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IFAS Extension

E X T E N S I O N

Institute of Food and Agricultural Sciences

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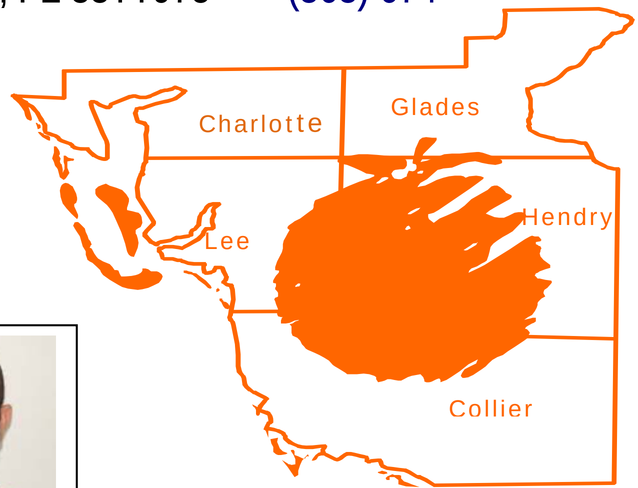

Flatwoods Citrus

Vol. 14, No. 6 **June 2011**

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

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Previous issues of the Flatwoods Citrus newsletter can be found at:
http://irrec.ifas.ufl.edu/flcitrus/
http://citrusagents.ifas.ufl.edu/agents/zekri/index.htm

IMPORTANT EVENTS

UF/IFAS Citrus Field Day

Location: Southwest Florida Research and Education Center
Date and Time: Thursday, June 23, 2011, **9:00 AM – 12:00 Noon**
Coordinator: Dr. Mongi Zekri
Free lunch will be served. **RSVP is required**. To RSVP, call 863 674 4092 or send an e-mail to **maz@ufl.edu**

1. Suppression of Citrus Canker – **Dr. Pam Roberts**
   - Field evaluation of conventional and novel products
   - Interaction of systemic acquired resistance (SAR) activators
2. Mitigation of HLB through Horticultural Practices – **Dr. Bob Rouse**
   - Nutritional/SAR programs
   - Tree rehabilitation by pruning
   - Use of rooted cuttings
3. Orchard Design for Early Production of New Plantings – **Dr. Kelly Morgan**
   - Open hydroponics systems
   - High-density plantings
4. Psyllid Management Strategies and Tactics – **Dr. Phil Stansly**
   - Product evaluations—field trials, bioassays
   - Search for economic thresholds
   - Production, release and evaluation of *Tamarixia radiata* for biological control
   - Psyllid movement studies
   - Leafminer control
5. Economics of HLB Management Programs – **Dr. Fritz Roka**
   - Nutritionals
   - Pesticides

2 CEUs for Pesticide License Renewal, 2 CEUs for Certified Crop Advisors (CCAs)

Florida State Horticultural Society

FSHS Annual Meeting - **Date:** June 5-7, 2011
Location: The Renaissance Vinoy Resort & Golf Club, St. Petersburg

June 9, 2011, Pesticide License Training at the Hendry County Extension Office in LaBelle. Earn CEUs. Registration is required. To register, call 863 674 4092

Tree Farming and Healthy Trees Workshop

June 26th, 2011, 9 am – 3:45 pm, Hendry County Extension Office

Details were included in the previous issue.

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POMEGRANATE WEBSITE AVAILABLE AT THE CREC

Ladies and Gentlemen,

It is a pleasure to announce that we now have a pomegranate website available at the CREC: http://www.crec.ifas.ufl.edu/extension/pomegranates/

The website is an outcome of our project that has been underway now for a couple of years. We have been collecting, propagating and distributing got cooperators. Our activities are described on the website. More important, we have hundreds of plants of 50 accessions available for distribution and will have another several thousand in early next year. The plants [rooted cuttings] are in one-gallon containers. Because the project is unfunded, we usually ask for a small donation form cooperators to help with our expenses.

Our intent is to get these into the field for evaluation. There are beautiful ornamental types and ones for commercial or homeowner use. Please help spread the word. If there are members of your local community that might be interested in working with us, please ask them to contact me. Also, if you have further questions, I can try and answer them.

A California 'Wonderful' pomegranate plant trained to a single trunk with an open vase canopy.

Bill

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CITRUS BLIGHT

Citrus blight, known as young tree decline, is a serious problem in Florida. It appears that blight is more of a problem in poor, shallow, high pH soils, and more frequent along roadways. This disorder has been recognized for over 100 years, but its cause has not been determined. The first symptoms are usually a mild wilt and grayish cast to the foliage often accompanied by zinc deficiency symptoms on leaves. Trees rapidly decline with extensive leaf loss and twig dieback, off-season flowering, reduced and delayed growth of the spring flush, and reduced fruit yield and quality. Symptoms often occur on one side of the tree. Blight trees reach a stage of chronic decline, but seldom die.

Blight affects only bearing trees and usually first appears when the grove is 6-8 years old. The first affected trees in a grove are usually randomly distributed, but groups of blighted trees may eventually occur, either as clusters or down the row. The disorder has been transmitted by root grafts, but not by limb grafts or with budwood. The means of spread, other than by root grafts, is not known.

Blight symptoms can be confused with other decline diseases and accurate diagnosis is important in order to follow proper practices. Citrus blight is characterized by: 1) high Zn content in trunk bark and wood, 2) presence of amorphous plugs in the xylem, 3) failure to absorb water injected into the trunk, and 4) presence of blight-associated proteins in roots and leaves. The best procedure for diagnosis of individual trees in the field is to test water uptake into the trunk using a battery-powered drill and a plastic syringe without a needle. Healthy trees or trees declining from Phytophthora root rot, nematodes, water damage, or tristeza will usually take up about 10 ml of water in 30 sec. Trees affected by citrus blight take up no water regardless of the amount of pressure applied.

All scion varieties of citrus as well as ungrafted seedlings may be affected by citrus blight. Trees on all rootstocks are susceptible, but significant differences among rootstocks exist. The rootstocks which are the most severely affected by blight are rough lemon, Volkamer lemon, Rangpur lime, trifoliate orange, Carrizo citrange, and some others. Those most tolerant to blight are sweet orange, sour orange, Cleopatra mandarin, and Swingle citrumelo. Sweet orange and sour orange have problems with Phytophthora and tristeza, respectively.

Recommended Practices

There is no known cure for citrus blight. Once trees begin to decline, they never recover. Severe pruning of blighted trees will result in temporary vegetative recovery, but trees decline again once they come back into production. The only procedures recommended are:

1. Remove trees promptly once yield of affected trees has declined to an uneconomic level.
2. Plant or replace trees with trees on relatively less susceptible rootstocks which do not develop blight at an early age.
3. Plant trees on vigorous, productive rootstocks such as Carrizo citrange which develop blight at an early age and replace trees that decline as soon as they become unproductive. Production can be maintained at relatively good levels in spite of blight with this rootstock.

OBSERVATIONS ON CITRUS BLIGHT (CB)

Dr. Ken Derrick,
Professor Emeritus, UF-IFAS, CREC

1. The cause of citrus blight (CB) is not known. It has been transmitted through root grafting, which suggests an infectious agent.
2. How CB is introduced into groves and how it spreads from tree to tree are not known.
3. CB occurs in hot, humid areas, and is more severe in areas of high year around temperatures. In Venezuela and Northern Brazil trees are usually dead within six months of initial symptoms. In more temperate areas, trees with CB seldom die and will survive for many years.
4. CB has not been observed in Mediterranean climates.
5. Symptoms of CB are a general decline that are not diagnostic. Trees with CB have a xylem dysfunction that restricts water flow resulting in drought symptoms.
6. Trees with CB have a significant loss of fibrous roots.
7. Symptoms of CB are not seen on young trees, but are seen on bearing trees approximately four or more years old.
8. The first trees to be seen with CB in a grove are randomly distributed.
9. Trees adjacent to trees with CB are at high risk for getting CB, resulting in clustering of diseased trees, but random single tree infections will continue to be observed throughout the grove, which suggest CB may be moved by an aerial vector.
10. Clonal propagation of scion and rootstock did not reduce the incidence of CB. This contradicts the suggestion of possible seed transmission, which is indicated by the initial random incidence of the disease.
11. Budded trees on all rootstocks are susceptible to CB. Seedling trees are also susceptible to CB.
12. The age at which trees develop CB varies greatly with rootstock: Rangpur lime, lemon types and Carrizo - 5 years; Swingle 5-12 years; Cleopatra - 15 years; sour orange - 25 years; and sweet orange - 30 years.
13. Prior to the 1960s, CB was rare in Florida.
14. The increase in the incidence of CB, starting in the 1960s, correlates with the use of clonal budwood in Florida and Brazil. It also correlates with the use of herbicides, which resulted in higher soil temperatures; increases in the use of lime in some groves, and decreases in the use of sulfur.
15. There are blocks on rough lemon that are 50 to 75 years old that have lost very few trees. These trees were propagated using old-line budwood.
16. Any block in Florida that was propagated using clonal budwood on rough lemon will lose up to 10% of the trees per year, starting at an age of about five years.
17. Whenever a grove is essentially lost to CB there will often be a few surviving trees with no symptoms of CB randomly distributed throughout the grove. Are these trees genetically different; do they contain cross-protecting, microorganisms, or did they just escape infection?
18. Trees with CB can be identified by zinc accumulation in the wood, reduced water uptake and serological assays.
19. Trees with CB express several pathogenesis related proteins.
20. Failure to transmit CB using bark patch inoculations or through limbs suggest that the pathogen that causes CB is restricted to the xylem of roots.
21. In some cases, CB appears to be associated with high pH soils.
22. The most vigorous trees in a grove will frequently be the first ones to have CB.
23. Treatment with tetracycline appeared to lesson the symptoms of CB.
24. Frequent spraying with insecticides was reported to decrease the incidence of CB.
25. In a replicated experiment, replacing the soil around healthy trees with soil, taken from under a tree with CB, did not induce CB on the healthy trees.

NOAA HURRICANE OUTLOOK INDICATES AN ABOVE-NORMAL ATLANTIC SEASON

http://www.noaanews.noaa.gov/stories2011/20110519_atlantichurricaneoutlook.html

Hurricanes Karl, Igor and Julia (from left to right on Sept. 16) were part of the onslaught of Atlantic storms last hurricane season (2010).

The Atlantic basin is expected to see an above-normal hurricane season this year, according to the seasonal outlook issued by NOAA's Climate Prediction Center – a division of the National Weather Service.

Across the entire Atlantic Basin for the six-month season, which begins June 1, NOAA is predicting the following ranges this year:
12 to 18 named storms (winds of 39 mph or higher), of which:
6 to 10 could become hurricanes (winds of 74 mph or higher), including:
3 to 6 major hurricanes (Category 3, 4 or 5; winds of 111 mph or higher)

Each of these ranges has a 70 percent likelihood, and indicate that activity will exceed the seasonal average of 11 named storms, six hurricanes and two major hurricanes.

"The United States was fortunate last year. Winds steered most of the season's tropical storms and all hurricanes away from our coastlines," said Jane Lubchenco, Ph.D., under secretary of commerce for oceans and atmosphere and NOAA administrator. "However we can't count on luck to get us through this season. We need to be prepared, especially with this above-normal outlook."

Climate factors considered for this outlook are:
The continuing high activity era. Since 1995, the tropical multi-decadal signal has brought ocean and atmospheric conditions conducive for development in sync, leading to more active Atlantic hurricane seasons.
Warm Atlantic Ocean water. Sea surface temperatures where storms often develop and move across the Atlantic are up to two degrees Fahrenheit warmer-than-average.

La Niña, which continues to weaken in the equatorial Pacific Ocean, is expected to dissipate later this month or in June, but its impacts such as reduced wind shear are expected to continue into the hurricane season.

"In addition to multiple climate factors, seasonal climate models also indicate an above-normal season is likely, and even suggest we could see activity comparable to some of the active seasons since 1995," said Gerry Bell, Ph.D., lead seasonal hurricane forecaster at NOAA's Climate Prediction Center.

NOAA's seasonal hurricane outlook does not predict where and when any of these storms may hit. Landfall is dictated by weather patterns in place at the time the storm approaches. For each storm, NOAA's National Hurricane Center forecasts how these weather patterns affect the storm track, intensity and landfall potential.

"The tornadoes that devastated the South and the large amount of flooding we've seen this spring should serve as a reminder that disasters can happen anytime and anywhere. As we move into this hurricane season it's important to remember that FEMA is just part of an emergency management team that includes the entire federal family, state, local and tribal governments, the private sector and most importantly the public," said FEMA Administrator Craig Fugate.
"Now is the time, if you haven't already, to get your plan together for what you and your family would do if disaster strikes. Visit ready.gov to learn more. And if you're a small business owner, visit www.ready.gov/business to ensure that your business is prepared for a disaster," added Fugate.

Hurricane impacts are not limited to the coastline; strong winds and flooding rainfall often pose a threat across inland areas along with the risk for tornadoes. May 22-28, is national Hurricane Preparedness Week. To help prepare residents of hurricane-prone areas, NOAA is unveiling a new set of video and audio public service announcements featuring NOAA hurricane experts and the FEMA administrator that are available in both English and Spanish. These are available at http://www.hurricanes.gov/prepare.

The National Weather Service is the primary source of weather data, forecasts and warnings for the United States and its territories. It operates the most advanced weather and flood warning and forecast system in the world, helping to protect lives and property and enhance the national economy. Visit us online at weather.gov and on Facebook.
NOAA's mission is to understand and predict changes in the Earth's environment, from the depths of the ocean to the surface of the sun, and to conserve and manage our coastal and marine resources. Visit us on Facebook.

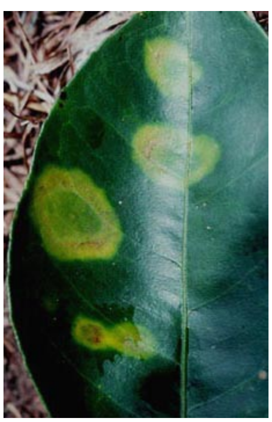
CITRUS LEPROSIS,

NOT HERE YET IN FLORIDA

Leprosis is one of the most important citrus diseases in Brazil. This problem is caused by the *Citrus leprosis* virus and is transmitted by mites of *Brevipalpus* spp. It also occurs in other South American countries and has been recently identified in Central America. This northbound spread of leprosis is being considered a serious threat to the Florida citrus industry.

Prior to 1925, leprosis had a negative impact on citrus production in Florida. Then about 1926, the incidence of leprosis in Florida drastically declined, with the decline coinciding with the introduction of sulfur as an effective miticide for controlling citrus rust mite. The last time leprosis was reported in Florida was in the mid-1960s.

This disease alone is responsible for approximately $60 to 100 million per year losses in Brazil. It is quite difficult to work with the citrus leprosis virus, which has hindered much of the progress regarding its accurate detection. Symptoms require field experience and can be confused with those caused by other plant pathogens. On the other hand, laboratory analysis of lesions is time-consuming, requires experience, and is not always very accurate, leading to some false negatives.



Leprosis produces symptoms on leaves, branches and fruit. It causes lesions in the fruit skin, premature drop of leaves and fruits, and twigs dieback, with the possible death of the tree. The damage to the branches can decrease the plant productivity after some years because the damaged branches prevent the normal flow of plant sap. With effective mite control, it might take two years for a citrus tree with leprosis to fully recover.

Citrus leprosis infects all varieties of sweet orange, and has been reported on lemon and mandarin. Tangerines and tangor are also susceptible to the disease. Grapefruit is reported to be tolerant.

Dissemination of the disease occurs only when infected citrus trees and vectors are present. In citrus, the population of the leprosis mite is low and usually occurs in clusters of trees, which should be monitored carefully. When the trees are contaminated with the leprosis virus, the number of diseased trees will increase as the contaminated mites disperse.

Leprosis control is based mainly on the elimination of the sources of inoculum by pruning the affected trees and by using miticides to reduce the vector. Additional control procedures are also recommended, such as:

- Planting of young trees free from leprosis mites and from leprosis virus
- Controlling the leprosis mites host weeds
- Disinfection of equipment, boxes and vehicles
- Use of mite non-host species as windbreak
- Developing and using procedures that favor the increase of the population of natural enemies of the leprosis mite.

United States Department of Agriculture
National Agricultural Statistics Service

CITRUS

MAY FORECAST
MATURITY TEST RESULTS AND FRUIT SIZE

All Oranges 140.0 Million Boxes

The 2010-2011 Florida all orange forecast released today by the USDA Agricultural Statistics Board is lowered from last month to 140.0 million boxes. The total is comprised of 70.0 million boxes of non-Valencia oranges (early, midseason, Navel, and Temple varieties) and 70.0 million boxes of Valencia oranges. The hurricane seasons of 2004-2005 and 2005-2006 have been excluded from the usual 10-year regression analysis and from comparisons of the current season to previous seasons. For those previous 8 seasons, the May forecast has deviated from final production by an average of 2 percent with 3 seasons above and 5 below, with differences ranging from 1 percent above to 3 percent below. All references to "average" or "minimum" refer to the previous 8 non-hurricane seasons unless noted.

Non-Valencia Oranges 70.0 Million Boxes

The forecast of non-Valencia orange production is unchanged at 70.0 million boxes. The Navel portion of the forecast remains unchanged at 2.6 million boxes and represents 4 percent of the non-Valencia total. Harvest of the early, midseason, Navel and Temple varieties is complete. The route survey (Row Count) conducted May 2-3 showed over 99 percent of the rows are harvested.

Valencia Oranges 70.0 Million Boxes

The forecast of Valencia production is lowered to 70.0 million boxes. Weekly utilization of Valencias was just over 5 million boxes the last three weeks of April. The route survey (Row Count) conducted May 2-3 showed 50 percent of the rows have been harvested. An objective survey conducted during April shows fruit size is below the minimum of the 8 previous seasons, and fruit droppage increased at a higher than average rate.

All Grapefruit 19.6 Million Boxes

The forecast of all grapefruit production remains at 19.6 million boxes, including an allocation of 700,000 boxes for non-certified gift fruit and local sales. Of the total grapefruit forecast, 5.6 million boxes are white and 14.0 million boxes are the colored varieties. The route survey conducted May 2-3 shows that 96 percent of the white rows and 99 percent of the colored rows have been harvested. Estimated utilization through the end of April for all grapefruit is 19.2 million boxes.

All Tangerines 4.6 Million Boxes

The forecast of all tangerine production is raised 100,000 boxes to 4.6 million. The change is in the later maturing Honey tangerine forecast. The total is comprised of the early varieties (Fallglo and Sunburst) at 2.6 million boxes and Honey tangerines now forecast at 2.0 million boxes. Row Count Survey indications show that over 99 percent of the Honey tangerines have been harvested.

Tangelos 1.15 Million Boxes

The forecast of tangelo production is unchanged from the previous forecast. No certifications were recorded the final three weeks of April. The Row Count survey shows over 98 percent of the tangelo rows are harvested. This forecast is 28 percent more than last season's final utilization of 900,000 boxes.

Maturity – Florida May 1, 2011

Regular bloom fruit samples were collected from groves on established routes on May 2-3, 2011 in Florida's five major citrus producing areas and tested May 4, 2011 at the laboratory of the National Agricultural Statistics Service (NASS), Florida Field Office. Acid level is slightly higher and soluble solids (Brix) is significantly higher than last season, resulting in a higher ratio. Unfinished juice per box and solids per box are higher than last season. Acid level and soluble solids in fruit from the Indian River District are higher than in other areas, but the ratio is lower. Unfinished juice per box is lower and solids per box are higher in fruit from the Indian River than in fruit from other areas.

CITRUS VARIEGATED CHLOROSIS (CVC)

NOT HERE YET IN FLORIDA

From: http://edis.ifas.ufl.edu/pp137

Citrus Diseases Exotic to Florida: Citrus Variegated Chlorosis (CVC)

By Drs. Chung and Brlansky
UF-IFAS, Lake Alfred CREC

There are several serious pathogens that have not been introduced into Florida. Any exotic disease, if introduced, has the potential to significantly increase production costs and thus decrease profitability for Florida growers. This paper will discuss a disease caused by a xylem inhibiting bacterium, Citrus Variegated Chlorosis (CVC).

CVC first appeared in Brazil in 1987 and has rapidly become one of the most economically important diseases affecting sweet orange production in Brazil. Losses due to CVC are now estimated to exceed several million dollars per year in Brazil. CVC also has been reported in Argentina and Paraguay, but has not been found outside of South America.

The causal agent of CVC is vectored by sharpshooter leafhoppers. Sharpshooters feed on plant xylem (Xylem conducts water within the plant) and acquire the CVC causal agent during feeding, and then spread the pathogen when they move and feed on a new plant. Some of these sharpshooters are already established in Florida.

CVC is caused by the xylem-inhabiting bacterium *Xylella fastidiosa.* Similar strains of *X. fastidiosa* cause Pierce's disease of grape, phony peach, and leaf scorch diseases of almond, coffee, oak, plum and sycamore. These strains can be distinguished by host range and other physiological characteristics. The exact origin of the CVC pathogen is unknown, but it could likely have been transmitted into citrus from another host by sharpshooter vectors and from that point has continued to spread by propagation and insect vectors.

Studies have shown that the CVC strain is apparently closely related to the bacterium causing coffee leaf scorch, and inoculation of coffee with the CVC bacterium causes coffee leaf scorch symptoms. The CVC pathogen has been the subject of intensive research in Brazil and its genome has recently been completely sequenced. Identification of the bacterial genes associated with CVC pathogenicity will help characterize relationships among different *Xylella fastidiosa* strains.

Nearly all cultivars of sweet orange are susceptible to infection by CVC, but the severity of symptoms may be variable. Lemons, limes, mandarins, mandarin hybrids (including Murcott and Sunburst), kumquats, trifoliate orange and grapefruit show less severe symptoms. Rangpur lime, citron and pummelo are tolerant to CVC. CVC does not kill trees, but trees become less productive within a few years following infection.

When young trees are infected, CVC causes severe leaf chlorosis between veins, resembling nutritional deficiencies. Leaves on affected trees frequently have brown gummy lesions on the lower side corresponding to yellow areas on the upper leaf surface. Affected trees may exhibit reduced vigor and growth, and show abnormal flowering and fruit set. Affected fruits are often small and hard with high acids, which are not suitable for juice processing or fresh market. As with other *Xylella*-induced diseases, symptoms are most pronounced in older tissues. Symptoms may appear initially on only one limb or branch and then spread to the whole tree. If the affected limb is pruned out, the remaining part of the canopy may remain symptomless for some time. In Brazil, if 30% of trees in a grove are infected, the recommendation is to remove the entire grove.

CVC can be graft-transmitted or vectored by sharpshooters. In Brazil, spread of CVC incidence was primarily due to the movement of infected nursery stock into many new locations.
Field diagnosis of CVC is difficult, since symptoms caused by CVC are variable and can be confused with other health conditions (diseases, nutritional deficiencies).

There is no effective method to cure CVC. It is important to keep it out of Florida and to be able to quickly detect any infections that may occur. Budwood certification and exclusion are the primary strategies to prevent the introduction of CVC to new areas that are not yet affected. In Brazil, control strategies to manage CVC include nursery certification, protection of nursery stock from infection, and pruning of symptomatic parts of trees to remove inoculum sources (labor intensive and time consuming). Control of sharpshooters is very difficult. Long term approaches involve the identification and development of CVC resistant sweet orange cultivars.

CVC primarily affects sweet oranges. Given that the climatic conditions are highly suited for establishment of the pathogen, CVC is predicted to have significant economic impacts on citrus production if found in Florida. Preventing CVC from entering Florida is much easier than trying to eradicate or control it. It is important to avoid bringing propagation materials from CVC-infected areas into Florida. Any citrus propagating materials must be introduced through the Florida Department of Agriculture and Consumer Services, Division of Plant Industry.

Flatwoods Citrus

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__Asian American
__Hispanic
__White, non-Hispanic
__Black, non-Hispanic

Gender

__Female

__Male