



UK OAK DOORS

A Guide To:

Tree Diseases

Acute oak decline

AOD (Acute Oak Decline) affects several thousand oak trees, particularly in East Anglia, the Midlands, and The South East. It typically affects trees over 50 years' old, and often causes the death of the tree within four to five years. Although the cause of AOD has not been confirmed, pathogenic bacteria appears to be a key factor in the onset of AOD.

Symptoms:

- *Dark fluid bleeding from cracks in the bark. (right)*
- *Dry, black streaks that occur when the bleeding stops.*
- *Rapid decline of the health of the tree.*



Figure 1

Management:

Since a number of pests and pathogens can cause bleeding, it's important that AOD is diagnosed so that the disease can be properly managed.

Once AOD has been confirmed, details of the affected tree should be reported to:

The Forest Research Tree Health Diagnostic and Advisory Service

Telephone: **01420 23000**

Email: **ddas.ah@forestry.gsi.gov.uk**

If possible, the affected tree should be cordoned off; both for safety and to reduce the risk of spreading the disease to other trees. In some cases it may be necessary to fell and destroy infected trees.

Chalara dieback of ash

Caused by a fungus called *Chalara fraxinea*, Chalara dieback of ash (known also as ash dieback) is a serious disease affecting ash trees. The disease causes crown dieback (dead branch tips in the crown of the tree) and leaf loss. It usually results in the death of the tree.

The disease has caused vast damage to ash trees across the UK and continental Europe, including between 60 to 90 percent of Denmark's ash trees. Although it affects trees of all ages, young ash trees tend to succumb to the effects of the disease much more quickly than older trees.

Symptoms:

- *The main symptom of ash dieback is that the tree has not reached full leaf by mid-June.*



Figure 2

Management:

If disease levels are low, selective thinning of infected tree's branches is recommended. If more than 50% of mature trees in the stand are infected, felling should be considered, since the trees will be producing great numbers of spores, which will be carried in the wind and will infect other trees.

Sweet chestnut blight

Caused by the ascomycete fungus, chestnut blight killed an estimated 3.5 billion trees in eastern USA, during the first half of the 20th Century. The disease has spread steadily throughout Europe, although no outbreak as severe as that seen in the USA has occurred yet.

Symptoms:

- *Wilted branches caused by stem girdling.*
- *Cankers - discoloured areas on the bark. The bark may appear dead.*
- *Orange spores seen within cracks in the bark. (right)*



Figure 3

Management:

Suspected cases should be reported to either:

The Forest Research Tree Health Diagnostic and Advisory Service

Telephone: **01420 23000**

Email: **ddas.ah@forestry.gsi.gov.uk**

The Forestry Commission Plant Health Service

Telephone: **0131 314 6414**

Email: **plant.health@forestry.gsi.gov.uk**

The Fera Plant Health and Seeds Inspectorate

Telephone: **01904 465625**

Email: **planthealth.info@fera.gsi.gov.uk**

The Forest Commission has also issued a Statutory Plant Health Notice, stating that owners of affected trees should remove and destroy them – either by burning or deep onsite burial.

Dothistroma needle blight

Also known as Red Band Needle Blight, DNB is caused by the fungus *Dothistroma septosporum*. Although the disease can be found on many different conifer species, it most commonly affects types of pine trees. DNB causes the tree to weaken and the leaves to thin year on year. It can eventually cause the death of the tree. Trees of any age can be affected. The disease is widespread in the UK – in 2006, 70 percent of inspected trees were found to be infected.

Symptoms:

- *Yellow and tan spots or bands on the tree's needles, which quickly turn red.*
- *Reddish-brown colour at the end of the needles.*



Figure 4

Management:

The Forestry Commission are managing a research programme which includes:

- *Disease surveillance.*
- *Monitoring the extent and severity of the disease.*
- *Increasing our understanding of the disease epidemiology.*
- *Investigating potential management strategies.*

Dutch elm disease

Dutch elm disease is caused by a type of sac fungi, and is spread by the elm bark beetle. The disease is believed to be native to Asia, however it has been introduced to a number of Western countries where it has caused vast devastation.

The disease was first seen in Europe in 1910; its spread was slow and relatively mild, and had almost disappeared by 1940.

In the late 1960s a far stronger strain of the disease arrived in Britain, and has since resulted in the death of more than 25 million UK trees.

Symptoms:

- *Leaves that wilt or turn yellow, then during early summer, turn brown and fall. (right)*
- *Twigs that turn downwards, forming 'shepherd's crooks'.*
- *Dark brown or purple streaks seen under the bark of affected twigs.*



Figure 5

Management:

Upon confirmation of the disease, the tree should be destroyed, usually by burning on site. Many local (UK) authorities have the legal right to inspect and take samples from trees they believe to be infected, and order destruction of the tree/s if the disease is found.

Phytophthora alni

Phytophthora alni is a lethal disease causing root and collar rot, which threatens all species of alders. It was first discovered in the South of Britain in 1993. It is now widespread across Europe, and was recently spotted in North America.

Symptoms:

- *Leaves that are unusually small and yellow, and very sparse. This is most noticeable in summer.*
- *Leaves that fall prematurely.*
- *Dead twigs and branches at the crown of the tree (most common in trees that have been infected for several years).*



Figure 6

Once the last symptom (dead twigs and branches in the crown) appears, most infected trees die very quickly. However chronic forms of the disease can see the tree deteriorate slowly over many years.

Management:

There are currently no requirements to report cases of *Phytophthora alni*; however owners of infected trees may want to consider coppicing, which has been shown to help regenerate diseased trees.

Phytophthora austrocedrae

Only found recently for the first time in the UK, *Phytophthora austrocedrae* is a fungus-like plant pathogen which can cause a fatal disease in the trees it infects. So far the pathogen has had limited impact in the UK, however it is a potentially serious threat to the rare Upper Teesdale juniper.

Symptoms:

- *Dying or dead foliage. (right)*
- *Stem lesions.*
- *Collar lesions.*
- *Phloem necrosis – visible by removing the outer bark, the phloem will be disintegrated and brown in colour.*



Figure 7

Management:

Trials are currently being carried out to establish if removal of infected plants may slow or stop the spread of the disease; however there are no conclusive results as yet. It is possible that disturbing the soil might actually help spread the pathogen further.

Phytophthora lateralis

Phytophthora lateralis is a pathogen most known for attacking and killing the roots of trees. However aerial infections which affect branches and foliage do occur.

The disease was first discovered in North American around 1923. Outbreaks have since been reported in France, and the Netherlands, but have been eradicated. The disease wasn't seen in the UK until 2010.

Phytophthora lateralis spreads when *P. lateralis* spores are present in soil or water, and come into contact with tree roots. When an infected tree is planted, the disease is introduced to a new site and the spores can spread via water or footwear.

Symptoms:

- *Leaves that turn pale green, then later, reddish-brown.*
- *Dead phloem – visible by removing the outer bark.*
- *Girdling of the tree trunk.*



Figure 8

Diagnosis can be confirmed using a lateral flow device (LFD).

Management:

In nurseries, drenching the soil can remove *P. lateralis* spores, however in larger areas this is unlikely to have much impact.

Currently, infected trees are felled and destroyed. If possible, disinfectant mats are used at the entrance to public sites, which should be used by visitors to kill any spores that may be on their footwear.

If you have a confirmed case of an infected tree on private land, consult an arborist.

Phytophthora ramorum

Phytophthora ramorum (also known as Ramorum disease) is a pathogen which causes great damage and death to a wide range of trees and plants. In the USA the disease is often referred to as Sudden Oak Death, due to its effect on native species of oak. However the disease has so far had little effect on British oak trees.

The disease was first spotted in the UK in 2002, at a Sussex garden centre. Very few trees were diagnosed with Ramorum until 2009, when it was determined as being responsible for the deaths of large numbers of Japanese larch trees.

Symptoms:

- *Lesions which bleed fluid.*
- *Discoloured and dying bark, beneath the bleeding. (right)*
- *Wilting foliage, or blackened needles.*
- *Resinous cankers.*



Figure 9

Management:

Although some fungicides can reduce the symptoms of *Phytophthora ramorum*, no cure has yet been found. Due to the severity of the disease, infected trees should be felled.

Image credits

Figure 1

http://commons.wikimedia.org/wiki/File:Sudden_Oak_Death.jpg#mediaviewer/File:Sudden_Oak_Death.jpg

Image: Inbreeding damage on Allium porrum - http://commons.wikimedia.org/wiki/Commons:GNU_Free_Documentation_License_1.2

Figure 2

http://upload.wikimedia.org/wikipedia/commons/9/97/Chalara_ash_dieback_-_symptoms_-_29.jpg

Courtesy The Food and Environment Research Agency (Fera), Crown Copyright

Figure 3

http://commons.wikimedia.org/wiki/File:Chestnut_blight_on_tree_in_Adams_County_Ohio.jpg#mediaviewer/File:Chestnut_blight_on_tree_in_Adams_County_Ohio.jpg

Image By Claudette Hoffman (Own work) [CC-BY-SA-3.0 (<http://creativecommons.org/licenses/by-sa/3.0/>) or GFDL (<http://www.gnu.org/copyleft/fdl.html>)], via Wikimedia Commons

Figure 4

http://commons.wikimedia.org/wiki/File:2013_03_14_Brno_9999_50.JPG#mediaviewer/File:2013_03_14_Brno_9999_50.JPG

By I.Sáček, senior (Own work) [CC0], via Wikimedia Commons

Figure 5

http://commons.wikimedia.org/wiki/File%3ADavid_Elm_with_DED_2.jpg

By User:Gerhard Elsner (Own work) [GFDL (<http://www.gnu.org/copyleft/fdl.html>) or CC-BY-SA-3.0 (<http://creativecommons.org/licenses/by-sa/3.0/>)], via Wikimedia Commons

Figure 6

<http://commons.wikimedia.org/wiki/File%3AErlensterben.jpg>

By User:Gerhard Elsner (Own work) [GFDL (<http://www.gnu.org/copyleft/fdl.html>) or CC-BY-SA-3.0 (<http://creativecommons.org/licenses/by-sa/3.0/>)], via Wikimedia Commons

Figure 7

<http://commons.wikimedia.org/wiki/File%3AEImphloemnecrosis.jpg>

By Pennsylvania Department of Conservation and Natural Resources [CC-BY-3.0 (<http://creativecommons.org/licenses/by/3.0/>)], via Wikimedia Commons

Figure 8

http://commons.wikimedia.org/wiki/File%3AChamaecyparis_lawsoniana_Phytophthora.jpg

By US Forest Service Dorena Genetic Resource Center [Public domain], via Wikimedia Commons

Figure 9

http://commons.wikimedia.org/wiki/File%3ASudden_oak_death_IMG_0223.JPG

By Hemhem20X6 at en.wikipedia [Public domain], from Wikimedia Commons