

# Agriculture Extension and the Ethical Problems in Providing Expert Advice: An Example from Plant Pathology

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## **Page 1: Preparation and General Objective**

Preparation: Students should have a graduate level understanding of plant pathology concepts and have reviewed [Module 3.42: Social mission of universities](#).

Module Objective: Introduce plant pathology doctoral students to the ethical concerns they may encounter while providing expert advice as extension specialists.

## **Page 2: Introduction**

*“Many people believe that quarantine constitutes an unwarranted diminution of personal liberty, whereas others see it as an integral aspect of...disease control.”* (Upshur, 2003). While this quote pertains to human disease quarantine, the same concept was debated during the recent outbreak of citrus canker (a bacterial disease affecting citrus) and subsequent regulatory efforts in southern Florida. This module uses this outbreak to demonstrate the multiple ethical issues that University Agricultural Extension Specialists face.

The mission of an Agricultural Extension Specialist can be defined as “an educational partnership helping people put research-based knowledge to work for economic prosperity, environmental stewardship and an improved quality of life” (NCCES, 2007). Extension Specialists are under immense pressure to perform by many standards. They are at once employees of the University and members of their home department but also representatives of the Extension Service with the duty to serve the residents of the State. In each of these arenas, Extension Specialists are required to produce measurable achievements, although what is valued by the State’s residents and industry members can be much different than what is defined as success by an academic department or university. For additional scientific details see the articles listed in the reference section. This module will be useful to students in any discipline who are considering a career in the Extension Service.

## **Page 3: Citrus Canker in Southern Florida** **Citrus Canker in Southern Florida**

Citrus canker, caused by the bacteria *Xanthomonas axonopodis* pv. *citri*, affects all citrus species including oranges, lemons, and grapefruit. The citrus canker pathogen is an exotic invader native to Southeast Asia and is a major economic concern for citrus producing areas of the US with a suitable climate for development of the disease (including Florida, Texas and portions of California).

Citrus canker infection is characterized by distinctive circular raised pustules on the fruit, leaves, and twigs. Older pustules may show a yellow halo and a sunken center. Bacterial streaming from lesions is a key diagnostic factor. Defoliation can occur, but

economic losses are due to markedly reduced appearance of the fruit (although penetration into the fruit itself does not occur) and abscission of heavily infected fruit.

*X. axonopodis* pv. *citri* overwinters in lesions on twigs. During warm wet weather in early summer the bacteria ooze out of the lesions and are easily spread by wind-driven rain. Long distance transport is human mediated; either by shipment of diseased fruit, movement of contaminated equipment or possibly large storm events such as hurricanes (Gottwald and Irey, 2007). New infections are initiated when the bacteria enter plant tissues through natural openings such as leaf stomata or through wounds caused by insect feeding, rubbing of branches or fruit, or pruning.

While citrus canker does not kill trees, major economic losses result from unmarketable fruits and regulatory actions that prohibit shipping outside of infested areas. Since no effective remedial treatments are available to reduce citrus losses from citrus canker, management requires removal of infected citrus to reduce spread of the pathogen to noninfected citrus plantings. Citrus canker has been found and successfully eradicated from Florida three times through infected citrus removal programs (outbreaks in 1910-1933, 1984, 1986-1994). The most current outbreak began in 1995 when the disease was first detected on a backyard tree near the Miami International airport. It's unknown if the disease arrived through shipments or was brought in with Hurricane Andrew. USDA-APHIS was notified and officials immediately set in place an eradication plan. This plan originally involved removing all green tissue from citrus trees within 125 ft of an infected tree. It was clear after the first year that the extreme measures of complete tree removal was needed as citrus canker had spread to infect 265 mi<sup>2</sup>. In 1997, citrus canker was discovered in a commercial citrus grove in the west central region of Florida which intensified eradication efforts across the state. The tree removal zone was expanded from 125 ft to 1900 ft around an infected tree (Gottwald et al., 2002).

Public opposition to the citrus canker eradication program was spreading as fast as the canker-infected trees. Residential trees were the first affected and many people thought that their trees were being sacrificed to protect the citrus industry without adequate compensation for their losses. There was widespread skepticism on the need to remove apparently healthy trees to prevent a disease that didn't outright kill trees. While some residents were indifferent to tree removal, many resisted the efforts to cut down their backyard trees. In fact, a class action suit was filed on behalf of 30,000 Miami-Dade county residents accusing the Florida Department of Agriculture of trespassing and cutting down trees without compensating for the losses (Betancourt, 1997). As of 2001, over 579,000 residential trees had been removed.

While the tree removal effort was supervised by the USDA-APHIS and implemented by the Florida Department of Agriculture, university extension plant pathologists were also involved. The University of Florida Citrus Research and Education Center in Lake Alfred, FL established the existing Citrus Canker Extension Program which consists of a team of seven PhD extension specialists, three of which are plant pathologists. This team is charged with reducing the spread of citrus canker through educational activities directed at residential and commercial growers. For the following questions, imagine you are a new pathologist assigned to the Citrus Canker Extension Program in 2000. The most recent citrus canker outbreak and subsequent tree removal policy (above) have been in effect since 1995. Use your knowledge of plant pathology and the additional resources provided to discuss the following questions.

#### Page 4: Discussion Questions

- Identify the stakeholders in the citrus canker outbreak: Who is affected by the outbreak and how are they affected by the subsequent eradication efforts? What are the ethical dilemmas faced by each stakeholder?
- A regulatory plant protection and quarantine program is comprised of three components: exclusion of a pest; containment, suppression, and eradication of a pest; and assisting in meeting import/export regulations to control entry of a pest. Discuss the means in which *X. axonopodis* pv. *citri* could have arrived in the US and what was being done to control entry in the country. What could be potential roles of an extension specialist with regard to regulatory practices?
- Why is the introduction of *X. axonopodis* pv. *citri* into the US such a concern?
- Extension specialists are expected to be responsive to client needs, but who is the more important client in the case of the citrus canker outbreak? The commercial citrus producer or the backyard hobbyist? What do you do when your clients needs are in direct opposition of each other?
- Using information from this module and your own experience, decide how you would handle a phone call from an elderly resident asking why her backyard tree must be destroyed even though it appears completely healthy. (Consider that citrus trees take 3-5 years to bear fruit and 8-10 years to mature to full size.)
- A change in tree removal policy occurred in 1997 when the tree removal zone was expanded from 125 ft to 1900 ft. This increase was mandated when an epidemiological study determined that the bacteria could be spread much farther than earlier research suggested. As an extension specialist, how would you present this policy change to a grower meeting? Would you present differently to a group of Master Gardeners? How would you address public skepticism of the science behind this policy?
- As of Jan 2006, USDA-APHIS is no longer enforcing an eradication policy for citrus canker. The infected area was deemed too large to feasibly quarantine (an estimated 200,000 acres of citrus were exposed) and tree removal will no longer be funded. How does this ruling affect the public's opinion of an extension specialist who was recently advocating tree removal as the only means of controlling citrus canker?
- What are a few examples of plant health quarantines in your local areas?
- The role of the Extension Service has been changing over the last few decades as less and less people are directly involved in agriculture. How will these continued changes affect how you do your job if hired as an extension specialist?

- Consider you are an extension specialist in Florida at the time of the initial outbreak of citrus canker. You have a choice to either get involved in citrus canker extension or not. What are the consequences of not getting involved in this new disease compared to integrating it into your program?

## Page 5: References and Additional Resources

### References

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- Gottwald, T. R., and Irely, M. 2007. Post-hurricane analysis of citrus canker II: Predictive model estimation of disease spread and area potentially impacted by various eradication protocols following catastrophic weather events. Online. Plant Health Progress doi:10.1094/PHP-2007-0405-01-RS. <http://www.plantmanagementnetwork.org/sub/php/research/2007/hurricane/>
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- USDA-APHIS. 2007. Hot issues: citrus canker. [http://www.aphis.usda.gov/newsroom/hot\\_issues/citrus\\_canker/citrus\\_canker.shtml](http://www.aphis.usda.gov/newsroom/hot_issues/citrus_canker/citrus_canker.shtml) (last accessed April 6, 2007)
- Florida Department of Agriculture. 2006. USDA determines citrus canker eradication not feasible. [http://www.doacs.state.fl.us/press/2006/01112006\\_2.html](http://www.doacs.state.fl.us/press/2006/01112006_2.html) (last accessed April 12, 2007)
- Upshur, R.E. 2003. The ethics of quarantine. *Medicine and Society* 5(11): online. <http://www.ama-assn.org/ama/pub/category/11535.html> (last accessed 08/31/05)

### Additional Resources

- Boyer, E. 1996. The Scholarship of Engagement. *Journal of Public Service and Outreach* 1(1):11-20.
- The Journal of Extension is the referred journal of the US Cooperative Extension Service and is available online at [www.joe.org](http://www.joe.org)
- Hightower, J. 1973. *Hard tomatoes, Hard Times: A report of the Agribusiness Accountability Project on the Failure of America's Land Grant College Complex.* Schenkman Publishing Company, Cambridge, MA. 268 pg.