



LEAF MOLD OF TOMATO

Leaf mold, caused by the fungus *Fulvia fulva* (synonym *Cladosporium fulvum*), is a common and destructive disease on tomatoes worldwide grown under humid conditions. Leaf mold is primarily a problem on high tunnel and greenhouse tomatoes.

SYMPTOMS

Symptoms usually develop on foliage, with fruit infections being rare. Older leaves are first affected, with symptoms on younger leaves occurring later (Figure 1). The first leaf symptom is the appearance of small, pale-green, or yellowish spots with indefinite margins on the upper leaf surface (Figure 2). The margins of the spots are not well defined. When infection is severe, these spots coalesce, and the foliage is killed. On the



Figure 1. Leaf mold symptoms on tomato foliage, caused by *Fulvia fulva*.

corresponding areas of the lower leaf surface the fungus begins to sporulate (Figure 3). The fungus appears as an olive green to grayish purple velvety growth, composed mostly of spores (conidia) (Figure 4). The mold is denser and deeper in color toward the center of the discolored area. The leaves curl and wither and may drop from the plant. Occasionally petioles, peduncles, stems, blossoms, and fruit are attacked by the fungus. Blossoms may be killed. Green and ripe fruit can have a black, leathery rot on the stem end. The margins of the rotted areas may be irregular, with as much as one third of the fruit affected.



Figure 2. Leaf mold symptoms on upper surface of a tomato leaf.

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DISEASE CYCLES

The fungus survives between seasons as conidia and sclerotia on plant debris. Conidia can be produced from surviving sclerotia. Conidia, produced on the undersurface of infected leaves, are easily spread from plant to plant by air currents, splashing water, tools, and clothing of workers. Conidia germinate in water films or when humidity levels are above 85%, at temperatures between 39 and 93°F (4-34°C) [optimum: 75-79°F (24-26°C)]. Leaf infection occurs most rapidly when humidity levels at the leaf surface fluctuate between 85% (day) and 100% (night). Symptoms usually appear in 10 days after inoculation, with spore formation beginning a few days later.



Figure 3. Leaf mold symptoms on lower surface of a tomato leaf. Note black fungal mold on the lesions.

DISEASE MANAGEMENT

The following practices help to reduce crop losses to the leaf mold.

1. Keep the relative humidity in the greenhouse below 85 percent, and keep free moisture from forming or persisting on leaves. This will inhibit the development and spread of the leaf mold fungus.
 - a. Provide good ventilation and as much light as possible. Circulate air with fans to eliminate dead-air pockets.
 - b. Keep night temperatures in the greenhouse warmer than outside air temperatures. If leaf mold becomes a problem, some night heating may be needed in Illinois through late spring and again in early fall.
 - c. Attempt to avoid wetting the leaves when watering. Water early in the day to allow leaves to dry by mid-afternoon.
 - d. Maintain a temperature of at least 60° to 65°F (16° to 18°C) throughout the season.
 - e. Provide adequate plant and row spacing to avoid excessive shading.

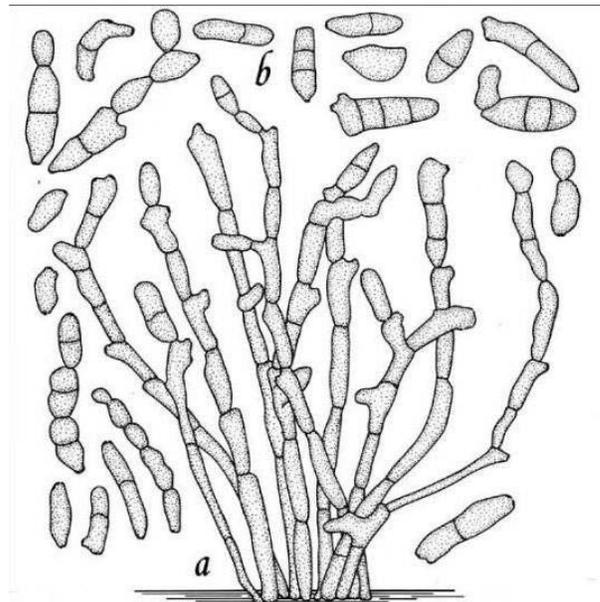


Figure 4. *Fulvia fulva*:
a, conidiophores emerging from the leaf surface; b, conidia (drawing by Lenore Gray).

2. Plant resistant varieties, if available.
3. A fungicide spray program may help control the disease, but should be considered secondary to environmental control measures. A weekly spray program may be necessary. For current recommendations on fungicide control of the disease, refer to the current edition of publication number C1373, "Midwest Vegetable Production Guide for Commercial Growers" (www.btny.purdue.edu/pubs/id/id-56/). This publication is available from ITCS, University of Illinois, 1917 S. Wright St., Champaign, IL 61820; or call 1-800-345-6087.
4. Reduce primary inoculum levels through sanitation, steam treatment of greenhouses, and seed treatment.
 - a. After harvest, carefully remove and destroy (burn) all plant debris.
 - b. Where possible, steam entire greenhouse sections between crops, preferably on a bright, hot day when less steam will be needed. Close all ventilators, and maintain the temperature at 135°F (57°C) for at least six hours.
 - c. Where necessary, use hot water treated seed. Treat seed for 25 minutes at 122°F (50°C).