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BACTERIAL WILT OF CUCURBITS

Bacterial wilt is a destructive vascular disease of cucurbit vegetables, such as cucumber, melon, squash, and pumpkin. The disease can cause wilting of leaves and rapid death of plants, which results in significant or complete yield losses even before the first harvest.

SYMPTOMS AND DIAGNOSTICS

Symptoms of bacterial wilt may vary among cucurbit species/or cultivars. On cucumber and squash, the initial symptom appears as wilting of one or a few leaves on individual runners, which may recover during the night. As the disease progresses, the symptom becomes irreversible, and symptomatic leaves turn into dry and crispy. Upon the bacteria move into the main stem through the vascular system, the entire plant may wilt and die. Young, succulent plant tissues are more susceptible to the infection and develop symptoms more rapidly. On pumpkin plants, the initial symptom appears as chlorosis of leaves between veins and drooping of leaves. As the disease progresses, the affected leaf tissues become necrosis from the margin of leaves before the entire plant collapses (Figure 1). These symptoms normally go unnoticed until mid- or late-summer. Upon the bacteria enter vascular tissues, they destroy plant cells and block xylem vessels, which causes wilting of leaves and death of a runner or entire plant. Damaged stems tissues become water-soaked and discolored (Figure 2). When a diseased stem is cut through using a sharp knife and the cut ends are separated apart slowly, a thin bridge of a sticky substance between the ends can confirm the

Figure 1. Chlorosis and necrosis of leaves, and collapse of a pumpkin plant.

Figure 2. Water-soaking and discoloration of vascular tissues of a pumpkin stem.

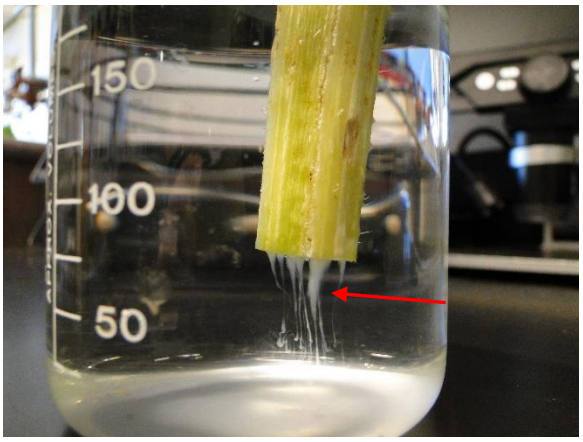

Figure 3. Bacterial slime (arrow) from infected pumpkin stem in water.

disease in fields. When an end of the cut is immersed into clear water in a glass container, a flow of milky substance may ooze from the cut after a few seconds (Figure 3).

DISEASE DEVELOPMENT

The pathogen of bacterial wilt of cucurbits, *Erwinia tracheiphila*, overwinters inside the digestive system of adult cucumber beetles. In the spring, the overwintered beetles deposit infested frass onto leaves or flower nectaries of cucurbit seedlings or younger plants. The bacteria from the insect frass infect plants through open wounds, such as insect feeding and mechanical injuries. Although a small proportion of overwintering beetles harbor bacteria, the number of contaminated beetles rapidly increased when they feed on infected plants in fields, which causes a wide spread of the disease during the season. Epidemics of bacterial wilt are closely associated with the size of the cucumber beetle population.

MANAGEMENT

Resistant varieties: Within the family Cucurbitaceae, cucumber and muskmelon are highly susceptible whereas squash and pumpkin are moderately susceptible, and watermelon is apparently highly resistant. Few cucumber varieties are considered resistant to cucumber beetles.

Cultural practice: Protect seedlings and transplants from cucumber beetle feeding by using floating cover sheets in fields until plants start to flower. Monitor leaves and destroy any cucumber beetle eggs by removing or squashing them. When symptoms of wilting are first noticed on individual leaves, remove diseased leaves immediately to prevent the bacteria move to the other parts of the plant. If most leaves wilt, the entire plant should be removed. Do not compost infected plant materials. Rotate away from cucurbit hosts to reduce the cucumber beetle population in the field.

Chemical control: There is no cure for the disease upon plants are infected. Apply insecticides to control cucumber beetles as soon as seedlings emerge or immediately after transplanting. Insecticides that are registered to control cucumber beetles include permethrin, pyrethrin, malathion, neem oil, carbaryl, kaolin clay, and insecticidal soap.

READ THE LABEL BEFORE APPLYING ANY PESTICIDE! We keep all archives of our fact sheets posted. While most practices for disease management do not change over time, please be aware that changes in pesticide regulations occur constantly. When applying pesticides, always consult the label to make sure the pesticide is approved for use on your plants.