

# What is potato blight?

## A guide for gardeners

Recognise – Prevent – Control



I think this is a very clear, concise document and I hope it gets to as many allotment sites as possible!



Alys Fowler



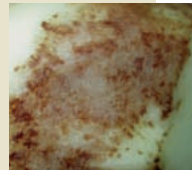
## What is potato blight?

Potato blight or late blight disease is caused by the fungus-like organism *Phytophthora infestans*, which spreads rapidly in the foliage of potatoes and tomatoes causing collapse and decay.

The disease spreads most readily during periods of warm and humid weather with rain. Late blight can also infect potato tubers causing a rapid tuber rot.

It is the most important disease of potatoes and outdoor tomatoes and caused the Irish potato famine of the 1840s. It has been around for a long time and over the years has evolved with more aggressive strains making it harder to control.

*Potatoes growing on an old compost heap is a common source of infection.*



## Blight life-cycle

- Blight is a microscopic, fungus-like organism whose spores (sporangia) easily break away from infected foliage and may be wind-blown for long distances during dull, humid weather.
- If a spore lands on a wet leaf surface, it soon produces many swimmers (zoospores) that swim over the leaf surface then settle and grow into the tissues of the leaf.
- After about three days in humid conditions, a lesion is visible and new spores are formed on stalks that grow out from the lower leaf surface. These can detach from the stalks in air currents, drift off and may land on another leaf or stem and start a new infection.
- If foliage is destroyed by blight early in the growing period before tubers are formed, the crop will fail. Early varieties have often formed a crop of new potatoes before blight strikes in **July** or **August**, however, even early varieties will fail if blight arrives unusually early in **May** or **June**.
- Potato blight will defoliate a potato crop but if blight occurs after the tubers are a good size and they are harvested before they become infected, little is lost.
- Early attacks can be a problem, as the tubers may be under threat of infection for a long time, especially while they are developing.



## This is what blight looks like



The initial symptoms of blight on potato plants are **small, dark spots or lesions on leaflets**, usually on the margins. The dark brown lesion is often surrounded by **a halo of light green tissue**.

During humid conditions, a **fine white downy growth** may be seen around the edge of the lesion, on the underside of the leaflets. This downy growth can release thousands of spores (sporangia) each day into the air. If the weather continues to be humid, within a few days the initially small circular lesions will grow in size until all of the leaf is colonised. This is why a crop can appear green and healthy and one week later the foliage is essentially blackened and dead.



Left: a fine white downy growth seen around the edge of the lesion

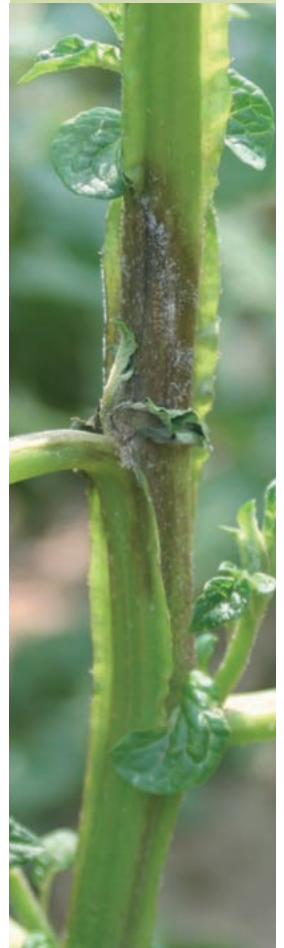
**Brown lesions** may also develop on the stems, often starting at the leaf axils and spreading up and down the stem. In wet weather the spores will be washed down from the leaves or stems into the soil where they can infect the developing tubers.

Infected tubers have a brown (or for red-skinned varieties, a purple) **discolouration** on the surface and reddish-brown granular markings in the tuber flesh.

The tubers may remain firm but can develop **soft rot** if the tissues are invaded by bacteria that cause tissue breakdown. Early attacks of blight may not be visible on tubers but any infected tubers will usually rot during storage.



Brown lesions may develop on the stems



## Sources of infection

Blight over-winters in:

- **infected seed potatoes**
- **diseased potatoes dumped by the plot**
- **unharvested potatoes left in the soil which are capable of growing the following season.**

For this reason it is best to think about garden hygiene and remove all potatoes at harvest. Buying certified seed each year from a retailer or by mail order, rather than planting old potatoes, will also help prevent blight infection. However, the great majority of infections in gardens arise from wind-blown spores originating in other gardens, allotments and commercial crops, even if the nearest infected crop is miles away.

**Don't risk importing serious diseases. For high quality British seed, look for the Safe Haven logo on seed packs.**



## New blight strains

Populations of blight are evolving rapidly. In recent years two new strains have come to dominate the population in Britain. These strains are known as Blue 13 and Pink 6 and are particularly damaging to potato crops.

Research sponsored by Potato Council has found that some strains are able to reproduce sexually when they meet. They form thick walled resting spores that can survive in soil for several years and generate a new strain, if the resting spore develops and infects a plant. At present, infections from resting spores have not been detected in crops in Britain.



*Following a blight outbreak on our allotments last summer, we were sent copies of the Potato Council's 'What is potato blight?' guide. Our allotmenters have found the photographs easy to use in knowing what to look for, the text succinct, easy to follow and reassuring.*

*Potatoes nourish and sustain us. We need to take care of them by stopping blight spreading. So study this guide and pass on its messages to other gardeners.*



**Noreen Salway**, Chairman,  
Southfleet Parish Council, North Kent

*There are varietal differences in resistance to late blight.*

## Variety choices

Those varieties that have a high degree of resistance to blight may not show symptoms at all when blight pressures are moderate but under high pressure, infection may produce small, slow growing lesions in the foliage, ensuring the plant's survival over many weeks.

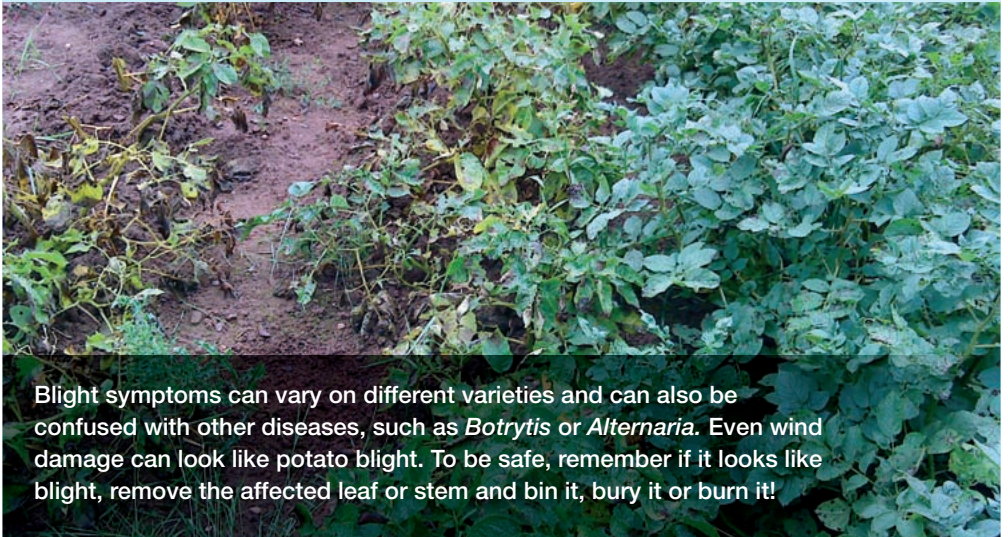
Some resistant varieties show resistance in the foliage but their tubers are susceptible. Other varieties rarely suffer from tuber blight but have only moderate or low resistance to foliage blight.

Data on blight resistance had to be revised recently due to the prevalence of the new and highly virulent strains.

**Many maincrop varieties with good resistance for blight pre-2005 are now seen as being more susceptible**, such as Lady Balfour and Setanta.

In contrast to these, varieties such as Sarpo Mira and Axona, have retained their high scores for blight resistance. Sarpo Mira can display small, black lesions on lower leaves in some soils, most likely due to a nutrient deficiency.

Most early varieties are very susceptible but as they are often harvested before blight starts (usually in July), blight is rarely a problem. Similarly, early maincrop varieties are more likely to produce a reasonable crop before blight appears than are later maincrop varieties.



Blight symptoms can vary on different varieties and can also be confused with other diseases, such as *Botrytis* or *Alternaria*. Even wind damage can look like potato blight. To be safe, remember if it looks like blight, remove the affected leaf or stem and bin it, bury it or burn it!

## Weather and Smith periods

Meteorological data are used to warn commercial growers when high risks of blight infection have occurred.

A two-day Smith Period of warm (more than 10°C), humid (humidity of greater than 90% for at least 11 hours each day) indicates a high risk of infection if blight spores are present.

Periods of warm, dry, sunny weather prevents both infection and any blight that is already established from getting worse. However, a return to 'blighty' weather will allow the disease to continue its development.

## Non-chemical control

**1 Chitting the seed** (storing in the light to encourage short, strong sprouts) can reduce the time to emergence and full canopy development. This can help as the foliage is more susceptible during the growth phase, plus the tubers will start to develop earlier. If seed is chitted, take care not to damage the chits at planting.

**2 Watering your crop** can increase the humid microclimate around the haulm (foliage) which can help the spread of the disease. If the soil is dry, it is best to water the soil around the base of the stems rather than wetting the entire plant. Take care not to wash away soil as a good depth of soil covering the tubers or mulching provides some protection to tubers.

**3** If you are growing more than one variety, there is evidence that **growing alternate rows of varieties** with lower and higher resistance can help to reduce the spread of blight if disease pressure is not too high.

**4 Always try to check the foliage regularly** for signs of blight. Remember a tidy allotment or plot will help to reduce the risk of infection.



*It is best to water around the base of the stems rather than wetting the entire plant.*



*If spraying, remember to include outdoor tomatoes, as these are as susceptible to blight as potatoes.*



## Chemical control

If, as a gardener you want to use chemicals, you must rely on a **very restricted range of protectant fungicides all containing copper** (Bordeaux mixture or Fruit and Vegetable Disease Control), since the more modern and effective products are not approved for non-commercial use.

You should be aware that copper is a heavy metal **toxin** and can have a negative effect on many soil organisms at the concentrations used. It is important to realise that copper fungicides will not kill an infection within the leaf but **will only slow down the spread of the**

### **disease by preventing new infections.**

Therefore, these protectants are most effective when applied before any blight is present in the crop and applications should be repeated on a regular basis as recommended on the label.

If the plants are growing rapidly, any new growth made since the last chemical application will not be protected. It is therefore critical to get a good coverage to all parts of the foliage, as any stems or leaves not treated won't be protected. If spraying, remember to include outdoor tomatoes, as these are as susceptible to blight as potatoes.

## Blight websites

Potato Council has linked with another provider (Blightwatch) to give commercial growers combined warnings on which they can base their fungicide spray programmes. Amateur growers are able to access this service free of charge by registering on the Potato Council website. The website shows when blight has been detected in an area and also highlights when

high-risk Smith Periods have been recorded. You can log on to the Potato Council's website at [www.potato.org.uk/gardeners](http://www.potato.org.uk/gardeners). When you register for the blight-outbreak information on the site, you can receive email and/or text messages that warn you of both the presence of blight and Smith Periods for up to five postal districts.

Visit the Potato Council's website at [www.potato.org.uk/gardeners](http://www.potato.org.uk/gardeners)



## What if an infection occurs?

Firstly, all is not lost. **Cutting** off all blighted leaves and stems can help slow the infection but healthy looking leaves may already be infected at a microscopic level and the blight will usually appear again a few days later.

The blighted foliage should be **binned** (if possible or taken to a Council green waste facility), **buried** in the ground more than 12 inches deep or **burned** if there is just a small amount of foliage and it is allowable. If tubers are buried they should be crushed first.

Garden composting, unless in a sealed container, may leave the haulm exposed, which will allow blight spores to spread until the green material dies. If open composting is the only option, the infected material should be placed under the top layer in the compost to help reduce the movement of spores in the wind.

If blight strikes when the crop has already formed tubers of a reasonable size it is often better to cut off the foliage flush

with the soil, if it is severe or the weather is predicted to remain suitable for blight infection. If foliage had blight, it is likely that spores will have penetrated the soil in rainwater. So it is worth trying to prevent these spores from infecting the tubers, particularly if the crop is to be stored. As spores are known to die off in the soil fairly rapidly, it is best to wait about three weeks for tuber skins to thicken and for spores to die before digging the crop up.

**When harvesting**, remove and dispose of all diseased and unwanted tubers to prevent blight from overwintering and establishing an early infection next season, by binning if possible or burying.

Potatoes growing on an old compost heap is a common source of infection so tubers of any size should not be composted. There are no problems using the soil next year for other crops but the potatoes should be grown on another part of the allotment or garden. This crop rotation is just part of good practice.



These stems should be cut off flush to the soil.

## Storage

- Harvest your potatoes in dry weather and allow them to dry before storing in a cool dark environment in paper or hessian bags, **not in polythene.**
- Use them before they start to sprout and remember to check them regularly, especially if the foliage showed signs of potato blight. Any diseased looking tubers should be binned where possible or buried.



Example of blight in a commercial crop

## Recipes

If you would like some great recipe ideas for your home-grown potatoes, try the website [www.lovepotatoes.co.uk](http://www.lovepotatoes.co.uk)

## Other species

**Late Blight is a serious disease for outdoor tomatoes** but not as common on tomatoes grown in greenhouses. This is mainly because the foliage of greenhouse-grown tomatoes is kept dry and this prevents infection that is dependent on water being present. Also, air-borne spores are less likely to land on the foliage. However, if the greenhouse is not properly ventilated, water condenses on the glass at night and can wet the foliage and allow infection, which is often fast spreading, with devastating results. Blight is specific to potatoes and tomatoes and some ornamental relatives of these two crops, such as *Solanum laciniatum* and *Petunia* but the disease on these is not as serious.

## Sponsor

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## Thanks

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## Production

Potato Council is the division of AHDB which works towards making the British potato industry more sustainable, competitive and profitable and helps stimulate use of the GB potato crop in home and export markets.

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