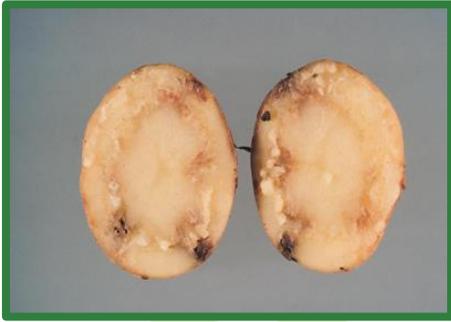


Ring Rot Disease of Potato

Wilt and Ring Rot of Potato is a notifiable bacterial disease.



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Pathogen Description

Clavibacter michiganensis is one species of phyto-pathogenic bacteria divided into 5 sub-species (subsp.). *Clavibacter michiganensis* subsp. *sepedonicus* (*Cms*) causes wilt and ring rot in potato. The bacterium is a gram-positive, non-spore forming actinomycete with rod-shaped cells.

Mode of Infection

The main source of *Cms* infection is from infected tubers which contaminate other tubers via direct contact or the contamination of farm machinery and equipment. Infection is aided by contamination of knives and ant equipment that may wound tubers.

Symptoms

Cms causes wilting, stunting and tuber rot. The effects of the disease on the tubers can be obvious and are shown in the pictures above. Early tuber symptoms are a glassy, water-soaked appearance of the vascular tissues in cut tubers developing to give a pale yellow 'cheese-like' ooze (left). Rotting continues around the vascular ring, tissues darken, tubers breakdown further and internal cracks/hollowing occurs (right). Yellowing, followed by browning can occur during leaf infections. 'Latent' infections of tubers can occur which provides a long-term source of potential re-infection (bacteria are present but not showing disease symptoms).

Disease Spread

Spread from infected plants into progeny tubers occurs through the stolons & lenticels. The disease can spread easily by contact with infected tubers, but also via contaminated equipment used to harvest and grade potatoes. With low humidity and low temperature, the bacteria may remain viable, with the potential to cause surface contamination for several years. Contaminated wash water from infected tuber lots can transmit *Cms* to lots washed in the same water.

Control

There are no effective biological or chemical control methods for the disease, and resistance to the disease in potato stocks has not been found. Control relies upon keeping the pathogen out. It is a quarantine disease and notifiable in the UK.

Seed potatoes must be sourced from certified sources, which employ a zero-tolerance approach to the disease. UK Legislation prevents import of seed potatoes from outside the EU (except Switzerland) and restricts the movement of potatoes for human consumption (ware potatoes) from outside of the EU.

Those sites at which ring rot has been found, are subject to stringent 'clean-up' procedures including incineration or deep burial of infected material and decontamination of machinery using disinfectants. No potato tubers, plants or other potential hosts of the pathogen can be planted until fields are found free of volunteer potato plants for several years.

Detection

Laboratory testing is required to confirm the presence of *Cms* in potato stocks. Sensitive laboratory methods such as indirect fluorescent antibody staining (IFAS), and various DNA-based procedures are used to detect potential contamination. Confirmation requires culturing of the organism, usually via an aubergine bioassay.

Interesting Facts

Cms is regarded as 'absent' from the UK (UK Plant Health Risk Register) but still a major threat as it occurs sporadically across Northern and Eastern Europe and America and the climate would allow *Cms* to establish.

Further Reading

Plant Health description: <http://tinyurl.com/hfj4qrb>