

Sudden Oak Death Identification, Biology & Management

Glynn Percival, PhD, Plant Physiology

Phytophthora ramorum the casual organism responsible for Sudden Oak Death (SOD) is a serious fungal pathogen causing damage to trees and a range of ornamental and native plants in California and Oregon, USA and in many European countries to include Belgium, Denmark, France, Germany, the Netherlands and the UK.

In the USA, the disease has reached epidemic proportions especially in California where it is causing the death of hundreds of thousands of trees annually. In the UK, the first findings of SOD were in 2002 on container-grown viburnum plants. Findings on rhododendron and several other shrubs followed. The first tree infection on an American southern red oak tree was reported in October, 2003 in the South of England. SOD has since been identified causing trunk cankers on beech, horse chestnut and Turkey oak. SOD is also responsible for a foliar and shoot-blight on evergreen oak, Turkey oak and sweet chestnut.

The susceptibility of European tree species has not been fully determined. From experimental work, the species at greatest risk in the UK are American northern red oak, Turkey oak, Evergreen oak, European beech, sweet chestnut, Sitka spruce, Douglas fir, and Lawson cypress. The deciduous English and sessile oaks appear more resilient to SOD and consequently considered less at risk.

Symptoms

On trees, SOD can affect just the bark (e.g. beech), or both bark and leaves and shoots (e.g. tan oak in California); it is also possible that some trees may be just leaf hosts (e.g. ash, which has highly susceptible leaves experimentally, but has not yet been found to be a natural host). Bark infections appear most typically as large cankers that have brown to black discoloured outer bark on the lower trunk that seep dark-red sap (commonly called 'bleeding cankers' or 'tarry spots'; Figures 1-2). These cankers most typically occur on the lower portion of the trunk. When the outer bark is removed mottled areas of necrotic, dead and discoloured inner-bark tissue with black 'zone lines' around the edges may be seen. Diseased areas may become colonised by bark beetles. When cankers girdle the trunk, death of the tree occurs resulting in a rapid change in the colour of the foliage. Cankers do not extend

below the soil line and do not appear to infect the roots. Leaf infections most commonly appear as brown necrotic areas, often at the edge or tip of the leaf. However, it is important to emphasise a range of other *Phytophthora* diseases have existed in the UK for many years such as *Phytophthora cinnomomi*, *P.cactorum* and *P.citricola* and can be found on many trees, especially horse chestnut. All these *Phytophthora*'s cause similar disease symptoms to SOD and true identification can only be determined using special laboratory diagnostic equipment.

SOD is thought to be dispersed locally by rain splash, wind-driven rain or irrigation or ground water. Long distance spread may be by movement of contaminated plant material, growing media, and in soil carried on vehicles, machinery, footwear or animals.

Control

Clean footwear, tools, vehicles, machinery and clothing between site visits, in outbreak areas to prevent further spread.

Although a fungicide has been registered to control *Phytophthora* diseases this has not been specifically tested against SOD but is recommended as part of an integrated management strategy.

Suppression of SOD has been achieved under laboratory and landscape conditions using high phosphite compounds as part of a fertilisation regime.

Promote tree health by alleviating soil compaction (air-spading), mulching and appropriate fertilisation

Defra's Plant Health and Seeds Inspectorate and the Forestry Commission are carrying out extensive surveys to check for the presence of the organism. Statutory action is being taken whenever the pathogen is found. Measures include destruction of affected plants, and tracing of related stocks.

***Phytophthora ramorum* is a notifiable pathogen resulting in statutory action to prevent its introduction and spread. Consequently if you suspect the presence of this disease on your premises you should contact your local Defra Plant Health and Seeds Inspector or the PHSI HQ, York. Tel 01904 455174, Fax 01904 455197**



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Figures 1-2: Symptoms of SOD on tree trunks

