

Citrus Notes



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March 2008

Vol. 08-03

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Don't forget the "Citrus Greening Summit" at the 2008 Florida Citrus Growers Institute in Avon Park. Also, please note the announcement for Florida Citrus Mutual's Area Grower Meeting to be held in Alturas. The 2008 annual meeting of the Florida State Horticultural Society will be held at the North Fort Lauderdale Marriott in June. This year there are a number of presentations on citrus greening and if you have drifted away from the society in the past this maybe an excellent opportunity to join and attend this year's meeting. The citrus greening update article continues from last month with comments on the distribution of symptomatic trees. Lastly, we have included an update version of the 2008 pest control table in the pesticide news and information section.

Enjoy the issue,



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Greening Summit at the 2008 Florida Citrus Growers Institute

On Tuesday, April 8, 2008, the “Greening Summit” at the 2008 Florida Citrus Growers Institute will be held at the University Center Auditorium of South Florida Community College in Avon Park. This year the program was developed as a cooperative effort of your local county citrus advisory committees, the Citrus Greening Task Force of the Florida Citrus Production Research Advisory Council and the University of Florida, IFAS County Extension. Preregistration is required, contact Jane Wilson at 863-956-1151.



2008 Florida Citrus Mutual Area Meetings

Florida Citrus Mutual has announced the list of the 2008 Area Grower Meetings. One has been scheduled in Alturas beginning at 6:00 p.m. on Thursday, April 17, 2008. All growers are invited to attend and dinner will be served, but you must RSVP to 863-682-1111 by Monday, April 14, 2008. When you RSVP you will be provided with the location and directions by Mutual.

Annual Meeting of the Florida State Horticultural Society (FSHS)



The following is a listing of the citrus presentations accepted for the 2008 Annual FSHS meeting in June. You will notice there is a separate section devoted to citrus greening which should be of interest to all citrus growers. I strongly urge you to consider attending to get the latest information on citrus greening research and other citrus topics.

Titles for the 2008 annual meeting of the Florida State Horticultural Society-Citrus Section

Special Joint Session (7:30) June 2, 2008

Digital Imaging Best Management Practices for Agricultural Professionals using Adobe Photoshop CS.

*Steve Rodgers
EcoStat, Inc., Highland City, FL.*

Mechanical Harvesting (9:00 to 10:00)

Scheduling the Harvest of Florida Oranges to Maximize Juice Production.

*Jacob Searcy, Fritz Roka, Thomas Spreen.
University of Florida, IFAS, Food Resource Economics Department, Gainesville, FL. and Southwest Florida Research and Education Center, Immokalee, FL.*

Incorporation of Air Temperature into a Model That Predicts Loosening of Oranges by CMNP.

*Robert C. Ebel and Jacqueline K. Burns.
University of Florida, IFAS, Southwest Florida Research and Education Center, Immokalee, FL and Citrus Research and Education Center, Lake Alfred, FL.*

The Economic Value of Abscission for Mechanically Harvest Late-season 'Valencia' Oranges.

German Blanco, Fritz Roka and Jackie Burns.
University of Florida, IFAS, Food Resource Economics Department, Gainesville, FL and Southwest Florida Research and Education Center, Immokalee, FL and Citrus Research and Education Center, Lake Alfred, FL.

Interaction of Drought Stress and CMNP on Abscission of Oranges.

Robert C. Ebel, Kelly Morgan, Peter Newman, Jacqueline K. Burns, Jim Syvertsen.
University of Florida, IFAS, Southwest Florida Research and Education Center, Immokalee, FL and Citrus Research and Education Center, Lake Alfred, FL.

Weather Data Collection and Management Inputs (10:30 to 11:30)

The Florida Automated Weather Network: Ten Years of Providing of Weather Information to Florida Growers.

William R. Lusher, John L. Jackson and Kelly T. Morgan.
University of Florida, IFAS, Gainesville, FL and Southwest Florida Research and Education Center, Immokalee, FL.

El Niño-Southern Oscillation Effects on Freeze Probabilities in Florida.

Clyde Fraisse, Howard Hu, Guillermo Baigoria.
University of Florida, IFAS, Agricultural and Biological Sciences Department, Gainesville, FL.

Citrus Cold Weather Protection and Irrigation Scheduling Tool Using Florida Automated Weather Network Data.

John L. Jackson, Kelly T. Morgan, and William R. Lusher.
University of Florida, IFAS, Gainesville, FL and Southwest Florida Research and Education Center, Immokalee, FL.

Workshop on Greening, Canker, and Phylid management (1:30 to 5:00, including sectional business meeting)

How the Florida Citrus Production Research Advisory Council Works Together With Other Industry Organizations for Solutions to the Greening Crisis.

Steve Rodgers.
Ecostat, Inc., Highland City, FL.

Exploratory Research on Control Measures for Citrus Canker.

Kateel G. Shetty and Krish Jayachandran.

Means and Pathways for Long-range Movement of Citrus Greening in Florida.

Susan Halbert, Manjunath Keremane and Chandrika Ramadugu.
Division of Plant Industry, Department of Agriculture and Consumer Services, Labelle, FL.

Real-Time PCR Increases Efficiency and Sensitivity for Testing Citrus Budwood Source Trees.

Peggy J. Sieburth, Karen Nolan, Richard Dexter and Steve Alderman.
Bureau of Citrus Budwood Registration, Division of Plant Industry, Department of Agriculture and Consumer Services, Winter Haven, FL.

Greening Effects on Fruit Size Distribution in a Citrus Tree.

Tim Spann and Chris Oswald.
University of Florida, IFAS, Citrus Research and Education Center, Lake Alfred, FL and Polk County Cooperative Extension Service, Bartow, FL.

Citrus Practices for Accelerated Fruit Production for Greening Management (preliminary title).

Ed Stover.
USDA, Fort Pierce, FL.

Greenhouse Investigations on the Effect of Guava on Infestations of Asian Citrus Psyllid in Citrus

D. G. Hall, T. R. Gottwald, N. M. Chau, K. Ichinose, L. Q. Dien, and G. A. C. Beattie

Evaluation of Low Volume Application Technologies for Psyllid Control: Initial Results.

Ryan Atwood, Lukasz Stelinski and Masoud Salyani.

University of Florida, IFAS, Lake County Cooperative Extension Service, Tavares, FL. and Citrus Research and Education Center, Lake Alfred, FL.

Impact of Insecticidal Control on Asian Citrus Psyllid and its Natural Enemies.

A. H. Jawwad, H. Qureshi, Alejandro Arevalo, and Philip A. Stansly.

University of Florida, IFAS, Southwest Florida Research and Education Center, Immokalee, FL.

Dynamics of Mortality Factors of the Citrus Psyllid in South Florida.

Jorge E. Peña, R. E. Duncan and Josep A. Jacas. University of Florida, IFAS, Citrus Research and Education Center, Lake Alfred, FL.

Streptomycin Controls Citrus Canker in Brazil and Florida and Reduces Risk of Copper Phytotoxicity on Grapefruit.

J. H. Graham, CREC, University of Florida, Lake Alfred; R. P. Leite, Jr., Instituto Agronômico do Paraná, Londrina, Paraná, Brazil; H. D. Yonce, KAC Agricultural Research, Inc. Deland, FL.

Combating Huanglongbing and Canker via Genetic Engineering of Citrus.

M. Dutt, A. Omar, V. Orbovic, G. Barthe, J. Gmitter, M. Vasconcellos, C. Dunning and J.W. Grosser. University of Florida, IFAS, Citrus Research and Education Center, Lake Alfred, FL.

Progress in Manipulating Citrus Defense Pathways in Favor of Citrus Resistance Against Greening and Canker.

Vicente J. Febres, Abeer Adhed Khalaf, Frederick G. Gmitter and Gloria A. Moore. University of Florida, IFAS, Citrus Research and Education Center, Lake Alfred, FL.

Citrus Horticultural Management (9:00 to 11:00) June 3, 2008

Citrus Best Management Practices: Efforts and Achievements in Florida.

Geovanne Stingham. University of Florida, IFAS, BMP Project, Immokalee, FL.

Spectral Differentiation of Young Flush and Old Citrus Leaves.

M. Salyani, R. Ehsani, A. Mishra, and R. Sweeb. University of Florida, IFAS, Citrus Research and Education Center, Lake Alfred, FL.

Results of Ground and Foliar Application of Nitamin Urea Polymer to Citrus.

Gene Albrigo. University of Florida, IFAS, Citrus Research and Education Center, Lake Alfred, FL.

Microbial Soil Amendments do Little to Improve Citrus Tree Performance in Florida Soils.

AW Schumann, JP Syvertsen, JH Graham. University of Florida, IFAS, Citrus Research and Education Center, Lake Alfred, FL.

Glyphosate and Carfentrazone Tank-mix for Hard-to-control Weeds in Citrus

Shiv D Sharma, M. Singh and S. H. Futch. University of Florida, IFAS, Citrus Research and Education Center, Lake Alfred, FL.

Rootstocks Affect the Yield and 16-Year Survival of ‘Valencia’ Trees Grown in Immokalee.

Bill Castle. University of Florida, IFAS, Citrus Research and Education Center, Lake Alfred, FL.

Growth, Tree Survival, and Juice Quality of Early-Season Sweet Oranges Grown on Seven Rootstocks in Immokalee.

Bill Castle. University of Florida, IFAS, Citrus Research and Education Center, Lake Alfred, FL.

Conference Registration

for the

2008 Joint Meeting

of the

Florida State Horticultural Society

and the

Soil and Crop Science Society of Florida

June 1 –4, 2008

Held at the Ft. Lauderdale Marriott North

***With Scientific Sessions on CITRUS,
HANDLING AND PROCESSING, GARDEN
AND LANDSCAPE, TROPICALS and
VEGETABLES along with aspects of SOIL &
CROP SCIENCE***

And featuring

***Florida Agriculture Commissioner
Charles Bronson, Keynote Speaker,
Citrus Consultant Paul Driscoll,
Special Speaker,
Scientific Coordinator Steven Rogers,
Professional Development Seminar Speaker
Dr. Terrell Neil, Horticultural Breakfast
Speaker
Vice-President Armando Campos, Extension
Luncheon Speaker***

REGISTER ON-LINE

at

(www.fshs.org and scssf.org)



***Citrus
Greening
Update***

In this month's update we are going to discuss some observations related to the distribution and subsequent spread of citrus greening disease in the commercial citrus grove we have been following this past year. As a review, a paper written by Mike Irely, Tim Gast and Tim Gottwald titled: "Comparison of Visual Assessment and Polymerase Chain Reaction Assay Testing to Estimate the Incidence of Huanglongbing Pathogen in Commercial Florida

Citrus", appeared in Volume 119 (2006) of the Proceedings of the Florida State Horticultural Society. One aspect of the paper analyzed the distribution of citrus greening disease in blocks of 14 rows by 14 trees in South Florida.

The study identified trees in these blocks as: a) having visual greening symptoms and PCR positive, b) having only visual greening symptoms and PCR negative, c) PCR positive only with no visual greening symptoms and d) having no visual greening symptoms and PCR negative. A number of statistical analyses were employed to better describe the distribution of greening in the blocks. The data revealed that in blocks where there was an aggregation of symptomatic greening infected trees, it was highly probable that adjacent trees were more likely to become infected with citrus greening. On the other hand, in blocks where infected trees were scattered and not grouped together, adjacent trees had a lower incidence of citrus greening. This would indicate large amounts of inoculum in concentrated areas of a block, could cause an increase in the localized spread of greening, compared to a single site source of inoculum.

Having reviewed the above, we looked at our block considering this additional information. We arbitrarily divided the grove into blocks of 240 trees (12 rows by 20 trees). This resulted in blocks 300 feet long by 300 feet wide or about 2 acres in area. In viewing a map of these blocks, it became quite evident that with a high percentage of trees infected, these symptomatic trees were grouped together. In blocks where the number of infected trees were lower, these trees were not as aggregated. This indicates that the distribution of citrus greening in these blocks is similar to what was found in the study done by Irely et al. The greater the number of greening infected trees in a block, the more these trees are grouped together.

The grove was divided into 9 blocks of about 2 acres in size. These blocks were labeled 1-9 as indicated in the table (table 1) with north at the top of the table. The following tables (tables 2 and 3) indicate the increase (+), decrease (-) or no change (0) in the total percentage of symptomatic trees from 2006 to 2007 and 2007 to 2008. Blocks 1 and 2 had the highest total percentage of greening infected trees. In these blocks the greening diseased trees were largely aggregated.

| North | | |
|-------|---|---|
| 9 | 8 | 7 |
| 6 | 5 | 4 |
| 3 | 2 | 1 |

Table 1. Initial map with block numbers.

| North | | |
|-------|---|---|
| 0 | + | + |
| - | + | + |
| 0 | - | + |

Table 2. Direction of change in total percentage of symptomatic trees from 2006 - 2007.

| North | | |
|-------|---|---|
| - | - | 0 |
| 0 | - | + |
| - | - | 0 |

Table 3. Direction of change in total percentage of symptomatic trees from 2007 - 2008.

From 2006 - 2007, 5 (#'s 1, 4, 5, 7, 8) of the 9 blocks had a positive percentage increase in symptomatic trees (table 2). In 2007, a psyllid management program was begun and surveys in the winter of 2008, indicated that only 1 block (#4) out of the 9 (table 3) had a positive percentage increase in symptomatic trees from 2007 to 2008. This example indicates the potential positive effects of psyllid control and tree removal as methods to reduce the spread of citrus greening within a grove. One additional observation on blocks 4 and 5 is related to the spread of greening in this grove. On the south side of this block there is an open field with no citrus. Having this condition the natural spread of greening and psyllids should be to the north. Note that the percentage of symptomatic trees in block #5 decreased but, in block #4 the percentage increased from 2007 to 2008. In looking at the total number of symptomatic in both blocks 4 and 5, they were the same after 2 years. This demonstrates the difficulty in trying to discern the distribution and spread of citrus greening, especially with low levels of infection.

In closing, this is just one grove in one location and the information provided makes no recommendations, only observations and comparisons. The discussion only seeks to provide additional insight into the battle with this disease in Florida.



***Emerging
Technology for
the 21st Century
Citrus Grove***

When: Tuesday, April 22, 2008

Where: Southwest Florida Research and Education Center,
2686 State Road 29 N., Immokalee, FL 33415

- 7:30 AM Registration, Coffee and refreshments
- 8:00 AM Welcome and Program Outline, Dr. Dunkelmann and/or Dr. Waddill
- 8:15 AM Travel to SWFREC field sites

Concept Grove and New Ideas for Grove Design - Dr. Bob Rouse, UF-SWFREC, Dr. Kelly Morgan, UF-SWFREC and Dr. Bill Castle, UF-CREC

Autonomous Guidance for Robotic Harvesting and Disease Detection - Dr. Tom Burks, UF-Ag. Eng.

Abscission Trials, 2007-08 - Dr. Bob Ebel, UF-SWFREC

10:30 AM Presentations in SWFREC main building

Yield Estimation with Digital Photography - Dr. Arnold Schumann, UF-CREC

Machine Enhancements for Mechanical Harvesting - Dr. Reza Ehsani, UF-CREC

12:00 PM Lunch

Update on Abscission Research and CMNP Registration - Dr. Jackie Burns, UF-CREC

Field Day Evaluation

1:15 PM Adjourn

For more information or to RSVP, please contact Barbara Hyman at 239-658-3461 or Fritz Roka at 239-658-3428.



Pesticide News and Information



2008 Pest Control Table

I have included on the last page of the newsletter the updated version of the pest control table from Dr. Michael Rogers (CREC). The information will be useful when making determinations on what materials to incorporate in your pest management program and their effect on beneficial organisms.

Table 1. List of insecticides and miticides recommended for use in the Florida Citrus Pest Management Guide and their effects on different pests and beneficial insects (Revised January 2008).

| Pesticide active ingredient | Target pest | | | | | | | | Effects on beneficial insects |
|---------------------------------------|-----------------------------|------------------|------------------|------------------|------------------|--------------------|------------------|------------------|-------------------------------|
| | Mode of Action ¹ | Psyllid | Leafminer | Rust Mites | Spider Mites | Root Weevil Adults | Scale Insects | Mealybugs | |
| Abamectin + oil | 6 | ++ | +++ _R | +++ _R | + | +(oil) | +(oil) | +(oil) | medium |
| Acetamiprid | 4 | - | +++ _R | - | - | ? | + | ++ | medium |
| Aldicarb | 1A | +++ _R | - | +++ _R | +++ | - | - | - | low |
| Carbaryl | 1A | +++ _R | - | + | ? | +++ _R | +++ _R | + | high |
| Chlorpyrifos | 1B | +++ _R | + | + | - | + | +++ _R | +++ _R | high |
| Diflubenzuron | 15 | ++ | +++ _R | +++ _R | - | +++ _R | - | - | low |
| Dimethoate | 1B | +++ | - | - | - | ? | +++ _R | + | high |
| Fenbutatin oxide | 12 | - | - | +++ _R | +++ _R | - | - | - | low |
| Fenpropathrin | 3 | +++ _R | ? | + | + | +++ _R | - | + | high |
| Imidacloprid (soil appl., nonbearing) | 4 | +++ _R | +++ _R | - | - | + | ++ | + | low |
| Imidacloprid (foliar application) | 4 | +++ _R | + | - | - | - | ++ | + | medium |
| Petroleum oil | NR | + | ++ _R | ++ _R | ++ | +(eggs) | ++ _R | + | low |
| Pyridaben | 21 | - | ? | ++ | +++ _R | - | - | - | high |
| Spinosad | 5 | - | +++ _R | - | - | - | - | - | Low |
| Spinetoram | | ? | +++ _R | ? | ? | ? | ? | ? | Low |
| Spirodiclofen | 23 | - | - | +++ _R | +++ _R | ? | - | - | low |
| Sulfur | NR | - | - | +++ _R | +++ | - | ? | ? | High (short term) |

¹Mode of action class for citrus pesticides from the Insecticide Resistance Action Committee; NR = no resistance potential

(R) = product recommended for control of pest in Florida Citrus Pest Management Guide

(+++)= good control of pest

(++) = short-term control of pest

(+) = low levels of pest suppression

(-) = no observed control of pest

(?) = insufficient data available