

Understanding Early Blight of Tomatoes

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Learn the basics about early blight tomato disease and practical ways to control it.

What is early blight?

Early blight, caused by the fungal pathogen *Alternaria solani*, is one of the most common tomato diseases. It brings significant damage to tomato leaves, stems, and fruits almost yearly in West Virginia. Early blight can also affect potato foliage.

How is early blight spread?

Early blight fungus survives the winter on infected plant debris, or it can be brought with infected seeds that initiate the disease in the spring. Any fungal conidia spores surviving in the soil or plant debris are splashed on the lower leaves during rain or sprinkler irrigation. Conidia germinate in the presence of a thin film of water on foliage. Germinated conidia infect tissues if foliage remains wet for another 5 to 10 hours, depending on the temperature. High humidity and temperatures above 75°F favor disease development.

What are the symptoms of early blight?

Early blight is identified by the appearance of a few (5 to 10 in most cases) circular brown spots on a leaf. The spots are up to a half-inch in diameter, with concentric rings or ridges that form a target-like pattern surrounded by a yellow halo. As the disease progresses, spots merge together and may kill the whole leaf. Over time, the stem and fruit may also be infected, showing dark and sunken spots. Cankers with a similar dark and sunken target-like appearance are often found at or above the soil line on the stem (Fig.1B).

Early blight and closely related diseases

Do not confuse early blight with two other diseases, late blight and Septoria leaf spot. (See Figure 2 on back.)

Late blight spots, caused by the fungus *Phytophthora infestans*, start out pale green, usually near the edges of tips of foliage, and turn brown to purplish black (Fig. 2B). Under humid conditions, a fuzzy mold appears on the undersides of leaves and may quickly blight the stems and fruits, resulting in a leathery-brown appearance.

Septoria leaf spot manifests as numerous brown spots having a diameter of approximately $\frac{1}{16}$ to $\frac{1}{8}$ inch on the leaves, with gray or tan centers (Fig. 2C). These spots have a dark brown margin compared with early blight's yellow halo.

As the spots mature, many dark brown, pimple-like structures called pycnidia (fruiting bodies of the fungus)

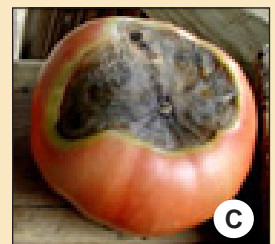
Figure 1. Early blight symptoms on tomato



Target-like spots on leaves



Black sunken lesions on stems



Black sunken areas on fruit

(Photo credits:
A – R.L. Stevenson;
B & C – MM Rahman)

How can early blight be managed?

What should be done if tomatoes have been infected by early blight?

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may appear inside the spots. These pycnidia can easily be seen with a hand lens. Early and late blight spots do not produce pycnidia. Unlike the other two diseases, Septoria leaf spots do not affect stems or fruits, but defoliation caused by more severe disease may expose fruits to sunscald.

- Use certified seeds from a reputable company or seeds that were kept from disease-free fruits.
- Use resistant varieties such as ‘Mountain Fresh Plus F1’, ‘Juliet F1’, ‘Tommy Toe’, ‘Old Brooks’, or ‘Cabernet F1’.
- Use mulch to prevent soil splash and stake the plant to keep it upright. Because wooden stakes and caging from previous years may be contaminated, do not use them unless they are treated with a 10% bleach solution for 30 minutes.
- Prune lower leaves and stems that are close to the soil surface.
- Grow tomatoes under a well-ventilated plastic tunnel that keeps foliage dry and relative humidity low.
- Use drip tape instead of sprinkler irrigation.
- Keep or let foliage dry during or after a rain or morning fog to minimize the level of infection.
- Space plants and orient rows to allow air to circulate and sunlight to penetrate.
- At the end of the season, remove all plant debris from the garden and burn or bury it by deep plowing.

In an area previously having early blight, apply either of the following products on a preventative schedule if rotation is not an option.

- For organically grown tomatoes, use copper hydroxide (Kocide 101) or Serenade on a 10-day schedule, starting pre-bloom or at first sight of blight spots.
- For conventional tomatoes, use chlorothalonil (Daconil 2787) or azoxystrobin (Quadris, Amistar, etc.) if disease is detected and weather remains damp and rainy.

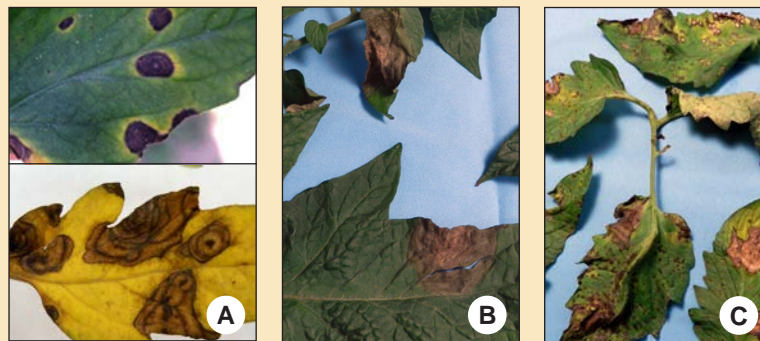
Do not use azoxystrobin more than two consecutive sprays or a total of five sprays in a growing season to keep the fungus from developing resistance.

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Figure 2. Three diseases



Early blight:
Concentric rings
with yellow halo.

(Photo credits: A – Stacey Huffman;
B & C – MM Rahman)

Late blight: Brown
purplish blighted
areas.

Septoria leaf spot:
Spots with gray
or tan centers
and dark brown
margins.