

Background

Phytophthora ramorum is a fungus-like pathogen which causes extensive damage and mortality to a wide range of trees and other plants. Many host species, such as beech, Douglas fir and western hemlock are understood to be terminal hosts, from which the disease cannot reproduce itself. However, some susceptible species including larch, *Rhododendron* spp., and sweet chestnut are *sporulating hosts*, from which the disease spreads by producing water-borne spores from infected foliage.

Sweet chestnut has been commonly found to be infected with *P. ramorum* when in close association with infected larch and rhododendron. However, in 2015 a number of infected sweet chestnut stands were found in locations not containing other known sporulating host species.

Symptoms

There appear to be a variety of symptoms associated with *P. ramorum* infection in sweet chestnut. The most commonly seen symptoms are:

- Crown dieback (generally observed with year on year decline).
- Epicormic growth with symptomatic foliage occurring in abundance low on the stem.
- Foliar symptoms which include wilting, and leaves with 'water-soaked' or discoloured margins, and these often remain attached to epicormic shoots after death. Some leaves may also have blackened petioles, with the discolouration extending up the mid-ribs. These leaves are frequently shed prematurely and can often be seen underneath affected trees.

Foliar symptoms can be observed throughout summer until leaves fall in autumn. (Dieback may also be the result of 'ink disease' which is caused by *Phytophthora cinnamomi* and *Phytophthora cambivora*. Ink disease infects and kills roots of sweet chestnut, turning them an inky black, and sometimes also causing cankers at the base of affected trees.)



A stand of mature sweet chestnut showing crown dieback from *P. ramorum* infection

Phytophthora ramorum in Sweet Chestnut



Severe crown dieback symptoms



Prolific epicormic growth, with brown and wilting hanging foliage



Wilting, 'water-soaked' and discoloured foliage on epicormic shoots.



Underside of leaves, with discoloured midribs



Close-up of infected leaf