

# The biology and epidemiology of '*Candidatus Liberibacter solanacearum*' and potato phytoplasmas and their contribution to risk management in potato and other crops



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## Research consortium

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## Key outputs and results

- Understanding of Psyllid vectors and their ability to transmit CaLsol
- Detection of CaLsol in seed and its transmission under field conditions
- Real-time PCR assays for the identification of psyllid species
- Evaluation of suction trap networks as a sentinel system for the detection of psyllid vectors
- Distribution of CaLsol in European countries and host range

## Goals

The proteobacterium '*Candidatus Liberibacter solanacearum*' (CaLsol) is an emerging threat to a range of crops most notably potato, tomato, carrot and celery. CaLsol causes zebra chip symptoms in potatoes in the Americas and New Zealand, reducing tuber yield and processing quality (Butler & Trumble, 2012).

Currently there are 5 described CaLsol haplotypes.

Very little is known about the differences between the haplotypes and any host/ vector specialisation, however both examples of transfer from carrot to potato given above involve the local CaLsol haplotype (E in Spain and C in Finland) and vector, suggesting that European haplotypes are capable of infecting both solanaceous and non-solanaceous hosts if a suitable vector is present.

One of the major difficulties in conducting research on CaLsol and phytoplasmas is that they are both obligate pathogens that cannot be cultured. In phytoplasmas, this has been resolved by using alternative hosts, such as periwinkle. However, this may bear little relationship to what happens in natural plant hosts. Currently detection of both pathogens utilises conventional and real-time PCR methods. However, successful detection is challenging, because of the uneven distribution of the pathogen in the plant host and the generally low titre of the pathogen.

For reliable detection, it is therefore important that a sampling protocol is established.