



AVRDC - The World Vegetable Center

Fact Sheet

Tomato Diseases

Late Blight

Phytophthora infestans

Found in temperate climates and tropical highlands



Symptoms

All aboveground parts may show symptoms. On leaves, small (2–10 mm), irregular-shaped, pale, brown patches, sometimes with a purplish tinge, appear on the upper leaf surface. The margins of these spots are pale green or watersoaked. The leaf spots may enlarge and coalesce very quickly until the entire leaflet is killed. Under moist or humid conditions, a downy white mold growth appears near the leaf spot margins on the undersurface of the foliage.

The disease can develop very quickly, causing severe

defoliation of entire fields within two weeks under ideal conditions (moist with moderate temperatures). In dry weather, infected plants appear burned with shrivelled foliage, but the disease will not progress.

Lesions on the stem and the petioles appear dark brown and watersoaked and can have sporulation. Entire sections may be killed or the lesions may remain superficial and dry out.

Invasion of fruit by the fungus can occur at any stage of fruit development, often beginning at the stem end. The lesions have an olive-brown appearance with a rough

How to Identify Late Blight



On leaves, look for irregular-shaped brown patches with pale margins (left photo). Dark brown lesions appear on stems (center photo). Infected fruit have olive-brown lesions with a rough surface, often beginning at the stem end (center and right photos).

leathery surface. The lesions may expand until the entire fruit is affected. Initially, the fruit remains firm with a variation in discoloration within the tissue. Under humid conditions, a white fungal growth may appear on the affected surface portions of the fruit. Bacteria and other secondary organisms may invade the fruit and cause a soft rot. Tomato seeds infected with the fungus are discolored.

Under exceptionally wet conditions, lesions due to gray mold (*Botrytis cinerea*) may resemble late blight lesions. The sporulation from *B. cinerea* has a grayer color than the white of *P. infestans*. When conditions become very dry, the late blight lesions can be mistaken for lesions of *B. cinerea* or for early blight (*Alternaria solani*) lesions. However, late blight lesions do not have a definite outer margin and are not ringed as with early blight lesions.

Conditions for Disease Development

Late blight is a common disease of tomato crops grown in the tropical highlands and temperate regions. Extended periods of leaf wetness from frequent rain or dew formation, and cool to moderate temperatures (for example, 13–20 °C) are required. Hot, dry weather stops disease development.

The fungus persists on tomato and potato plants and residues, and in potato tubers. Many strains attack both tomato and potato. The spores are spread by wind and splashing rain.

Control

Reduce the amount of initial inoculum or suppress the rate of disease development. Start by avoiding seeds from affected fruit. Commercial tomato seed will not

harbor *P. infestans* because acid and fermentation treatments of the seed destroy the fungus. Use disease-free seedlings.

Remove and destroy blighted tomato or potato plants. Eliminate all tomato or potato cull piles in the vicinity of the tomato field.

Reduce leaf wetness by staking tomatoes and using drip irrigation. If drip irrigation is not available, reduce the number of furrow irrigations to a minimum or use sprinkler irrigation in the morning or midday to prevent the foliage from being wet overnight. Avoid overfertilization of nitrogen.

Spores of *P. infestans* can be dispersed aerially over long distances; therefore, all tomato growers nearby in the production region need to collaborate to eliminate sources of inoculum. If this doesn't happen, a few fields with infected plants can affect production over a much larger region.

Use tomato varieties that are less susceptible to *P. infestans*. Check plants carefully for the first incidence of the disease particularly after extended periods of leaf wetness and moderate temperatures. Apply fungicides as soon as possible at the first sign of the disease or ideally before symptoms develop. Both protectant and systemic fungicides will likely be necessary. Some strains of the fungus may be resistant to some fungicides with a selective mode of action. Rotate with a broad-spectrum protective fungicide. Check with your local extension agent for varieties and fungicides that may be used effectively in your region.

For more information on the production of tomato and other vegetables, go to <www.avrdc.org>.