

# Late Blight

## on Home Garden Potatoes and Tomatoes Q&A

March, 2018

This factsheet contains answers to some common questions that home gardeners ask about potato or tomato blight. For further advice or help in recognizing the disease, please contact a local garden centre or "Master Gardener" in your area.

### **Q** *What is potato or tomato blight? What causes it?*

**A** This disease is famous as the cause of the Irish potato famine in the 1800's.

When gardeners on the West Coast refer to "blight", they usually mean the disease called "late blight", caused by *Phytophthora infestans*. *Phytophthora infestans* belongs to a group of organisms called "protists", although they are still commonly referred to as "fungi". They are also called "water moulds" because they thrive and produce spores in humid, moist environments and cause infection only when free water is present on the plants.

Late blight can occur in the Interior, but "early blight" is more common than late blight in this drier region. Early blight is caused by a fungus called *Alternaria solani*. Both diseases cause leaf and stem lesions and fruit rot, so are sometimes confused. Although they are called "early" and "late" blight, both diseases can occur at any time from spring to fall if weather conditions are favourable. Early blight generally develops at warmer temperatures than late blight, which generally prefers cool, wet weather. In the lower mainland, late blight is common during spring and fall under cool and wet conditions. Late blight also occurs on other solanaceous plants such as eggplant, nightshade and occasionally on peppers.

### **Q** *Does the late blight pathogen infect stems as well as leaves?*

**A** Yes. On tomato, the first symptom on plants is often a brown/black lesion on the stem or petiole.

Leaves develop large brown/black blotches, often starting at leaf margins. In humid weather and in early mornings, a fuzzy mould can often be seen on the underside of the brown/black blotches or on the stem lesions. This fuzzy growth contains structures called sporangia containing spores of the pathogen. On tomato fruit, infection causes a brown/black, leathery rot. It may become soft and mushy if invaded by secondary organisms.

On potato, large, soft, grayish-green to tan areas first appear on leaves. Shoot tips may turn brown or black. Brown to black lesions also develop on stems and leaf petioles. In humid, wet conditions, a grayish white, fuzzy mould can be seen beneath the spots on the underside of the leaves. In wet weather, the entire plant may die back to the ground. If the disease is present at harvest, and rain occurs, tubers may be infected resulting in a firm brown rot that starts from the skin. Eventually, infected tubers will rot from late blight and secondary soft rot bacteria.

**Q** *How does late blight spread?*

**A** In cool, wet or humid weather the pathogen produces structures called "sporangia". These sporangia can travel up to 20 kilometers in wind-blown rain. Rain-spread sporangia can cause infection even in a garden where tomatoes or potatoes have not been grown before.

Sporangia can also move in ground water, runoff or in watering splash from plant to plant in the garden. If they are contained in a water droplet which does not dry up for a few hours, they will release tiny spores called "zoospores" which swim through the water, attach themselves to the leaf or stem tissue and cause infection.

Sporangia and zoospores don't survive long. However, the pathogen can survive mild winters on un-rotted or un-frozen plant debris in the soil. The pathogen can form thick-walled resting spores called "oospores" when two different mating types happened to be present on the same plant. Oospores can survive for many years in soil without living on plant debris.

**Q** *Is the late blight disease worse than it used to be?*

**A** Every year, temperature and rainfall affect the timing and severity of late blight disease. New and highly aggressive strains of late blight can appear across North America, including B.C. Some strains, affect both tomatoes and potatoes while others affect mostly potatoes or tomatoes. Home garden potato and tomato are often left untended and diseased plants are allowed to remain in the garden through the summer and fall. This leads to high spore levels and more potential for recombination of the two mating types (i.e. A1 & A2) to produce new strains. Home gardeners are encouraged to destroy severely infected tomatoes and potatoes to prevent the spread and development of new strains. Severely diseased plants should be burned (where permitted), buried or sent to a landfill. Oospores may carry over in soil and may survive the composting process.

**Q** *Why does the blight seem to be worse (or milder) in my garden than in my neighbour's? Or worse in one part of the garden than another?*

**A** Rain-spread spores can cause spotty outbreaks. Also, disease development depends on the temperature and humidity around your plants. Plants in warmer, drier, sunny spots will have less disease. For example, plants that receive the morning sun will dry off quickly from nightly dew and fog. Plants grown in a high moisture-holding soil or high density planting mix will have a cooler and high humid environment which is more favourable for disease, than plants grown on a sandy soil or plastic mulch.

**Q** *Are there any blight-resistant potatoes or tomatoes?*

**A** No. Earlier-maturing varieties may escape the peak weather conditions for blight infection in years when there is a warm, dry spring and the disease does not develop until the fall.

Most varieties of potato have little or no resistance to the new strains of late blight. Please check with your local seed supplier for information on new varieties and disease resistance.

**Q** *When I bring healthy green tomatoes indoors to ripen, they often rot anyway. Why does this happen? Can it be prevented?*

**A** In wet weather, green fruit may have been infected already, or be carrying spores on the surface. As the fruit ripens, rot develops. Some gardeners report that washing fruit after picking, followed by sanitizing with a vinegar solution reduces fruit rot during ripening. Vinegar should be mixed 1 part vinegar to 3 parts water. Rinse fruit with fresh water after treating.

**Q** *What can I do to control late blight?*

**A**

1. Grow plants in a warm, dry, sunny area. If you have had blight previously, move to a different area if possible, or replace the upper soil layer since "oospores" will carryover in soil.
2. Water the soil, not the foliage. Drip irrigation is preferable to watering with a hose, to reduce water splash. Don't over fertilize or over water.
3. Grow on a light sandy soil if possible or cover soil with a white plastic mulch to increase soil and air temperatures around the plants and reduce humidity.
4. Growing plants under an overhang or a clear plastic shelter will help prevent spores from being deposited on plants by wind and rain. But plants must be covered before infection has occurred. Covering the plants after they are infected may raise humidity and make the disease worse.
5. Grow tomatoes on raised beds with well-spaced trellises or in containers off the ground. Tomatoes grown on balconies or roof-tops rarely develop late blight, probably because the environment is warmer and drier.
6. Remove all of last year's tomato or potato debris to prevent carryover of disease.
7. Remove diseased leaves, shoots and plants immediately. Bury them, or seal them in a plastic bag and take to a landfill. Do not compost diseased plants. If oospores are present, they will survive in compost.
8. Destroy any volunteer potato or tomato plants in the garden.
9. Remove or control nightshade weeds. Nightshade is related to tomato and potato and is also a good host for late blight.
10. Apply copper sprays or other home garden fungicides recommended for late blight at least once a week when weather is favourable for disease. **READ THE LABEL.** Copper, which is accepted by most organic producers, should be applied for prevention more than cure, that is, before the disease has become established.
11. Gardeners who are unable or choose not to follow a regular fungicide spray program for late blight are strongly urged to destroy (bag or bury) all infected tomato or potato garden plants or plant parts as soon as the disease is observed. If in doubt whether it is late blight, take a sample to a local garden centre or Master Gardener for identification.

**Disposing of infected plants promptly to prevent spread will help the potato industry and other home & market gardeners.**