Future Threat: *Xylella fastidiosa*

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Summary: *Xylella fastidiosa* is a xylem restricted bacterium transmitted by xylem-sap-feeding insects. European outbreaks confirm *Philaenus spumarius* (meadow spittlebug) is a common vector in Italy and is also present in the UK but differences in climate may change its behaviour and the risk posed. Aphids and leaf hoppers are also known to occasionally feed on xylem sap and could therefore also transmit the bacterium.

Common Names: Bacterial Leaf Scorch (BLS), Pierce's disease of grapevines, oleander leaf scorch, citrus variegated chlorosis disease (CVC), Olive Quick Decline Syndrome

Host: The bacterium has a very wide host range, most notably *Acer rubrum, Catharanthus roseus, Citrus sinensis, Coffea, Morus rubra, Myrtus communis, Nerium oleander, Olea europaea ssp. europaea, Platanus occidentalis, Polygala myrtifolia, Prunus spp., Quercus rubra,*

In 2013, a disease known as bacterial leaf scorch, olive quick decline syndrome and Pierce's disease (*Xylella fastidiosa*) has been discovered spreading through southern Italy, causing major damage to olive production. This bacterial disease can infect a very wide range of hosts. It poses a serious threat to trees common in the UK such as *Acer, Platanus, Prunus*, *Quercus*, and *Ulmus* (maples, planes, cherries, oaks and elms respectively) as well as many others. On these trees, symptoms include peripheral burn of foliage and rapid crown dieback but can vary greatly. This can appear similar to drought, salt, herbicide, root, or canker damage. Due to symptoms varying and overlapping with abiotic and biotic disorders laboratory-based DNA diagnostic techniques are currently the only reliable diagnostic method.

Because this pathogen is not currently in the UK, it is unknown how it will spread here, if it eventually does. Certainly, a great number of potential hosts exist within the UK. *Xylella* generally grows best at 17-23°C (Feil and Purcell 2001) However, the subspecies *multiplex* has been found in areas where temperatures drop to -9°C. Temperature extremes are also likely to be mitigated within the plant increasing the likelihood of the bacteria surviving within the xylem.

Figures 1 and 2 – *Xylella* 'burn' and dieback
Image credit: Gareth Harrier, Bartlett Tree Experts

Xylella is transmitted through xylem feeding insects such as leafhoppers. Meadow spittlebugs have been shown to be key vectors in Italy. It is also present in the UK, although climatic differences may change its behaviour and the risk posed here. Aphids, common on UK trees and shrubs, are classically thought to feed only on phloem sap and thus not likely to transmit *Xylella*; however, some research indicates that aphids do occasionally feed on xylem sap (Pompon, et al. 2010), and therefore could pose some degree of transmission risk.

Xylella is subject to European Union emergency measures any suspected cases should be reported immediately. Once trees are infected control cannot currently be achieved; however, management by following rigorous biosecurity practices (even with no cases in the UK), ensuring any importing of trees is avoided wherever possible or done with adequate levels of care. Reducing the vectors of the disease may reduce local distribution should an outbreak occur but rapid removal of infected trees immediately is typically the main recommendation to reduce the chances of further spread.