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## Arboriculture Research Note

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### Fireblight of Ornamental Trees and Shrubs

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#### Summary

Fireblight is a disease caused by the bacterium *Erwinia amylovora*. It affects Rosaceous trees and shrubs with apple-like fruits, principally *Malus*, *Pyrus*, *Crataegus*, *Sorbus*, *Cotoneaster*, *Pyracantha* and *Photinia* (syn. *Stranvaesia*) species. Symptoms ??? then browning of leaves and dieback of shoots and a reddish brown stain in the cambium. Direct control measures involve cutting out and burning affected plant parts. Susceptible and resistant species are listed.

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#### Introduction

1. Fireblight is caused by the bacterium *Erwinia amylovora*, which attacks some trees and shrubs in the Rose family (*Rosaceae*). Since the disease was first recorded on pear trees in Kent in 1957 it has spread slowly to affect most areas of England and Wales and has continued to spread northwards. Fireblight occurs in many countries which export susceptible tree and shrub nursery stock to the UK and this potentially important source of infection should not be ignored.

#### Susceptible Plants

2. Fireblight affects only plants with the sub-family *Pomoideae* (plants with apple-like fruits) of the family *Rosaceae*. Some 180 species and varieties are susceptible to the disease, but serious damage to ornamentals is most often encountered on Whitebeam (*Sorbus aria*), cotoneaster (particularly the larger-leaved species) and pyracantha. Less frequent damage occurs on flowering pears (*Pyrus* spp.), apples (*Malus* spp.) and quinces (*Chaenomeles* species), hawthorns and other *Crataegus* species, rowan (*Sorbus aucuparia*) and *Stranvaesia* (now included in *Photinia*) species. Hawthorn and cotoneaster harbour the bacterium over winter and are therefore particularly important sources of fireblight inoculum. The disease does not appear to have been found on Swedish Whitebeam (*Sorbus intermedia*), *Sorbus decora* or *S. latifolia*, and it does not affect Rosaceous plants in the other sub families such as cherries and plums (*Prunus* species).
3. In ornamental species the disease is probably responsible for the dieback of a few flowers and twigs or death of a few trees and shrubs every year. More severe outbreaks occur locally but sporadically, with severity of the damage depending both on the weather and on the plant species involved.
4. Heavy losses of fruit crops can occur in apple or pear orchards as a result of both the disease and the severe surgery required to limit its spread.
5. In nurseries, the small plants are readily killed; the damage to infected survivors may render them unsaleable, or, if infected plants are sold, the disease will be introduced to the planting site. For this reason incidents of the disease on registered premises are notifiable and the destruction of any plants showing symptoms is required (see para 12).

#### Symptoms

6. Symptoms are more obvious between June and September. Look for:-

- Wilting or dead blossoms, or numerous dark brown, dead leaves hanging on a branch (these may remain on diseased branches during winter).
- Rapid die-back of shoots.
- Dark green or brown on young shoots, often looking water-soaked and contrasting with the normal healthy bark.
- Reddish-brown stained inner bark and cambium (tissue between the bark and wood) in affected shoots. The bacterium may spread from a branch and girdle the main stem. In this case, part or all of the crown will wilt and die but the cambial stain will be absent from all but the directly infested parts.
- A glistening whitish slime or mucilage exuding from affected tissues during warm, humid weather.
- Bark cankers (these are not always present).

### **Infection and spread**

7. Infection most often occurs through the floral nectarines but it can occur through other natural openings in the plant such as lenticels, and through fresh bark wounds or pruning cuts. The bacteria spread rapidly through and kill the phloem and cambium.
8. The bacterium is usually spread from a diseased tree or shrub growing close by. Most often it is introduced to the plant by insects, especially the larger pollinating species, but sometimes by wind, rain, birds or on pruning implements.
9. In spring the infective bacterial slime (a mucilage consisting of myriads of bacterial cells) oozes from bark infected the previous year. This slime may be produced throughout the summer, especially in warm, wet weather.

### **Avoidance**

10. In areas where fireblight is a recurrent problem, consider the use of resistant species showing the Appendix or use non-susceptible trees and shrubs.
11. In the southern half of Great Britain do not plant large numbers of the more susceptible species in any one place or rely exclusively on these in any small ornamental plant scheme.

### **Control**

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| <ol style="list-style-type: none"> <li>12. In 1993, fireblight ceased to be a notifiable disease except where it occurs on premises registered for trade under the Plant Health (Great Britain) Order 1993 or in the associated 'buffer zones'. This legislation also requires that fireblight susceptible plants sent to certain fireblight-free regions ('protected zones') in the European Community originate on registered premises (within a buffer zone) or from other fireblight 'protected zones'. Fireblight protected zones in the UK are Northern Island, The Channel Islands and the Isle of Man.</li> <li>13. Detailed information is available from, and notifiable cases of the disease should be reported to plant health inspectors of the Ministry of Agriculture, Fisheries &amp; Food or those of the Departments of Agriculture of the Scottish or Welsh Offices, or the Department of Agriculture, Northern Ireland.</li> </ol> |
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14. The risk of infection may be minimised by:
  - Specifying that nursery stock is to be disease free, checking on delivery of symptoms of fireblight, and rejecting infected plants.
  - Trimming hawthorn hedges or other vulnerable plants to reduce flowering in order to reduce local build-up of the disease.
  - Inspecting plants regularly during the growing season for symptoms of fireblight.

15. If fireblight is confirmed, infected tissue should be removed and disposed of safely. This will reduce the risk of the disease spreading to neighbouring trees and shrubs and may save the infected plant itself. This should be done by:
- Cutting out infected branches and shoots 30-60cm below the leading edge of the diseases tissue, i.e. below the lowest extent of the stained inner bark. Between each cut disinfect pruning implements by rinsing in a 3% solution of Lysol, Clearsol or Sudol in water, or in a solution of seven parts methylated spirit to three parts water.
  - Grubbing out the whole plant if the inner bark of the main stem is stained.
  - Burning or burying all the diseased plant material.

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