



Pine Pitch Canker – *Fusarium subglutinans* f. sp. *pini*

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Pine Pitch Canker is a serious fungal disease of pine trees. *Pinus radiata* is highly susceptible to this disease. Many thousands of trees have been killed by the disease in the USA. The agent causing the disease is a fungal pathogen, *Fusarium subglutinans* f. sp. *pini*. It was first reported in North Carolina in the USA in 1946. First reports of it on *P. radiata* were in 1986 in California. Since then it has become widespread in most parts of the south eastern USA. It has also been found in Mexico, Haiti, Japan, South Africa and Spain. So far Australia remains free of this disease but it would pose a considerable threat to Australia's pine plantations if it ever became established here.

Symptoms

The first symptoms include yellowing of the needles and wilting and dieback of the branch tips. The needles eventually turn red and drop from the tree. Cankers (lesions) may appear on the main branches or trunk. Resin is exuded from these cankers, often in copious quantities. This resin, or pitch as it is called in the USA (hence the name Pitch Canker), may coat the trunk for several metres below the infection. Lower limbs and vegetation may also be covered.

Infection can occur on branches, shoots, cones, exposed roots and stems. Infected seedlings may develop root rot. Stem cankers are flat or slightly sunken and may be up to 30cm in diameter. These cankers usually appear after branch dieback has occurred. Significant crown dieback may occur if multiple branch tips are infected. Female cones on infected branches often abort before reaching full size and fail to open.

Symptoms may appear at any time of year, but most new symptoms are found to occur in spring or early autumn.

Methods of Infection

The Pine Pitch Canker fungus is a wound pathogen i.e. it enters the tree through a wound. Naturally occurring wounds such as hail, wind stress and various animals (including insects feeding) as well as branch removal and other mechanical damage can all provide entry sites for spores. The spores are spread by wind and rain splash, also by insects such as bark beetles (e.g. *Ips*, which is already present in Australia). The fungus can grow and persist in soil and may sometimes act as a root infecting pathogen. It is also found in seeds and on seed coats. The fungus is able to survive for more than 12 months in logs, in resin impregnated tissues.

Impact

Pines are planted over vast areas throughout Australia and are the basis of a major industry. If Pitch Canker were to infect pines in Australia, it would have the potential to

cause severe damage and losses. Substantial economic loss could be expected in both pine plantations and amenity plantings, especially in drought affected areas. In the USA, losses from tree mortality, reduced timber quality, reduced growth and seed contamination have been extensive.

Risk

Pitch Canker poses a potentially serious threat to pine forests in Australia, particularly as there are no fungicidal or other treatments that are effective in controlling the disease.

However, it seems that in California, Pitch Canker is primarily a disease of amenity trees and not of plantation trees. This is possibly because amenity trees are more susceptible to mechanical damage and damage from pollution than plantation trees. Since the disease is transmitted to the tree through a wound, these trees are the most likely to be affected.

Standard forestry practices such as pruning, harvesting etc provide suitable entry sites for the fungus. Potential vectors of the disease such as the bark beetles *Ips grandicollis*, *Hylurgus ligniperda* and *Hylastes ater* are already established in Australia and could aid in the rapid spread of the disease.

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