



# Citruslines

The Mission of UF/IFAS is to develop knowledge in agricultural, human and natural resources and to make that knowledge accessible to sustain and enhance the quality of human life.

Spring 2009

April, May & June

**UF** UNIVERSITY of  
**FLORIDA**

IFAS Extension

Lake County Extension



## Upcoming Events <http://cfextension.ifas.ufl.edu/calendar.shtml>

<b>Citrus Grower's Institute</b>	<b>Bartow</b>	<b>April 7</b>
<b>Field Day at MFCF</b>	<b>Winter Garden</b>	<b>May 14</b>
<b>Private Applicator Review &amp; Exam</b>	<b>Kissimmee</b>	<b>May 20</b>
<b>Florida State Horticultural Society Meeting</b>	<b>Jacksonville</b>	<b>June 7-9</b>
<b>CEU Day</b>	<b>Apopka</b>	<b>June 10</b>
<b>Citrus Research and Education Center Tour</b>	<b>Lake Alfred</b>	<b>June 17</b>

Dear Growers,

It has been a long winter season. I for one am glad to see the spring time arrive. We had two freeze events this winter. Thankfully we had a good bit of cool weather in the fall to help condition the trees and lower the leaf freezing points. There were still individual groves that suffered some fruit and tree losses. Already you can see trees that lost leaves coming back strong, with all this young flush comes ideal habitat for the Asian citrus psyllid. As always controlling psyllid populations, scouting your groves for HLB symptoms and removal of inoculum sources are key in today's citrus production. Your extension program has been heavily focused on the HLB issue for the past few years and with the amount of research on-going in this area, hopefully there will continue to be new recommendations to maximize citrus production and sustain tree health.

COOPERATIVE EXTENSION SERVICE, UNIVERSITY OF FLORIDA, INSTITUTE OF FOOD AND AGRICULTURAL SCIENCES, Larry R. Arrington, Director, in cooperation with the United States Department of Agriculture, publishes this information to further the purpose of the May 8 and June 30, 1914 Acts of Congress; and is authorized to provide research, educational information, and other services only to individuals and institutions that function with non-discrimination with respect to race, creed, color, religion, age, disability, sex, sexual orientation, marital status, national origin, political opinions, or affiliations. Single copies of extension publications (excluding 4-H and youth publications) are available free to Florida residents from county extension offices. Information about alternate formats is available from IFAS Communication Services, University of Florida, PO Box 110810, Gainesville, FL 32611-0810.



## 2009 Freezes

Well this year started off with two hard freeze events on January 21-22 and February 5-6. As one grower said “at least it was a democratic freeze” meaning that the whole state got to share the sleepless nights. Looking at FAWN temperature data for two locations (Umatilla and Avalon) between January 1st to March 1st; Umatilla had total of 69 hours and Avalon a total of 35 hours at or below 32 degrees. Thankfully we had a unseasonably cool October and November which helped to hardened the trees and reduced there leaf freezing points allowing most of our trees to pull through the freeze events relatively unscathed (for more information on 2009 leaf freezing point data please visit [http://fawn.ifas.ufl.edu/tools/coldp/crit\\_temp\\_select\\_guide\\_citrus.php](http://fawn.ifas.ufl.edu/tools/coldp/crit_temp_select_guide_citrus.php)).



Pictured above: Some tree damage from radiation freeze event. Temperatures are colder in low elevation areas. This happen to be a depressed area in the grove. Trees lost their leaves but are currently recovering with new flush. Below: A close up of the same area as the picture above. Trees started to lose their leaves, but this spring trees began pushing out new leaves.



However, there was some damage as I am sure you are aware. The coldest temperatures recorded at the FAWN sites were 28 for Avalon (recorded on 1/22) and 23 for Umatilla (recorded 2/6). In speaking with growers around those areas and the state, there were some temperatures as low as 17 or 18 in low cold pockets. I heard grow-



Pictured left: These lemon trees were in a protected structure but still suffered some foliage damage. They were trimmed up and are already back to health.





ers as far south as LaBelle and Martin County that experienced similar temperatures in small isolated areas. Of course we have known that using irrigation for cold protection can be beneficial during freeze events, particularly radiation events which do not have much wind. The process of water turning to ice is called heat of fusion. As long as you are constantly turning water to ice you can maintain temperatures at or near 32 degrees.



Pictured above: This grove did not have the capability to cold protect the entire grove. The row to the left of the middle had irrigation for cold protection whereas the row to the right of the middle did not have irrigation for cold protection.

One of the problems in using irrigation for freeze protection during windy nights with low humidity is the chance of evaporative cooling taking place. Evaporative cooling occurs when water instead of freezing evaporates (heat of vaporization). When it evaporates it takes with it 7.5 times more heat than is being produced by water freezing. So for every gallon of water that evaporates, it takes 7.5 gallons of water to freeze to balance out the heat lost to evaporation.

When using microsprinklers for cold protection, the higher the volume of water applied to the

Pictured below: Classic radiation freeze in which high elevation have higher temperatures which can protect trees from potentially damaging temperatures. The picture shows the effect of elevation can have on a cold night.



tree the more effective it will be (see graph on page 5). Water can be an effective tool in the protection of crops when systems are operating properly and environmental condition lend to effective use of water. Using leaf freezing point data, having a reliable weather forecast and being prepared all are critical in minimizing damage from freezes.



## 2009 Freezes

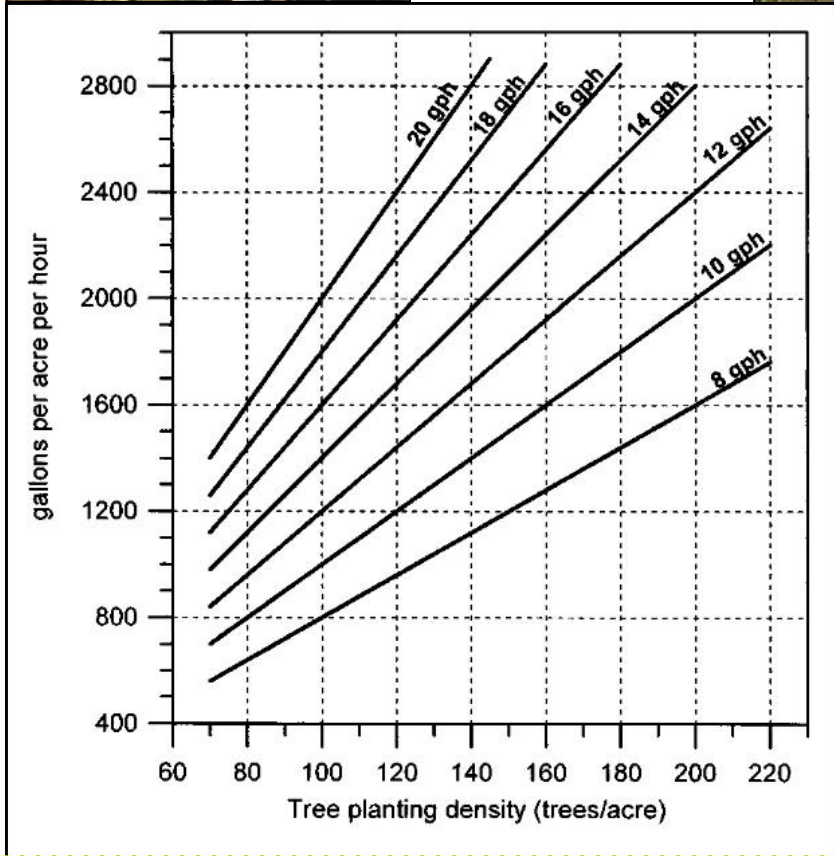


Pictured left: These young trees were planted a few weeks before the first freeze event. This grower ran water during both nights of 1/22 & 1/23 the trees were iced in well and sustained no damage. Pictured below: Same grove as the tree to the left with irrigation system protecting young trees during freeze event.



Pictured above: A young tree where water was run all nights of both freeze events. The area that was protected with water and had good ice formation was relatively undamaged. While the areas that were on the outside or edge of ice formation sustained damage.

The graph to the left is gallons per acre per hour of water available for freeze protection based on micro-prinkler discharge rate (ranging from 8-20 gph per tree) and tree planting density. It can be found in Drs. Parson and Bowman's UF publication Micro-prinklers Irrigation for Cold Protection in Citrus. If you would like a copy of the publication please contact our extension office.



## A Summary: Georeferenced Ground Photography of Citrus Orchards to Estimate Yield and Plant Stress for Variable Rate Technology

Arnold W. Schumann, Kevin Hostler, Juan Carlos Melgar and James Syvertsen Proc. Fla. State Hort. Soc. 120:56-63. 2007

In honor of FSHS meeting coming up in June I would like to summarize the paper that won the “best paper” award in the citrus section from the 2007 meeting. I also ties into our recent OJ fertilization meeting. Variable rate application uses optic and ultrasonic sensors to measure citrus tree canopies. These technologies can save money by only applying fertilizer or chemicals in a grove to space that is occupied by trees. The research in this paper experiments using variable rate technology (VRT) to measure fruit load, flower intensity, and nutrient stress in the tree canopy. Additionally, the researchers looked at determining early water related stress before leaf wilting becomes visible using VRT and the possibility of disease detection. The overall objective was to determine the potential uses of georeferenced digital photography in citrus production.

Researchers used a digital camera mount on a vehicle to take pictures of the entire grove. Using the images colors, they determined the amount of mature fruit and canopy volume (I am keeping the description simple for all the details see paper). When using pictures of mature fruit or canopy volume to predict fruit yield they had a weak relationship. However, when using both images of mature fruit and canopy volume together the found they could predict fruit yield in Hamlin and Valencia groves (see figure 1). The calculation of individual tree fruit yield can then be used for site specific variable rate application of agrochemicals. Basically giving each tree only what it needs based on it fruit yield, which increases the productivity of your operation.

Increased productivity is key for maximizing returns. This digital images were also used to determine a relationship with water stress and disease detection. Repeated annual measurements using this technology could potentially be used to track the spread of disease (blight was used as an example in paper). This technology may hold potential in the future for detecting and tracking the spread of canker or greening.

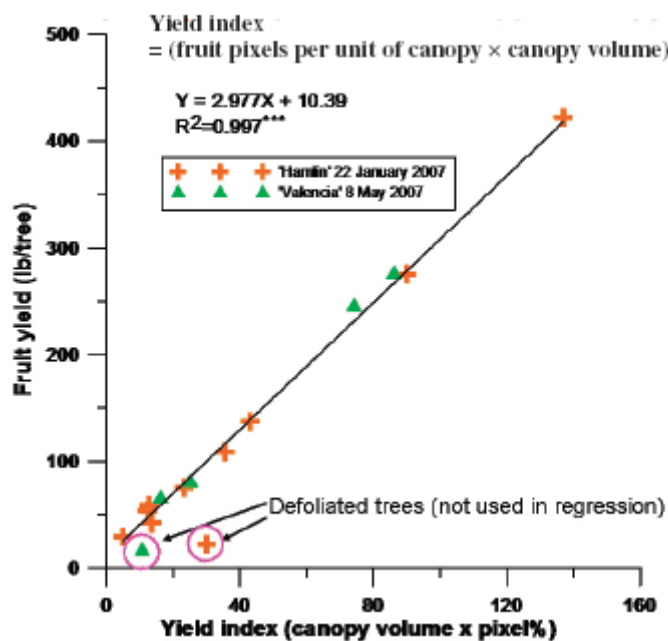


Figure 1 (Figure 10 in FSHS proceedings). Relationship between fruit yield per tree and the yield index calculated from percent fruit pixels and canopy volume of each tree.



## Mid Florida Citrus Foundation's A.H. Krezdorn Grove Field Day May 14th 9:00-11:30 AM

We will be having a field day at the Mid Florida Citrus Foundation's (MFCF) A.H. Krezdorn grove on May 14th from 9:00-11:25. This the second of two field days this year in which researchers will provide an update on their current research trials conducted at the MFCF. Topics will include psyllid control chemical trials and applicator trials, herbicide trials, open hydroponic system research, windbreaks, and a low volume applicator demonstration. There will also be a discussion on peach production and fruit evaluation.

- 9:00-9:30 Peach production and tasting  
-Gary England
- 9:35-9:55 OHS experiment and  
Windbreaks  
-Dr. Bill Castle
- 10:05-10:25 Psyllid control experimental  
compounds  
-Dr. Lukasz Stelinski
- 10:25-10:45 Psyllid control trials  
-Dr. Michael Rogers
- 10:45-11:05 Herbicide research results and  
recommendations  
-Dr. Steve Futch
- 11:05-11:25 Low volume applicator  
Demonstrations  
- Ryan Atwood

Please call Maggie at 352-343-4101 so we know how many handouts and drinks we will need. Bring a lawn chair if you want to sit!

## The Greening Summit at the Grower's Institute Polk County Agricultural Center –Bartow April 7th

Citrus Greening or Huanglongbing (HLB) continues to spread throughout the citrus production areas of Florida. The symposium is an opportunity for Florida Citrus Growers to come together under a single purpose to effectively manage this devastating disease. Topics this year include production systems, plant improvement, vector management, horticultural responses to HLB, disease detection and spread.

Continuing Education Units (CEU's) will be offered for holders and restricted use pesticide licenses (RUP) or certified crop advisors (CCA). CEU's will be offered for the following categories: private, agricultural tree, regulatory, demonstration and research for RUP holders. CCA's will be offered CEU's in the pest management category.. Registration is limited to the first 300 participants. Sign up sheet was previously mailed.

## Florida State Horticultural Society Annual Meeting June 7-9 Jacksonville

This years Florida State Horticultural Society Annual Meeting is being held in Jacksonville, FL at the Windham Riverwalk. The early registration deadline is April 15th. You can obtain additional information and register thru the FSHS website <http://www.fshs.org/meetings.htm>. The annual meeting provides growers with a great opportunity to interact with researchers. I encourage everyone to become a member of FSHS and/or attend the annual meeting.

## Citrus Research and Education Center Tour June 17th 9:30-4:00

On June 17th we will be touring the University of Florida's Citrus Research and Education Center (CREC) in Lake Alfred. The center houses IFAS and DOC research employees, has over 600 acres of research grove, multiple greenhouses, a fresh fruit packinghouse, a pilot juice processing plant and the world's largest citrus library. A free lunch will be provided, registration is required please call Maggie at 352-343-4101 to sign up.

<u>Linda Murphy</u>	Welcome to the CREC	9:30 a.m.
<u>Dr. Reza Ehsani</u>	Precision Tech. Lab/Grove Tour	9:35 – 10:15
<u>Dr. Fred Gmitter</u>	RES/Advance Breeding Greenhouse	10:20 – 11:00
<u>Dr. Ron Brlansky</u>	Greenhouse/Plant Pathology Lab Tour	11:05 – 11:45
-	Break for lunch	11:50 – 1:00
<u>Dr. Bill Dawson</u>	Screening Greenhouse Tour	1:05 – 1:45
<u>Dr. Jude Grosser</u>	Cell Genetics/Plant Improvement Lab Tour	1:50 – 2:30
<u>Dr. Lukasz Stelinski</u>	Entomology/Nematology Lab Tour/Psllid Rm.	2:35 – 3:15
<u>John Henderson</u>	Packinghouse/Pilot Plant Tour	3:20 - 3:45

## CEU Day –June 10th Mid Florida Research and Education Center Starts at 8:30

If you are in need of CEU's to renew your pesticide license here is your chance to get a few in one location. We will be holding one of our two annual CEU Day events in Apopka at the Mid Florida Research and Education Center. Call Seminole County Extension to register 407-665-5551.

CEU's offered include General Standards/CORE, Private Applicator, Agricultural Tree Crop and more. Sign in starts at 8:15 and Session 1 begins at 8:30AM. There is a charge of \$20 per two hour session. In the afternoon will be Worker Protection Standards Train the Trainer session for those that would like to have a WPS training card. You do not need a WPS training card if you have a valid pesticide license.

## Private Agricultural License Review & Exam May 20th 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 Kissimmee on May 20th. 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 on-line at [www.ifasbooks.ufl.edu](http://www.ifasbooks.ufl.edu) or by calling 800-226-1764. We also recently donated all pesticide books to the Lake County library system, so they can be checked out. The private agricultural license itself cost \$100 which does not have to be paid until after you pass the exam. To register please call Jennifer Welshans at 321-697-3000.





## Mr. Florida Citrus—Jerry Chicone elected to Citrus Hall of Fame.



Jerry Chicone aka “Mr. Florida Citrus” was inducted to the Citrus Hall of Fame this past month. The event was held at Florida Southern College which is the host site of the Citrus Hall of Fame. Mr. Chicone has a wonderful history of fighting for the Florida citrus growers well being and is known for his coined slogan “squeeze oranges not growers”. This year was the first Citrus Hall of Fame event that I had the privilege of attending. It was a great honor to participate in the event. I would encourage anyone connected to the Florida Citrus Industry to take some time to visit the Florida Citrus Hall of Fame, it is worth your effort. I personally want to congratulate Mr. Chicone on a well deserved honor. Thank you for your support of the Florida Citrus Industry!

## La Nina returns to Pacific which usually impacts Florida agriculture

La Nina has returned to the Pacific Ocean. La Nina ocean conditions mean warm dry spring weather for Florida. The years of 1999, 2000, and 2006 were also La Nina events. Typically these drought conditions bring on forest fires (already being seen as of this writing) and the need for good irrigation systems. It might be wise if you have yet to check your sprinkler heads to make sure that every tree is getting irrigated.

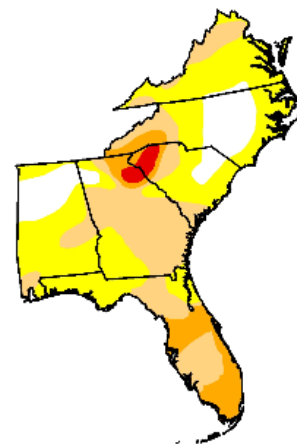
### U.S. Drought Monitor Southeast

March 17, 2009  
Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	13.6	86.4	41.9	11.8	1.6	0.0
Last Week (03/10/2009 map)	8.5	91.5	42.1	9.8	1.6	0.0
3 Months Ago (12/23/2008 map)	70.7	29.3	14.3	6.0	4.3	0.0
Start of Calendar Year (01/06/2009 map)	65.3	34.7	15.7	5.3	2.8	0.0
Start of Water Year (10/07/2008 map)	35.2	64.8	41.8	20.8	9.4	1.9
One Year Ago (03/18/2008 map)	23.8	76.2	58.5	40.5	18.8	0.3

Intensity:

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional



The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements

<http://drought.unl.edu/dm>



Released Thursday, March 19, 2009

Author: Laura Edwards, Western Regional Climate Center



## Pictures of recent Extension Activities

We got a good start to the new year with your extension program. There was unfortunate timing on our Mid Florida Citrus Foundation field day which was on Jan. 22nd right after a major freeze. Attendees learned about the latest citrus variety release, the Sugar Belle™. Drs. Grosser, Gmitter, Castle, Ling and Bowman also shared results of their citrus improvement research efforts. Dr. Parsons spoke on how to improve irrigation efficiency using new technology. Gary England reviewed containerized blueberry and peach production in Florida.



Pictured above: Dr. Jude Grosser shows off the internal quality of a seedless triploid that the CREC plant improvement team has created. The main focus of the breeding program, as the rest of the citrus industry, is to find a solution to the greening problem.



Pictured above: Blueberries grown in containers were iced in to protect flowers and fruit from the freezes with overhead irrigation.



Pictured left: Dr. Castle discusses the results of a Midsweet and Valencia variety trial. This trial evaluation will most likely lead to more productive varieties being recommended for juice production.



## Pictures of recent Extension Activities cont.

We had a greening field day in Osceola County. Jamie Yates and I lead everyone on identification of symptomatic trees, trees with Phytophthora and nutritional issues, and even gave a quiz to try to see if you could determine which trees were truly greening. Dr. Dewdney spoke about the latest in greening research and why it is important to remove inoculum sources from your grove. We ended it all with a low volume applicator demonstration and a talk about low volume application research results and labeling issues concerning this technology.



Pictured left: Participants try and determine which trees are and are not PCR positive for greening. Survey results indicated that 28% of attendees felt they could not accurately identify greening prior to the field day. 90% of attendees could identify the disease symptoms after attending the field day.

Pictured below: Growers peer through the trees to watch a low volume applicator mist the adjacent row. Low volume application has been proven for psyllid control and is cheaper application than more traditional methods.



Pictured left: Rob Arnold shows off his Citruscloud low volume applicator and fields questions on its use in groves.

Fall 2007

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**Reminder: Please fill out the post card we sent in the mail a few weeks ago to continue to receive Citrus-lines newsletters. We need to reduce the use of physical mailing due to budget constraints. Thank you.**

## Greening bacteria sequenced

USDA researchers have sequenced the genome of the greening bacteria. This will allow scientists to study the bacteria's genetic code and potentially give greater understanding on how the organism is spread and how it can be stopped. This is some much needed good news, hopefully this is just the first breakthrough of knowledge in the fight against the greening bacteria. To learn more visit <http://www.ars.usda.gov/citrusgreening>

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.

## New aerial label for Agri-Mek

Syngenta Crop Protection has received approval for the aerial application of Agri-Mek® Miticide/Insecticide for the control of citrus leafminer to aid in the management of citrus canker. This label is effective immediately. The supplemental labels have been distributed to all local retail outlets and are also available directly from your local Syngenta representative.

### SUPPLEMENTAL LABEL

syngenta

Syngenta Crop Protection, Inc.  
P.O. Box 18300  
Greensboro, NC 27419-8300

**RESTRICTED USE PESTICIDE**  
TOXIC TO FISH, MAMMALS, AND AQUATIC ORGANISMS  
FOR RETAIL SALE TO AND USE ONLY BY CERTIFIED APPLICATORS OR PERSONS UNDER THEIR DIRECT SUPERVISION, AND ONLY FOR THOSE USES COVERED BY THE CERTIFIED APPLICATOR'S CERTIFICATION.

Agri-Mek® 0.15 EC Miticide/Insecticide

EPA Reg. No. 100-898

SUPPLEMENTAL DIRECTIONS FOR USE for:

- Revised Spray Drift Directions
- Addition of Aerial Application to the Citrus Fruit Crop Group
- Addition of Pests to Fruiting Vegetables Crop Group, Grapes, and Potatoes

Active Ingredient:	
Abamectin <sup>1</sup> .....	2.0%*
Other Ingredients:	98.0%
Total:	100.0%

<sup>1</sup>CAS No. 65195-56-4 and No. 65195-55-3  
\*1 gal. contains 0.15 lb. abamectin

KEEP OUT OF REACH OF CHILDREN.

WARNING/AVISO

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle.  
(If you do not understand the label, find someone to explain it to you in detail.)

SCP 898A-S8 1208