

Pest Alert

Animal and Plant Health Inspection Service
Plant Protection and Quarantine

Ralstonia solanacearum race 3 biovar 2

Ralstonia solanacearum race 3 biovar 2 is a bacterial pathogen that infects certain vegetables and ornamental crops, causing brown rot of potato, bacterial wilt of tomato and eggplant, and southern wilt of geranium. The pathogen is not harmful to humans or animals. It is not known to occur in the United States.

In April 2020, the U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS) confirmed the detection of *R. solanacearum* race 3 biovar 2 in a U.S. greenhouse that had purchased geranium cuttings from an offshore production facility. This is the first confirmed detection of this pathogen in a U.S. greenhouse since 2004. APHIS has successfully eradicated all previous detections of this pathogen in U.S. greenhouses.

Symptoms

In geraniums, *R. solanacearum* race 3 biovar 2 causes a disease called southern wilt. Look for upwardly curling leaves, often beginning near the bottom of the plant. Affected leaves will become limp, wilted, and yellowed. In advanced stages of the disease, the lower stem may become discolored and browning of roots can occur. Symptoms of southern wilt may appear similar to those of bacterial blight, which is caused by *Xanthomonas campestris* pv. *pelargonii*; however, bacterial blight causes leaf spots that are not typical of *R. solanacearum*.

In potatoes, *R. solanacearum* race 3 biovar 2 causes potato



Symptoms of bacterial wilt of tomato caused by *Ralstonia solanacearum* race 3 biovar 2. Photo courtesy of C. Allen, University of Wisconsin.

brown rot (also known as bacterial wilt). Symptoms include wilting, stunting, yellowing, upward curling of the leaves, and eventually death. Symptoms may occur at any stage of potato growth. Wilting may be severe in young plants of highly susceptible varieties. In the early stages of the disease, only one leaf or branch of a plant may show wilting. But as the disease develops rapidly, all branches may wilt quickly. Young potato plants may develop dark narrow streaks on the stem.

Brown rot symptoms may be visible in potato tubers in the later stages of the disease. A cross section of an infected potato may show a gray-brown ring that extends into the center of the tuber. Infected potatoes may ooze a milky-white substance. Symptoms in potatoes can be confused with bacterial ring rot.

In eggplant and tomato, *R. solanacearum* race 3 biovar 2 causes bacterial wilt. Look for severe rapid wilting of leaves, particularly

in lower areas of the plant where moisture accumulates. Infected tomato plants may also have pale or yellow leaves. Glistening beads of dark gray, slimy ooze may appear at cross sections of the stem. When stems are cut and placed in water, fine, milky white strands will be visible to the naked eye. Infected plants may not show any symptoms for long periods of time.

Transmission

R. solanacearum race 3 biovar 2 is transmitted mainly through contaminated water, including shared water systems. It can also be spread through contaminated soil and equipment or inadvertently by people. For example, people can spread it by propagating infected plants, taking cuttings without disinfecting tools between plants, and pinching buds of infected plants without sanitizing hands. The pathogen is not readily spread from plant-to-plant contact or aerially.



Symptoms of brown rot of potato caused by *Ralstonia solanacearum* race 3 biovar 2. Photo courtesy of P. Champoiseau, University of Florida.



Symptoms of southern wilt of geranium caused by *Ralstonia solanacearum* race 3 biovar 2. Photo courtesy of the Wisconsin Department of Agriculture, Trade and Consumer Protection.

Management

There is no effective chemical control for *R. solanacearum* race 3 biovar 2. Prevention is critical.

Geranium growers should start by purchasing clean cuttings. They should label and separate geranium varieties and avoid using sub-irrigation systems in greenhouses. Greenhouse workers should wear gloves or wash hands between handlings of different varieties and use footbaths between houses.

Potato growers should start with certified seed potatoes to avoid *R. solanacearum* race 3 biovar 2.

Guidance for Homeowners and Gardeners

Homeowners and gardeners who recently purchased geraniums from a retail store, nursery, or greenhouse should monitor the plants for signs of disease and place any dead or wilting plants, along with their pots and soil, in a sturdy garbage bag. Do not discard diseased or dying geraniums or contaminated potting soil in a compost pile. Instead, place the bagged plants, pots, and soil in a trash can with refuse that will ultimately end up in a landfill.

FOR MORE INFORMATION

If you suspect *R. solanacearum* in geranium, potato, tomato, pepper, or eggplant, contact your nearest APHIS office or State department of agriculture immediately for further instructions. For a list of APHIS offices, go to www.aphis.usda.gov/planthealth/sphd. A directory of State Plant Regulatory Officials is available on the National Plant Board website at www.nationalplantboard.org/membership.