FOREST WATCH AUSTRALIA

National Priority Plant Pest

Exotic Environmental Pest

NOT PRESENT IN AUSTRALIA – REPORT IT – **CALL 1800 084 881**

SUDDEN OAK DEATH

Phytophthora ramorum

Description

Sudden oak death is a disease caused by the fungus-like organism *Phytophthora ramorum*. It is found in North America, the UK, Europe, Vietnam and Japan. Despite its common name, *P. ramorum* is not restricted to oaks and affects over 150 species. It spreads carried in moist air. The stems, growing shoots and leaves, or combinations thereof, affected depending on the host species. Tree death is common in highly susceptible species.

P. ramorum poses a serious threat to Australia's urban trees, native and plantation forests and nut and nursery industries.

Affected tree species

Shining gum (*Eucalyptus denticulata*), Cider gum (*E. gunnii*) and Mountain ash (*E. regnans*) are highly susceptible. Susceptibility of pine trees varies from resistant (*Pinus radiata*) to highly susceptible (*P. halepensis* and *P. pinea*). Species of oak, maple, larch, camelia and rhododendrons common in urban parks and gardens are highly susceptible. For host list visit https://gd.eppo.int/taxon/PHYTRA/hosts.

Symptoms

The size and age of the plants affected, and the symptoms observed vary with the host species. One or more of the symptoms may be observed, including:

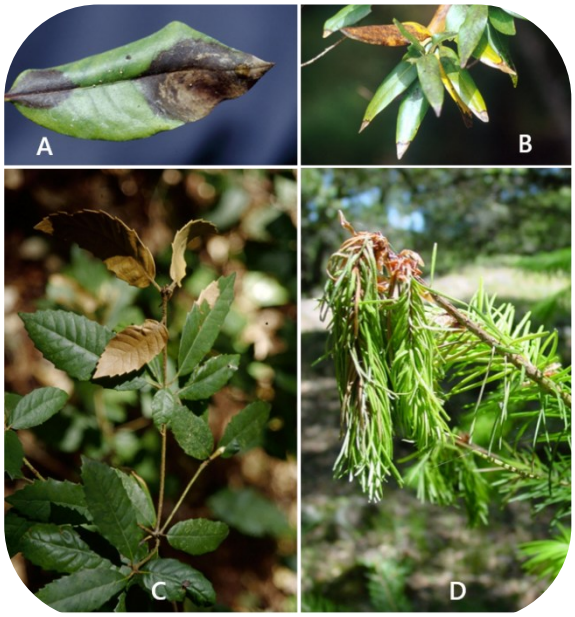
Cankers (i.e., sores) appear on the lower trunks with sap bleeding from the cracking outer bark. When the bark is removed, areas of dying or dead discoloured inner-bark tissues are revealed. Black 'zone lines' are often present within and around edges of the dying tissue. As cankers expand, they girdle the tree restricting the movement of water and nutrients. This can occur within a few weeks of infection. Girdled trees will continue to look healthy until all the tree's resources are depleted, after which the crown will discolour and decline suddenly.

LEFT: Bleeding canker/sores on tree bark. RIGHT: Dark brown/red areas of dead or dying tissue under the bark. Credit Joseph O'Brien, USDA Forest Service, bugwood.org.

Leaf blight symptoms include the appearance of diffuse brown (dark-brown) spots or blotches with fuzzy margins frequently at the leaf tip (where moisture accumulates and remains for extended periods). Eventually, entire leaves can turn brown to black and fall prematurely.

Shoot dieback is characterised by wilting or dead brown to black shoots with or without foliage attached.

Suspected cases must be reported.



A & B: Leaf blight symptoms, brown/black leaf blotches often starting at the leaf tip. C & D: Shoot dieback symptoms, browning or wilting at the shoot tips. Credit Joseph O'Brien, USDA Forest Service, bugwood.org

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Time most likely to be seen

Cool, moist conditions, with periods of mist favour survival, infection and spread of *P. ramorum*. In Australia, these conditions are more likely in autumn through to spring.

Can be confused with

Infection by *P. ramorum* cannot be identified based on field symptoms alone as these vary depending on the plant species affected or are like symptoms caused by other pathogens and abiotic stresses.

Pathogens present in Australia such as *Botryosphaeria*, other *Phytophthora* species, species of *Armillaria* and Chestnut blight (*Cryphonectria parasitica*) also cause bleeding cankers with dark stained wood under the bark. The presence of fan-shaped, white, string-like like growth under the bark of cankers is characteristic of *Armillaria* infection and would distinguish it from *P. ramorum* infections. Also, any cankers observed on roots would not be caused by *P. ramorum*.

Colletotrichum, *Botryosphaeria* and *Botrytis* may cause leaf and shoot blight symptoms like those of *P. ramorum*.

Abiotic factors such as sunburn cause similar symptoms, although in these cases a defined margin with dying tissues is not observed.

Bleeding cankers from exotic pathogens such as Chrysoporthe canker (*Chrysoporthe cubensis*) and Teratosphaeria canker (*Teratosphaeria zuluense*) can be confused with *P. ramorum*. Exotic aerial *Phytophthoras* also cause leaf and shoot blight symptoms like those of *P. ramorum*.

Further information

- Pest and Diseases Image Library – https://www.padil.gov.au/search/?q=Phytophthora%20ramorum.
- Atlas of Living Australia – https://bie.ala.org.au/species/NZOR-6-112561.
- Global Biodiversity Information Facility – https://www.gbif.org/taxon/6VJF5.
- European and Mediterranean Plant Protection Organization Global Database – https://gd.eppo.int/taxon/PHYTRA.

Dead, brown crowns impacted by *P. ramorum*.

Phytophthora ramorum features observed under the microscope. Credit: EPPO

MyPestGuide Trees

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