



Xylella fastidiosa



Figure 1. Symptoms on cherry. Photo: Donato Boscia, CNR - Institute for Sustainable Plant Protection, UOS, Bari (IT) (EPPO images).



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 two validly published subspecies of the bacterium: subspecies *fastidiosa* and subsp. *multiplex*; other names are widely used but not validly published, such as subsp. *pauca* and subsp. *sandyi*. The association between subspecies and host is complex.

The presence of 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) and *Spartium junceum* (Spanish broom), and since then it has also been found in mainland France in Menton (2016), in Occitanie region (2020) and Var and Alpes-Maritimes (2022). In 2016 *Xylella* 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* (almond), in Alicante. *Xylella fastidiosa* subsp. *fastidiosa* was also found in 2017-2018 on almond in Israel and in 2021 it was confirmed in five commercial vineyards on symptomatic grapevines (*Vitis vinifera*). In Portugal, *Xylella fastidiosa* subsp. *multiplex* was first reported in December 2018 near Porto. There have also been detections in 2018 in the Toscana region, Italy. In 2021 *X. fastidiosa* was found in the Algarve region and near Lisbon, the subspecies are yet to be determined. 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 with supplementary data is available online at:

<https://planthealthportal.defra.gov.uk/pests-and-diseases/uk-plant-health-risk-register/viewPestRisks.cfm?csref=12570&riskId=27924>

Geographical Distribution

Before the current outbreaks in Europe, the pathogen was restricted to the Americas with the exception of a single outbreak 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 two isolated, unconfirmed reports in southern Canada.

Host Plants

Worldwide, more than 300 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 scorch has caused significant harm to broad leaved trees in northeast 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 1, 2, 3 and 4) can be non-specific and confused with many other diseases, pests or abiotic factors which elicit wilt and leaf dehydration. Due to its cryptic past, diseases caused by *Xylella fastidiosa* have been given many names: 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 die. 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.



Figure 3. Pierce's disease: Marginal necrosis and leaf wilting caused by *Xylella fastidiosa* on grapevine leaves. Photo: M. Scortichini, Istituto Sperimentale per la Frutticoltura, Rome (IT). (EPPO images).



Figure 4. Symptoms on *Nerium oleander*. Photo: Donato Boscia, CNR - Institute for Sustainable Plant Protection, UOS, Bari (IT) (EPPO images)



Figure 5. Symptoms of *Xylella fastidiosa* subsp. *multiplex* on *Lavandula x allardi*. Photo; Agnès POIRIER, NPPO of France (EPPO Images).



Figure 6. Infected blueberry plants with yellow stems and 'skeletal' appearance. Photo: Phillip M Brannen, University of Georgia (US) (EPPO images)

Dispersal and Detection

Natural dissemination occurs through vectors such as leafhoppers and froghoppers/spittlebugs, which often only fly short distances, though these distances can be increased in windy conditions. Evidence from Italian outbreaks indicate that there is the possibility of long-distance dispersal of *Xylella*-carrying vectors by “hitchhiking” on vehicles travelling through heavily infected areas. 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 *X. fastidiosa* 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.

Pest Management and reporting

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**, York. Tel: 0300 1000 313 (please select option 3 when calling)
Email: planthealth.info@apha.gov.uk

For **Scotland**:

Contact the local RPID officer if found in agricultural crops

Web: <http://www.gov.scot/Topics/farmingrural/Agriculture/AOcontacts/contacts>

For non-agricultural crops, 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

Web: <https://www.daera-ni.gov.uk/topics/plant-and-tree-health>

For additional information on UK Plant Health please see:

<https://planthealthportal.defra.gov.uk/pests-and-diseases/uk-plant-health-risk-register/>

<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 Commission has also produced a 2015 Pest Alert for *Xylella fastidiosa* available at: <https://www.forestryresearch.gov.uk/publications/xylella-fastidiosa-pest-alert/>

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