PLP News

The Newsletter of the Plant Pathology Department
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Citrus Canker at the Top of the Polls

By Bob Kemerait

Here in the United States, many people are obsessed with rankings, polls, and who's #1. For example, not too many years ago, Gainesville was rated as the best city in the country by Money Magazine. Many of those who have lived here for a period of time were somewhat astounded by this honor and curious about the criteria by which the city was selected. Our curiosity was piqued even further when in the following year, our ranking dropped down to sixth, though life here remained pretty much unchanged. Today, I have no idea if Money Magazine even remembers us. Another area where rankings are taken very seriously is in college athletics. In the past couple of days, the Bowl Selection Committee has published their rankings for the best college football teams in the nation. Florida State tops the list followed by Penn State. Florida falls in at number six, behind Kansas State. I really don't know how this was decided, but I KNOW that we are better than Kansas State, and how can we be ranked behind Tennessee when we beat them at the Swamp? A related area involves the ranking of universities based upon their perceived importance and achievement. These rankings serve not only as a source of pride for alumni, but also a rallying point for administrators at the institution. For example, if we are not among the top five hallowed schools or departments, we are asked what it will take for us to join these elite. The point of these examples is that rankings are often quite subjective and this needs to be considered before one becomes too excited about failing to be at the very top.

Since coming to the Plant Pathology Department here at the University of Florida, I have been asked two questions frequently by friends, family, and acquaintances. The first is, of course, "Plant *what*??!!" After this question is resolved, they want to know what plant disease is most important in the state. This is not a frivolous question nor is there an easy answer. The thought that is required to give an educated response requires consideration of the many ways in which plant disease affects producers, commercial industries, and ultimately, the consumers. Much of the difficulty lies in defining the meaning of "important". A peanut farmer who is losing a field to southern stem blight caused by *Sclerotium rolfsii* may feel that this is the most important disease because of its impact on him. However, neither peanut nor southern stem blight is likely to be considered at the top of the list by many plant pathologists around the state. Some might argue that emerging diseases of tomato caused by gemini viruses such as tomato mottle virus and tomato yellow leaf curl virus are potentially the most important plant diseases in Florida. These pathogens affect a crop worth millions of dollars and have the potential to cause devastating losses. As of now, there are not any truly effective means of controlling these diseases.

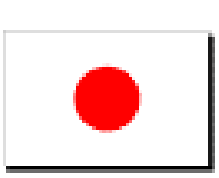
I would agree that gemini viruses cause some of the most important diseases, but on my own personal ranking scale, I would put citrus canker at the top of the list. As its name implies, this disease affects the most important crop in the state. Millions of dollars have been spent since the early 1900's to eradicate it, but like the Ener-

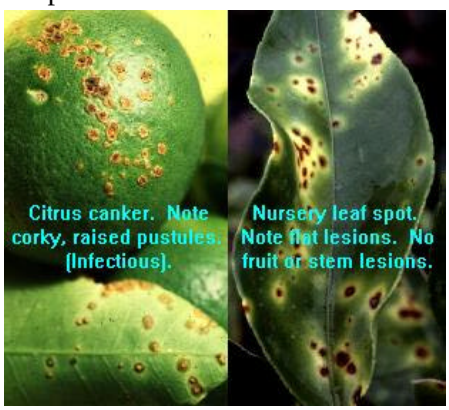
gizer Bunny, the disease just keeps coming back. If citrus canker did become established in Florida, it would cause tremendous damage to our citrus production. Historic eradication programs have been successful, but have not prevented the reintroduction of the disease.

From a biological standpoint, citrus canker appears to be a fairly simple and unremarkable disease. It is caused by the bacterial pathogen *Xanthomonas axonopodis* pv. *citri* , formerly known as *X. campestris* pv. *citri.* These bacteria cause necrotic lesions on the fruit, leaves and stems. The lesions first appear as small, slightly raised, round, light green spots that later become grayish white. The older lesions have a corky appearance with brown sunken centers and are often surrounded by a yellowish halo. The lesions on the fruit do not affect the pulp itself, but make it impossible to sell them as fresh fruit. The pathogen survives in the cankers on leaves, twigs, and the fruit of citrus trees. During warm, rainy weather, the bacteria ooze from the lesions and are spread by splash dispersal from rain and irrigation onto young tissue. The bacteria enter the young tissue through wounds and stomates. Older tissue is infected through wounds and several cycles of infection may occur on a single fruit. Spread of the disease is favored by free moisture and strong winds; citrus canker is most important during periods of high temperatures and rainfall.

Quarantine measures are often used to try and exclude the pathogen from citrus producing regions where it is not yet found. Once the pathogen has been identified in a region, efforts are then made to eradicate it by destroying infected trees and those that are planted near them. In areas where the disease has become endemic, growers can try to use resistant varieties, windbreaks, and copper sprays, though these measures are generally not sufficient to permit commercial fresh fruit production.

Citrus canker appears to have been introduced to Florida around 1912, perhaps on infected trifoliate orange seedlings imported from **Japan**. An eradication program was initiated jointly by state and federal agencies, and Florida was declared free of citrus canker in 1933. The eradication effort had cost six million dollars and resulted in the destruction of 250,000 fruit-bearing trees and 3 million nursery trees. By 1949, the disease had been eradicated from the entire United States. In 1984, the discovery of a new bacterial disease, **citrus bacterial spot** (*X. axonopodis pv. citrumeolo*), and the suspicion that this disease might represent a new strain of citrus canker, led to the destruction of 20 million nursery trees through 1990. However, in 1986, the real citrus canker, also known as Asiatic canker or canker A, was found and eradication procedures continued until 1992.





In 1994, Florida was again declared free of the disease. In October of 1995, the disease was again found in Florida. This time it was discovered infecting trees in residential areas of Miami and the tree-removal regulations were reinstated. As of 1996, the infested area covered about 47 square miles. A quarantine area covering 170 square miles was established in which citrus propagation, movement, and sales were prohibited.

I recently had the opportunity to talk with Dr. Tim Schubert, a plant pathologist with the Florida Department of Plant Industries. Dr. Schubert continues to play an important role in the regulatory aspects of the citrus canker eradication program. Today, the majority of the citrus canker appears to be confined to a 500 square mile quarantine area in south Florida that includes parts of Dade and Broward counties. Citrus trees cannot be planted or moved in this quarantine area. The Florida Supreme Court has ruled that any citrus tree within 125 feet of an infected tree can be legally removed and destroyed by the state. However, Dr. Schubert adds that for eradication programs to be effective, trees within 1900 feet of an infected tree must be removed and destroyed. Although this distance is supported by recent studies in urban epidemiology, it has been met with considerable opposition and legal contention. It should be added that there have also been recent outbreaks of citrus canker in commercial and residential trees in Manatee, Collier, and Hendry Counties. Dr. Schubert states that these areas are in the "mop-up" phases of the eradication program.

Scouts are employed by the Department of Plant Industry to search for infected citrus trees. These scouts form an important part of the citrus canker eradication program and many have college degrees and additional specialized training. There are currently 540 employees in the eradication program and approximately 80% of them are involved in scouting. Dr. Schubert hopes that the total number of employees will be increased to 1,500, so that each scout will be responsible for a smaller area in the two counties.

Essentially all of the infected citrus trees in Dade and Broward Counties have been found in residential areas and not in commercial groves. Once trees are identified for removal, they are cut down and taken to the street where they are put through a chipping machine and then hauled away for incineration. Since October, 1995, approximately 156,000 trees have been destroyed by a private company contracted by the state. Some homeowners have been concerned that the very act of chipping the trees may aide in the spread of the pathogen by introducing inoculum into the air. Dr. Schubert acknowledges that there have been rare instances where protocols were not followed and chipping was conducted in weather where spread of inoculum could have occurred. However, he adds that such events have been isolated and that chipping prior to incineration is an effective way of removing the diseased trees.

The eradication program in the Dade-Broward area has at times been met with some heated opposition. On occasion, homeowners have refused the scouts access to their property and have faced prosecution. On other times, homeowners have threatened scouts with dogs and even firearms. Dr. Schubert emphasizes that most of the homeowners living in the quarantine area are understanding and tolerant of the activities of the eradication program. Many of the homeowners are members of the Cuban and Hispanic communities. Although a number of the scouts belong to these same communities, there remains suspicion and distrust of some of the higher officials in the program who live outside of south Florida. Unfortunately, this distrust does not help interactions necessary for the successful eradication of the citrus canker.

Dr. Schubert believes that it is still possible to eradicate citrus canker from Florida, at least from a biological standpoint. However, the keys to the eradication of this disease also lie in social and political issues. Success in the eradication program requires voluntary cooperation from those involved, which is not always easy to achieve.

Is citrus canker truly the most important disease in the state when it is only found in a restricted area and does not affect the commercial citrus production? I believe it is, based upon the potential threat it poses to the state's citrus production and because we still have the ability to either contain it or eradicate it completely. Gemini viruses and *Sclerotium rolfsii* are established in the state and growers must accept at least some level of co-existence. Citrus growers do not have to co-exist with citrus canker yet and this makes eradication of the disease a number one priority for plant pathologists. If the reader remains unconvinced, I am sure that the editors of this newsletter would welcome essays on other important diseases.

References

Agrios, G. N. 1997. Plant Pathology. Academic Press, New York, pp. 445-449.

Graham, J. H. and Gottwald, T. R. 1991. Research perspectives on eradication of citrus bacterial diseases in Florida. Plant Dis. 75:1193-1200.

Schubert, T. S., Miller, J. W., and Gabriel, D. W. 1996. Another outbreak of bacterial canker on citrus in Florida. Plant Dis. 80:1208.

Stall, R. E. 1988. Canker. *in* Compendium of Citrus Diseases. J. O. Whiteside, S. M. Garnsey, and L. W. Timmer, eds. APS Press, St. Paul, MN.

(Ed. Note- For more pictures and information, go to Dr. Dean Gabriel's web page on citrus canker disease at: www.biotech.ufl.edu/~pcfcl/canker.htm)

Faculty, staff, students, alumni, and colleagues of our department...

Mariadaniela Lopez succesfully defended her Master's Thesis entitled "Detection, Distribution, Incidence and Impact of Dasheen mosaic virus potyviridae in Caladium x hortulanum" on October 22nd, 1999. Way to go!!!

The International Luncheon- A Unique Gastronomic Experience

The Plant Pathology Graduate Students' Association sponsored the International Luncheon last October 22 at the Fifield Hall conference rooms. Grad students, postdocs and USPS prepared dishes from their respective native countries or their country of choice.

Main dishes, side dishes, vegetarian dishes, and desserts were served to an overwhelming number of guests who decided to trade their lunch money for an adventure into the world's cuisine. The

guests and the cooks feasted on Empanada Chilena (Chile), Jachshotel (Holland), Empanada de Maduro con Queso y Yuca- plantain empanadas with cheese and cassava (Costa Rica), Summer Wahe (Switzeralnd), Chicken Pilau with Dates (Oman), Cuzcuz Brasileiro- Brazilian couscous (Brazil), Paella (Spain), Dal-lentil soup (India), Adobo and Pancit- vermicelli (Philippines), Aji de Gallina- chicken in pepper and cheese sauce (Peru), Porkkana Laatikko- carrot casserole (Finland), Eggplant Parmesan (Italy), Sweet Corn and Rice (USA), Bobotie (South Africa), Lasagna (Italy), Maionese -potato salad (Brazil), Beef

Stroganoff (Russia), Turkey Chili (USA), Potatoes with White Sauce and Dutch Cheese (Holland), mashed potatoes and rice. The dessert table was loaded with mouthwatering Baklava (Turkey), Brownies and Strawberry Cheesecake (USA), Molasses Cookies (Germany), Caramel Corn and Pumpkin Pie (USA), Doce de Abobura- pumpkin dessert (Brazil), Banana Cake with Cream Cheese Icing (USA), Doce de Leite- milk dessert (Brazil), Bico- rice dessert (Philippines) and Quesillo Flan and Torta tres leches(Venezuela).

Thank you all for making the International Luncheon a success!

Publications

Peever, T.L., Canihos, Y., Olsen, L., Ibanez, A., Liu, Y.-C., and Timmer, L.W. 1999. Population genetic structure and host specificity of Alternaria spp. causing brown spot of minneola tangelo and rough lemon. Phytopathology 89: 850-860.

Coffee Break Schedule and Birthdays for October 1999

Friday Coffee Break

11-5 Kucharek, Kimbrough and Song
11-12 Pring and Chourey
11-19 Niblett
11-26 Simone and Purcifull
12-3 Bartz and Berger

Birthdays!!

11/7 Dr. Kimbrough
11/7 Dr. Kucharek
11/18 Chuck Semer
11/29 Mark Elliott

Noteworthy Achievements

Gail Harris was one of the winners of the IFAS Superior Accomplishment Award.

Alison Walker was a University Scholar.

Dr. Richard Raid, professor at the Everglades REC, was presented with the first Superintendent's "Partners in Education Award" for Palm Beach County in the non-profit category for installing 18 gardens in public schools with his SOAR (Sharing Our Agricultural Roots) program.

Jessica Roberts was recognized as a Four Year Scholar for her academic excellence throughout her undergraduate academic career.

Dr. Charudattan and **Dr. Kucharek** received the 1998-99 UF PEP (Professorial Excellence Program) Award.

Christina Fulford became a College of Agriculture 1999-2000 IFAS Ambassador.

Dr. Robert Schmidt, professor at the School of Forest Resources and Conservation, received the Outstanding Forest Pathology Extension Paper Award at the Southwide Forest Disease Workshop. Dr. Schmidt also received the Southern Forest Pathologists Achievement Award at the workshop.

Dr. Mike Olexa, professor of Food and Resource Economics and graduate of our department, was awarded the Teaching Award of Merit by the National Association of Colleges and Teachers of Agriculture (NACTA) and also received the USDA Secretary's Honor Award for "Outstanding leadership in environmental protection by developing effective educational programs for culturally diverse audiences on laws and regulations governing agricultural practices in the United States.

Dr. George Blakeslee, professor at the School of Forest Resources and Conservation, received the School's Outstanding Advisor of the Year Award.

Leisure and Culture in Gainesville, Florida November '99 and Beyond

- "Persistent Visions", JWRU, 2nd floor gallery. Through November 7, 1999. Call 392-2378.
- "DUAFE: A Sister in Primary Colors" on display in the Center for Women's Studies and Gender Research. Through December 20. Call 392-3365.
- "Seeing Double" on display in the Harn Museum through December 13. Call 392-9826.
- "The Karnoff Collection: Etruscan and South Italian Vases" on display in the Harn Museum through January 2. Call 392-9826.
- "Doing our Part: Saving Art" on display in the Harn Museum through April 15. Call 392-9826.
- "Surplus of Memory" at the University Gallery through December 10. Call 392-0201.
- Tibetan Sand Painting Demonstration at the Florida Museum of Natural History, on Sunday, November 14 - 19. Call 846-2000.

* "Asian Art from the Permanent Collection" on display in the Harn Museum through January 2000.

* "Equal Partners" on display in the Harn Museum through November 28.

* "Two Centuries of American Drawings" on display in the Harn Museum through November 28.

* "American Impressionism from the Sheldon Memorial Art Gallery" on display in the Harn Museum through January 2. Call 392-9826.
* "EarthQuest; The Challenge Begins", at the Florida Museum of Natural History. Thorugh January 30.

- "Children's Natural History Gallery", at the Florida Museum of Natural History. Through January 30. Call 846-2000.

Greetings to all PI's at REC's! We would like to hear from you! Do you have any visiting scientists/scholars or post-docs that we haven't heard about? If so, we would like to feature them in future issues of PLP News. Please send us a short summary of where they are from, their educational background, the project they are working on, and personal interests and/or hobbies. You can email us at plpnews@gnv.ifas.ufl.edu. We look forward to hearing from you!

T-Shirts On Sale Now !!!!

The new departmental t-shirts are on sale now through November 8th. The shirts are silk screened on 100% white cotton shirts and are only $10.00! The back design is as seen below and there is also a pocket design with an alligator and the words University of Florida Plant Pathology. Comes in small, medium, large, and x-large. XX-large available upon special request. T-shirts will be ready for pick-up December 3rd or can be shipped for an extra $2.00 .Contact chaos@grove.ufl.edu for more information or to order!

Important Dates : November

November 5-6, Homecoming
All classes suspended
November 8, Deadline for Plant Pathology T-Shirt orders.
November 11, Veterans Day
All classes suspended, all offices closed
November 15, Last Day of Submission of Defended Master's Theses
November 25-26 Thanksgiving
All classes suspended, all offices closed

Plant Pathology Sunshine Fund

The Plant Pathology Sunshine Fund is a service managed by the Plant Pathology Departmental University Service Personnel where money is set aside to help our colleagues in times of need. The fund was started by Ruth Kusky, who was a secretary in the front office. To date, the sunshine fund has been used to encourage those who's loved ones have passed away or to cheer up those who are sick. Since 1990 we have distributed $1799.13 in cards, flowers and donations to members of the Plant Pathology Department. We also provide gifts to the custodial staff every year for Christmas.

We are always grateful to receive contributions from the entire department to help in this service. It is very easy to donate if you are interested. On payday Fridays, just drop your contribution in the wooden box next to the pay check box in the front office. From our experiences we have learned that as little as a dollar per pay day from each person is sufficient to finance the sunshine fund.

As a final point we recognize that some people prefer such issues remain private. In this light we would like to emphasize our intent to honor such a person's wishes. If, however, you know of someone in our department who is enduring a difficult situation and think it is appropriate to give fellow colleagues a chance to respond to those needs, then please communicate this information through the front office.

Interview with a Scientist

Han Xiao was born in the Jiangxi Province of China and later attended the Agricultural University there, where he earned his B.Sc. in Plant Breeding. Han then attended the Graduate School of the Chinese Academy of Agricultural Sciences in Beijing to complete his Master's work on the evolution of rice and breeding for crop improvement.

Han is currently working on his Ph.D. at the Institute of Genetics (part of the Chinese Academy of Sciences), studying the genomics of rice. Han met Dr. Song through colleagues in California, and Dr. Song invited him to join his lab for one year to work on rice transformation.

Han mostly works since his wife is still in China (she will hopefully join him later this year), but he enjoys listening to popular music when he wants to relax.

We would like to extend a warm welcome to Han. we hope that your stay here is productive and enjoyable!

Where in the World Wide Web?

Halloween-
Tired of being a witch? Looking for something a tad more interesting than dressing up in a sheet this year? Try this site for some creative AND CHEAP ideas!
http://www.excite.com/travel/destinations/

Travel-
Going somewhere but don't know what the hottest sites are? Or the best restaurants? Check out Excite's destinations website- you choose your destination and it tells you where the online travel guides are for that city/country/or region. Great for finding discounts before you leave!
http://www.excite.com/travel/destinations/

Just Bee-cause-
I know everyone out there is wondering how to start beekeeping but just doesn't know where to look. Well, try the Apiservices Virtual Beekeeping Gallery for hints, news and updates on the honey market!
http://www.beekeeping.com/index_us.htm

Search and Screen Committee for the Plant Pathology Department Chair

Jerry Bennett, Chair
Raghavan Charudattan
Jeff Jones
Jim Kimbrough
Ken Pernezny
Jane Polston
Juliana Freitas-Astua

PLP News can now be accessed via the world wide web at the following address: http://plantpath.ifas.ufl.edu/

For those of you who were marveled by last month's feature article on mangoes, you might want to check out some spectacular pictures at www.ifas.ufl.edu/~imaguire/

If you would like to join our staff or contribute an article, contact us!

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