AVRDC - The World Vegetable Center

Fact Sheet

Tomato Diseases

Bacterial Spot

Xanthomonas campestris pv. *vesicatoria*

Found worldwide, most severe in the tropics and subtropics

Symptoms

Foliar lesions are dark, circular, water-soaked, and usually smaller than 3 mm in diameter. They are greasy in appearance on the top surface. The lesions become brown-black and angular in shape. The center of the spots may dry and fall out. When numerous lesions occur (often during wet conditions), lesions may coalesce and give plants a blighted appearance. Affected leaves may turn yellow and drop off or become dry and remain on the plant. Lesions are generally more numerous on young tissue that is more susceptible compared to old tissue.

Affected seedlings become more spotted with leaf yellowing and in severe stages with defoliation. Infected stems and petioles are similar to those found on leaves, but are elliptical in shape.

Symptoms also appear on immature fruit. Lesions begin as small, raised, black specks surrounded by a water-soaked border, enlarging to become brown, slightly sunken, scabby spots, sometimes surrounded

How to Identify Bacterial Spot

Initital symptoms are tiny, circular, dark lesions on leaves (left photo). Lesions may coalesce, causing blighted areas on leaves (center photo). Immature fruit show brown, slightly sunken, scabby spots. Lesions on stems are elliptical in shape (right photo).

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by a halo. The spots are not deep and do not usually lead to rot. Ripe fruit are rarely infected.

Conditions for Disease Development

Infected crop debris is often the source of the disease in a new crop. The pathogen cannot survive long in the soil without crop debris to live on. Weeds such as black nightshade and volunteer tomato plants can also harbor the pathogen and transmit it to healthy plants.

The bacterium is seed-borne on pepper and tomato seed. The bacterium is also disseminated by windblown rain, overhead irrigation, drainage of infested water, and by mechanical means such as the handling of infected transplants, on equipment, and by workers on hands or clothing.

The bacterium invades the plant through stomata and wounds created by windblown soil, insect punctures, or mechanical means. The bacterium may enter fruit through growth cracks or wounds caused by abrasions or insect feeding.

Temperatures between 24 and 30 °C and leaf wetness periods of 24 hrs or longer (arising from dew, fog, rain or overhead irrigation) are favorable for disease development. Night temperatures between 25 and 28 °C favor disease development.

Control

Once infected transplants are introduced into the field, effective control of bacterial spot is difficult to achieve; therefore, use pathogen-free seed or transplants. Grow seedlings in a pathogen-free seedbed. Avoid clipping the seedlings to minimize secondary spread of bacteria. Avoid overhead watering in transplant production.

In the seedbeds and production fields, rain shelters will reduce rain splash and disease severity during periods of high rainfall. Do not grow plants near cull piles.

Practice a 2–3 year rotation with nonhost crops (avoid pepper, in particular). Remove tomato vines, burn them, or chop and bury them immediately after harvest, and incorporate into the soil to assist in rapid decomposition of diseased tomato debris. Control weeds and volunteer tomato plants in affected fields.

Work in affected areas last, after working in the healthy portions of a field. Avoid working in affected areas when the foliage is wet. Decontaminate tools after working in the infested areas.

Use furrow irrigation if possible. Avoid use of overhead irrigation, but if necessary, it should begin early in the day so that the foliage can dry before the evening.

Some tomato varieties show fewer symptoms of bacterial spot, although there is no complete resistance due to the presence of many races of the disease.

Fixed-copper or fixed-copper + maneb sprays applied on dry seedlings before transplanting to production fields may be effective. The material will kill only those bacteria on the surface of the leaf and not within the leaf tissue. Therefore, the sprays should be started a few days after emergence, continued at 5-day intervals, applied with equipment that ensures good coverage, and applied on dry plants. Avoid overhead irrigation or rain for 24 hr after application. Frequent application of fixed-copper may result in the development of resistance in the bacteria to the material.

For more information on the production of tomato and other vegetables, go to <www.avrdc.org>.

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