

# Chalara dieback of ash

Symptoms associated with **Chalara dieback** of ash (1–7)



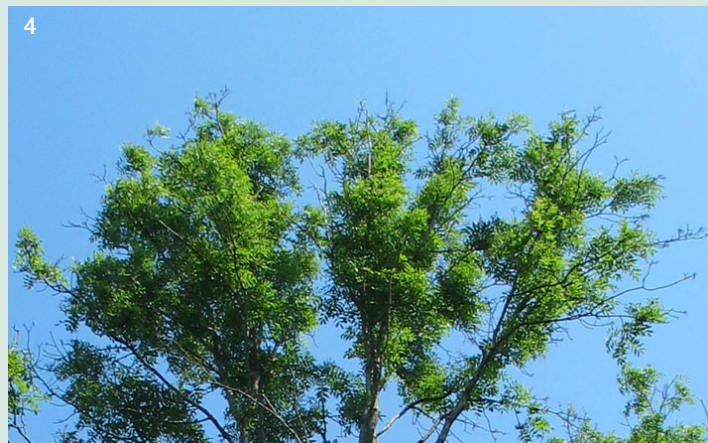
1  
Diseased saplings typically display dead tops and/or side shoots.



2  
At the base of dead side shoots, lesions can often be found on the subtending branch or stem.



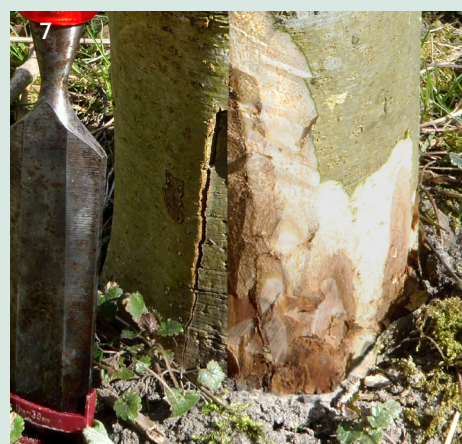
3  
Lesions which girdle the branch or stem can cause wilting of the foliage above.



4  
Mature trees affected by the disease initially display dieback of the shoots and twigs at the periphery of their crowns. Dense clumps of foliage may be seen further back on branches where recovery shoots are produced.



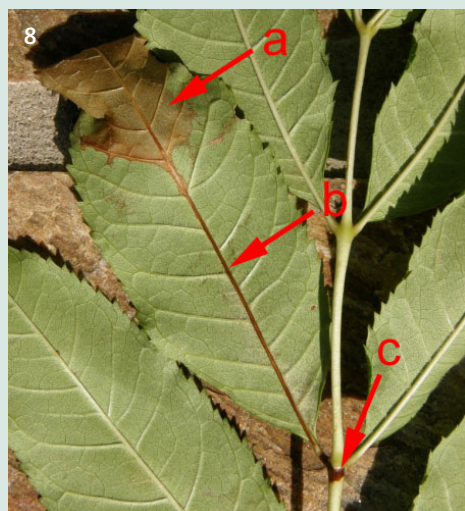
6  
In late summer and early autumn (July to October), small white fruiting bodies can be found on blackened rachises (leaf stalks) of ash in damp areas of leaf litter beneath trees. These do not necessarily belong to the pathogen but can be tested to determine their identity.



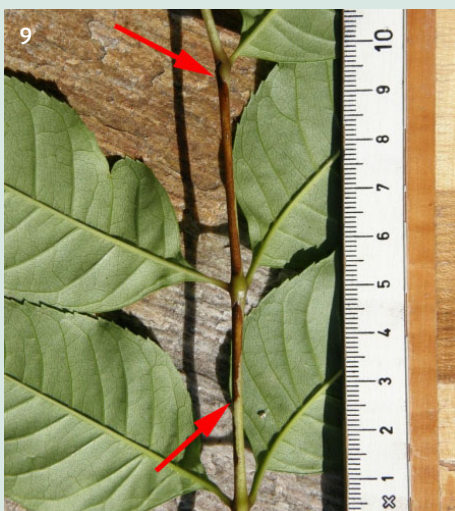
7  
If the disease is well established, some trees may have tongues of bark killed by *C. fraxinea* at the base of their stems.



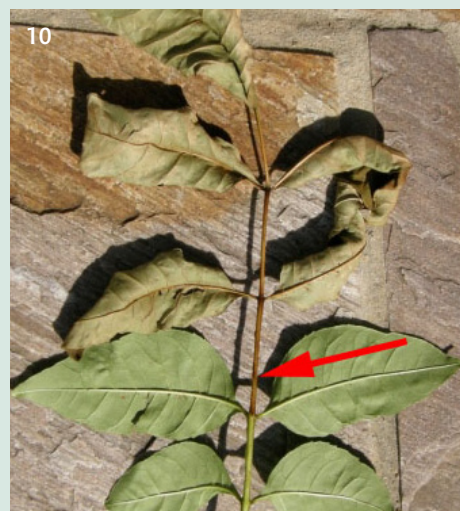
## Symptoms associated with **Chalara dieback** of ash (8–16)



Leaf necrosis (a) extending into leaflet vein (b) and leaf stalk (c).



Lesion on leaf stalk (ends arrowed) without leaflet symptoms.



Necrosis of leaf stalk (arrowed) and associated desiccation of leaflets.



Developing lesions associated with former insertion points of leaf stalks.



Older lesion associated with former insertion point of leaf stalk.



Developing lesion centred on a dead side shoot.



Older lesion centred on a dead side shoot.



Old lesion centred on a dead side shoot.



The wood and pith underlying bark lesions is usually strongly stained.



## Symptoms associated with **other disorders** of ash (17–24)



Browning of leaves is also caused by the activity of mining insects. When held up to the light, the browned area is translucent but includes darker regions of frass material excreted by the insect larva which has caused the damage; the larva itself can sometimes be seen moving within the mined area.



Insect damage may also account for failure of ash buds to flush, or production of weak shoots which shrivel after flushing. When cut open with a knife, unflushed buds damaged by insects are found to have no contents and wilted shoots are hollowed out at their bases.



On young ash, cankers on shoots may be formed by the fungus *Phoma exigua* – the bark within these cankers often has a shredded appearance and fruiting bodies of the pathogen may be evident in the form of small 'pimples' on the surface of the dead bark.



## Symptoms associated with **other disorders** of ash (25–29)



Cankers on the stems of larger trees with a roughened or target-like appearance are generally due to infection by the fungal pathogen *Nectria galligena*.



Irregular roughening of the bark, which can sometimes be extreme, can result from infection by the bacterial pathogen *Pseudomonas savastanoi*.



In established woodlands, death of bark at the base of ash stems may be due to infection by honey fungus (*Armillaria mellea*). The fungus only produces fruiting bodies occasionally but typically forms a leathery mycelial fan beneath the bark which can be revealed by cutting down to the underlying wood.



### Notes

Dark staining of the wood and pith associated with stem lesions (photo 16) is a good indication of *Chalara* infection, particularly when stain is present in the wood beyond the obvious limits of bark killing.

Symptoms of *Chalara* infection of the foliage (photos 8 to 10) develop during the late summer and autumn following infection of leaves by spores of the pathogen earlier in the year. Browning of leaves in the spring and early summer is very unlikely to be associated with *Chalara* dieback of ash and is frequently the result of insect damage (photos 19 to 21).