Xylella fastidiosa

PLANT DISEASE FACTSHEET

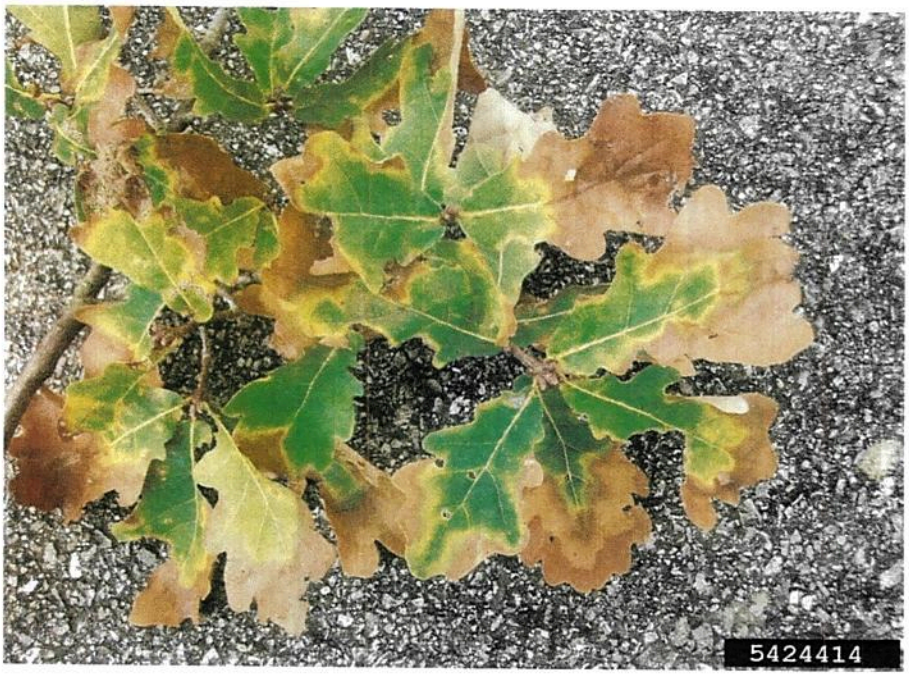

Figure 1. Bacterial leaf scorch of Oak (*Quercus robur*)
© John Hartman, University of Kentucky (Bugwood/ Forestry Images images)

Background

This bacterial pathogen colonises xylem vessels and when these become blocked by bacterial polymers disease symptoms are produced, which include wilts, diebacks, stunts and leaf scorches. The bacterium is spread through xylem feeding insects notably leaf hoppers and sharp shooters. In 2013, the first occurrence of the pathogen in Europe was reported from southern Italy where olive, almond and oleander have been affected (Saponi *et al.*, 2013; EPPO special alert 2013; and EFSA Rapid Assessment, 2013). It is difficult to predict the outcome of this introduction in Europe at this early stage and much will depend on the efficiency of vector transmission and the properties of the specific invasive strain. The purpose of this fact sheet is to raise awareness of the threat and provide specialists with information to assist in early detection of the pathogen should it enter the UK. This factsheet will be updated when more information on the outbreak becomes available.

Geographical distribution

Before the current outbreak in southern Italy, the pathogen was restricted to the Americas with the exception of a single outbreak affecting pear in Taiwan. Within the Americas some subspecies of the pathogen are restricted to tropical and subtropical regions including Argentina, Brazil, Costa Rica, Mexico, Paraguay and mostly southern states in the USA. *Xylella fastidiosa* subsp. *multiplex* however, has a more northerly range and affects broad-leaved trees up to New York (Gould, 2004, 2013) and there has been a single report of the pathogen in southern Canada (Goodwin & Zhang, 1997).

fera
The Food and Environment Research Agency

Symptoms and Diseases

In hot climates the pathogen causes several important diseases which have been described by Janse & Obradovic (2010). Pierce's disease of grapevine is characterised by leaf necrosis and scorch symptoms which may progress to defoliation, shoot shortening and dehydration of fruit clusters. The vines may become stunted unproductive and can eventually be killed. The symptoms of peach phoney disease (which may affect both the roots and aerial parts of the plant) include early blooming and abnormally long retention of leaves and flowers. Twigs may become shortened with increased lateral branching and fruit production is severely impaired.

Leaf scorch diseases of broadleaved trees (caused by *X. fastidiosa* subsp. *multiplex*) can be rather non-specific and so are easily confused with other conditions which elicit wilt and leaf dehydration. However, a narrow band of discolouration may be evident at the boundary between the desiccated tissue and the non-affected parts of the leaf (Figs. 1-3). Premature leaf abscission, most commonly observed late in the season is also characteristic. Leaf scorches progress to affect the appearance of the whole tree (Figs. 4 and 5). The caption in Fig. 5 provides further details of the progression of leaf scald disease in the tree canopy of the American sycamore *Platanus occidentalis*.

Host Plants and Potential Impacts

More than 150 host plants have been found to be infected with the bacterium, although in most of these hosts no symptoms are produced and the host does not become systemically infected. However, wild herbaceous plants may potentially become disease reservoirs even though infections may be symptomless. It is difficult to predict which UK plants could be vulnerable to infection should the pathogen become established in Europe. Leaf scorches have caused significant disease to broad leaved trees in north east USA, especially to urban plantations of red oak species, *Ulmus americana* and *P. occidentalis* (Gould, 2004; Lashomb, 2002). Symptom progression in trees is usually slow taking several seasons to reduce the structural integrity of larger branches. Disease incidence is highly sporadic and often trees surrounding a severely affected tree may remain free of disease. However, significant reduction in amenity value and economic losses associated with tree pruning, to avoid hazard and potential litigation has occurred in the New Jersey region, where up to 35% of urban plantings were affected (Gould, 2013). It is possible that broadleaved trees may be vulnerable to the pathogen in the UK, however, the likely hosts are very difficult to predict and the presence of the pathogen in other hosts with unusual symptoms should be considered.

Figure 2. Bacterial leaf scorch of *Acer negunda*
© John Hartman, University of Kentucky (Bugwood/ Forestry Images images).

Figure 3. Bacterial leaf scorch of *Celtis occidentalis*
© John Hartman, University of Kentucky (Bugwood/ Forestry Images images).

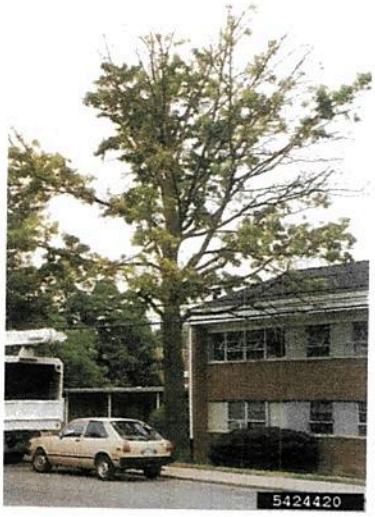

Figure 4. Bacterial leaf scorch of Pin oak *Quercus palustris*
© John Hartman, University of Kentucky (Bugwood/ Forestry Images Images).

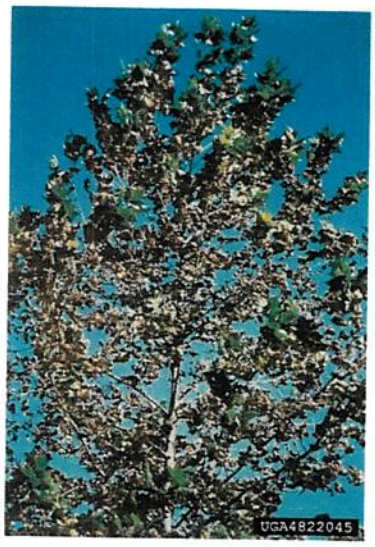

Figure 5. Bacterial leaf scorch of American sycamore (*Platanus occidentalis*). "Symptoms characteristically develop from bottom of the tree upward and inside of crown outward. Older leaves will have a "scorched" curled appearance while younger leaves at branch tips will appear healthy". © Edward L. Barnard, Florida Department of Agriculture and Consumer Services. (Bugwood/Forestry Images images).

Advisory Information

Suspected outbreaks of *Xylella fastidiosa* or any other non-native plant pest should be reported to your local Fera Plant Health and Seeds Inspector, or
Tel: 01904 465625
Email: planthealth.info@fera.gsi.gov.uk
Web: www.defra.gov.uk/fera/plants/plantHealth

Author

Neil Parkinson
The Food and Environment Research Agency (Fera). July 2014

References

EFSA (2013) Rapid risk assessment available at: (http://www.efsa.europa.eu/en/efsajournal/pub/3468.htm).
EPPO (2013) First report of *Xylella fastidiosa* in the Eppo region. Available at: www.eppo.int/QUARANTINE/special_topics/Xylella_fastidiosa/Xylella_fastidiosa.htm
Gould AB, Hamilton G, Vodak M, Grabosky J, Lashomb J (2004) Bacterial leaf scorch of oak in New Jersey: Incidence and economic impact. *Phytopathology* **94**: S36-S36.
Gould A, Hamilton G, Vodak M, Grabosky J, Lashomb J (2013) American Phytopathological Society (APS) MSA Joint Meeting August 10-14 Austin, Texas.
Janse JD, Obradovic A (2010) Xylella fastidiosa: its biology, diagnosis, control and risks. *Journal of Plant Pathology* **92**: S1.35-S31.48.
Lashomb J, Gould A, Iskra A, Hamilton G (2002) Conference paper. Bacterial leaf scorch of amenity trees: a wide-spread problem of economic significance to the urban forest. September 11-12, 2001. Rutgers University, Cook College. Available at: http://na.fs.fed.us/pubs/tps/bls/bls_amenity_trees.pdf
Saponari M, Boscia F, Nigro F, Martelli GP (2013) Identification of DNA sequences related to *Xylella fastidiosa* in oleander, almond and olive trees exhibiting leaf scorch symptoms in Apulia (Southern Italy). *Journal of Plant Pathology* **95**: 659-668.