72 ^a (3 inspections)
Total Additional Costs for Citrus Greening	223.93	223.93	175.95
Total Additional Costs for Citrus Canker and Greening	<u>342.47</u>	<u>289.33</u>	<u>268.24</u>

^aField inspections can be combined or fresh fruit market production program.

^bSpray program for psyllid control is already included in fresh grapefruit production program.

Source: Ronald P. Muraro, Extension Farm Management Economist, University of Florida, IFAS, CREC, Lake Alfred, Florida, December 2006.