

Blackleg and Soft Rot

Introduction

A range of bacterial plant pathogens can cause blackleg and soft rot symptoms in potato. *Pectobacterium* spp. and *Dickeya* spp. can both cause tuber rots and haulm symptoms leading to yield losses and losses during storage. Improved understanding of the pathogens which contribute to these problems and correct, careful management of crops and stores can successfully limit or reduce impact of these pathogens where present.

Key Facts

- Several species of *Pectobacterium* and *Dickeya* cause blackleg and tuber soft rot
- In the UK, *Pectobacterium atrosepticum* is by far the most important cause of blackleg
- Other species (*P. carotovorum* subsp. *brasiliensis*, *P. parmentieri*, *Dickeya dianthicola* & *D. solani*) have also been found to cause blackleg in the UK to some extent
- Blackleg symptoms vary according to the prevailing weather conditions rather than the species of bacterium present.
- Hotspots of blackleg are found to occur at different locations each year
- *P. atrosepticum* causes blackleg at lower soil temperatures (<15°C) than other *Pectobacterium* species
- *Dickeya* spp. cause blackleg at higher soil temperatures (>25°C) than *Pectobacterium* spp.
- All *Pectobacterium* and *Dickeya* spp. can survive on harvested tubers during cold storage
- Sources of infection of high grade seed in the first field generation may include neighbouring infected potato crops, crop and weed rhizospheres, waste dumps, insects/nematodes, surface water, wind and rain dispersed aerosols and/or contaminated machinery
- The bacteria can infect growing plants systemically from the mother tuber or plant via the stolon, via wounds, via lenticels or during emergence of root hairs
- All varieties of potato are susceptible, although some seem more tolerant than others
- Blackleg incidence in high grade seed usually increases after each field generation
- Bacterial loading on seed tubers increases after each field generation
- Disease development and severity increases with bacterial loading on seed tubers
- Disease initiates when bacteria multiply to a critical threshold population (quorum sensing ensures that pectic enzymes are induced when the threshold population is reached)
- Bacterial multiplication requires moisture and is temperature dependent
- Wet tubers quickly become anaerobic, lowering plant defences and increasing susceptibility
- Disease incidence and severity increases with temperature and period of tuber wetness
- Irrigation can increase tuber contamination and blackleg disease
- Improved irrigation management and good drainage can reduce blackleg
- Condensation during storage can initiate bacterial multiplication and soft rot initiation.
- Strict temperature control and ventilation with dry air is essential to prevent bacterial multiplication during storage and transit

Symptoms



Blackleg of potato plant stems



Soft rotting of potato tuber