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LEAF MOLD OF TOMATO

Leaf mold, caused by the fungus *Fulvia fulva*, is one of most severe diseases of tomatoes grown in greenhouses and high tunnels. It can also occasionally be problematic in the field. During wet and highly humid conditions, the disease develops rapidly, moving from lower to upper leaves, and killing large portions of the foliage. Leaf mold can result in significant yield losses.

SYMPTOMS AND DIAGNOSTICS

Leaf mold mainly affects the leaves. The symptoms begin with yellowish patches on the upper surface of leaves, and expand to irregular, vein-restricted yellow to light brown areas without well-defined margins (Figure 1). On the lower surface of affected leaves, olive-green or brown masses of fungal spores are associated with the discolored areas, which is one of the most important diagnostic characteristics (Figure 2). Fungal growth is denser and deeper in color toward the center of the discolored area. The disease develops from older to younger leaves. As the disease progresses, the leaves become chlorotic, and then necrotic, followed by lesion coalescence and defoliation. These leaves may curl, wither, and drop from the plants. Occasionally, petioles, peduncles, stems, blossoms, and fruit are attacked by the pathogen. Infected blossoms may wither without setting fruit. When green fruit are infected, black, leathery rot symptoms may be observed on the areas near peduncles. The

Figure 1. Yellow patches and spots (arrows) on the upper leaf surface.

Figure 2. Brown spore masses (arrows) on the lower leaf surface.

rotted areas may be irregular and can occasionally expand to encompass one third of the fruit.

DISEASE DEVELOPMENT

The fungus survives as a saprophyte in tomato debris and as sclerotia (resting structures) in soil during winter. Contaminated seed may also serve as a primary source of the pathogen. Leaf mold occurs at temperatures between 50º and 95º F, but the optimal temperature for disease development is between 71º and 75º F. Spore germination requires free water or high relative humidity (over 85%). Thus, disease progress may slow down at relative humidity levels below 85%.

Large numbers of fungal spores are produced in the brown masses on the lower surface of diseased leaves and these spores are readily disseminated by wind, air currents, rain-splash, and insects.

MANAGEMENT

Crop residue should be removed and destroyed once the tomato crop is harvested to reduce pathogen inoculum. In greenhouses or high tunnels, production areas should be cleaned and steamed at 135º F for at least 6 hours to reduce inoculum. Reused potting mix for "in-bag" production needs to be sterilized to avoid carry-over of the pathogen.

Avoid overhead irrigation. Irrigate plants in the morning to reduce relative humidity in the evening. Circulate air with fans to provide good ventilation. Maintain night temperatures higher than outside temperatures. Provide adequate spacing of plants, support plants (e.g., stakes, trellis, or cages), and prune suckers and branches to increase air circulation and reduce humidity in the canopy.

Among greenhouse tomato varieties, Geronimo and Blitz are resistant; Big Beef and Boa are susceptible to leaf mold in Northeast U.S. Because new virulent races can develop in only a few years, a tomato variety that is resistant one year may be very susceptible the next.

Fungicide applications are also necessary for effective management of this disease. Among the fungicides registered for controlling leaf mold in Connecticut are chlorothalonil and mancozeb. The option for organic production is using copper products such as copper hydroxide. It is important to thoroughly cover all leaf surfaces prior to the infection or during the early stages of disease development. The fungicide label will contain information on dosage rates, pre-harvest interval (PHI), and safety precautions.

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