

Pine Pitch Canker

Pine Pitch Canker (PPC) is a serious fungal disease of many pine species and of Douglas-fir. It was first reported in 1945 on Virginia pine in North Carolina and has since spread throughout the southeastern United States. PPC is now known to occur north to Virginia, south to Florida, and west to Texas where it has caused extensive damage in pine plantations and in seed orchards. This disease also occurs in Mexico and in Haiti and has recently been identified in Japan and in South Africa.

In 1986, PPC was identified in Santa Cruz County, California, on trees in a stand of Monterey pine. The disease quickly spread throughout the coastal regions of California (Figure 1). Oregon pines and Douglas-fir may soon be at risk as PPC has been identified as far north as Mendocino County, only 200 miles from Oregon's southern border.



Figure 1-PPC distribution in California

Symptoms

PPC on pine is characterized by bleeding, resinous, slightly depressed cankers on the trunk (Figure 2), large branches, cones, and exposed roots.



Figure 2-Large main stem canker

The wood beneath the sunken canker is often pitch soaked (Figure 3).



Figure 3-Resin soaked branch

As the tips of branches and the tree top die, the needles fade from yellow to red and fall from the tree (Figure 4).



Figure 4-Top dieback

Cones, once infected, never reach maturity (Figure 5). Symptoms of PPC on Douglas-fir are similar to those on pine except no cankers form.



Figure 5-Infected cones

Trees suffering from PPC will exhibit reduced growth, stem deformity, seed and cone losses, and sometimes mortality. The disease is most severe in nurseries and urban landscapes.

Hosts

The following tree species found in California and in Oregon can be naturally infected by PPC: Bishop pine, Coulter pine, Digger (gray) pine, Knobcone pine, Monterey pine, Monterey x Knobcone pine, Ponderosa pine, Shore pine, Torrey pine, and Douglas-fir. Sugar pine, Scots pine, Mugo pine, and Jeffrey pine were susceptible to PPC in greenhouse inoculation tests, although no naturally infected trees have been found. White fir, Coastal redwood, Giant sequoia, Incense cedar, Brutia pine, and Norfolk Island pine are all resistant to the disease.

Epidemiology & Life Cycle

PPC is caused by the fungus *Fusarium circinatum* (= *F. subglutinans* f. sp. *pinii*), an opportunistic pathogen that can infect the vegetative and reproductive structures of host species. The fungus reproduces by means of spores produced on a pinkish to purplish cushion-like fruiting body called a sporodochium or on aerial mycelium. These spores can be spread by wind, precipitation, insects, and infected seed. PPC can also be transported on contaminated lumber, firewood, and nursery stock.

Tree wounds provide sites for fungal infection. Wounds can be caused by weather, cultivation practices, and

insects. Trees are typically infected during the summer and fall, when wounding is most likely to occur. Insects, such as engraver beetles, cone beetles, and twig beetles, may carry the fungus to wounds on the tree. PPC symptoms generally do not develop until winter or early spring.

Control

At present, the best control measure for PPC is to prevent its introduction and establishment in Oregon! There is no known cure for this disease!

In California, current management strategies to reduce the risk of PPC include:

- ✓ Not transporting infected wood to uninfested areas;
- ✓ Planting seeds certified as PPC-free;
- ✓ Treating trees with insecticides to kill PPC's insect vectors; and
- ✓ Using sensible plantation and forest management practices (e.g. remove all slash and minimize the wounding of remaining trees).

*Chemical treatments with fungicides (e.g. thiabendazole) are **not** effective against PPC!*

We need your valuable assistance to prevent the introduction of PPC to Oregon. You can help reduce the risk of spreading PPC to Oregon's trees:

- ✓ Avoid moving infected wood from infested areas into Oregon;
- ✓ Plant seeds certified as PPC-free;
- ✓ Use sensible plantation and forest management practices; and
- ✓ Contact the Plant Division at (800) 525-0137 immediately if you see PPC.

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