

Citrus Notes



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Dear Growers,

Mark your calendar for Thursday February 14, 2007 for the February OJ Break. At our OJ Break we have invited a number of speakers to bring us up to speed on the 2008 Florida Citrus Pest Management Guide. In our citrus greening segment I have made an interesting observation over the past month and it seems to have occurred in both groves we have been watching. There are also a couple of articles from the Southwest Water Management District relating to water used for cold protection and flow meter testing.

Enjoy the issue,

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***February
2008 OJ
Break
Citrus Pest
Management
Guide Up-
date.***



Mark your calendars for Thursday February 14, 2008 for our Polk County OJ Break. Our topic at this OJ Break will be updates contained in the 2008 Citrus Pest Management Guide. We have asked Drs. Michael Rogers, Lukasz Stelinski, Jim Graham, Ron Muraro and Allen Morris to speak on management of citrus pests and diseases. All our speakers are from The Citrus Research and Education Center (CREC) in Lake Alfred. We have CEU's available for your Restricted Pesticide License and your Certified Crop Advisory designation.

Dr. Rogers will give us an update on significant changes made in the 2008 edition of the Florida Citrus Pest Management Guide. Dr. Stelinski has been working with pheromone attractants for the citrus leafminer. Lukasz has some interesting information to pass on as it relates to some new management techniques for monitoring and control of the citrus leafminer. Citrus canker has become an important issue in Polk County with the recent increase in the number of canker infected groves. Dr. Jim Graham will be presenting, "Citrus Canker Update 2008" addressing issues and changes in effectively managing this disease. Allen Morris and Ron Muraro will be speaking on economic considerations for resetting citrus trees.

***Citrus
Greening
Update***



In our last issue we were mentioning some of the more common greening symptoms that had begun to develop over the previous month. Along those same lines, I wanted to focus on one particular symptom that has been common this past month and some of the changes or the evolution of this symptom over the past few weeks.

Generally, initial greening symptoms include blotchy mottle on interior canopy foliage, yellow veined leaves and small misshapen fruit. These symptoms seem to begin development in the late summer and continue into the fall and winter. One symptom that has appeared and tends to draw significant interest from the scouting standpoint is the appearance of yellow shoots. These shoots really became prevalent during the early winter around the first part of December this year. In my observations, I have found typically two types of yellow shoots in our area. The first type has shoots that appear to be yellow, but upon closer inspection are predominately a yellow veining pattern.

*Yellow veined
leaves on greening
infected shoots.*



The second has yellow shoots that are predominately comprised of blotchy mottle

Yellow leaves with the blotchy mottle pattern.



leaves that are located on the exterior portion of citrus tree canopies. It has been our experience that the yellow veined leaves appear to remain persistent through the winter and can be found on symptomatic trees during the summer. Some of these affected leaves will drop during the growing season but not all at one time. The blotchy mottled leaves on these yellow shoots appear to be short lived and may give rise to the associated defoliation that typically occurs on symptomatic trees.

One of the proposed causes of blotchy mottled leaves on greening infected citrus trees is an excess accumulation of starch in the leaf tissue. This is a reason why the leaf starch test has become a reliable screening tool for identify potential leaves for PCR testing. In talking with IFAS researchers, the conversion of sugar to starch in citrus leaves has become excessive in some greenhouse studies with elevated carbon dioxide levels. Excessive vegetative growth due to luxurious air CO₂ levels with limited translocation of sugar carbon (to pot-limited root systems) resulted in starch accumulating in leaf chloroplasts-- the cellular photosynthetic leaf structures. Excessive starch actually caused the chloroplasts to burst and the leaves to yellow. An analogous condition could occur in situations on the outer canopy of citrus trees that receive direct sunlight. In these leaves an increase in sugar carbon accumulation and starch conversion could

occur, especially in the winter when net carbon assimilation (photosynthesis) is high and the physiological plant processes of respiration and plant growth (typically users of carbon) are reduced. If the resulting increases in leaf starch become excessive, it could lead to the destruction of some chloroplasts causing blotchy mottle symptoms. This cell destruction would result in the production of leaf ethylene and could result in leaf drop.

Defoliation of blotchy mottle leaves associated with a greening symptomatic in late December.



You may be asking about the practical application of this information or even questioning why go through this drawn out explanation? It seems evident that during the late summer/fall when plant growth decreases, infected leaves on the interior of the tree canopy may be accumulating sugar and converting this to starch. Since these leaves are not in full sun and have a lower sugar requirement at that time of the year, blotchy mottle symptoms may appear. Infected leaves on the outer canopy also may be affected but carbon use is greater than carbon accumulation as there may not be an excessive amount starch in these outer canopy leaves at that time. Now, I would propose that as respiration and plant growth slows when we get into winter (December), that these outer leaves begin to accumulate excess sugar carbon converting it to starch and causing the blotchy mottle symptoms. Since these leaves reside on the outer canopy, continue carbon accumulation (photosynthesis) and build up starch until the leaf chloroplasts are destroyed resulting in ethylene production and leaf drop.

This information may be critical to scouting for citrus greening symptoms during the winter. Looking for blotchy mottle yellow shoots in the summer may be a waste of time, as would blotchy mottle leaves on the interior tree canopy. If you are only looking for yellow shoots with blotchy mottled leaves during late winter you may find that all of these symptomatic leaves may have dropped off the tree especially if you weren't timely in your inspections. It does appear based on my limited observations that the yellow veined leaf symptoms appear to persist, but you may not find all of your potential symptomatic trees if you only search for typical blotchy mottle. These ideas are stimulating some research so stay tuned.

***Report
Water Used
for Cold
Protection
during
Freeze
Events***



The following reminder is from the Southwest Florida Water Management District.

Besides being a requirement of a water use permit, reporting cold protection pumpage is needed to help resolve potential compliance issues and to ensure that a permittee's conservation credits are calculated correctly. Cold protection amounts are not limited by a permits' annual average allocation. However, the cold protection amounts need to be reported so that they can be subtracted from the submitted pumpage quantity. If a permittee does not report the use of irrigation for cold protection, this could make it

appear that the permittee overpumped the permitted quantity and cause the District's computer system to flag the reported high water use as a permit violation.

Reporting cold protection water use also ensures that a permittee receives all the SWUCA conservation credits they have earned. The cold protection pumpage report is used by the District to ensure that conservation credits are not deducted for this important use of irrigation for cold protection.

The District realizes that they are busy with their crops, but it will be in their own best interest to follow through with this information. If they can get the reports to the District within the next two weeks it will help both them and the District. The following link contains the Cold Protection WUP reporting form:

http://www.swfwmd.state.fl.us/permits/wup/WUP-18_cold_protection.pdf



***Flow
Meter
Testing***

In January 2003, the Southern Water Use Caution Area (SWUCA) rules went into effect and several permit conditions were added or changed. One of those conditions changed the reporting of flow meter accuracy testing from every two to every five years. Many water use permits will have this condition due by January 31, 2008, and there is a list of companies that can perform this test on the District's web page at:

<http://www.watermatters.org/permits/consultants/>.

It has come to the District's attention that, due to the number of meters to be tested, these companies might not be able to schedule all the tests by the end of January. The District would like to work with the permittees to help them satisfy this permit condition. Therefore, we would appreciate your help in getting the word out to your industry members that if there is a problem scheduling the accuracy test before the due date, the District will modify the condition's due date to coincide with the scheduled testing date.

The permittees will need to contact the District's Regulation Performance Management PMD Section staff (1-800-423-1476) in the Brooksville office, with the date the meters are scheduled to be tested. Staff will arrange to have the permit condition's due date changed to accommodate the meter testing date. An informational letter describing this process has been sent to permit holders.

Accurate flow meter data provides important information that helps both the permittee and the District. In addition to ensuring that they are applying sufficient irrigation to their crop, thus saving water and fuel, accurate flow meter data also ensures that a permittee is not washing fertilizer out of the root zone. Accurate meter data will also help permittees on a FDACS BMP program document their irrigation practices. The District uses the information to document permit compliance and record a permittee's water needs. In addition, the information is used to calculate conservation credits in the SWUCA.

Pesticide News and Information



Original Canker Pathogen Fingered



Forensic plant pathologists have identified the original pathogen responsible for the first U.S. outbreak of citrus canker. The project was led by Agricultural Research Service (ARS) plant pathologist John Hartung. He and colleagues studied plant specimens dating back nearly 100 years housed at the ARS Henry A. Wallace Beltsville Agricultural Research Center in Beltsville, MD. The ongoing project is a collaboration between Hartung and plant pathologist Wenbin Li, with USDA's Animal and Plant Health Inspection Service, which provided funding. The scientists selected the 90 oldest specimens from among 741 preserved leaves, bark or fruit peels that showed signs of citrus canker. They carefully cut 10 raised lesions, or cankers, from each selection. Such cankers weaken trees, induce premature fruit drop and reduce the value of the crop.

The researchers also developed a sensitive new technique for extracting and analyzing degraded DNA fragments from the excised lesions. The team then matched the DNA fragments with strain-specific, genetic targets taken from a previously sequenced citrus canker strain. Standard bacterial identification methods require intact DNA that has been removed from live bacteria. The new technique is called IES, for insertion event scanning. The IES is especially useful for identifying bacterial strains that are present in preserved specimens, in which the bacteria are no longer viable and their DNA has been partially degraded. By finding an exact match between pathogens from both Japan and Florida preserved in herbarium specimens, the researchers revealed the source of the original outbreak of citrus canker in Florida in 1911. Using the new IES method to solve contemporary problems could shed light on how bacteria are disseminated around the world, according to researchers. (USDA ARS, 12/17/07).

Farmers Urged to Review Homeland Security Guidelines

Billy Dictson, the director of the office of bio-security at the Southwest Border Food Safety and Defense Center at New Mexico State University's College of Agriculture and Home Economics, was cited as saying that farmers and agribusiness operators should review chemical guidelines and determine whether they will be affected by a new U.S. Department of Homeland Security regulation, adding, "In an effort to increase the security of high-risk chemical facilities, the Department of Homeland Security recently released a list of chemicals that, if possessed by a facility in a specified quantity, would require them to complete a Chemical Security Anti-Terrorism Top-Screen assessment. Those required to go

through this initial screening must do so before January 21."

Failure to comply with the regulations could result in civil penalties of up to \$25,000 per day or the shutdown of the facility. Chemicals of interest and quantities that are most likely to affect agriculture include, but are not limited to:

- * Chlorine: 2,500 pounds bulk, not bagged or in some other transportation package.

- * Chlorine: 500 pounds bagged, on a trailer or in some other transportation package.

- * Anhydrous ammonia: 10,000 pounds in typical pull behind tanks, completely loaded.

- * Ammonium nitrate: 2,000 pounds bagged, on a trailer or in some other transportation package.

- * Potassium nitrate: 400 pounds bagged, on a trailer or in some other transportation package.

- * Sodium nitrate: 400 pounds bagged, on a trailer, or in some other transportation package.

For more information on the U.S. Department of Homeland Security's Chemical Facility Anti-Terrorism Standards, or to view the chemicals of interest list, visit: www.dhs.gov/chemicalsecurity. (Sott.net, 12/22/07).