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Bacterial Spot of Tomatoes and Peppers

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BACTERIAL SPOT OF TOMATOES AND PEPPERS

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Bacterial spot is periodically a destructive disease of tomatoes and sweet peppers in Indiana. Damage is most noticeable on the fruit, but considerable injury can also occur on the foliage of seedlings and plants in the field. The bacterial pathogen is seed, soil, and transplant borne. Spread within the field is primarily by splashing rains. Thus, bacterial spot generally causes most serious losses during growing seasons that receive above average rainfall.

Symptoms of bacterial Spot

Bacterial spot, caused by the bacterium Xanthomonas vesicatoria may first appear as small dark brown or black greasy spots on leaves and stems of seedlings. Spots may enlarge up to about 1/8 inch in diameter. With age, the spot centers may dry and tear. Abundant lesion development may seriously weaken young tomato and pepper seedlings and cause distorted growth. On older plants, early symptoms are found

Bacterial Spot on Pepper Leaf

Bacterial Spot on Tomato Fruit
mostly on the lower leaves. Large numbers of lesions on a single leaf may cause that leaf to turn yellow. Slight to moderate defoliation may occur. Infections on flower pedicels cause blossoms to drop, sometimes seriously reducing early flower set.

Fruit infection is the most economically serious phase of bacterial spot since infected fruit are unmarketable on the fresh market. Infection occurs when the bacterial pathogen enters wounds on the immature fruit surface caused by wind blown soil particles or insects. Fruit symptoms begin as small water soaked lesions that enlarge until they reach a diameter of 1/8 to 1/4 inch with slightly raised centers. As spots mature, borders become irregular and the brown centers become slightly sunken giving the fruit surface a rough, scabby appearance. Ripe fruits are reportedly not penetrated by the bacterial pathogen.

Sources of Bacterial Spot

Bacterial Spot Is Seed Borne

The surface of pepper and tomato seed may become contaminated with the spot pathogen during the seed extraction process. Bacteria can survive on the seed surface if you do not treat the seed properly. You can eliminate such contamination if you use one of the seed treatments listed below. Seed transmission of the bacterial spot organism can become a problem if you attempt to save your own seed or purchase uncertified seed. It is imperative that bacterial spot does not enter the seed bed or field via contaminated seed.

Bacterial Spot Is Soil Borne

Unfortunately, seed treatment or pathogen free seed does not always insure control of bacterial spot. Tomatoes or peppers planted in fields contaminated with the bacterial spot pathogen are likely to become infected if favorable weather conditions for spot development exist. The bacterial spot pathogen can persist on infected plant debris for at least 1 year. Care should be taken to insure a 3-year rotation between susceptible tomato or pepper crops.

Bacterial Spot Is Carried on Infected Transplants

Bacterial spot may be present on tomato and pepper transplants received from open-field seedlings grown in southern states. This is particularly true in those seasons when plants are exposed to considerable rain in southern areas before pulling and shipping.

Once bacterial spot appears in the field, it is very difficult to control. It is therefore important for growers who purchase southern grown transplants to purchase transplants from fields certified free from this disease. If you grow your own transplants, plant beds should not be located in areas where bacterial spot has occurred in previous years. Protect plant beds from wind blown rains or overhead irrigation that will spread bacteria, if present, from plant to plant.

Control of Bacterial Spot

Seed Treatment

Seed treatment of tomato and pepper seed is a valuable control measure if you save your own seed from year to year. Treatment may provide adequate control if the seed is planted in clean plant beds and the resulting transplants are set in soil not infested with the bacterial spot pathogen.

Treat tomato or pepper seed by either of the following methods:

Copper sulfate soak: Soak either freshly extracted or once-dried seed for 1 hour in 2 ounces of copper sulfate for each gallon of water. Use the soluble, blue vitriol or snow form of copper sulfate and not one of the insoluble or fixed copper forms used for foliar application. Dry seed thoroughly after treatment.

OR
Hot water seed treatment: Pre-warm seed in a loosely-woven cotton bag (not over one-half full) for 10 minutes in 100 degrees F water bath. Place pre-warmed seed in a water bath that will constantly hold the water at 122 degrees F for 25 minutes for tomatoes and 125 degrees F for 30 minutes for pepper. Length of treatment and temperature of water must be exact. After treatment, dip bags in cold water to stop heating action. Spread seed out to dry. When thoroughly dry, apply a protective seed treatment fungicide such as captan (75% WP) or thiram (75% WP) to hot-water treated seed. Since old seed may be severely damaged by hot water treatment, treat a small seed sample and test for germination prior to treatment of large seed lots.

Control of Bacterial Spot

1) Crop rotation. Use a 3-year rotation between tomato or pepper crops.
2) Maintain clean seed beds. Shield plants from splashing or windblown rain. Spray plants in the bed if necessary with one of the copper fungicides listed below (5). In addition you may use streptomycin sulfate (200 ppm) as a foliar treatment in the seed bed.

3) Growers purchasing seed or transplants should plant only certified disease-free seed and/or transplants. If you maintain your own seed stocks, use only seed treated as described above.

4) Examine all transplants carefully for characteristic greasy spots on leaves and stems before transplanting. Samples from shipments with suspected symptoms should be referred immediately to your state Extension plant pathologist for diagnosis.

5) Copper containing fungicides have long been the only materials giving practical control of bacterial spot in the field. They are not, however, fully satisfactory when abundant rains occur. Although their application may help to reduce secondary spread, they are effective only when there is limited rainfall and dew formation. Copper containing fungicides include COCS, Copper-Count-N, Kocide, Tri Basic Copper Sulfate, etc. Labels on chemical containers give the necessary directions for preparation and use. Spray weekly as needed in the field particularly during flowering.

Follow manufacturers’ label directions for safe use and handling of agricultural pesticides.

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