



Extension FactSheet

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Late Blight of Potato and Tomato

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Late blight is one of the most devastating diseases of potato and tomato worldwide. It was responsible for the devastating Irish potato famine of the 1840's and has continued to be important to the present. Since 1990, late blight has caused widespread damage across the United States and Canada. If left unmanaged, this disease can result in complete destruction of potato or tomato crops.

Symptoms

Late blight appears on potato or tomato leaves as pale green, water-soaked spots, often beginning at leaf tips or edges. The circular or irregular leaf lesions are often surrounded by a pale yellowish-green border that merges with healthy tissue. Lesions enlarge rapidly and turn dark brown to purplish-black. During periods of high humidity and leaf wetness, a cottony, white mold growth is usually visible on lower leaf surfaces at the edges of lesions. In dry weather, infected leaf tissues quickly dry up and the white mold growth disappears. Infected areas on stems appear brown to black and entire vines may be killed in a short time when moist weather persists.

On potato tubers, late blight appears as a shallow, coppery-brown, dry rot that spreads irregularly from the surface through the outer 1/8–1/2 inch or more of tissue. On tuber surfaces, lesions appear brown, dry, and sunken, while infected tissues immediately beneath the skin appear granular and tan to copper-brown. When tubers are stored under cool, dry conditions, lesion development is retarded and, upon prolonged storage, lesions may become slightly sunken and desiccated. Secondary bacteria and fungi frequently enter late-blight lesions, usually resulting in a slimy breakdown of entire tubers.

Late blight can also develop on green tomato fruit, resulting in large, firm, brown, leathery-appearing lesions, often concentrated on the sides or upper fruit surfaces. If conditions remain moist, abundant white mold growth will develop on the lesions and secondary soft-rot bacteria may follow, resulting in a slimy, wet rot of the entire fruit.

Causal Organism

Late blight is caused by the fungus *Phytophthora infestans*. Unlike most pathogenic fungi, the late blight fungus cannot survive in soil or dead plant debris. For an epidemic to begin in

any one area, the fungus must survive the winter in potato tubers (culls, volunteers), be reintroduced on seed potatoes or tomato transplants, or live spores must blow in with rainstorms. Disease development is favored by cool, moist weather. Nights in the 50's and days in the 70's accompanied by rain, fog or heavy dew are ideal. Under these conditions, lesions may appear on leaves within 3–5 days of infection, followed by the white mold growth soon thereafter. Spores formed on the mold are spread readily by irrigation, rain and equipment. They are easily dislodged by wind and rain and can be blown into neighboring fields within 5–10 miles or more, thus beginning another cycle of disease.

Infection of potato tubers arises from spores that develop on foliage. Tubers exposed by soil cracking or erosion of hills may come in contact with spores washed down from infected leaves and stems by rainfall or irrigation. Tubers infected during the growing season may partially decay before harvest. Tuber infection may also occur at harvest when tubers contact living spores remaining on infected vines. Little if any tuber-to-tuber spread of late blight occurs during storage if tubers are kept under cool, well-ventilated conditions.

Besides potatoes and tomatoes, *P. infestans* can infect only a few other closely related plants. Occasionally peppers and eggplants are mildly infected, as are a few related weeds such as hairy



Figure 1. Irregular, purplish-black late blight lesions on leaves of potato.

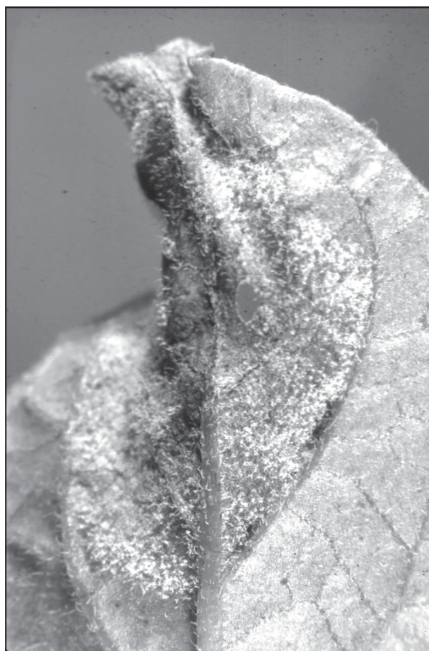


Figure 2. Close-up of underside of lesion showing cottony, white mold growth of the late blight fungus on a potato leaf.



Figure 3. Tomato fruit with late blight have large, firm, brown, leathery-appearing lesions and may show a cottony, white mold growth.

(but not black) nightshade. Since 1990, there have been severe outbreaks of late blight in commercial and home garden plantings of potato and tomato in both the U.S. and Canada. Much of this has been associated with new strains of the late blight fungus that have spread to many areas. Some of these strains may interact and form a type of resistant spore that can survive for long periods in soil. Others are insensitive to a systemic fungicide (metalaxyl) that has been widely used in late blight management. The protectant fungicides commonly used to protect plants from late blight remain fully effective with all known strains of the fungus.

Management

1. Infected cull potatoes are a major source of spores of the late blight fungus and must be disposed of properly—**DO NOT MAKE CULL PILES**. Cull potatoes should be spread on fields not intended for potato production the following year in time that they will totally freeze and be destroyed during the winter. If this is not possible, they must be destroyed in some other way such as by complete chopping, burial, burning or feeding to livestock.

2. Plant only certified seed potatoes. Use of “year-out” seed or seed saved from local crops is asking for trouble with late blight. Seed sources should be selected very carefully to avoid bringing in late blight on seed potatoes, especially new strains of the fungus. Look for the characteristic coppery-brown discoloration of the potato flesh under the skin of seed tubers. Infected tomato transplants also can be a significant source of the disease.

Use only obviously healthy tomato transplants free of dark lesions on leaves or stems.

3. Volunteer potatoes and tomatoes can be a significant source of spores of the late blight fungus. All volunteers should be destroyed as quickly as possible by herbicides, chopping, or cultivation.

4. Growers should scout fields regularly to look for late blight. Special attention should be paid to early-planted fields because that is where the disease is likely to develop first. Scouting should be concentrated in low-lying areas, field edges along creeks or ponds, near the center of center-pivot irrigation rigs, in areas near woodlots or any area that is protected from wind where the leaves tend to remain wet longer. Any area where it is difficult to apply fungicides such as edges and corners or under power lines if using aerial application should be examined. Scouts should look for large, black or purplish lesions on stems or leaves and the telltale cottony, white mold growth, usually on the undersides. Be sure to check leaves and stems under the crop canopy as that is where the disease is most likely to begin.

5. Use of a good protectant fungicide program is necessary to fully protect any crop of potatoes or tomatoes. For current recommendations consult your local county Extension agent or the Ohio Vegetable Production Guide (OSU Extension Bulletin 672).

6. With potatoes, make sure that vines have been completely dead for 2–3 weeks prior to harvest. Fungicide applications should be continued until vines are dead. When foliage dies, spores of the late blight fungus that remain on the foliage also die. This practice will prevent infection of tubers during harvest and development of late blight in storage.

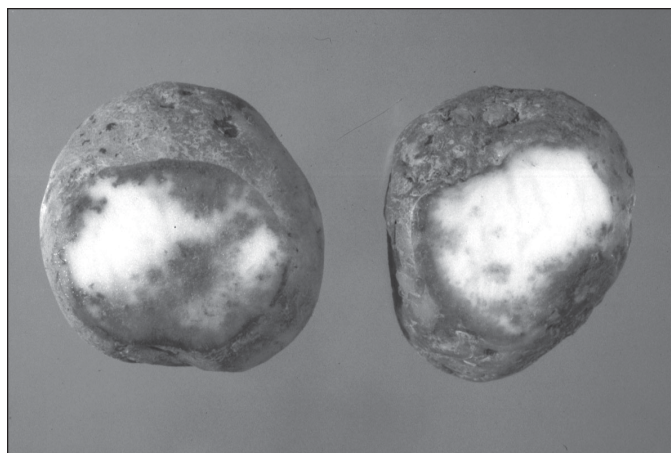


Figure 4. Potato tuber tissues infected with late blight are firm and appear tan to copper-brown with a granular texture.

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