Dr. Yonghao Li
Department of Plant Pathology and Ecology
The Connecticut Agricultural Experiment Station
123 Huntington Street, P. O. Box 1106
New Haven, CT 06504

Phone: (203) 974-8601
Fax: (203) 974-8502
Email: Yonghao.Li@ct.gov
Website: www.ct.gov/caes

Founded in 1875
Putting science to work for society

POWDERY MILDEW OF TOMATO

Powdery mildew of tomato has become an important disease problem worldwide in both field and greenhouse production since outbreaks of this disease were reported in Europe, North and South America, and Asia in the early 1990's. The disease mainly affects leaves, causing yellowing, drying, necrosis, and defoliation. Losses in fruit production due to early plant senescence can reach up to 50% in commercial production regions where powdery mildew is severe.

SYMPTOMS AND DIAGNOSTICS

Tomato plants may be infected at any growing stage whenever environmental conditions are favorable for disease development. Symptoms initially appear as light green and yellow blotches on leaves. Diagnostic, powdery fungal growth with dense sporulation may be found on the upper surface of the leaves (Figure 1). As the spots enlarge and the fungus grows, the chlorotic lesions turn purple with necrotic centers, and a whole leaf can be covered by white fungal growth. Under high humidity and cloudy conditions, white mildew may also be observed on the under-surfaces of leaves (Figure 2). Severe infections may result in twisted and deformed leaves. Petioles and stems may occasionally be infected, but the fruit remain uninfected.

DISEASE DEVELOPMENT

Powdery mildew of tomato is caused by the fungus *Oidium neolycopersici*, an obligate parasite that obtains nutrients only from living

Figure 1. Light yellow spots with white mildew (arrow) on the upper surface of leaves.

Figure 2. White mildew (arrow) on the under-surface of a tomato leaf.

Figure 1. Light yellow spots with white mildew (arrow) on the upper surface of leaves.

plant tissues. The host range of this fungus also includes several other solanaceous crops (pepper, eggplant, potato, and tobacco) and weeds (nightshade). The fungus survives as mycelium in living or dormant volunteer host plants. In the asexual stage, the fungus forms conidia in white mildew during a growing season. These spores are easily dislodged from the infected leaves and carried long distances by wind and air currents. Spores land on leaf surfaces and germinate to start an infection cycle. The infection cycle may be repeated many times in a season. The sexual stage of the fungus has not been found. High humidity is favorable for the development of powdery mildew, but free water is not necessary for spore germination and infection. Disease development can occur in the presence or absence of dew. Excess nitrogen fertilization and high density stands may also be favorable for disease development.

MANAGEMENT

Resistant varieties: Most tomato varieties are susceptible to powdery mildew. 'Geronimo F1', 'Granadero F1', 'Massada F1', and 'Striped Stuffer' have been listed as tomato varieties that are resistant to powdery mildew.

Cultural practices: Select and plant healthy, pathogen-free transplants. Reduce fungal inoculum by destroying diseased plant debris at the end of the season. Improve air circulation by staking, pruning, and maintaining adequate spacing between plants. Avoid high rates of nitrogen fertilizer.

Fungicide application: Chemical control can be used as a supplement to the preventative practices described above. Since fungicides are used to prevent diseases, early application by scouting the disease and thorough coverage are critical for effective control. The fungicides registered for use in Connecticut are azoxystrobin, chlorothalonil, bicarbonates, cupric hydroxide, sulfur, and horticultural oils. To prevent the development of fungicide resistance, rotate fungicides that have different modes of action.

April 2013