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ANTHRACNOSE OF TOMATO

Anthracnose is a common fungal disease on ripe tomato fruit in the field and during the period of postharvest ripening and storage. The pathogen mainly affects fruit, but can also infect leaves, stems, and roots. The disease can cause significant losses in yield and marketability, especially during humid and wet environmental conditions. Additionally, infected fruit have a short storage life and are vulnerable to a wide variety of secondary organisms that can accelerate fruit rot.

SYMPTOMS AND DIAGNOSTICS

Small and green fruit can be infected, but symptoms do not show on the fruit until ripening due to the characteristic latent

infection of this disease. The symptoms start as small, slightly sunken, water-soaked, circular spots. These lesions can expand to a half-inch in diameter and form concentric rings. Dark fungal fruiting structures (acervuli) develop in the center of the lesions (Figure 1). Masses of salmon-colored spores can be released from the fruiting bodies in wet conditions (Figure 2). The lesions on the fruit often merge together and result in large rotted areas. In addition, secondary organisms often grow on these lesions and result in complete fruit rot.

Occasionally, leaves can be affected and show symptoms of small, circular spots with yellow halos. Stems and roots may also be infected.



Figure 1. A sunken, circular lesion with dark brown fruiting bodies at the center of the lesion on ripe tomato fruit.



Figure 2. Salmon-colored spores on the enlarged sunken lesion.

Lesions on infected roots are brown and dotted with black microsclerotia, a resting structure of the fungus.

DISEASE DEVELOPMENT

Anthracnose of tomato is caused by the fungus *Colletotrichum coccodes*, which has a wide host range that includes 68 species of crops and weeds. The fungus can survive as small, black microsclerotia in the soil and as acervuli in plant debris between seasons. The pathogen may also be seedborne and can cause infections of seedlings in seedbeds. The lower leaves and fruit may become infected first by germinating microsclerotia and then by splashing spores from soil and debris. The fungal spores from the infected plant tissues serve as important inoculum sources for secondary infections throughout the growing season. The fungal spores are usually dispersed by splashing water from rain and overhead irrigation. Anthracnose can infect both ripe and green fruit, but on infected green fruit, symptoms may not show up until the fruit begin to mature. On ripe fruit, lesions become visible within 5 to 6 days after infection.

The disease is favored by warm temperatures (75-80°F), although the fungus can cause infections over a wide range of temperatures (55-95°F). Extended periods of leaf and fruit wetness due to frequent rain and overhead irrigation are favorable for disease development. The longer the fruit surfaces are wet, the greater the anthracnose severity.

MANAGEMENT

Pathogen-free seed: Because the pathogen can persist on seed from infected fruit, purchase certified seed from a reputable source. If you are using seed that you saved, treat seed in hot water (122°F) for 25 minutes. Following treatment, plunge the hot seeds into cold water, and dry them on paper. (Note: carefully monitor water temperatures to avoid killing the seeds.)

Rotation and weed control: Rotate with non-host crops and avoid potato, pepper, eggplant, and cucurbit for at least two years to prevent a buildup of inoculum in the soil. Keep fields free from weeds to reduce inoculum from wild host plants.

Cultural practices: Since anthracnose is more prevalent on plants grown in poorly-drained soil and wet conditions, planting tomatoes on well-drained soil and staking plants can prevent anthracnose by reducing the humidity of the microenvironment. The pathogen overwinters on infected plant debris, so it is very important to reduce the inoculum by disposing of rotten fruit and infected plants. Avoiding overhead irrigation or watering early in the day allows plants to dry. Mulching the soil may reduce soil splash onto the fruit and lower leaves. Harvest fruit promptly to prevent over-ripening in the field.

Fungicide application: If conditions are favorable for infection or if there is a history of anthracnose, fungicide treatment can be important, especially as the fruit begin to ripen. However, a preventative fungicide program needs to start once the first fruit set because latent infections can occur even on green fruit. Repeat fungicide applications at short label intervals during continuous moist weather; the schedule can be extended to longer intervals in dry weather. Among fungicides registered for tomato in Connecticut include chlorothalonil, mancozeb, azoxystrobin, and copper products. Check the label for application rates and the number of days between the last application and harvest.

April 2013