

Questions and Answers on *Ralstonia solanacearum* Race 3 Biovar 2

General

Q. What is *Ralstonia*?

A. *Ralstonia solanacearum* race 3 biovar 2 is a bacterial pathogen that infects numerous plants. Various races of *Ralstonia* affect different crops around the world including tomato, potato, eggplant, and banana. While race 1 is endemic to the Southeastern United States where it affects tomato crops, *Ralstonia solanacearum* race 3 biovar 2 is not known to occur in the United States and is considered of quarantine importance.

Q. What are the horticultural and agricultural risks of *Ralstonia*?

A. *Ralstonia solanacearum* race 3 biovar 2 is known to infect ornamental plants (e.g., geraniums) and several important agricultural crops (e.g., potatoes, tomatoes, eggplants, and peppers). In potatoes, *Ralstonia solanacearum* race 3 biovar 2 causes brown rot, or bacterial wilt, which renders the potatoes unmarketable. Global damage estimates on bacterial wilt of potatoes currently exceed \$950 million per year.

Q. How is *Ralstonia* transmitted between plants?

A. *Ralstonia solanacearum* race 3 biovar 2 can be transmitted through irrigation water, contaminated soil, equipment, or people. For example, it may be spread by propagating infected plants, taking cuttings without disinfecting cutting implements between plants, pinching buds of plants without sanitizing hands, and especially by shared water irrigation systems.

Q. Does *Ralstonia* pose a threat to human health?

A. *Ralstonia solanacearum* race 3 biovar 2 does not cause disease in humans or animals.

Scope of Recent *Ralstonia* Infestation

Q. How many geranium plants have tested positive in the United States?

A. *Ralstonia solanacearum* race 3 biovar 2 was found in two varieties of geraniums—Americana Coral and Americana Bright Red in a greenhouse in New York in December 2003. A third variety, American Cherry Red II, is implicated because it was produced in the same greenhouse in Guatemala as the two varieties that tested positive.

Q. How many greenhouses are thought to be affected?

A. Approximately 450 facilities in 41 States have received suspect geraniums from the infected Guatemalan facility.

Q. How were greenhouse owners notified that they may have received potentially infected plants?

A. Based on records provided by the plant importer, U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service's (APHIS) Plant Protection and Quarantine (PPQ) officials compiled a confidential list of potentially affected nursery facilities. This list was then provided to the corresponding State Department of Agriculture, who in cooperation with Federal officials, contacted the affected nurseries to schedule an investigation. During this investigation, PPQ or State inspectors collected invoices and shipping lists and recorded the location and number of suspect plants. The purpose of the investigation was to assess the extent of potential contamination of other plants in addition to the three geranium varieties of concern, and whether wilt was present in other geranium varieties as well.

Q. Has any sampling been performed in the country of origin to establish a link between the positive plants in New York and the host country?

A. PPQ scientists have inspected the implicated Guatemalan facility and have confirmed *Ralstonia solanacearum* race 3 biovar 2 in 5 Americana Bright Red samples collected from 2 greenhouses in Guatemala. The positive test results were confirmed by a University of Wisconsin researcher. Some of the positive samples and the New York-positive plants were collected from the same Guatemalan greenhouse. The basis for APHIS' control program is the positive test samples in New York. Confirmatory testing in Guatemala was not necessary for APHIS to initiate control actions.

APHIS Control Actions

Q. Is there an available treatment for infected geraniums?

A. No. There is no available treatment for plants infected with *Ralstonia solanacearum* race 3 biovar 2. Potentially infected geraniums must be destroyed to prevent the spread of the disease.

Q. Can greenhouse owners sell infected geraniums?

A. No. Greenhouses that have received suspect geraniums will be issued a “hold order,” which prohibits the movement of suspect geraniums and other potentially infected plants from the property until further evaluations can be made or control actions taken.

Q. Will potentially infected geraniums be destroyed?

A. Yes. USDA has ordered the destruction of all Americana Bright Red, Coral, and Cherry Rose II, also marketed as Cherry Rose, shipped from a geranium producer in Guatemala between August 2003 and January 2004. Additional plants may be potentially infected based on watering and sanitary practices at the nursery. Destruction of potentially infected geraniums should be witnessed, supervised, and documented by a PPQ or State official.

Q. Is APHIS testing plants prior to destruction?

A. No tests are available for the large-scale nondestructive sampling necessary to reliably determine if stock is free of *Ralstonia solanacearum* race 3 biovar 2. Available immunological tests require the destruction of tested plants and can only identify the *Ralstonia solanacearum* bacterial group, not the targeted race and biovar. Based on the lack of available testing methods and more precise data from the geranium producer on potentially infected plants, APHIS must conclude that all Americana Bright Red, Coral, and Cherry Rose II cuttings produced in Guatemala between August 2003 and January 2004 are potentially infected and should be destroyed.

Q. Are asymptomatic (i.e., wilt-free) geraniums necessarily free of *Ralstonia solanacearum* race 3 biovar 2?

A. No. Geraniums that appear healthy and do not exhibit symptoms of wilt may in fact be infected with *Ralstonia solanacearum* race 3 biovar 2. The only way to ensure a plant is not infected with *Ralstonia solanacearum* race 3 biovar 2 is to destroy the plant and perform laboratory testing. The number of asymptomatic plants that would be required for testing to assure a group of plants is free of the pathogen is not currently known.

Q. What are the major differences between the 2003 and 2004 *Ralstonia solanacearum* race 3 biovar 2 action plans?

A. The February 2003 action plan developed to manage last year’s *Ralstonia* introduction is not to be used to manage the current introduction. The major changes from the 2003 action plan are:

- Definition of the basic unit of control. In the February 2003 version, the shipment was the basic level of control. In the current situation, three geranium varieties (Americana Bright Red, Americana Coral, and Americana Cherry Rose II [also marketed as Americana Cherry Rose]) are the basic unit of control. These plants, and other potentially infected plants as defined in the action plan, are targeted for destruction.
- Elimination of the destruction of all plants within 1-meter of an infected shipment. There is little or no risk of *Ralstonia solanacearum* race 3 biovar 2 transmission through leaf contact or splashing of water from leaf-to-leaf.
- Elimination of the time/temperature model for holding plants. The model was an attempt to predict when infected plants express wilt symptoms. USDA based this on the idea that uninfected plants would not express wilt while infected plants would wilt if subjected to high enough temperatures for a long enough duration. USDA has since learned through research that this model is unreliable and cannot be used to accurately and consistently identify infected plants. Studies indicate that some plants continue to have latent infections, not showing wilt, even when high temperatures are maintained for long periods of time.

Compensation

Q. Will greenhouse owners be compensated for destroyed stock?

A. USDA is not compensating owners for destroyed stock. For additional information or guidance, growers may consult the USDA Crop Disease Assistance services (i.e. Farm Service Agency, Risk Management Agency) at http://disaster.usda.gov/crop_jump.htm, as well as private insurers for crop insurance.

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