The Plant Doctor's LANDSCAPE TIPS

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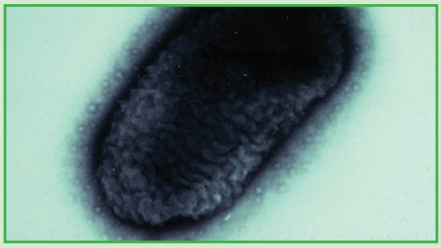

Photo 1. A transmission electron micrograph shows fine detail of this Xanthomonas bacterium, measuring only about one micron or four hundred thousandths of an inch.

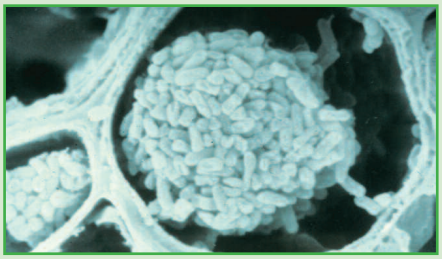

Photo 2. The xylem (scanning electron micrograph) of this plant is practically plugged with tiny bacteria (small tube shaped objects), essentially causing wilt and death of the plant.

Photo 3. Typical initial symptoms of Xanthomonas-infected geraniums include wilted leaves. Often, "V-shaped" lesions may be observed at the leaf margins (inset). In the author's experience, geraniums affected by drought do not show this type of wilt symptom.

Photo 4. Due to the rapid reproduction and insidious nature of the bacterium, many plants may succumb to bacterial wilt very quickly, as exhibited in this landscape planted with geraniums.

BACTERIAL WILT OF GERANIUM

INTRODUCTION:

Bacterial Wilt of Geranium is caused by the bacterium, Xanthomonas campestris pv. perlargonii. The bacterium is highly lethal to many varieties of geranium plants, Pelargonium sp. and Geranium sp. Because bacteria are so small (Photo 1), measuring about one micron (one micron = one millionth meter = about four one hundred thousandths of an inch = .00004 inches), and so rapid in their reproductive rate (potentially reproducing every 20 minutes to several hours under conducive conditions), the bacterium can spread quickly among geraniums and cause great devastation to geraniums in the greenhouse or landscape. This disease is a limiting factor in greenhouse production of geraniums, especially where the organism can spread during propagation by cuttings. Problems with bacterial wilt in the landscape can often be traced from greenhouse production problems or from prior bacterial wilt infections in the landscape.

SYMPTOMS AND DISEASE CYCLE:

The bacterium infects plants through wounds or through natural plant openings, such as lenticels, stomata and hydathodes. Generally, the bacterium is spread to these natural plant openings by physical transfer, such as in splashing water, by human contact or by insects, such as fungus gnats. After infection, the bacterium multiplies quickly in the vascular system of geraniums (Photo 2). The rapid reproductive rate causes a plugging of the vascular tissues of the plants, preventing uptake and translocation of water and nutrients. Symptoms include leaf wilt (Photo 3) and "V-shaped" lesions with dark veins on leaves. With continued disease progression, the entire plant wilts and dies. Blackened rotting stems may be confused with other diseases, such as Pythium (fungus) blight and root rot. Water splashing, either from irrigation or rain, as well as human handling or transfer of bacterial cells by insects will cause further spread as bacteria emerge from natural openings of infected plants or from decomposing infected plant tissues. Many plants may be killed in a short time (Photo 4).

The bacterium is insidious and may be transferred on plants that show no symptoms. The bacterium can survive for years in the greenhouse on production benches or in soil or other surfaces beneath benches. Likewise, the bacterium can survive for years in landscape soils and refuse.

BACTERIAL WILT MANAGEMENT:

One of the most important means of managing this devastating disease is prevention. Purchase plants through a reputable supplier. Because primary stock geranium production occurs from only several large propagation sources, the disease can be a serious threat for many landscapers. Propagation sources may be able to supply documentation demonstrating frequent testing for bacterial-wilt-free greenhouse environments. It is advisable to learn to recognize symptoms and to avoid purchasing plants that appear suspicious or to even avoid sources of suspicious plants.

In greenhouse situations, strict sanitation and sanitizing measures are recommended. Use sanitizing agents to sterilize utensils and surfaces where the bacterium may survive. In landscape situations, it is usually advisable to avoid replanting geraniums in the same location where plants were previously killed by the disease. As with the greenhouse, use sanitation and sanitizing agents where feasible, particularly on shovels and other utensils. Potentially, the bacterium can be minimized in landscape situations by expensive soil replacement or soil sterilization efforts; neither is recommended except for special situations. Avoid frequent overhead irrigation, which can encourage spread of bacteria and infection of plants. There are no practical chemicals for control of this devastating disease in the landscape.

For more information, please feel free to email me at robertsd@msu.edu or contact a professional plant health-care provider. The author, MSU or MGIA do not endorse any particular products. If using pesticides, be sure to read and follow label directions.