



Tomato Blight

Identification

- Initially, small dark spots form on older foliage near the ground. Leaf spots are round, brown and can grow up to 1/2 inch in diameter.
- Larger spots have target-like concentric rings. The tissue around spots often turns yellow.
- Severely infected leaves turn brown and fall off, or dead, dried leaves may cling to the stem.
- Seedling stems are infected at or just above the soil line. The stem turns brown, sunken and dry (collar rot). If the infection girdles the stem, the seedling wilts and dies.
- Stem infections on older plants are oval to irregular, dry brown areas with dark brown concentric rings.
- Fruit can be infected at any stage of maturity.
- Fruit spots are leathery and black, with raised concentric ridges. They generally occur near the stem. Infected fruit may drop from the plant.



Early blight starts at the bottom of the plant.

Biology

- Early blight can be caused by two closely related species: *Alternaria tomatophila* and *Alternaria solani*.
- Both pathogens can infect tomatoes, potatoes, peppers, and several weeds in the Solanaceae family including black nightshade (*Solanum ptycanthum*), and hairy nightshade (*Solanum physalifolium*).
- Disease develops at moderate to warm (59 to 80 F) temperatures; 82 to 86 F is its optimum temperature range.
- The pathogen is most likely to spread with wet weather or heavy dew, or when relative humidity is 90% or greater.
- The early blight pathogens both overwinter in infected plant debris and soil in Minnesota. The pathogen also survives on tomato seed or may be introduced on tomato transplants.
- Lower leaves become infected when they come into contact with contaminated soil, either through direct contact or when raindrops splash soil onto the leaves.
 - Spores (reproductive structures) can germinate between 47° and 90° F and need free water or relative humidity of 90% or greater.
 - Spores infect plants and form leaf spots as small as 1/8 inch in diameter in as little as five days.
- Spores can be spread throughout a field by wind, human contact or equipment, resulting in many reinfection opportunities throughout a growing season.

Managing early blight in the home garden

Cultural controls

- Cover the soil under the plants with mulch, such as fabric, straw, or dried leaves.
- Water at the base of each plant, using drip irrigation, a soaker hose, or careful hand watering.
- Increase airflow by staking or trellising, removing weeds, and spacing plants adequately apart
- Pruning the bottom leaves can also prevent early blight spores from splashing up from the soil onto leaves.
- Let two years pass before you plant tomatoes or peppers in the same location.

Physical controls

- Remove leaves with leaf spots. Place them in a sealed plastic bag and throw them away.
- If you touch infected leaves, wash your hands well before working in healthy tomato plants. If you use pruning tools, wash and sanitize them after touching infected plants.
- It is okay to remove up to one-third of the plant's leaves if you catch the disease early. Do not remove more than one-third of the plant's leaves.
- Keep leaves dry to reduce the spreading of disease.

Fungicides

Most home gardeners don't need to treat tomatoes with a fungicide. Tomato plants can tolerate a lot of early blight without reducing the number of tomatoes they produce.

Preventative spray schedules can be helpful. Fung-onil, Fungicide 5 and Copper fungicide can be used. Consult labels for directions and dosage.

Applications should be made when environmental conditions favor disease to be the most effective and repeated according to label instructions. Once the pathogen appears, keep track of forecasts and plan applications accordingly.

It is important to alternate between different chemical families to avoid the development of pathogen insensitivity to particular active ingredients.

Cultural Controls

- Use pathogen-free seed, or collect seed only from disease-free plants.
- Rotate out of tomatoes and related crops for at least two years.
- Control susceptible weeds such as black nightshade and hairy nightshade, and volunteer tomato plants throughout the rotation.
- Fertilize properly to maintain vigorous plant growth. Do not over-fertilize with potassium and maintain adequate levels of both nitrogen and phosphorus.
- Avoid working in plants when they are wet from rain, irrigation, or dew. Use drip irrigation instead of overhead irrigation to keep foliage dry.
- Stake or trellis and prune the plants to increase airflow around the plant and facilitate drying. Staking will also reduce contact between the leaves and spore-contaminated soil.
- Carefully prune infected leaves, take care to wash and sanitize tools as you prune, and dispose of infected leaves far away from your tomato production areas.
- Apply plastic or organic mulch to provide a barrier between contaminated soil and leaves.
- In the fall, remove or bury infected plants to reduce the likelihood of the pathogen surviving into the following year.
- For greenhouse production, early blight has been reduced by as much as 50% by covering houses with UV-absorbing vinyl film.