

GROWERTALKS

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Acres & Acres

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Forget the rumors, hearsay, opinions and recriminations. Here is every *fact* we have been able to acquire from the companies, pathologists and government agencies that are involved with the recent outbreak of *Ralstonia solanacearum* race 3, biovar 2 on geraniums:

The disease. *Ralstonia solanacearum* is a bacterial pathogen that causes Southern bacterial wilt of mainly solanaceous crops, including potatoes, tomatoes, peppers and tobacco. There are a small number of other hosts, including some weeds and geranium. This soil-borne bacterial pathogen has been typed into different races and biovars. Race 1 is endemic to much of the tropical world, including the southern United States. Race 3, biovar 2 has a smaller host range, but it's capable of surviving in more temperate climates in the soil and in certain weed species. This ability to survive in more northern soils is why it's of concern to commercial potato production in the northern United States. In geraniums, *Ralstonia* can be spread through diseased cuttings, from root system to root system by water movement (such as through subirrigation), and through sap transmission while handling or propagating plants. The last known case of race 3, biovar 2 in the United States was in 1999, on geraniums that originated in Guatemala. There have been no documented cases of recurrence from the 1999 outbreak.

The "Bioterrorism" list. Because of its threat to food crops, especially potatoes, this particular biovar of *Ralstonia* was included in a list of ten pathogens that the USDA considers hazardous to U.S. food and plant crops. The list, published in the Federal Register on August 12, 2002 (Volume 67, No. 155) is part of the *Agricultural Bioterrorism Act of 2002*.

The introduction. Sometime during Weeks 44, 45 and 46 (October 27 to November 16), workers at Goldsmith Plants' Kenya facility took cuttings from seven Americana Dark Red stock plants, unaware that those plants were infected with *Ralstonia* race 3 biovar 2. Those seven plants, which share a greenhouse, had been part of Goldsmith's 550,000 plant stock base since Week 40, producing an average of one cutting per week.

Each cutting was packaged with 129 others and shipped to a rooting facility—in the case of the United States, either Glass Corner Greenhouses in Michigan or Pleasant View Gardens in New Hampshire. Official estimates vary, but from as few as 15 to as many as 100 infected cuttings wound up at Glass Corner or Pleasant View during those ship weeks. They were stuck in a peat-based rooting medium in strips of 17, three strips per tray, set out on elevated trays on concrete floors, rooted for five weeks, then shipped to customers during Weeks 49 to 51 (December 1 to December 21).

The spread. Sometime in Week 2 (January 5-11), an Indiana grower notified Goldsmith that he'd found some Americana geraniums from Glass Corner that were showing disease-like symptoms. Goldsmith instructed the grower to ship them samples. On January 13, Goldsmith diagnosed the samples as infected with *Ralstonia*

solanacearum. However, they don't have the ability to determine the specific race and biovar. On January 14, Goldsmith quarantined two greenhouses of stock plants in Kenya where they suspected the disease originated. On January 15, Goldsmith's Don Snow and the Glass Corner staff scouted the crop at Glass Corner. No suspicious plants were found. All Sanitation procedures were reviewed, and spread of any potential problems was determined to be very unlikely.

On January 23, a second Indiana grower sent a sample of wilted Americana geraniums to Purdue's Plant and Pest Diagnostic Lab. On January 28, lab tests came back positive for *Ralstonia solanacearum*. Samples from an Illinois greenhouse reached the lab January 28 and were confirmed with *Ralstonia* on February 3. Like Goldsmith, Purdue's pathologists aren't able to test for specific race and biovar. Plants from these two cases samples were forwarded by Purdue to the USDA February 3 for race and biovar identification.

As of February 10, *Ralstonia* had been identified at five greenhouses in Indiana, Illinois and Wisconsin on three Americana cultivars, Dark Red, Pink and Violet. By February 14, 10 greenhouses had been confirmed with *Ralstonia*, including one in Georgia, and Americana Bright Red was added to the list. By February 19, 20 greenhouses had reported symptomatic plants, with two testing negative for *Ralstonia*. All infected plants originated in Kenya, and were shipped from Glass Corner to growers between weeks 49 and 51. Approximately 150 growers received Kenya cuttings from those weeks. Thus far, no infected cuttings had been connected to Pleasant View.

The communication. January 24: Goldsmith notified APHIS, SAF and Goldsmith's fellow members of the Geranium Bacterial Disease Control Initiative (Oglevee Ltd., Fischer USA and Ball FloraPlant) of the presence of *Ralstonia solanacearum* on some Americana geraniums that originated from Kenya.

February 4: Goldsmith sent a letter to brokers saying that *Ralstonia solanacearum* had been found on six Americana Dark Red stock plants at their production farm in Kenya, that the suspect stock plants were quarantined even before the diagnosis was made, and offering contact information and free plant testing for any customers who see wilting symptoms in their crops.

February 5: Pleasant View sent an email to brokers restating Goldsmith's letter, reiterating that the disease had been found on six stock plants, and adding that they had a maximum yield of 15 cuttings.

February 8: Purdue's horticulture department and pathology lab sent a fax memo to Indiana growers, alerting them to the fact that *Ralstonia* had been found in two Indiana greenhouses, and providing details about what to do if they have any questions.

February 10: SAF sent out a press release on behalf of Goldsmith, restating the letter of the 4th but updating the information to seven stock plants.

February 12: Purdue and Goldsmith received confirmation from USDA that the *Ralstonia* they found is race 3, biovar 2.

February 13: An APHIS spokesperson gave GrowerTalks "unofficial confirmation" that the *Ralstonia* in question is race 3, biovar 2.

February 14: APHIS notified all state and territory agricultural regulatory officials, confirming that the disease found in four commercial greenhouses was race 3, biovar 2. The memo says that race 3, biovar 2 is cited on USDA's Agricultural Bioterrorism Act of 2002 Select Agents and Toxins list, adding that, "PPQ has no information that indicates the introduction of this pathogen was deliberate but instead resulted from unintentional contamination in the routine importation of geraniums."

of the situation.

The quarantines. As mentioned above, Goldsmith put a voluntary quarantine on two of their Kenya stock houses on January 14.

During Week 4 (January 19-25), Glass Corner stopped shipping cuttings from Kenya when they learned the tests were positive for *Ralstonia*. The last week any Kenya cuttings were shipped was Week 4. During propagation, Kenya and Guatemala cuttings (from Goldsmith's other production site) may share the same range, but are kept separated. Glass Corner isolated approximately 500,000 remaining Kenya cuttings from any other cuttings. With USDA approval, they continued to ship cuttings that originated in Guatemala.

On February 13, Pleasant View and Glass Corner, with USDA and state ag officials present, disposed of Americana Dark Red cuttings from Kenya. Glass Corner disposed of 10,000 cuttings. Pleasant View chose to dispose of a total of about 40,000 cuttings of five Americana varieties on seven benches, even though there was no confirmation that they'd received infected cuttings. The cuttings were bagged, placed in a dumpster, and trucked to an incineration facility. Pleasant View also continued to ship product originating in Guatemala.

On February 14, the USDA stopped all geranium shipments from Kenya to the United States until further notice. This impacted Goldsmith, Oglevee and Fischer, who each have stock facilities there. Goldsmith asked APHIS to reconsider the ban on other producers' products, which were not implicated in the outbreak.

We have no official reports of when or if any of the other affected greenhouses were quarantined.

The meeting. On Friday, February 14, representatives from three of the four Geranium Initiative group companies met with APHIS in Washington to provide further facts and discuss the details of an action plan. *GrowerTalks* was told that APHIS was considering three lists: 1) the 18 greenhouses known at that time to have symptomatic or infected plants, 2) approximately 150 greenhouses who received cuttings that were from Kenya during Weeks 49-51, and 3) approximately 850 greenhouses that received cuttings originating from Kenya from Week 40 through Week 6. Industry members urged APHIS to focus on the list from Weeks 49-51, since all known cases to date had come from that time frame. APHIS told the group about their official notice to the states, and described the forthcoming Emergency Action Notice, which would give detailed quarantine and inspection protocol.

The inspections. In the official APHIS announcement dated February 14, a sentence that now appears to have caused considerable confusion among state inspectors said, "Shipments from the affected greenhouses will be suspended until PPQ ascertains that tests for the presence of the pathogen are negative. Contaminated U.S. greenhouses will not be allowed to move plants until the PPQ-approved procedures are used both to destroy plants and decontaminate greenhouses." The letter went on to say that, "APHIS will make every effort to implement its emergency response as soon as technically feasible."

The Newspaper articles. On February 19, the Lawrence (Kansas) *Journal-World* publishes a story titled "Terror Questions Blossom." The lead states, "Kansas officials say there's a chance that geranium plants shipped to more than 20 greenhouses statewide harbor a plant-killing bacterium listed by the U.S. government as an 'agricultural bioterrorism' threat." Letters from *GrowerTalks* and others prompted a follow up the next day titled "Tainted geranium threat unconfirmed in Kansas." That same day, APHIS told *GrowerTalks* that the Associated Press had called for information about the outbreak.

The Action Notice. *Unfortunately, due in part to the ensuing holiday and blizzard, APHIS has been delayed in issuing its detailed Action Notice. At press time, APHIS has issued a detailed draft to the states. However, the complexity of the technical issues involved have led to delays in issuing that plan; and, in the interim, much*

inconsistency has ensued in state reactions to the February 14 letter.

Check with www.growertalks.com/ralstonia for updates as we get them.