

## Stewart's Wilt of Corn

### *Pantoea stewartii* subsp. *stewartii*

**Hosts:** Corn (maize) (*Zea mays*) and fodder grasses, eastern gamagrass (*Tripsacum dactyloides*) and teosinte (*Zea mexicana*).

**Disease common names:** Stewart's wilt, Stewart's wilt of corn, and bacterial wilt.

**Pathogen:** *Pantoea stewartii* subsp. *stewartii*; syn.: *Erwinia stewartii*.

### Disease Cycle

**Inoculum:** The pathogen overwinters in the gut of the dormant corn flea beetle, which also is the most important vector of the bacterium. The bacterium is reported to survive at low levels in corn seed.

**Transmission:** Adult corn flea beetles deposit bacteria into wounds while feeding (Fig. 1). Disease incidence increases when mild temperatures enhance survival of flea beetles throughout the previous winter. Transmission in corn seed is considered to be insignificant.

**Infection:** The bacterium enters plants through feeding wounds made by corn flea beetles. It then invades the xylem and moves to other parts of the plant, causing water stress and wilt.

**Symptoms and signs:** There are two stages of the disease, the wilt stage and the leaf blight stage. Initial phases of both are similar; leaf tissues surrounding feeding wounds become water-soaked and then show pale green to yellow linear streaks with irregular or wavy margins that parallel leaf veins (Fig. 2). The tissues later become necrotic. Plants that survive the wilt stage may produce bleached, dead tassels. The wilt stage occurs when seedlings or young plants are infected systemically. The plants become stunted, leaves may wither, and the plant dies (Fig. 3). Cavities also may form in stalks near the soil line and even kernels may become infected as bacteria spread throughout the vascular system. The leaf blight stage is commonly observed after tasseling. The leaf symptoms, similar to those described above, may be limited to a few centimeters depending upon the degree of susceptibility or they may extend the entire length of leaves (Fig. 4).

**Survival:** Cold winters adversely affect beetle populations, and consequently, the incidence of Stewart's wilt is likely to be low or absent. The bacteria may also survive in corn seed.

### Disease Management

Use of resistant corn hybrids is recommended. Seed treatment with systemic insecticides has given good control of early-season flea beetles, thus limiting development of the disease. Postemergence spraying of plants with insecticides may be used for vector control, but the expense and environmental concerns of pesticides have limited this approach.

### References

- Bradbury, J. F. 1986. Guide to Plant Pathogenic Bacteria. CAB International, Slough, U.K.
- Janse, J. D. 2005. Phytobacteriology, Principles and Practice. CABI Publishing, Wallingford, U.K.
- White, D. G., ed. 1999. Compendium of Corn Diseases, 3rd ed. American Phytopathological Society, St. Paul, MN.



Figure 1. Flea beetle and scars from previous feedings. (Courtesy APS)



Figure 2. Pale green to yellow streaks and brown necrotic areas on leaves of young wilted plant. (Courtesy APS)



Figure 3. Infected seedling exhibiting signs of systemic infection. (Courtesy APS)



Figure 4. Leaves with typical lesions that have gone from gray-green to yellow-green to brown. (Courtesy APS)