

Bacterial Spot of Pepper & Tomato

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IMPORTANCE

Bacterial spot can result in severe damage to tomato, sweet pepper, and pimento crops. The bacterium attacks leaves, fruits, and stems causing blemishes on these plant parts. Outbreaks of leaf spotting have resulted in leaf drop and poor fruit set in the field. Defoliation due to leaf spotting can increase the incidence of sun scald on fruit. Fruit infections result in badly spotted fruit, which are of little market value. In addition, fruit injury from this disease allows entry of secondary fruit rotting organisms, causing further damage.

SYMPTOMS

Leaves

Spots begin as small, dark, water-soaked areas that become dark brown and slightly raised on leaf undersides. Spots often enlarge, and may be either dark-colored or have tan-colored centers with dark margins (FIGURE 1). Size and shape of leaf spots may vary under different conditions. Spotted leaves on pepper plants turn yellow and drop, defoliating plants, while diseased tomato leaves, tend to remain on plants as they turn brown (FIGURE 2).

Fruit

Fruit blemishes begin as small, water-soaked spots that enlarge, becoming blister-like, rough,



FIGURE 1. BACTERIAL SPOT LESIONS ON PEPPER FOLIAGE MAY BE EITHER DARK-COLORED OR HAVE TAN-COLORED CENTERS WITH DARK MARGINS.

and warty (FIGURE 3). Fruit spots are brown and seldom exceed $\frac{1}{4}$ inch in diameter. Often the disease extends into the seed cavity. Secondary decay organisms may invade bacterial spot lesions (FIGURE 4), resulting in fruit decay.

CAUSE & DISEASE DEVELOPMENT

Bacterial spot is caused by one or more of the following species of *Xanthomonas*: *X. euvesicatoria* (synonyms: *X. axonopodis* pv. *campestris* and *X. axonopodis* pv. *vesicatoria*), *X. vesicatoria*, *X. perforans*, and *X. gardneri*.



FIGURE 2



FIGURE 3

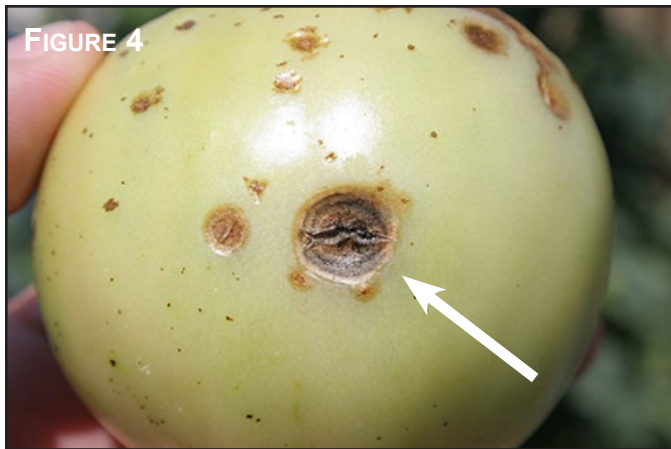


FIGURE 4

FIGURE 2. BACTERIAL SPOT-INFECTED TOMATO FOLIAGE EVENTUALLY TURNS BROWN, BUT REMAINS ON PLANTS. **FIGURE 3.** BLISTER-LIKE, WARTY SPOTS APPEAR ON INFECTED PEPPER FRUIT. **FIGURE 4.** BACTERIAL SPOT LESIONS CAN SERVE AS ENTRY POINTS FOR SECONDARY DECAY ORGANISMS (LARGER LESION INDICATED BY THE ARROW).

Infections often originate from contaminated seed or transplants. The pathogen overwinters in plant debris remaining in the field or garden from the previous crop, as well as in nearby weeds. Bacterial spot is favored by warm, wet weather. Disease spread is aided by driving rain, as well as wind-blown debris and soil that cause mechanical injury to leaves and fruit. During these conditions, the pathogen can colonize leaf surfaces, and then enter through wounds or leaf stomates to infect susceptible tissues.

DISEASE MANAGEMENT

Disease management must focus on preventing the introduction of the bacterium into the planting and on slowing its spread, rather than eradicating the disease after it occurs. Refer to the following UK Extension publications for more details on disease management strategies: ID-36 (commercial growers) and ID-128 (home gardeners)

- Use resistant varieties whenever possible. Commercial growers may refer to ID-36 for a list of suggested cultivars for Kentucky.
- Practice crop rotation. Do not grow peppers or related crops (tobacco, tomatoes, eggplants, potatoes) for 2 to 3 years after a pepper crop. Also, exclude small grains from the rotation in the year before peppers are to be planted. Fescue sod is an excellent rotational crop.
- Control broadleaf weeds in the tomato/pepper crop and around field borders; also control broadleaf weeds during the rotation.
- Plow under crop residues promptly after harvest to encourage more rapid decline of infected leaves.
- Plow under cover crops early in the spring to minimize carryover.
- Do not work in the field or garden when plants are wet.
- Use commercially produced certified

disease-free seed. If seed has not already been treated, treat seed prior to planting (see Appendix J of ID-36).

- When growing transplants from seed, treat weekly with a fixed-copper product beginning roughly 2 weeks after emergence.
- If transplants are purchased, make sure they are certified disease-free.
- Spray plants with an approved bactericide/fungicide before symptoms are evident, beginning immediately after transplanting. Continue at 7-day intervals during wet weather to reduce the spread and buildup of the bacterium.

ADDITIONAL RESOURCES

The following University of Kentucky publications are available at county Extension offices, as well as on the Internet.

- Home Vegetable Gardening in Kentucky, ID-128

<http://www.ca.uky.edu/agc/pubs/id/id128/id128.pdf>

- Vegetable Production Guide for Commercial Growers, ID-36

<http://www.ca.uky.edu/agc/pubs/id/id36/id36.htm>

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Photos: Kenneth Seebold (Figures 1, 2 & 4) and Julie Beale (Figure 3), University of Kentucky

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