



Department
for Environment
Food & Rural Affairs

Plant Pest Factsheet

Brown Rot

Ralstonia solanacearum



Fig 1. Cut potato showing brown staining of vascular ring © Fera Science Ltd.

Background

Brown rot is caused by the bacterium *Ralstonia solanacearum* and is a regulated quarantine disease of potato 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. If allowed to become established in potato crops in the UK, the effect on our seed-potato industry could be substantial, especially for exports. It has a wide host range, affecting other crops, ornamental plants and some weed species. 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.

Geographical Distribution

Ralstonia solanacearum is widely distributed in warm temperate areas of the world. Within Europe, there have been sporadic findings in many member states including Belgium, France, Germany, Greece, Hungary, Italy, The Netherlands, Portugal, Slovakia, Spain, and the UK of a variant that tolerates cooler temperatures. In England it has entered certain watercourses, possibly in industrial or municipal effluents containing potato washings, and become established in the weed host, woody nightshade (*Solanum dulcamara*), which commonly grows on riverbanks. This pathogen has quarantine status in Europe and other areas to restrict its spread. There have been occasional, isolated, outbreaks in the UK since 1992, including outbreaks on tomato in 1997-1998; the most recent outbreak on potatoes being in 2010. All except the 2010 outbreak, which was linked to infected imported seed potatoes, have been associated with contaminated water.

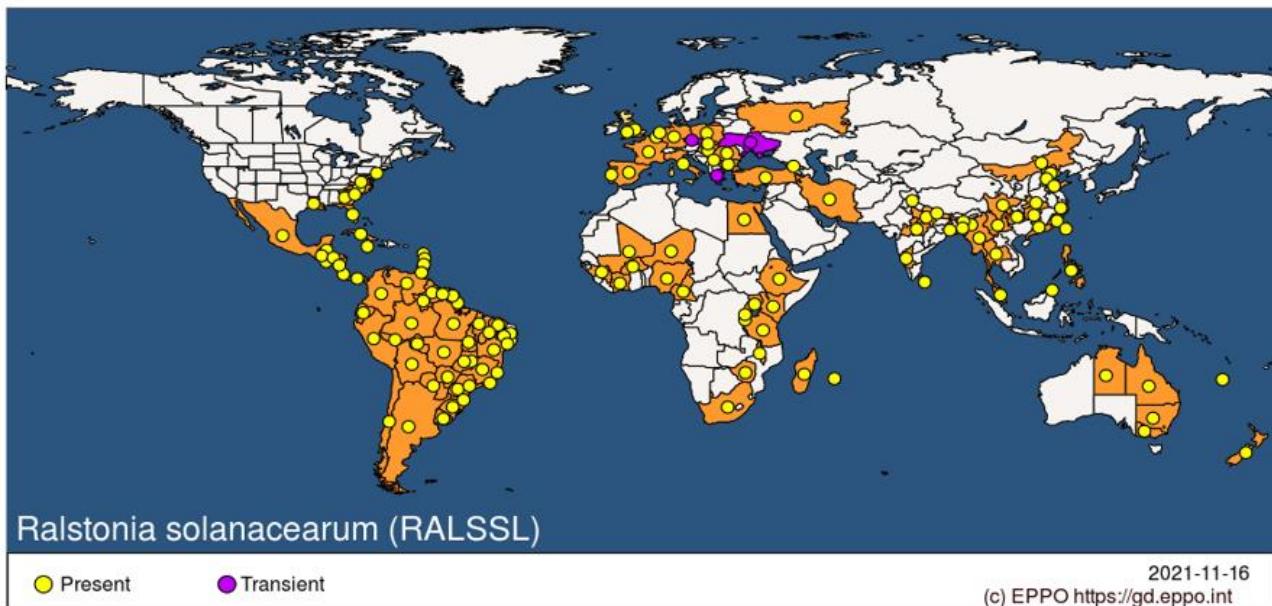


Fig. 2 EPPO map showing distribution of *Ralstonia solanacearum* © EPPO accessed Nov 2021

Host Plants

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 with the lower temperature variant and this has acted as a continuing source of infection in the water. *Ralstonia solanacearum* has been found naturally infecting other weeds, such as black nightshade (*Solanum nigrum*), nettle (*Urtica urens*) and common groundsel (*Senecio vulgaris*). Other crop hosts that are grown in the UK and could be infected in favourable conditions include: cucumber (*Cucumis sativus*), pumpkin and squash (*Cucurbita pepo* and *C. maxima*), common, or French, bean (*Phaseolus vulgaris*), tomato (*Solanum lycopersicum*), and blueberry (*Vaccinium corymbosum*). Numerous ornamental hosts are also susceptible. See <https://gd.eppo.int/taxon/RALSSL/datasheet> for further details.

Description

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



Fig. 3 & 4 The initial symptom is brown staining of the vascular ring (hence the name "brown" rot) which starts from the stolon (heel) end. © Fera Science Ltd.



Fig. 5 & 6 A pale, creamy bacterial exudate may ooze from the cut vascular tissues. © Fera Science Ltd.



Fig. 7 & 8 In severe infections the vascular tissues rot away completely. Bacterial exudate may ooze from the eyes and heel end © Fera Science Ltd.

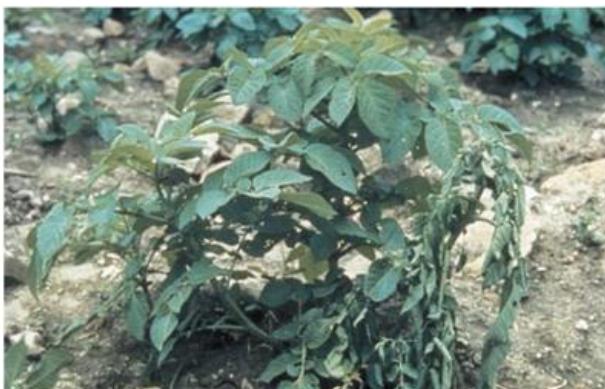


Fig. 9 & 10 Wilting of the leaves starts towards the top of the plant and may be initially confined to one side of a leaf or to only one stem. This can lead to rapid drying and death of the whole plant, although wilting has rarely been observed in European crops. Bacterial exudate also oozes from cut stems of infected plants, as in the tomato stem shown above. © Fera Science Ltd

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

Dispersal and Detection

The most effective means of spread of brown rot worldwide is through distribution and planting of infected seed potatoes.

In England only one outbreak was due to planting infected seed, all other outbreaks were due to waterlogging associated with either irrigation from, or flooding by, infected watercourses.



Fig. 11 Woody nightshade © Fera Science Ltd.

Advisory Information

What is being done to help

Legislation: Importation of material carrying this disease into GB is prohibited under the Plant Health (Amendment etc.) (EU Exit) Regulations 2020 with equivalent requirements for Northern Ireland. There are also specific requirements for potatoes (seed and ware) and for all plants with roots, grown in open air, to mitigate the risk of this disease arriving in the UK. In addition, the potato brown rot contingency plan lays down measures aimed at preventing its spread wherever it is found and, if possible, eradicating it.

Import inspections. Consignments of seed potatoes imported to England and Wales are inspected by the PHSI. Samples are taken for official testing for the disease. Equivalent arrangements apply in Scotland and Northern Ireland.

The Plant Health Service (APHA, Defra and Fera Science Ltd in England and Wales, with equivalents in Scotland and Northern Ireland) carry out official surveillance of potatoes and waterways and are trained in responding to an outbreak of potato brown rot in line with the measures set out in the UK contingency plan.

Import inspections. Consignments of ware potatoes imported to England and Wales are inspected by the PHSI. Samples are taken and tested for the disease at the Fera Science Ltd Laboratory. Equivalent arrangements apply in Scotland and Northern Ireland.

What can you do?

Plant only certified potato seed. All seed potatoes marketed in England and Wales must be classified under the Seed Potato Classification Scheme (SPCS), with similar arrangements elsewhere in UK. When sourcing seed potatoes, source from certified material. From July 2021, you cannot market EU seed potatoes in GB.

Do not be tempted to plant “ware potatoes” (potatoes destined for human consumption) as seed potatoes. Planting non-certified seed potatoes poses a real threat to the UK potato industry. The planting of ware potatoes increases the risk of introducing potato pests and

disease that the UK is currently free from, such as: Ring rot and *Epitrix* potato flea beetles. The accidental introduction of any of these pests and diseases could be disastrous for the UK's potato industry, resulting in yield losses, unmarketability of tubers and possible losses of UK exports.

Control groundkeepers. Potato groundkeepers are a key factor in the long-term survival of the disease. Their control removes an important source of disease inoculum.

Practise good hygiene and biosecurity. Regularly clean and disinfect all machinery, equipment, containers, vehicles, and storage facilities used during potato production.

Do not spread disease. Discarded potatoes and potato processing waste could harbour the disease.

Irrigation. Be aware of restrictions on irrigation from waterways under official control, check with the relevant authorities in your region.

Suspected outbreaks of Brown rot of potato or any other non-native plant pest should be reported to the relevant authority:

For **England and Wales**, contact your local **APHA Plant Health and Seeds Inspector** or the **PHSI Headquarters**, York.

Tel: 0300 1000 313 (please select option 3 when calling)

Email: planhealth.info@apha.gov.uk

For **Scotland**, contact your local **RPID officer**:

Web site: <https://account.ruralpayments.org/publicsite/futures/topics/contact-us/>

Email: potatoexports@sasa.gov.scot

For **Northern Ireland**, contact the **DAERA Plant Health Inspection Branch**:

Tel: 0300 200 7847 Email: planhealth@daera-ni.gov.uk

For additional information on UK Plant Health please see:

<https://secure.fera.defra.gov.uk/phiw/riskRegister/>

<https://planhealthportal.defra.gov.uk/>

<https://www.gov.uk/plant-health-controls>

<http://www.gov.scot/Topics/farmingrural/Agriculture/plant/PlantHealth/PlantDiseases>

[SASA \(Science & Advice for Scottish Agriculture\) | Science & Advice for Scottish Agriculture](#)

<https://www.daera-ni.gov.uk>

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