



Department
for Environment
Food & Rural Affairs

Plant Pest Factsheet

Bacterial spot and canker of *Prunus*

Xanthomonas arboricola pv. *pruni*



Figure 1. Bacterial leaf spot and shot-holing symptoms on *Prunus laurocerasus* (cherry laurel) caused by *Xanthomonas arboricola* pv. *pruni* (Fera, Crown Copyright ©)

Background

Bacterial spot and canker is a notifiable disease of *Prunus*. Although potentially damaging on all *Prunus* species, the most severely affected stone fruit hosts are peach, apricot and plum. The Sino-Japanese group of plums (*P. japonica* and *P. salicina*) are generally more susceptible than European plums. Although it is not known to occur on stone fruit cultivars in the UK, it has become locally established in several European countries. It was recently found in commercial production of ornamental cherry laurel in Europe, and was found for the first time in the UK on this host in 2013.

The bacterium causes leaf spots and shot-holing of leaves, spotting of fruit and stem cankers. Greatest damage arises from severe defoliation. In the USA, production of Japanese plum trees gradually became uneconomic as leaders died following pathogen invasion and fruits were small and often unmarketable.

Geographical Distribution

It first caused very severe damage in the USA in the early twentieth century and has since been widely reported in both North and South America and many countries in Asia, Australasia and southern Africa. High losses in some years have been reported, especially in peach, apricot and Japanese plum orchards, from USA, Australia (Queensland), New Zealand and South Africa. The pathogen has become locally established in several European countries (Belgium, Bulgaria, Cyprus, France, Germany, Italy, Moldova, Montenegro, Netherlands, Romania, Russia, Slovenia, Spain, Switzerland and Ukraine), although low economic damage has generally been reported.

Host Plants

The known host range of *X. arboricola* pv. *pruni* includes the following *Prunus* species:

- *Prunus armeniaca* (apricot)
- *Prunus avium* (sweet cherry)
- *Prunus cerasus* (sour cherry)
- *Prunus domestica* (plum)
- *Prunus dulcis* (almond)
- *Prunus japonica* (Japanese bush cherry tree)
- *Prunus laurocerasus* (cherry laurel)
- *Prunus mume* (Japanese apricot tree)
- *Prunus persica* (peach)
- *Prunus persica* var. *nucipersica* (nectarine)
- *Prunus salicina* (Japanese plum)

How does it develop and spread?

Infected planting material probably represents the highest risk of introduction and spread of this bacterium. It is not known to occur in UK stone fruit orchards but widespread findings on cherry laurel (*Prunus laurocerasus*) in the Netherlands and Italy, and several outbreaks detected in the UK since 2013 suggest that this widespread ornamental *Prunus* species could be a potential source of infection for fruit crops.

Primary infections occur through natural openings (stomata and lenticels) or through wounds. Infection and disease development are favoured by warm, wet and humid conditions. As leaf or fruit spots develop, they exude bacterial ooze (gummosis). Further infections occur as this ooze is dispersed by insects, wind and rain. The bacteria can also be spread on contaminated pruning and harvesting equipment. Although canker development differs with host species, cankers can be an important source of infection in the following spring. The bacteria overwinter in twig cankers and leaf scars that are exposed during autumn and then multiply in the following spring. The bacteria can then be spread by water splash to the opening leaf buds. However, in some hosts, the pathogen can overwinter in shoots infected late in the autumn, or on infected plant debris. Ornamental *Prunus* species may be a source of infection for fruit cultivars.

Symptoms



Figure 2. Leaf symptoms of bacterial spot and shot-holing on cherry laurel (Fera, Crown Copyright ©)

All aerial parts of the host plant can be infected. On leaves, the first symptoms are small, water-soaked spots on the lower surface. These develop into brown to black spots, often with a pale green to yellow halo, evident on both leaf surfaces. Bacterial ooze may be associated with the spots. The spots are often more numerous towards the leaf tip because the bacteria accumulate in this region in droplets of rain or dew. The diseased areas often drop out, often after darkening in colour, giving a shot-hole appearance to the leaf. Often, a dark ring of diseased tissue is left with the formation of the shot-hole. In some cultivars, the presence of only a few spots can lead to the entire leaf becoming chlorotic and falling prematurely. Even a light infection can cause premature defoliation and greatly reduce fruit yield.

On fruits, symptoms are dark brown to black spots up to 10 mm in diameter. They are usually sunken and cracked and often have a water-soaked margin. Spots may be surrounded by a yellow halo. Large cracked spots may exude ooze laden with bacteria. Early cherry fruit infection results in distorted fruit and bacteria may be found throughout the fruit from the epidermis to the stone.



Figure 3. Leaf spots on plum. Courtesy of U. Mazzucchi – Università degli Studi, Bologna (IT)



Figure 4. Leaf spots on cherry fruit. Courtesy of Giorgio M. Balestra Dept. of Plant Protection, University of Tuscia, Via S. Camillo de Lellis, Viterbo, Italy

On stems, cankers can form in spring, usually on the tips of overwintering twigs. These may enlarge, causing dieback. In summer, other cankers may develop as dark water-soaked lesions around infected lenticels. As these cankers increase in size, they may become darker and sunken. Cankers on plum and apricot twigs are perennial and continue developing in 2- to 3-year-old twigs. The inner bark is penetrated, resulting in deep-seated cankers which girdle the stems and cause dieback.



Figure 5. Canker on plum twigs. Courtesy of U. Mazzucchi - Università degli Studi, Bologna (IT)



Figure 6. Peeling back the bark may reveal a red discoloration below these cankers. Courtesy of U. Mazzucchi - Università degli Studi, Bologna (IT)

In addition to *X. arboricola* pv. *pruni*, some other bacteria can also cause cankers and leaf spots on *Prunus*. These include *Pseudomonas syringae* pv. *morsprunorum* and sometimes also strains identified as *P. syringae* pv. *syringae* on plum and cherry.

Advisory Information

To meet quarantine requirements, consignments of plants for planting (except seeds) of *Prunus* should either come from an area free from the disease or come from a place of production found free from the disease by growing-season inspection. Care should be

taken to ensure that bud wood is obtained from disease-free areas. Current minimum official measures taken during the outbreaks in *Prunus laurocerasus* in England and Wales require destruction (e.g. by burning or deep burial) of any symptomatic plants intended for planting and any neighbouring *Prunus* plants within a 2 m radius. If any symptomatic plants seem to be isolated to a particular lot it is recommended that the whole lot is destroyed. Further movement/trading of any remaining *Prunus* plants is controlled by suspension of the plant passport, followed by official inspection over the following 12 months. Reinstatement of the plant passport is then dependent upon absence of the disease during this period. In the case of plants intended for retail, where plant passporting does not apply, the remaining *Prunus* plants are subject to a holding period of 3 months with monthly official inspections and can then be retailed only after the final inspection shows absence of any visible symptoms during this period.

Good general hygiene measures prevent introduction and spread. These may include, cleaning and disinfection of tools, equipment, footwear and growing containers. As spread is facilitated by water splash, a restriction on overhead irrigation is also recommended. Prophylactic chemical sprays (e.g. with copper- or zinc-containing compounds) have been used in some countries. *Prunus* breeding programmes in North America attach considerable importance to *X. arboricola* pv. *pruni* resistance and a number of resistant cultivars are available there.

Keep a good look out

Suspected outbreaks of *Xanthomonas arboricola* pv. *pruni* or any other non-native plant pest should be reported to the relevant 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.gsi.gov.uk

For **Scotland**, contact the **Scottish Government's Horticulture and Marketing Unit**:

Email: hort.marketing@gov.scot

For **Northern Ireland**, contact the **DARD Plant Health Inspection Branch**:

Tel: 0300 200 7847 Email: planthealth@dardni.gov.uk

For additional information on UK Plant Health please see:

<https://secure.fera.defra.gov.uk/phiw/riskRegister/>

<https://www.gov.uk/plant-health-controls>

<https://www.dardni.gov.uk/>

Authors

J. G. Elphinstone and A. Aspin (Fera Science Limited)

March 2016

© Crown copyright 2016