

Brown Rot of Potato

Why the concern?

This is a quarantine disease of potato that is listed in the EC Plant Health Directive and is notifiable in the UK. Yield losses are mostly caused by tuber rotting and, in many warmer areas of the world, it is one of the main limiting factors in potato production. The effect on our seed-potato industry could be substantial, especially for exports, if the disease became established in the UK. Once established, the costs of control could also be high. Control of this disease requires vigilance from all sectors of the industry, from growers through to merchants, packers and retailers.

What is it?

Brown rot is caused by the bacterium *Ralstonia solanacearum* and is widely distributed in warm temperate areas of the world. Within the EC, there have been sporadic findings in many member states including Belgium, France, Germany, Greece, Hungary, Italy, The Netherlands, Portugal, Slovakia, Spain, Sweden. There have been five outbreaks in England in ware potatoes between 1992 and 2000. Tomato crops are also susceptible and have been affected at a single location in the UK in 1997 and 1998.

What does it look like?

The bacterium can cause wilting of the potato plant but the symptoms you are most likely to see are in the tuber:



The initial symptom is brown staining of the vascular ring (hence the name "brown" rot) that starts from the stolon (heel) end.



SCOTTISH EXECUTIVE



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Welsh Assembly Government





A pale, creamy bacterial exudate may ooze from the cut vascular tissues.



In severe infections the vascular tissues rot away completely. Bacterial exudate may ooze from the eyes and the heel end (where the tuber was attached to the stolon).



Wilting of the leaves starts towards the top of the plant and may be initially confined to one side of a leaf or to only one stem. This can lead to rapid drying and death of the whole plant, although wilting has rarely been observed in European crops. Bacterial exudate also oozes from cut stems of infected plants, as in the tomato stem shown above.

Symptom expression occurs at different rates in different varieties and is favoured by warm temperatures (above 15°C with optimum around 25°C) and other environmental conditions (especially high soil moisture).

In some case the bacteria can latently infect tubers without causing noticeable symptoms and can survive in seed tubers during storage and cause disease when planted in the next season.

How does it spread?

- The most effective means of spread of brown rot worldwide is through distribution and planting of infected seed potatoes.
- Although seed transmission has occurred in some other European countries, all UK potato cases were due to waterlogging following irrigation, or flooding from contaminated watercourses.
- In almost all European outbreaks associated with contaminated water, woody nightshade (*Solanum dulcamara*) plants with roots growing in contaminated watercourses have been found to be infected and this has acted as a continuing source of infection in the water.



Woody nightshade (*Solanum dulcamara*)

- It is likely that contamination of watercourses has occurred in the past through discharge of untreated waste from imported infected ware potatoes.
- The bacterium can also survive from season to season in potato groundkeepers (unharvested potatoes from the previous crop).
- Spread may also occur via contaminated equipment or from waste dumps containing contaminated material.

What is being done to help?

● Legislation

Under the terms of the EC Plant Health Directive and the Plant Health (Great Britain) Order 1993 (as amended), importation of material carrying these diseases is prohibited. In addition, a specific control directive (98/57/EC) for the disease lays down measures aimed at preventing its spread and, if possible, eradicating it.

● Surveys

Defra Plant Health and Seeds Inspectors (PHSIs) and SEERAD carry out an annual survey of seed and ware potato stocks, including those grown from both UK and non-UK seed, and undertake annual surveys of watercourses which involves irrigation and spraying prohibitions for potato and tomato crops. Samples are tested for latent infection at the Central Science Laboratory (for England and Wales) and the Scottish Agricultural Science Agency (for Scotland).

● Import inspections

Consignments of imported ware potatoes are inspected by the PHSI and samples are taken for testing at the Central Science Laboratory. Potatoes originating in Egypt are subject to specific controls against brown rot, including inspection and testing and restrictions on processing to sites with adequate waste disposal facilities.

What can you do?

Plant only classified seed	All classified seed potatoes produced in the EC must have been derived from material found free from the disease. Source seed with extreme care.
Do not irrigate with contaminated water	Consult your local plant health inspector for advice on any locally contaminated watercourses and options for safe irrigation practices.
Control groundkeepers	Potato groundkeepers are a key factor in survival of the pathogen following an outbreak. Their control removes an important source of disease inoculum.
Good hygiene	Regularly clean and disinfect all machinery, equipment, containers, vehicles and storage facilities used during potato production.
Don't dump waste on agricultural land	Discarded potatoes and potato processing waste could harbour the disease. Dispose of all potato waste in accordance with the Code of Practice for the Management of Agricultural and Horticultural Waste (PB 3580).

Keep a good look out

If you see any of the symptoms described above you must immediately contact your local Defra Plant Health and Seeds Inspector or the PHSI HQ, York:

Tel: 01904 455174
Fax: 01904 455197
Email: planthealth.info@defra.gsi.gov.uk
Web: www.defra.gov.uk/planth/ph.htm

Or, in Scotland, contact your local SEERAD Area Office or SEERAD HQ, Edinburgh:

Tel: 0131 244 6352
Fax: 0131244 6509/6539
Email: plant.health@scotland.gsi.gov.uk
Web: www.scotland.gov.uk