



Southern Bacterial Wilt and Brown Rot: *Ralstonia solanacearum*

Introduction

Ralstonia solanacearum, previously known as *Pseudomonas solanacearum*, is a bacterial pathogen composed of several different Races and Biovars distributed worldwide and causing diseases of agricultural and flowering plants. The organism has a very broad host range, infecting over 200 plant families, but with some races being more specific to certain hosts. Presently, there are five races based on the host range while biovars are based on biochemical tests.

Race 1 has a broad host range and is endemic to the southern United States, South America, Asia, and Australia. **Race 2** is found in Brazil, the Caribbean, and the Philippines with the primary host being bananas. **Race 4** is found in Asia infecting Ginger species. **Race 5** has been identified from China on Mulberry species.

Race 3 Biovar 2 is the important one in terms of being potentially devastating. It infects both agricultural and ornamental hosts, causing brown rot of potato, bacterial wilt of eggplant and tomato, and southern wilt of geranium. Ornamentals and common solanaceous weed species are also infected. Some weed species are infected latently thus providing an overwintering source in temperate regions. This pathogen causes economic losses in potatoes in Europe and is a possible threat to the potato industry in the United States and Canada. The pathogen has occasionally been found on imported greenhouse stock in the United States but has been eradicated where introduced. There has been no natural occurrence in the United States.

Symptoms

Southern Bacterial Wilt of Geraniums: Lower leaves of infected plants curl upwardly initially near the plant base with the upward curling progressing up through the plant affecting younger leaves. Symptoms resemble those of bacterial blight, *Xanthomonas campestris* pv. *pelargonii*, however bacterial blight typically produces some angular leaf spots. Stems may be discolored brown to black externally or internally at the soil level. Infected roots are also brown to black.



Figure 1: Stem rot of infected Geranium, (photo provided by Margery Daugherty, Cornell University)

Brown Rot of Potatoes, Tomatoes, etc.: Symptoms on infected plants include wilting, stunting and yellowing of foliage, followed by the eventual death of the plant. A distinct diagnostic sign on plants in decline is that is when infected stems or tubers are freshly cut, glistening beads of bacterial slime flows from the vascular tissue. Bacterial ooze may emerge from the eyes and stem-end attachment of infected

tubers, but external symptoms on tubers may or may not be visible, and symptoms may also be confused with ring rot, *Clavibacter michiganensis* subsp. *sepedonicus*.



Figure 2: Close up of symptoms on Geranium leaves, (photo provided by Margery Daugherty, Cornell University)

Disease Cycle

Disease transmission in greenhouses occurs from root system to root system through water movement especially in recirculating sub-irrigation systems. Avoid use of sub-irrigation systems! Outdoors, infected potato seed is responsible for initiating disease, but disease transmission occurs from plant to plant in the soil usually by water movement.

Management Strategies

Geraniums: The most effective method of preventing this disease in geraniums is to start with clean seed or rooted cuttings. When establishing plant material in the greenhouse, separate and label different varieties

or sources. Use sanitary measures such as wearing gloves and washing hands and equipment between handling different varieties. Keep greenhouse areas weed free of latent hosts. Disinfect benches and tools using a labeled greenhouse disinfectant. Use of footbaths between growing areas is also recommended.

Potatoes: Brown rot transmits readily in seed pieces; plants that appear resistant may be latently infected thus spreading the pathogen. Plant certified disease free seed potatoes. Avoid cutting seed potatoes into pieces. Disinfect cutting tools.

Cultivation techniques that improve soil drainage and minimize root damage reduce disease levels. Crop rotation may decrease disease severity however alternate weed hosts must be eliminated.

Elisa and PCR test are now available for detecting *R. solanacearum*. If this pathogen is suspected in geranium, tomato, potato, pepper or eggplant, contact your state's Department of Agriculture or Animal and Plant health Inspection Service (APHIS) office immediately. At this time there is no effective chemical control for *R. solanacearum*.

Created by M. Ramos 12/05; Updated SLJ 2/15

READ THE LABEL BEFORE APPLYING ANY PESTICIDE! Changes in pesticide regulations occur constantly. All pesticides distributed, sold, and/or applied in New York State must be registered with the New York State Department of Environmental Conservation (DEC). Questions concerning the legality and/or registration status for pesticide use in New York State should be directed to the appropriate Cornell Cooperative Extension Specialist or your regional DEC office.

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