



# Extension FactSheet

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## Early Blight of Potato and Tomato

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**E**arly blight is a very common disease of both potato and tomato. It causes leaf spots and tuber blight on potato, and leaf spots, fruit rot and stem lesions on tomato. The disease can occur over a wide range of climatic conditions and can be very destructive if left uncontrolled, often resulting in complete defoliation of plants. In contrast to the name, it rarely develops early, but usually appears on mature foliage.

### Symptoms

On leaves of both crops, the first symptoms usually appear on older leaves and consist of small, irregular, dark brown to black, dead spots ranging in size from a pinpoint to 1/2 inch in diameter. As the spots enlarge, concentric rings may form as a result of irregular growth patterns by the organism in the leaf tissue. This gives the lesion a characteristic “target-spot” or “bull’s eye” appearance. There is often a narrow, yellow halo around each spot and lesions are usually bordered by veins. When spots are numerous, they may grow together, causing infected leaves to turn yellow and die. Usually the oldest leaves become infected first and they dry up and drop from the plant as the disease progresses up the main stem.

On tomato, stem infections can occur at any age resulting in small, dark, slightly sunken areas that enlarge to form circular or elongated spots with lighter-colored centers. Concentric markings, similar to those on leaves, often develop on stem lesions. If infested seed are used to start tomato transplants, seedlings may damp off soon after emergence. When large lesions develop at the ground line on stems of transplants or seedlings, the plants may become girdled, a condition known as “collar rot.” Such plants may die when set in the field or, if stems are weakened, may break over early in the season. Some plants may survive with reduced root systems if portions of stems above the canker develop roots where they contact the soil. Such plants, however, usually produce few or no fruits. Stem lesions are much less common and destructive on potato.

Blossom drop and spotting of fruit stems, along with loss of young fruit, may occur when early blight attacks tomatoes in the

flowering stage. On older fruits, early blight causes dark, leathery sunken spots, usually at the point of stem attachment. These spots may enlarge to involve the entire upper portion of the fruit, often showing concentric markings like those on leaves. Affected areas may be covered with velvety black masses of spores. Fruits can also be infected in the green or ripe stage through growth cracks



Figure 1. Dark brown, angular early blight lesions on a potato leaf.

and other wounds. Infected fruits often drop before they reach maturity.

On potato tubers, early blight results in surface lesions that appear a little darker than adjacent healthy skin. Lesions are usually slightly sunken, circular or irregular, and vary in size up to 3/4 inch in diameter. There is usually a well defined and sometimes slightly raised margin between healthy and diseased tissue. Internally, the tissue shows a brown to black corky, dry rot, usually not more than 1/4 to 3/8 inch deep. Deep cracks may form in older lesions. Tuber infection is uncommon under Ohio conditions.

### Causal Organism

Early blight is caused by the fungus, *Alternaria solani*, which survives in infected leaf or stem tissues on or in the soil. This fungus is universally present in fields where these crops have been grown. It can also be carried on tomato seed and in potato tubers. Spores form on infested plant debris at the soil surface or on active lesions over a fairly wide temperature range, especially under alternating wet and dry conditions. They are easily carried by air currents, windblown soil, splashing rain, and irrigation water. Infection of susceptible leaf or stem tissues occurs in warm, humid weather with heavy dews or rain. Early blight can develop quite rapidly in mid to late season and is more severe when plants are stressed by poor nutrition, drought, or other pests. Infection of potato tubers occurs through natural openings on the skin or through injuries. Tubers may come in contact with spores during harvest and lesions may continue to develop in storage.

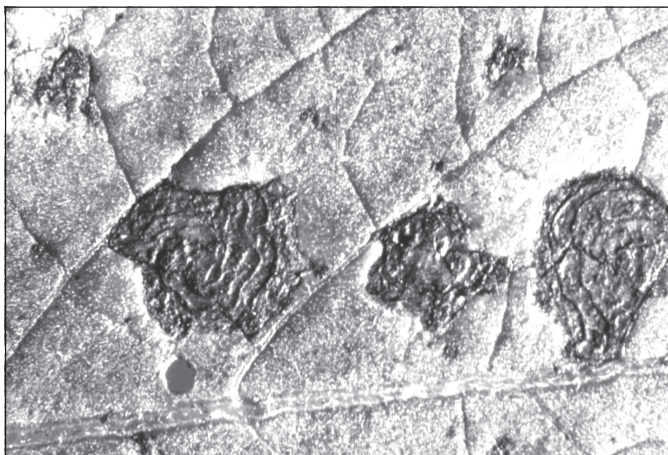


Figure 2. “Target-spot” or “bull’s eye” appearance characteristic of early blight lesions.

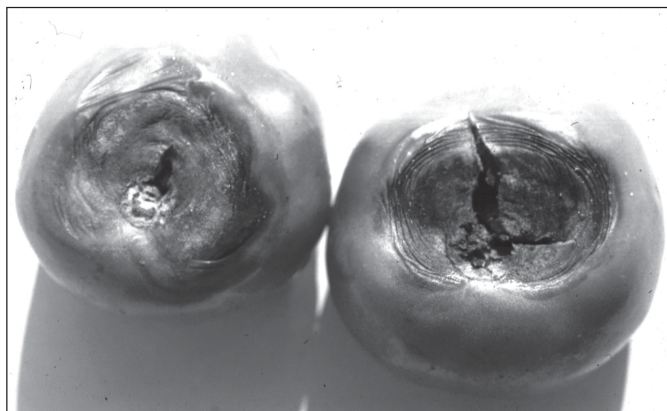


Figure 3. Dark, leathery, sunken early blight lesions on tomato fruit at the point of stem attachment.

### Management

1. Use a crop rotation that includes potatoes or tomatoes only every third or fourth year to allow infested plant debris to decompose in the soil. Rotations with small grains, corn or legumes are preferable.
2. Use tillage practices such as fall plowing that bury all plant refuse.
3. Select cultivars that have a lower susceptibility to early blight.
4. Use certified disease-free tomato seed and transplants.
5. If producing tomato transplants, disinfest soil in plant beds and control humidity in cold frames or greenhouses. Practice good sanitation throughout the transplant production operation.
6. Use appropriate measures to control weeds and volunteer potatoes and tomatoes in production areas.
7. Maintain fertility at optimal levels—nitrogen and phosphorus deficiency can increase susceptibility to early blight.
8. Time applications of overhead irrigation to allow plants to dry before nightfall.
9. Although the above measures are important to minimize infection, it is usually necessary to apply fungicide sprays to fully protect plants from early blight. Applications to tomato are usually begun 2–3 weeks following emergence or soon after transplanting if a calendar schedule is followed. Timing of fungicides can also be made using the TOM-CAST system. For potatoes, fungicide applications should be initiated when plants begin to flower. Thorough coverage is important. Adjust equipment for good vine penetration. For current fungicide recommendations and a description of the TOM-CAST system consult the Ohio Vegetable Production Guide (OSU Extension Bulletin 672).

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