



POWDERY MILDEW OF TOMATO

Two important powdery mildew diseases affect field- and greenhouse-grown tomatoes in the United States (US). One disease is caused by the endophytic powdery mildew pathogen, *Leveillula taurica*. This powdery mildew was first reported on tomato in US in 1978. This disease is restricted to fairly well-defined subtropical production areas with arid to semiarid conditions during the cropping season.

The second significant powdery mildew disease of US tomatoes is caused by *Oidium neolycopersici*. This disease was found first in Canada in 1994 and then in the US in 1996. It is now widely distributed throughout North America. Powdery mildew caused by *O. neolycopersici* is favored by more humid environments and can be particularly problematic in greenhouse-grown tomatoes.

SYMPTOMS

The most common initial symptom of powdery mildew caused by *L. taurica* is the development of small (less than 1 cm) irregularly shaped, light green to bright-yellow lesions on upper leaf surfaces (Figure 1). Lesions appear first on older leaves. Under warm conditions, the lesions may expand and become necrotic, often coalescing; entire leaflets may die. Severely affected leaves remain attached to the stem. Sporulation is typically observed on lesions on the undersides of leaves. Under conditions of high humidity, a powdery sporulation may be observed on both upper and lower leaf surfaces.

The most common symptom of powdery mildew caused by *O. neolycopersici* is the appearance of white, powdery colonies on upper leaf surfaces. These colonies result from the production of mycelium and conidia on the leaf surface. As the disease progresses, the colonies often coalesce, forming a dense, powdery sporulation over much of the leaf (Figure 2). Severely affected leaves become chlorotic and then necrotic but often remain attached.



Figure 1. Yellow leaf spots of powdery mildew on tomato leaves, caused by *Leveillula taurica*. (Courtesy R.L. Forster)

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DISEASE CYCLES

Both *L. taurica* and *O. neolycopersici* have a broad host range and are able to infect number of crop and weed species. However, it is not known if there are biotypes within either species that might have host specialization. Both are believed to represent species complexes composed of many different stains. It is likely that at least some weed species can serve as source of primary inoculum for infecting tomato. Also, cross-infectivity between other solanaceous crop hosts and tomato has been demonstrated for both species. Conidia of both pathogens can germinate over a wide temperature range [50-95°F (10-35°C)] and likely cause infection on tomato under conditions of high humidity. Infection can occur with little or no free moisture under high humidity. Secondary infection also readily occurs under conditions of high humidity. Conidia are readily wind-borne. Infection by *L. taurica* typically occurs during growing season with prolonged dry periods (little too no rainfall).

Early symptoms of powdery mildew are often difficult to observe. Even so, observing symptoms is critical for implementing fungicide-based management practices.



Figure 2. Conidiophores and conidia of *Oidium neolycopersici* on tomato leaves. (Courtesy the World Vegetable Center, Taiwan)

DISEASE MANAGEMENT

Good air circulation is the best way to prevent this disease. Excessive nitrogen fertilizer should be avoided.

There are no tomatoes resistant to this disease. The disease can be controlled by fungicide applications. 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.