Vegetable Crop Update

A newsletter for commercial potato and vegetable growers prepared by the University of Wisconsin-Madison vegetable research and extension specialists

Division of Extension
University of Wisconsin-Madison

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Calendar of Events

July 16, 2020 – UW Hancock Ag Research Station Field Day
December 1-3, 2020 – Midwest Food Producers Association Annual Convention/Processing Crops Conference, Kalahari, Wisconsin Dells, WI
February 2-4, 2021 – UW-Madison Div. of Extension & WPVGA Grower Education Conference, Holiday Inn, Stevens Point, WI

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https://wivegdis.plantpath.wisc.edu/

Potato brown rot pathogen reported on imported geranium cuttings in the US. The April report of *Ralstonia solanacearum* race 3 biovar 2 in geranium cuttings imported from Guatemala in Michigan has caused concern in commercial production of ornamental as well as food crops. We're fortunate to have established protocols in place in the US to ensure rapid management response to limit further spread and economic hardship. This article summarizes information on the pathogen, disease, management response, and current updates on the case in the US.

Much appreciation for the work of Dr. Brian Hudelson, Diagnostic Director with the UW-Plant Disease Diagnostic Clinic which is excerpted, below. The original source fact sheet can be found here: https://pddc.wisc.edu//Ralstonia wilt

Additionally, I acknowledge the expertise and contributions of Dr. Caitilyn Allen, Professor of Plant Pathology at UW-Madison. Her research and understanding of Ralstonia was recently shared in a publicly-available webinar coordinated by the Horticultural Research Institute. Components of her work are shared within my article, here, and her presentation along with others from USDA APHIS can be found here: https://www.hriresearch.org/article/ralstonia-webinar-what-you-need-know

USDA APHIS notification of this case and link to other regulatory information can be found here: https://www.aphis.usda.gov/aphis/ourfocus/planthealth/plant-pest-and-disease-programs/pests-and-diseases/plant-disease/sa_ralstonia/ct_ralstonia

In potato, disease caused by this bacterial pathogen is called brown rot or bacterial wilt, one of the most destructive diseases of potato. The disease occurs in the wet tropics, subtropics, and some temperate regions of the world. In the US, brown rot is limited to the southeastern US, from Maryland to Florida. Strains of the pathogen affect more than 200 plant species in over 50 plant families throughout the world, including a wide range of crop plants, ornamentals, and weeds. Susceptible greenhouse-grown ornamentals include, but are not limited to, plants in the

genera *Capsicum*, *Cosmos*, *Cyclamen*, *Dahlia*, *Fuschsia*, *Gerbera*, *Hydrangea*, *Impatiens*, *Lantana*, *Nasturtium* and *Pelargonium*.

Strains of *Ralstonia solanacearum* are classified as races and biovars based on host range. Brown rot of potato is caused by either race 1 or race 3. In the US, race 1 is endemic and can cause bacterial wilt on agricultural crops such as eggplant, pepper, potato, tobacco, and tomato. There have been several introduction of race 3 in the US as a result of importation of infested geranium cuttings form off-shore production sites. To reduce risk of introductions and potential negative impact to potato in northern states, *R. solanacearum* race 3 biovar 2 is considered a serious threat and has quarantine importance and is listed as a select agent under the Agricultural Bioterrorism Act of 2002.

The pathogen is not believed to survive cold temperatures such as those typical of Wisconsin winters. The bacterium can be moved in symptomless plants or cuttings, or in contaminated soil and plant debris (where the pathogen can remain dormant for many years).

Ralstonia wilt was first reported on geraniums (*Pelargonium* spp.) in Wisconsin in 1999. In April 2020, the disease was reported on Fantasia © 'Pink Flare' geraniums in Michigan. Potentially infected 'Pink Flare' geraniums were also distributed to 38 other states including Wisconsin. All 'Pink Flare' geraniums were immediately placed on hold and isolated, then all plants were collected and destroyed. Any plants in proximity to the geraniums were also isolated and destroyed. At time of writing this article, no geraniums in WI tested positive for the pathogen.

Bacterial wilt symptoms caused by *Ralstonia solanacearum* on geranium (left) and in potato (right). Photo credits to WI DATCP, geranium; Thurston, Cornell University, potato.

Symptoms of Ralstonia or bacterial wilt in susceptible plants can look like other systemic infections. Initially, lower leaves of infected plants yellow and wilt, then die. Yellowing and death of upper leaves follow. Symptoms may initially occur on only one side of the plant. Internally, the water-conducting tissue of the plant browns, and then the entire stem rots from the inside out. Eventually, infected plants die. Pictures, above, show symptoms on geranium and potato.

There are no known treatments that will save plants affected by Ralstonia wilt. If you believe your plants are suffering from this disease, immediately contact your local department of agriculture or county Extension agriculture or horticulture agent to arrange for confirmatory testing. If you live in Wisconsin, you can contact the UW-Madison Plant Disease Diagnostics Clinic (see below for contact information) for assistance. If your plants test positive for *R. solanacearum* race 3, biovar 2 the United States Department of Agriculture Animal and Plant

Health Inspection Service (USDA APHIS) must be notified and this organization will provide guidance on proper disposal of contaminated plants, as well as decontamination of greenhouses or other sites where contaminated plants have been grown.

To avoid introducing this regulated pathogen, start by purchasing and growing pathogen-free plant cuttings. Keep plants from different suppliers physically separated by at least 4 ft. to minimize the risk of cross contamination should a shipment of plants prove to be contaminated. Because *R. solanacearum* is easily moved with soil or water, minimize splashing or any other movement of water or soil from plant to plant when watering. When taking cuttings or trimming plants, be sure to clean cutting tools between cuts using an approved disinfectant. For a complete list of such products, contact the UW-Madison Plant Disease Diagnostics Clinic (see below for contact information). Also wear disposable gloves (nitrile are best) when handling plants, and change gloves between working with different geranium varieties. This will minimize the possibility of moving *R. solanacearum* by touch. If gloves are not available, wash your hands frequently and thoroughly (especially between geranium varieties) with lots of soap and water or with an alcohol-based hand sanitizer. Remove and destroy weeds or weed debris as these can harbor the pathogen. Finally, do not grow plants in a greenhouse where the disease has occurred unless it has been properly decontaminated.

For more information on Ralstonia wilt or help in diagnosing this problem: Contact Brian Hudelson, Plant Disease Diagnostics Clinic, University of Wisconsin-Madison, 1630 Linden Drive, Madison, WI 53706-1598 [phone: (608) 262-2863, fax: (608) 263-3322, email: pddc@wisc.edu.

2020 University of Wisconsin Madison Extension Commercial Vegetable Crop Production Management Guide: Our production guide is updated every October with release of a new guide in January. The book can be downloaded for free as a pdf at the link below, or can be purchased online for $12.50. https://learningstore.extension.wisc.edu/products/commercial-vegetable-production-in-wisconsin