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Agricultural Extension Service
The University of Tennessee

SP277-C

Plant Diseases

Bacterial Wilt of Cucurbits

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Bacterial wilt, caused by the bacterium *Erwinia tracheiphila*, affects members of the cucurbit family. Cucumber and cantaloupe are most susceptible, followed by squash, pumpkin and gourd. Watermelon is resistant.

Symptoms

The first symptoms usually appear on individual leaves as a wilting of the leaves, with dull green patches. Lateral branches wilt (Fig. 1), followed by wilting and death of the entire plant. The fruit may also show symptoms. At first, small water-soaked spots appear on the surface. These spots will later become shiny decayed spots on the fruit.

A quick test for bacterial wilt follows: cut the stem of a recently wilted plant near the crown. Squeeze the stem gently until sap emerges. Look for a milky color. Lay a knife blade across the cut stem and slowly draw it one-fourth inch away. Fine threads, like cobwebs, will string out between the knife and the stem. This test works well for cucumbers, but works only with difficulty for cantaloupes. A plant without bacterial wilt will have watery sap which does not form threads.

Figure 1. Vine wilting, a symptom of bacterial wilt.

Life Cycle

The bacterium overwinters either in the digestive system of striped and spotted cucumber beetles (Fig. 2) or in weeds. Beetles that feed on infected weeds bring the bacteria into the planting. The bacteria are not seed-borne or soil-borne, and survive in plant debris only about one month. Bacterial wilt can be expected to be more severe following a mild winter, since survival of the beetles is better under such conditions.

Cucumber beetle adults emerge in the spring and begin feeding on young cucurbit leaves. As they feed on cucurbits, they cause deep wounds in the plant and deposit bacteria on the leaves in their fecal droppings. When a film of water from rain, dew or irrigation is present on the leaf, the bacteria are able to reach the feeding wound and enter the leaf. Later the disease may be spread on beetle mouthparts after they feed on infected plants.

Once in the plant, the bacteria enter the xylem (water-conducting tissue). A viscous material is produced which plugs the xylem, preventing movement of water throughout the plant. Permanent wilting occurs in six to seven days after infection, resulting in death of the vine within two weeks.

Control

Early control is needed to prevent the most damaging aspects of bacterial wilt: infection of young, actively-growing plants that are very susceptible to the disease. These early infections also increase the bacterial inoculum for further spread.

Cucumber beetle control is necessary for control of this disease, unless resistant varieties are used. **Insecticides** such as carbaryl (Sevin) and methoxychlor are used to prevent primary infections and to slow secondary spread after the primary infections appear. Commercial growers should refer to Extension PB 1282 for additional insecticides. Insecticides should be applied only in the evening, when the bees are not active.

Primary infections can be delayed with the use of **screening materials** such as cheesecloth or spun-bonded materials, which keep the beetles away from the plants. The screening materials must be removed when bloom begins, to allow the pollinating insects to enter and to allow the vines room to grow.

Trap cropping can be used to reduce the beetle population before the main crop is planted. A trap crop is an early planting of cucurbits that attracts the overwintering beetles.

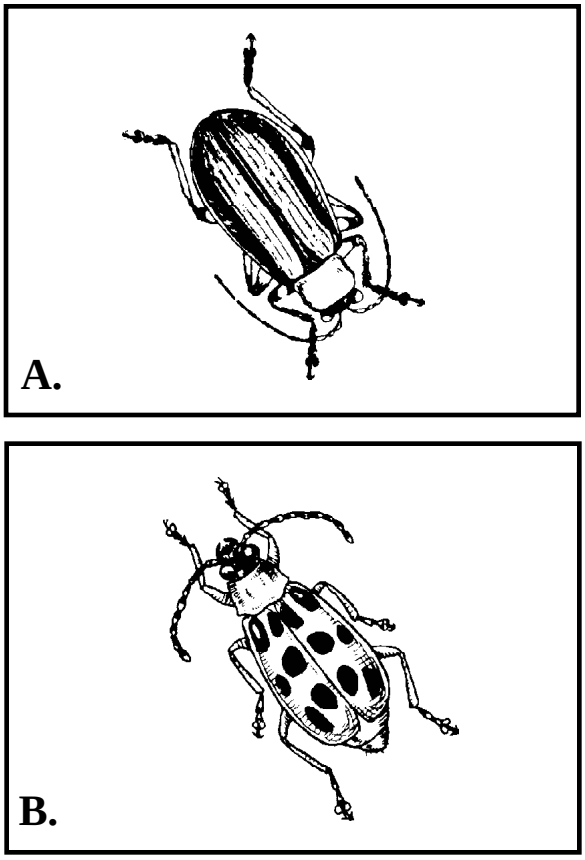

Figure 2. The striped (A) and spotted (B) cucumber beetles which transmit bacterial wilt of cucurbits. The actual length of these insects is 1/5 to 1/4 inch.

An insecticide application to the trap crop will reduce the number of beetles that could feed on the main crop planted later. It is important to destroy the trap crop plants after killing the beetles.

Resistant varieties are a very effective means of controlling wilt. However, few truly resistant varieties have been developed. Some resistant cucumber varieties, such as County Fair 83 and Saladin, are available.

Precautionary Statement
To protect people and the environment, pesticides should be used safely. This is everyone's responsibility, especially the user. Read and follow label directions carefully before you buy, mix, apply, store, or dispose of a pesticide. According to laws regulating pesticides, they must be used only as directed by the label.
Persons who do not obey the law will be subject to penalties.

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