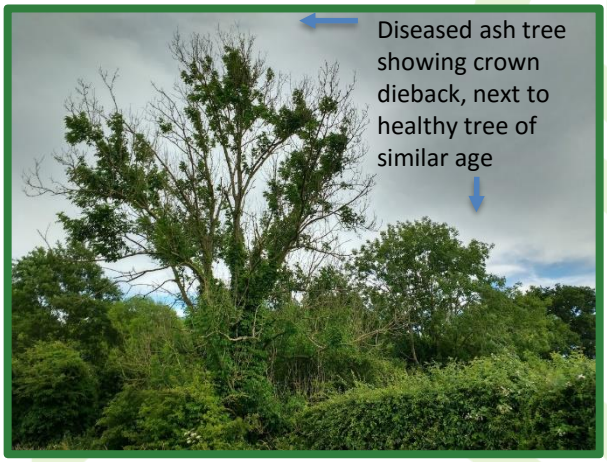
Chalara Ash Dieback

Ash Dieback is a lethal fungal disease of European and narrow-leaved ash trees, which appears impossible to control.



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Pathogen Description

The fungus *Hymenoscyphus fraxineus* causes ash dieback (it was previously known as *Chalara fraxinea,* hence its common name). The fungus grows in infected trees, attacking the bark and girdling twigs and branches. Reproduction happens sexually, occurring on infected rachises, or stalks, of the previous year's fallen leaves.

Mode of Infection

The fungus causes leaf loss, crown dieback and bark lesions in infected trees, eventually leading to death. Necrotic lesions (browning) occur on leaves, twigs and stems, eventually leading to wilting and dieback of girdled shoots. Bark lesions are characterized by a dark- to cinnamon-brown discoloration.

Symptoms

Ash dieback can affect young saplings and mature trees, although symptoms may take longer to develop in older trees. Leaves become infected in late summer with infection from airborne fungal spores (called ascospores). These are produced by apothecia (tiny mushroom-like structures, 3-5 mm diameter, RH picture above) found on the previous year's leaf litter. The spores produce a glue-like substance to stick to the leaf surface and penetrate the leaf from a swollen hyphal tip (an appressorium). The disease spreads through leaf veins and into the rachis and the petiole leading to wilting and leaf drop. Direct infection of the rachis has also been reported.

Disease Spread

The disease was first found in the UK in 2012 via importation of contaminated young trees. Natural woodlands in eastern England have been infected by airborne spores from mainland Europe.

Control

There is no known control method for ash dieback at present. Once infected, trees can't be cured. Not all trees die of the infection; some are likely to have genetic factors giving them resistance to the disease. These need to be monitored and preserved.

It is estimated that 95% of ash trees may die from this disease impacting heavily on biodiversity and the appearance of the natural landscape.

Detection

Scientists rely upon visual identification in the first instance to detect the disease, with symptoms often developing quite rapidly. Suspected cases may be reported using Treealert which helps build up a picture of the extent of the disease in the UK (https://treealert.forestry.gov.uk). These cases are investigated further by Plant Health Inspectors using DNA-based identification methods.

Interesting Facts

The fungus causing ash dieback is treated as a quarantine organism under national emergency measures. It is the only fungus to have caused a meeting of COBRA (the government's national emergency committee). A Plant Health Order prohibits all imports of ash seeds, plants and trees, and all internal movement of ash seeds, plants and trees and some wood.

Further reading

http://nornex.co.uk

http://www.forestry.gov.uk/pdf/National_Chalara_leaflet_Feb_2016.pdf