

Research in Support of Eradication and Control of Citrus Canker

Project No. 981-29P

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Project Report for FY 00-01, Year 3 of 3.

Abstract

Asiatic Citrus Canker (ACC) has spread from residential Dade Co. and infested residential and commercial areas of Manatee Co. to other locations in South Florida in spite of aggressive survey and eradication efforts. Outbreaks in commercial citrus areas were predominately traced back to the Miami infestation and presumably occurred due to human movement. In spite of significant removal of trees from the core areas of infestations, the inoculum has been spread repeatedly by hurricanes, tropical rainstorms, tornadoes and over long distances by humans.

Objectives

1. Analyze survey data to predict areas most likely for future spread, for risk assessment, and for reevaluation of survey and eradication procedures.
2. Study bacterial populations on plant surfaces to determine their role in the risk of ACC recurring and test survival on wood, metal, and plastic surfaces to determine how bacteria are transported to uninfected citrus trees.
3. Develop and evaluate methods for detection and location of low incidence infections.
4. Sample infected plant material taken to local landfills to determine survival and potential for spread.
5. Sample air surrounding landfills and chipping machinery for production of bacterial aerosols that might cause infection.
6. Evaluate new compounds for ACC control.

Summary of Accomplishments

Studies were conducted to determine the longevity and epidemiological significance of bacterial survival on plant material and inanimate objects in both shade and sun. Survival on most surfaces was 24 to 72 hours unless surfaces were kept moist and in the shade.

Bacterial aerosols were generated by chipping machinery and at landfills when debris was dumped. However, only the debris that escaped the chipping machinery was found to contain viable bacteria that initiated disease in trap plants.

New chemical materials including Induced Systemic Resistance (ISR) compounds were evaluated for augmentation of traditional chemical and horticultural control strategies. The most promising compounds have been taken to Brazil for further field-testing.

Studies on bacterial spread in urban Miami determined disease gradients in Miami resulting from rainstorms. To accomplish this, nearly 19,000 trees were located via differential GPS, and assessed three times over 18 months to date infections. Spread from point sources of infection was calculated. The majority of the disease spread by rainstorms was contained within 1900 feet of known infected source trees. This research prompted USDA, APHIS, and the Citrus Canker Eradication Program to replace the 125-ft rule to define exposed trees by a 1900-ft rule in January 2000.

A sentinel tree survey method to locate citrus canker infections was also developed as another outcome of the epidemiology study. The method has been deployed, validated, and implemented statewide by APHIS and the Citrus Canker Eradication Program to find infestations before they spread.

Funding:

FCPRAC Grants \$ 43,745

Agency (USDA, ARS) Contribution \$311,717

Other Grants (USDA, APHIS) \$283,490 (not included

Total \$355,462 in total

Source of Information:

Florida Citrus Production Research Advisory Council, 9th Annual Report, July 2000 to July 2001

Website:

<http://citrusrdf.org/annrep/2001-ann-rep/9thAnnualRept.htm>