

Threats to Trees in the UK

Oak Trees at risk

The Oak tree has a proud place in English countryside, and has been valued for centuries. Recently there have been a number of concerns raised about the health of this prominent tree due to new diseases and pests targeting them. The risk of losing oaks could have a serious knock-on effect on woodland ecosystems, as oak trees do have a very large associated number of specialist insects; and provide a good habitat for a wide range of lichen and fungi.

Because they grow to such a large size over such a long period of time, each oak tree can have a number of dead branches, and start to rot on the inside but still remain in reasonably good health. This means that there is an incredible range of different micro-habitats on a single tree - from the cracks in the bark to holes in the trunk; making old oaks one of the most important of our veteran trees.

One of the UK's chief tree experts has recently commented that the future well-being of the UK's oak trees could be at a crossroads. Keith Kirby from Natural England reports that oak deaths from pests and diseases in some areas are a growing cause for concern, with some experts even predicting that diseases such as Acute Oak Decline (prevalent in the midlands at the moment) could have a similar impact to Dutch Elm disease.

Phytophthora ramorum and *Phytophthora kernoviae* are strains of a deadly fungal disease (known generally as sudden oak death) that quickly kills trees it infects and can spread over a large area in a short space of time unless strict quarantine measures are put in place.

In recent years, the main concern about this disease has been its spread among commercial stands of Japanese larch, first in south-west England, then in Wales and Northern Ireland.

But, as Dr. Kirby explained, despite the disease's common name - sudden oak death - there have been no recorded cases of an English oak (*Quercus robur*) being infected.

The misnomer is a result of the name travelling across the Atlantic from the US, where the disease does affect a number of native oak species.

There are also other diseases affecting our Oaks at the moment, and Acute Oak Decline (AOD) is one of the most serious, which seem to be caused by a bacterium but requires more research to confirm this

AOD symptoms include "extensive stem bleeding" in which dark fluid seeps from small cracks in the bark and runs down the tree trunk. In early stages of the disease, the health of a tree's canopy does not appear to be affected, but it may become thinner as the tree succumbs to AOD.

Research suggests that the disease becomes established in oak trees more than 50 years old, and the UK's two native species of oak (sessile and pedunculate) - are both susceptible to AOD.

This map shows where symptomatic trees reported to Forest Research have been identified in the last 5 years. The establishment of acute oak decline on a particular site begins with a small

number of trees being affected, followed by a relatively rapid increase in numbers until more than half the oaks on the site can have symptoms of extensive bleeding.

He concluded by saying that there was no need to panic yet but it was uncertain times as far as England's national tree was concerned.

Ash Trees at Risk

It seems as though every year now, a new pest or disease is landing on our shores, and threatening to wipe out different species of tree. Over the last couple of years, we've seen Acute Oak Decline, Sudden Oak Death, the Asian Longhorn Beetle, and *Phytophthora ramorum* to name but a few.

Unfortunately, another one has now gained a foothold in the UK, and it is the turn of the common Ash to be targeted. Chalara ash die-back, caused by the fungus *Chalara fraxinea*, has already wiped out up to 90% of Denmark's Ash trees, and is prevalent across much of Europe.

Distribution of common ash in Europe (blue shading) and date of first confirmed finding of *Chalara fraxinea*.

In February 2012 it was found in a consignment of infected trees sent from a nursery in the Netherlands to a nursery in Buckinghamshire, England. In June 2012 it was found in ash trees planted at a car park in Leicestershire which had been supplied by a nursery in Lincolnshire, and the origins of the disease in this case are being investigated.

However, the disease has not yet been found in the natural or wider environment in Great Britain, that is, outside nurseries and recent plantings.

C. fraxinea is being treated as a quarantine pest under national emergency measures, and it is important that suspected cases of the disease are reported to one of the following organisations:

- Forest Research Disease Diagnostic Advisory Service T: 01420 23000; email: ddas.ah@forestry.gsi.gov.uk
- Forestry Commission Plant Health Service T: 0131 314 6414; email: plant.health@forestry.gsi.gov.uk
- Fera Plant Health and Seeds Inspectorate T: 01904 465625; email: planthealth.info@fera.gsi.gov.uk

It should be noted though, that there are a number of disorders affecting ash trees in Britain that may be mistaken for infection by *Chalara fraxinea*:

- A disorder also known as 'ash dieback' which has been known for many years in Britain and is widespread. Affected trees typically suffer from severe crown dieback but there may be recovery growth in the form of secondary shoots and 'epicormics'.
- Cankers on ash stems can be caused by the common fungal pathogen *Nectria galligena*, and the ash bark beetle *Leperisinus varius* can also cause bark necrosis.

- The activities of the ash bud moth *Prays fraxinella* in spring can also be mistaken for infection by *Chalara fraxinea* as the moth larvae mine into the base of shoots causing them to wilt and die.

Bleeding Canker - Horse Chestnuts

In the past few years, the bacterial pathogen *Pseudomonas syringae* pv. *aesculi* has emerged as a new and virulent agent for this disease in Western Europe. Specific to horse chestnut trees, this pathogen infects the bark (cambium) around the trunk and main branches. As it spreads, it cuts off the water supply to the crown; and when it completely encircles the trunk, the tree will die.

This particular infective agent emerged in the past few years, and has now spread rapidly to infect many trees in Western Europe.

Initially the outbreak was attributed to *Phytophthora*, until DNA tests suggested that a pathovar of *Pseudomonas syringae* was responsible; and this hypothesis was confirmed in 2007.

The disease has risen markedly in the UK since 2003, and now approximately half of all horse chestnuts in Great Britain are affected and showing symptoms to some degree.

Some bleeding cankers on horse chestnuts are caused by fungal pathogens including principally the fungus *Phytophthora*, which was responsible for mass die-off of horse chestnut trees in the 1940s worldwide. Originally contained largely to southern England, this now accounts for 5-10% of bleeding canker on horse chestnuts in the UK.

The first symptom is a sticky liquid oozing from blemishes on the bark of infected trunks. Later, the bark peels away, exposing a characteristically brown-orange stained inner bark below, and the whole tree shows a yellowing of foliage and premature leaf drop. Eventually the crown dies.

Progression is slow, but younger trees can succumb to the disease in just a few years as the smaller diameter of their trunks means that they can be girdled more quickly.

If the outer bark is cut away at the site of a bleeding canker, the discoloured and dying inner bark (which may be purple or brown or orange in colour) often appears mottled or zoned. A well-defined edge between the discoloured inner bark and the white or pinkish healthy areas suggests an infection that has stabilised; a diffuse boundary indicates that the infection is spreading.

There is as yet no tried and tested treatment, and cutting out the infected branches may even be counter-productive. In some cases the disease will stop spreading and the tree will recover—and it is for this reason that experts recommend that infected trees should not be felled at first signs of infection.

In many cases though, the disease will progress and eventually kill the tree, or weaken it to the point that it becomes dangerous and has to be felled.