AVRDC - The World Vegetable Center

Fact Sheet

Tomato Diseases

Early Blight

Alternaria solani

Found worldwide

Symptoms

The leaves, stems and fruit on the vine may be affected. Symptoms on leaves are most likely to appear on the older foliage. Small dark spots enlarge into circular lesions consisting of concentric rings. The tissue surrounding the lesions becomes yellow and the spots later become irregular in shape. The leaf becomes yellow as greater parts of the tissue are affected. The lesions turn brown and eventually drop from the plant. Defoliation occurs under prolonged periods of leaf wetness and high temperatures; exposed fruit become susceptible to sunburn damage.

Leaf lesions arising from *Septoria lycopersici*, another foliar pathogen of tomato, may be confused with early blight symptoms. However, *Septoria* lesions are lighter tan in color with a small pepper-like fruiting body in the center of the lesion, and the disease generally arises under cooler temperatures than with the case of early blight.

Stems and petioles affected by early blight have elliptical concentric lesions, which drastically weaken the plant. Lesions at the base of emerging seedlings can cause a collar rot. If this arises simultaneously on many seedlings, it may indicate contamination of tomato seeds or soil used for planting.

Mature and ripe fruit may be affected. Lesions occur

How to Identify Early Blight

Lesions on leaves have concentric rings surrounded by yellowing tissue (left photo). Dark concentric rings develop on the stem end of fruit (right photo).

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on the stem end or the upper shoulder and may be quite large. Fruit wounds or cracks may also have large, dark, leathery, sunken areas with concentric rings.

Conditions for Disease Development

The disease is favored by warm temperatures and extended periods of leaf wetness from frequent rain, overhead irrigation, or dews. The disease cycle is about five to seven days, so numerous repeating cycles can occur during the long growing season.

Plants under periods of stress are more susceptible, for example, during fruiting, under attack from nematodes, when inadequately fertilized, or on older plants. Early blight may be more prevalent on old transplants or transplants lacking vigor or stressed by wilting.

The fungal spores can be spread by wind and rain, running water, insects, workers, and on tools and implements. The fungus can be seed borne. The fungus can persist in soil or in diseased tomato debris. It may also persist on volunteer tomato plants or on solanaceous weeds. The spores are very resistant to hot and dry conditions. The survival of the spores is reduced by cultivation and especially by irrigation.

Control

Sow seed only from disease-free fruit. Use fungicide-treated seed and disease-free transplants. Minimize plant injury in transplants by controlling insects and by avoiding sandy soils.

Avoid extended periods of leaf wetness on plants. Trellis tomato vines and avoid dense plant populations in fields to allow for good ventilation between plants. Use furrow or drip irrigation rather than overhead irrigation. If overhead irrigation is used, irrigate in the late morning to allow the plants to dry before evening.

Use a three or four-year rotation with non-solanaceous crops. If possible, remove diseased plants or destroy them immediately after harvest. Alternatively, bury diseased crop debris by deep-plowing to reduce spore levels available for infection of new plants. Avoid planting overlapping tomato crops in adjacent areas. Maintain vigorous plant growth.

Varieties resistant to early blight are available. Broad-spectrum fungicides are available for control of the disease, if necessary. Control of late onset of the disease may not be required. Contact your local extension specialist for recommendations.

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

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