Department for Environment Food & Rural Affairs

Plant Pest Factsheet

Xylella fastidiosa

Figure 1. *Polygala myrtifolia* infected by *X. fastidiosa* subsp. *multiplex* in Corsica. Photo: Bruno Legendre, Anses Plant Health Laboratory, Angers (FR)

Figure 2. Bacterial leaf scorch of Oak (*Quercus robur*). Photo: John Hartman, University of Kentucky (Bugwood/ Forestry Images images)

Background

The bacterial pathogen, *Xylella fastidiosa*, colonises xylem vessels; and when the vessels become blocked, disease symptoms are produced, which include wilts, diebacks, stunts and leaf scorches. The bacterium is spread by xylem feeding insects, such as the meadow spittlebug (*Philaenus spumarius*), a very common species in the UK and Europe. There are four accepted subspecies of the bacterium: subspecies *fastidiosa*, ssp. *pauca*, ssp. *multiplex*, and ssp. *sandyi*. These have different host ranges. The pathogen was first confirmed in Europe in 2013 (and identified as a new strain related to the subspecies *pauca*) from Puglia in southern Italy where it has devastated olive plantations. In August 2015, outbreaks of the subspecies *multiplex* were confirmed in Corsica, causing extensive damage to *Polygala myrtifolia* (milkwort) (Fig. 1) and *Spartium junceum* (Spanish broom), and since then it has also been found in mainland France. In 2016 *Xylell*a was detected in Spain for the first time, in nursery stock on the Balearic Islands, and three subspecies have since been identified on a range of hosts in the islands. In 2017 the first finding in mainland Spain was confirmed, of subspecies *multiplex* in *Prunus dulcis*, in Alicante. The purpose of this factsheet is to raise awareness of the threat and to assist in the early detection of the pathogen should it enter the UK.

A pest risk analysis is available online at:
https://secure.fera.defra.gov.uk/phiw/riskRegister/downloadExternalPra.cfm?id=3843

Geographical Distribution

Before the current outbreaks in Europe, 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* ssp. *multiplex*, however, has a more northerly range and affects broad-leaved trees up to New York and there has been an isolated, unconfirmed report in southern Canada.

Host Plants

More than 150 host plants have been found to be infected with the various subspecies and strains of *Xylella fastidiosa*, although in many hosts, infections do not become systemic and so no symptoms are produced. Woody perennial plants (e.g. grapevine, olive, oleander, *Citrus*, coffee, *Prunus* spp. and hardwood trees) can be vulnerable to damage if vectors are present to spread the pathogen. Herbaceous plants growing in the environment may become disease reservoirs even though infections may be symptomless. It is difficult to predict which UK plant hosts could be vulnerable to infection. Leaf scorches have caused significant harm to broad leaved trees in north east USA, especially to urban plantations of red oak species, *Ulmus americana* (American elm) and *Platanus occidentalis* (American sycamore). Some species of broadleaved trees may be vulnerable to the pathogen in the UK depending on the presence of vectors and climatic suitability (see PRA).

Symptoms

Leaf scorch symptoms (see Figures 2, 3 and 4) can be non-specific and confused with many other diseases, pests or abiotic factors which elicit wilt and leaf dehydration. 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 and unproductive, and may eventually be killed. The symptoms of peach phony disease include early blooming and abnormally long retention of leaves and flowers. Twigs may become shortened with increased lateral branching, severely impairing fruit production. 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. Premature leaf abscission, most commonly observed late in the season is also characteristic. Leaf scorch can eventually affect the appearance of the whole tree (Figs. 1, 5 and 6). The caption in Fig. 6 provides further details of the progression of leaf scald disease in the tree canopy of *Platanus occidentalis* (American sycamore).

Figure 3. Bacterial leaf scorch of *Acer negundo*. Photo: John Hartman, University of Kentucky (Bugwood/ Forestry Images images).

Figure 4. Bacterial leaf scorch of *Celtis occidentalis.* Photo: John Hartman, University of Kentucky (Bugwood/ Forestry Images images).

Figure 5. Bacterial leaf scorch of Pin oak *Quercus palustris*.
Photo; John Hartman, University of Kentucky (Bugwood/ Forestry Images Images).

Figure 6. Bacterial leaf scorch of American sycamore (*Platanus occidentalis*). Photo: Edward L. Barnard, Florida Department of Agriculture and Consumer Services (Bugwood/Forestry Images images). *The following caption is provided: ''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''.*

Dispersal and Detection

Natural dissemination occurs through vectors such as leafhoppers, which often only fly short distances, though these distances can be increased in windy conditions. The pathogen is maintained in the gut of the vector and adults need to feed on infected plants in order to acquire and transmit the pathogen. Vectors are not active in winter months.

Movement of plants for planting affords an efficient means of disseminating the pathogen over long distances. Isolation and diagnosis of the bacterium can be difficult and take several weeks.

Impacts

Impacts are dependent on the complex interplay between climatic suitability, host susceptibility to the particular subspecies or strain and the presence of vectors. In the Americas, the pathogen is widespread and has caused severe losses to *Citrus*, coffee and grapevine production. Significant damage to the urban tree landscape has occurred in some regions of the USA (caused by subspecies *multiplex*), which have incurred economic costs and reduced the quality of the visual environment and street scene. In the New Jersey region, up to 35% of urban plantings were affected by the pathogen. These chronic infections have been very difficult to control. In Europe, the pathogen has been transmitted by high populations of meadow spittlebug, devastating areas of olive production in the Puglia region of southern Italy.

Advisory Information

Suspected outbreaks of *X. fastidiosa* or any other non-native plant pest should be reported to the relevant local authority:

For **England and Wales**, contact your local **APHA Plant Health and Seeds Inspector** or the **PHSI Headquarters**, Sand Hutton, York. Tel: 01904 405138
Email: planthealth.info@apha.gov.uk

For **Scotland**, contact the **Scottish Government's Horticulture and Marketing Unit:**
Email: hort.marketing@gov.scot

For **Northern Ireland**, contact the **DAERA Plant Health Inspection Branch:**
Tel: 0300 200 7847 Email: planthealth@daera-ni.gov.uk

For additional information on UK Plant Health please see:
https://secure.fera.defra.gov.uk/phiw/riskRegister/
https://planthealthportal.defra.gov.uk/
https://www.gov.uk/plant-health-controls
http://www.gov.scot/Topics/farmingrural/Agriculture/plant/PlantHealth/PlantDiseases
https://www.daera-ni.gov.uk

The Forestry Commision has also produced a Pest Alert for *Xylella fastidiosa* available at:
http://www.forestry.gov.uk/pdf/FCPH-XF.pdf/$FILE/FCPH-XF.pdf

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