



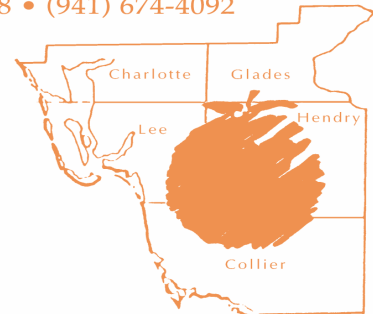
UNIVERSITY OF
FLORIDA

EXTENSION

Institute of Food and Agricultural Sciences

Hendry County Extension • P.O. Box 68 • LaBelle, Florida 33975-0068 • (941) 674-4092

Flatwoods Citrus



Vol. 5, No. 6 June 2002

Dr. Mongi Zekri, Multi-County Citrus Agent

UPCOMING EVENTS

Tuesday, June 18, 2002, 8:30 AM –12:00 Noon

Update on new citrus cultivars and rootstocks

New Location: Hendry County Extension Office in LaBelle

Speakers: Drs. Jude Grosser, Fred Gmitter, and Kim Bowman

Sponsor: Les Stephens, Duda Citrus Nursery

2 CEUs for Certified Crop Advisors

Following the seminar, we are planning a free lunch (Compliments of Duda Citrus Nursery) for only who call Sheila at 863 674 4092 no later than Friday, 14 June.

Wednesday, August 21 & Thursday, August 22, 2002

Citrus Expo in Fort Myers

For more information, call Bob Rouse at 941 658 3400

or Mongi Zekri at 863 674 4092

If you want to print a color copy of the Flatwoods Citrus Newsletter, get to the Florida Citrus Resources Site at

<http://www.fcprac.ifas.ufl.edu/>

You can also find all you need and all links to the University of Florida Citrus Extension and the Florida Citrus Industry

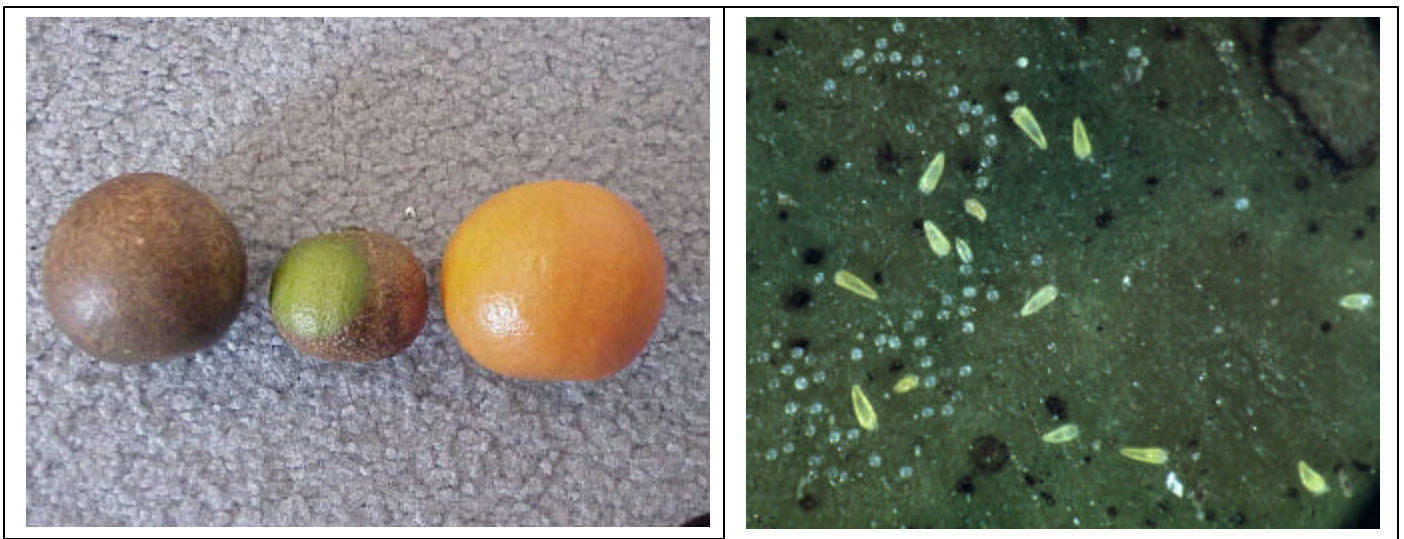
To get the best recommendations to reduce pressure of any citrus pest, refer to the Florida citrus pest management guide, which is updated every year by the University of Florida, IFAS.

More details on the control of citrus rust mites:

There are more than 10 products registered for use to control rust mites. Get your copy of the 2002 Florida citrus pest management guide.

To minimize risk of resistance, do not apply a specific miticide more than once per season with the exception of oil.

Pay attention to the comments in the guide about using each chemical. Oil or the combination of oil and other products should not be applied when the temperature gets to the 90s. Comite should not be used in spray solutions above pH 10. Kelthane should not be used in spray solutions above pH 7. Leaf distortion and/or fruit spotting may occur if Comite is tank mixed with oil. Tank mixing Vendex with oil or copper may result in reduced residual activity. Do not combine sulfur with oil or apply sulfur within 3 weeks of oil as fruit burn may occur. Nexter won't cause any damage to leaves or fruit, but when mixed with oil or copper may result in reduced residual activity. There are many more use restrictions on pesticides. For your safety, for better efficiency, and for many other good reasons, **ALWAYS READ THE PRODUCT LABEL PRIOR TO USE.**



Special Thanks to these sponsors of the Flatwoods Citrus Newsletter for their generous contribution and support. If you would like to be among them, please contact me at Phone: 863 674 4092, Fax: 863 674 4636 or E-mail: maz@gnv.ifas.ufl.edu

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GREASY SPOT

Management of greasy spot must be considered in every grove whether the fruit is intended for processing or for fresh market. Greasy spot is usually more severe on grapefruit, 'Pineapple' and 'Hamlin' oranges, and tangelos than 'Valencia', 'Temple', 'Murcott', tangerines, and tangerine hybrids. In southwest Florida, greasy spot has been very severe even on 'Valencia' orange and other citrus cultivars. Greasy spot spores germinate on the underside of the leaves and penetrate the leaves through the stomates (natural openings on the lower leaf surface). Warm humid nights and high rainfall in the summer favor infection and disease development. Favorable conditions for infection in southwest Florida occur from late May through September. Leaves are susceptible once they are fully expanded and remain susceptible throughout their life.



Two spray applications are needed to control greasy spot in southwest Florida. The first spray should be scheduled in May-June and the second in July-August. Copper fungicides are more effective when applied earlier in the season whereas petroleum oil is equally effective from June through August.

Copper fungicides provide a high degree of control more consistently than oil sprays. Thorough coverage of the underside of leaves is very important and necessary for the control of greasy spot. High spray volumes (125-150 gal/acre) and slower tractor speeds may be needed for maximum control of this fungal disease. Use 8-10 gallons of petroleum oil per acre or a copper fungicide at the label rate plus 1-2 gallons of oil. There is a high risk in fruit spray burn when 5 gallons of oil are added to 4 lbs metallic copper. For fresh fruit, petroleum oil alone is inadequate for the control of greasy spot rind blotch. Heavier oils (455 or 470) are more effective for rind blotch than lighter oils (435). Copper fungicides are effective for the control of greasy spot rind blotch, but if applied in July or August at full rates in hot, dry weather with oil, they will cause fruit spotting. Enable can only be applied on grapefruit for rind blotch control on fruit and for greasy spot control on foliage. Abound can be applied at any time to all citrus and provides effective control of the disease on leaves and fruit. Abound should not be applied more than once a year for greasy spot control. Addition of petroleum oil increases the efficacy of Enable and Abound. There are other registered fungicides for the control of greasy, get your copy of the 2002 Florida citrus pest management guide.

Always read the product label prior to use.

Look for **“Headline”**, a very effective fungicide that may be registered this year.

Special Thanks to the following sponsors of the Flatwoods Citrus Newsletter for their generous contribution and support. If you would like to be among them, please contact me at Phone: 863 674 4092, Fax: 863 674 4636 or E-mail: maz@gnv.ifas.ufl.edu

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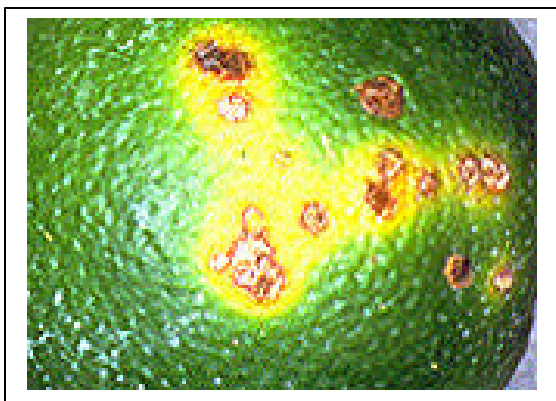
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CITRUS CANCKER

Florida's \$9 billion citrus industry is important to the State's and, therefore, residents' economic well being. An eradication program is being carried out in the State of Florida as a joint effort between the Florida Division of Plant Industry (DPI) and the U.S. Department of Agriculture and Plant Health Inspection Service (APHIS).

Citrus canker, caused by a bacterial pathogen *Xanthomonas axonopodis*, is a serious disease of most citrus varieties. The disease causes necrotic lesions on leaves, stems, and fruit. Severe infestation can cause defoliation, premature fruit drop, twig dieback, general tree decline, and very bad blemishes on fruit. The earliest symptoms on leaves appear as slightly raised tiny blister-like lesions. As the lesions age, they turn tan to brown and water soaked margin appears surrounded by a yellow halo. The center of the lesion becomes raised and corky. Lesions are usually visible on both sides of the leaf. Defoliation becomes a problem as the disease intensifies on the tree. Symptoms of bacterial citrus canker on twigs and fruit are similar and consisted of raised corky lesions surrounded by an oily or water-soaked margin. As the lesions on the fruit mature, they appear scablike or corky. The lesions on the leaves sometimes fall out, leaving round holes.



Citrus canker was first introduced in Florida in 1910 through citrus trees coming from Japan. It was eradicated in 1927. In June 1986, citrus canker was detected in residential citrus in Hillsborough, Pinellas, Sarasota and Manatee counties and was also found in commercial citrus groves in Manatee County. This second eradication program concluded with the last detection in January 1992. The official declaration of eradication was made 2 years later.



In late September 1995, citrus canker was discovered for the third time in Florida residential area near Miami International Airport. Even with an extensive eradication effort, the disease has spread northward from Dade into Broward County. In May 1997, citrus canker was rediscovered in Manatee County in both commercial groves and residential citrus. In June 1998, citrus canker was discovered in a commercial grapefruit grove in the Immokalee area in Collier County. In February 1999, citrus canker was found in a commercial citrus grove in Hendry County. In November 1999, citrus canker was detected in a residential area in Palm Beach County and in Hillsborough County. In September 2001, citrus canker was detected in a commercial grove in south Martin County. In October 2001, citrus canker was detected in a commercial grove in De Soto County northwest of Arcadia. In January

2002, citrus canker was found in residential area in Palm Bay in Brevard County. Canker was also confirmed in May 2002 in a citrus grove in SE Highlands County. Although eradication efforts have been very extensive to eradicate the disease in Hendry and Collier counties, citrus canker kept spreading in the groves where it was found and was detected in several others groves and residential areas. Genetic fingerprinting of the isolate of citrus canker in Collier, Hendry, and Palm Beach counties matches that of Miami and was different from that in Manatee County.

Citrus canker is highly contagious and can be spread rapidly by wind-driven rain, unusual storm events such as tornadoes and tropical storms, flooding, equipment, insects, and human movement within groves. Overhead irrigation may also play a role in spreading the bacteria.

Movement of infected or exposed trees, seedlings, propagative material, and fruit is the primary means of spreading the canker pathogen over long distances. Contaminated clothing, tools, ladders, containers and fruit boxes, and other items associated with harvesting and postharvest handling of fruit are also potential sources of infection.



Citrus canker is most severe on grapefruit, Key limes, trifoliolate orange and their hybrids. Calamondin, kumquat, and citron are considered resistant. To the present time, there is no cure for citrus canker. ***The only way to stop it is to uproot the infected and exposed trees within a radius of 1900 ft and burn them.***

Quarantine areas are extended at least one mile in all directions from any known infected tree. No citrus material should move into or out of the quarantine area. Sanitation is very important. Quaternary ammonium disinfectants are available for use on equipment, clothing, and even bare skin.

If someone suspects they have citrus canker, they should call the Division of Plant Industry. In Lee County, call 332 6913. In Collier County call 658 3684. Elsewhere in the state, call the canker hotline at 1 800 850 3781 or 1 800 293 3101. Citrus growers, production managers, and homeowners should not collect samples from suspected trees and take them to anyplace including county extension offices because of the risk of spreading more the disease. Do not destroy infected trees by yourself without reporting to Federal and State officials or inspectors. Allow them into your grove or yard to check your citrus trees. Give them permission to remove infected and exposed trees.

See enclosed sheets on citrus canker decontamination and recommendations to reduce the spread of citrus canker.

For more information on citrus canker visit
<http://doacs.state.fl.us/~pi/canker/menu1.htm>
<http://doacs.state.fl.us/~pi/canker/summary-justification-removing-canker.htm>
<http://doacs.state.fl.us/~pi/canker/links.htm>
<http://www.biotech.ufl.edu/PlantContainment/canker.htm>

Stop by the Extension Office to pick up copies of articles dealing with citrus canker.

SUMMARY OF THE JUSTIFICATION FOR REMOVING CANKER-EXPOSED TREES WITHIN 1900 FEET OF INFECTED TREES

An epidemiological study is designed to track disease spread so that intelligent regulatory or other disease management options can be targeted to best advantage. Epidemiological studies conducted in both commercial and residential citrus in Florida and South America over the last 10 years have strongly reinforced the concept that removal of citrus exposed to citrus canker inoculum from infected trees is an essential component of any successful eradication program.

Inoculum of the canker pathogen is dispersed in two ways: via wind-blown rain, and by human activity that involves the transport of infected or contaminated plants, tools, clothing, etc. The removal of exposed plants is crucial for eradication because the best detection methods currently available for disease detection are always well behind the actual expression of the disease on host plants. Delays in detection are caused by slow expression of detectable disease symptoms after infection and the constraints on visual survey methods.

The most recent epidemiological study used mixed age and varieties of residential citrus, and was conducted in North Dade and South Broward Counties during 1998-99. A description of this study is being prepared for publication. The study was done in an area where canker was only recently established, where the citrus leafminer was present (a new factor in the epidemiological equation for the Western Hemisphere), and where many thousands of trees in four separate sites could be monitored to provide the data for the study. This scenario was made possible only because of the unfortunate continued spread of the disease into new areas in spite of various protocols that had been utilized previously in the program. Previous methods included hatracking exposed trees; removing all exposed trees within 125 feet; removing of all infected

trees; and only infected trees as soon as possible after discovery.

Four study sites were selected based on their relative isolation from each other, the recent appearance of only a few infected trees in each area, and the absence of the disease in the surrounding citrus. At the beginning, all citrus (ca. 19,000) in the vicinity were identified and their location plotted using satellite-based global positioning technology. The disease status of each tree in the study area was then determined on a 30-day basis by a field plant pathologist. The trees infected at the outset were identified as focal trees, and presumed to be the direct or indirect source of inoculum for all subsequent disease development in the area. The data taken on each visit consisted of a determination of whether canker lesions were present or absent, host variety and age/size, lesion age, an estimate of disease severity based on percent of canopy exhibiting lesions, and location of the lesions within the canopy. Data was collected every 30 days at each of the study sites to monitor disease progress over time through the area. All trees remained in place throughout the course of the study.

The main conclusion that can be drawn from the composite data is that subsequent infections resulting from inoculum dispersal from focal trees lie within approximately 1200 feet 90% of the time, within 1900 feet 95% of the time, and within 2700 feet 99% of the time. In other words, in order to eliminate the next generation of canker infections (ones that are already established and not yet detected), the project will be successful nineteen times out of twenty if all citrus trees within 1900 feet of the infected tree(s) are removed. The program selected the 95% success level as striking a balance between taking too few and too many trees and still reaching the goal of eradication.

Prepared by Drs. Tim Schubert, Wayne Dixon, and Xiaoan Sun Florida Department of Agriculture and Consumer Services Division of Plant Industry PO Box 147100, Gainesville, FL 32614

RECOMMENDATIONS TO REDUCE THE SPREAD OF CITRUS CANKER

Groves and Nurseries

1. Whenever possible lock the gates of the property and restrict access at all times.
2. Before entering groves or nurseries, equipment should be first cleaned of all plant material, debris and soil and then disinfected with approved decontamination products.
3. Prior to entering or leaving groves, blocks and nurseries, all workers should disinfect hands and shoes with antimicrobial soap or other approved disinfectants.
4. All workers including fruit picking personnel should wear freshly laundered clothes each day.
5. All grove and nursery traffic including personal vehicles, equipment and visitors should be limited as much as possible.
6. Exchange of personnel, vehicles and equipment between groves, blocks and nurseries should be limited as much as possible.
7. It is very important to require grove service contractors to practice stringent decontamination and sanitation procedures.
8. Restrict access of all personnel, vehicles, and equipment and movement in groves or nurseries when foliage is wet with rain or dew. Do not harvest fruit before the trees dry.
9. Restrict irrigation to nighttime hours to reduce worker exposure to wet foliage.
10. Before entering a grove, all harvesting equipment including trucks, trailers, tractors, "goats", ladders, tubs, boxes, picking bags and gloves must be decontaminated.
11. Do not collect canker specimens. Flag adjacent trees, map the location and immediately contact the Division of Plant Industry at 1 800 850 3781.

Packinghouses and Processing Plants

1. Clean all debris including leaves, twigs and fruit from all fruit hauling equipment and containers. All debris should be burned or disposed of at the present location in a manner that will not pose any risk.
2. Avoid dumping culled fruit and debris in unauthorized areas especially near groves and nurseries.
3. Tarping for all fruit transport trucks and trailers should be required to eliminate escape of debris.