

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

PINE WOOD NEMATODE

Bursaphelenchus xylophilus

Description

The Pine wood or Pine wilt nematode (*Bursaphelenchus xylophilus*) is a microscopic organism affecting pines and other conifers that is native to North America but can be found in Portugal and parts of Asia. It has resulted in widespread reductions in growth and increases in tree deaths worldwide.

The nematode is primarily spread by large (up to three cm long and one cm wide) mottled, brown-grey coloured beetles with long antennae belonging to the *Monochamus* genus. The nematodes infect trees when *Monochamus* beetles lay their eggs in weakened or dying trees, or when they feed on the shoots of healthy but susceptible trees.

Within weakened or dying trees, the nematodes will feed on blue stain fungi (*Ceratocystis* spp.) that live in the wood. In healthy, but susceptible tree species the nematodes will feed on the tree directly, moving and multiplying within the tree's resin canals and water conducting vessels, which become blocked. This can result in rapid wilting of the affected branches and tree death.

Affected tree species

Pinewood nematodes can affect Pines (*Pinus*), Spruce (*Picea*), Douglas fir (*Pseudotsuga menziesii*), Larch (*Larix*), and Fir (*Abies*). Maritime pine (*P. pinaster*), Black pine (*P. nigra*) and Scots pine (*P. sylvestris*) are known to be killed by this nematode as mature trees.

Symptoms

Pinewood nematodes may impact weakened or dying trees, however, most infections and damage is caused when the nematodes infect healthy but susceptible trees. Symptoms may be observed on trees of any age.

When the nematodes infect susceptible trees, they multiply in the resin canals and block water carrying

Credit: Simon Hinkley & Ken Walker, Museums Victoria, PADIL



ABOVE; Dead and dying conifers in due to pinewood nematode. INSET; Side view of *Bursaphelenchus xylophilus* under the microscope.

vessels. This causes yellowing and wilting symptoms of the infected branches, followed by rapid tree death, withering 30 to 40 days in some instances. Trees that have lower susceptibility can still become infested but may not show symptoms for many years.

Adult *Monochamus* beetles themselves cause minor damage and may be seen feeding on the young shoots



Tree deaths due to pine wood nematode can occur rapidly. A. Steven Munson, USDA Forest Service, Bugwood.org.

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of various conifers. On weakened or dying trees, the larvae can be detected by the presence of tunnels (galleries) bored through the wood of affected branches and by the exit holes produced from emerging adults.

Suspected cases must be reported.

Time most likely to be seen

Symptoms of the Pinewood nematode typically develop shortly after *Monochamus* beetles have fed and transmitted the nematode. The disease caused by the nematode is exacerbated by hot, dry weather and will become evident through summer with the progressive yellowing and wilting of infested branches or tree tops, along with cumulative tree deaths.

Adult *Monochamus* beetles emerge in early summer, so adult beetles are most likely to be seen at that time.

Can be confused with

When the nematodes infect a susceptible tree, they cause yellowing and wilting symptoms that could also be caused by other disorders (e.g. Sirex wood wasp, Diplodia canker or Five-spined bark beetle (*Ips grandicollis*), but the rapid onset of symptoms (as short as

four weeks) and tree death is unlike other endemic pests or diseases and should be treated with suspicion.

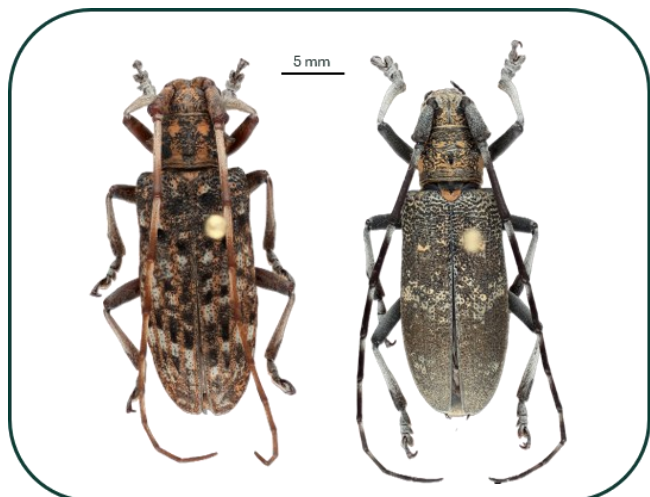
The long antennae of *Monochamus* beetles makes them distinctive from other beetles likely to be found on pines.

Further information

- Pest and Diseases Image Library – <https://www.padil.gov.au/pests-and-diseases/pest/136494>.
- Atlas of Living Australia – https://bie.ala.org.au/species/ALA_DR31252_744.
- Global Biodiversity Information Facility – <https://www.gbif.org/occurrence/search?taxonKey=C3JXH>.
- European and Mediterranean Plant Protection Organization Global Database – <https://gd.eppo.int/taxon/BURSXY/datasheet>.



Monochamus spp. exit hole. Jijing Song and Juan Shi, Beijing Forestry University, Bugwood.org.



Beetles that carry Pine wood nematodes. LEFT; *Monochamus galloprovincialis* Simon Hinkley & Ken Walker, Museums Victoria, PADIL. RIGHT; *M. alternatus*, Ken Walker, Museums Victoria, PADIL.

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