Cornell CALS
College of Agriculture and Life Sciences

Plant Pathology and Plant-Microbe Biology Section
School of Integrative Plant Science
Cornell Cooperative Extension
Cornell AgriTech

Tomato Leaf Mold

Introduction

Tomato leaf mold is a foliar disease that is especially problematic in greenhouse and high tunnels. It was first described in 1883 as a pathogen that causes leaf lesions. It is less common in the field compared to greenhouses and high tunnels. With the rise of high tunnel construction in New York State through assistance programs by the Natural Resources Conservation Service, tomato leaf mold is appearing more frequently. High tunnels allow for season extension of high value crops such as tomatoes, yet the structures are also conducive to the growth of tomato leaf mold, which favors humid, dry conditions. Despite the slower progression of disease compared to a pathogen such as *Phytophthora infestans*, management is still crucial because tomatoes are a high value crop and consistent yields are an important source of income for growers.

Causal Agent

Tomato leaf mold is caused by a fungal pathogen called *Passalora fulva* (syn. *Cladosporium fulvum*). It is an ascomycete fungus that lives on living tomato leaves. The fungus produces conidia that infect the lower surfaces of leaves (Figure 1). Upon landing on leaves, the fungus lands and enters plant stomata used in gas exchange. The stomata become clogged and tomato plants cannot respire well, resulting in wilting, defoliation, and infection.

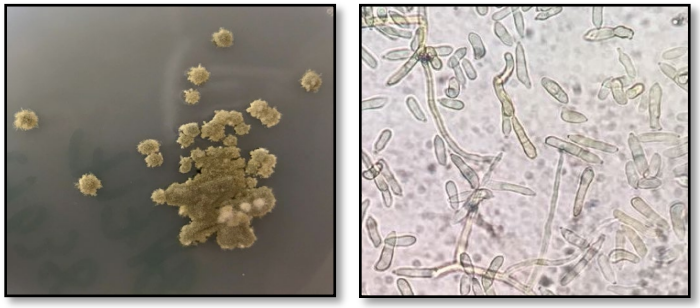

Figure 1. Left: The fungus *Passalora fulva* isolated from infected tomato leaves. Right: the fungus under the microscope.

Symptoms

Disease symptoms first appear after seven days as light green spots on leaves. Soon after, olive-green asexual conidia emerge, and eventually the spots become necrotic (Figure 2). Disease symptoms appear first on the lower leaves of tomato plants. Fruit production may not be severely hampered during the earlier stages of disease, but over time, disease severity increases and defoliation occurs. Proper identification of disease is important. Abiotic conditions such as magnesium deficiency and the beginning stages of other diseases can produce similar symptoms to tomato leaf mold (Figure 3).

How the pathogen spreads

The pathogen spreads by wind or by water splash. A relative humidity greater than 85% triggers the germination of conidia. Thread-like hyphae then grow and spread across the leaf surface. A few days later, after additional growth, the fungus can enter the plant. The fungus can survive on infected plant debris and perhaps in soil, which could allow the fungus to survive from year-to-year in greenhouses and warmer climates. Infected seed could also facilitate the spread of the pathogen. Tools and workers may also inadvertently help facilitate the spread of the pathogen, enabling the pathogen to travel to new tomato plants.

Figure 2. Left to Right: Progression of disease from early symptoms that begin as light green spots. Over time, the spots that are covered with olive-green spores that can be dispersed aerially or by water splash.

Figure 3. Left: Leaves show signs of magnesium deficiency. Middle: distinct light-green spots caused by tomato leaf mold. Right: an example of tomato leaf mold later in the disease cycle after the fungus has sporulated.

Management

Plant resistant varieties

- Determinant varieties-A high tunnel trial at Cornell AgriTech showed the most resistant varieties to be Red Mountain and Primo Red. Mountain Spring and Florida 97 have also shown some resistance.
- Indeterminant varieties: Geronimo, Trust, Boa
- Heirloom varieties: Cherokee Purple, Amish Paste, Prudens Purple.

Cultural practices

- If you observe symptoms in the greenhouse, remove the diseased plants and surrounding plants to prevent pathogen spread. Dispose of infected plant material and sterilize all equipment that was used in that greenhouse.
- Nutrients and disease pressures can build up in high tunnels, so rotate crops and move tunnels regularly.
- Make sure seed is clean and purchased from a reputable source.

Applying chemical treatments

- In ongoing field studies, Champ 30 WG and Zonix showed the best control of tomato leaf mold in organic trials that took place in 2017 and 2018.
- Control methods for conventional growers include the Quadris Top product, containing azoxystrobin and difenoconazole or products such as Bravo Weather Stik, containing chlorothalonil.
- For more information: consult the Cornell Integrated Crop and Pest Management Guidelines for Vegetable Crops available at cropandpestguides.cce.cornell.edu.
-

More information

- Visit the pest management section of the Cornell Vegetables website: vegetables.cornell.edu
- For more information, please contact: Chris Smart - cds14@cornell.edu
- This page was created by Martha Sudermann - mas835@cornell.edu