

Pitch Canker of Pine

You have a large pine tree in your yard that has started to decline. Upon closer inspection, you notice what looks like a waterfall of hardened sap covering a few feet or more of the bark of the tree. This is a strong indicator that your tree likely has pitch canker.

1. A loblolly pine tree with pitch covering several feet higher up on the trunk of the tree. (Left image)
2. Pitch coating one side of the base of a pine trunk. (Right image)



Photo by Colin Massey, University of Arkansas Division of Ag



Photo by FayetteSaws Tree Service, Fayetteville, AR

Pitch canker is a potentially devastating disease caused by the fungus *Fusarium circinatum*. The pathogen was first recorded in North Carolina in 1945, although genetic analysis suggests it originated in Mexico. It exists throughout the southeastern United States, California, and several distant countries, including Chile, Spain, South Africa, and Japan. It affects all southern pines, with loblolly and slash pines being particularly susceptible.

The fungus enters at the base of needle clusters or at the site of injuries such as those caused by insect feeding, lawnmower damage, or pruning. Infected needle clusters will often girdle the twigs and cause the needles on the twig to initially turn yellow before turning red and eventually falling off the tree. The infection doesn't spread very far in the

wood on its own, but wind can blow spores to several needle clusters, causing dieback of multiple branches. Infections on young growth can cause branches to grow in unusually curved or serpentine patterns. Trees stressed by several branches dying or by other sources of stress such as drought will attract bark beetles. These can spread the fungus to larger branches and the trunk.

3. Abnormal curved and serpentine growth of young branches with cankers caused by *Fusarium circinatum*.



Photo by Mike McClintock, SFRC, University of Arkansas Division of Ag

With both the smaller twig infections and the larger branch and trunk infections, pitch canker notably causes the production of copious amounts of pitch, which is a resin pine trees normally use to seal wounds and deter wood-boring insects. The bark will often be sunken at the site of a canker and the wood beneath the bark will be a dark honey hue due to being soaked with resin. The soaked wood is diagnostic for pitch canker. The resin may have run several feet down the tree below the canker for trunk or large branch infections. It should be noted that resin-soaked wood is more flammable than regular pine

wood. This can be useful if you are using the wood as firewood but more problematic if there is an unexpected forest fire or house fire near a heavily infected tree.

4. Several needle clusters infected with *Fusarium circinatum*. The stem has been split to reveal the resin-stained wood. (Left image)
5. A small branch with a canker caused by *Fusarium circinatum*. (Right image)



Photo by G. Blakeslee, SFRC, U of Florida



Photo by Sherrie Smith, University of Arkansas Division of Ag

The fungus, *Fusarium circinatum*, does not grow or cause new infections at temperatures below 50°F (10°C) and grows very slowly even at 57°F (14°C). This is one reason that pruning in the winter is less problematic than in the spring or summer. When pruning out infected wood, sterilize the tools between each cut with Lysol or a 10% bleach solution (1 part household bleach to 9 parts water). A 10% bleach solution is only effective for about 2 hours after mixing, so be sure to mix it fresh with each use. Soak tools for about 2 minutes in bleach before reusing. Using two pairs of tools can let one set soak while the other set is being used.

The fungal pathogen that causes pitch canker can infect a pine seedling and be symptomless for over a year or it can be on or in seeds, making it easily spread with new pine plants. While there are methods using bleach or hydrogen peroxide to sterilize a seed's surface, infections in the seed or asymptomatic infected seedlings aren't easily treated. The fungus can survive for over 8 weeks in the soil and can survive in cut wood or wood chips for over a year. Bark beetles that spread the pathogen can also survive in the cut wood or wood chips for several months. Ten days at temperatures at or above 122°F (50°C) will sterilize wood chips or other composted material. Burning up the wood will also destroy the pathogen infecting the wood and any beetles infesting it.

There are no chemical treatments for pitch canker. Pitch canker does not normally kill a tree on its own, but it can attract wood boring insects that could kill the tree. Pine trees of the same species can have variable levels of resistance to pitch canker, and it has been shown that a tree that is repeatedly exposed to the pathogen can develop a heightened resistance to pitch canker. Even trees with heavy resin flow and severe infection can sometimes recover in 6-7 years if nothing else kills the tree before that.

The tree can be cut down for aesthetic reasons, but cutting down the tree is only necessary if there is concern for its structural integrity. If there is an infection, homeowners can spray the lower 6-8 feet (2-2.5 m) of the trunk and lower limbs in the late spring with permethrin to protect against wood-boring insects. Commercial growers may use bifenthrin (such as Onyx) or permethrin (such as Astro). If there is a light infection, branches infected with pitch canker can be pruned out in the winter. With heavy infections, it is better to prune for the aesthetics in the winter rather than trying to cut out everything that is infected. Be sure to water the tree deeply and infrequently (roughly once a week) during droughts to keep the tree as healthy as possible.

Reducing any other stressors may allow the tree to recover in 6-7 years even from a heavy infection, but any deformities to the wood caused by the infection will remain. Ultimately, the decision to keep or remove an infected tree depends on several factors, including your tolerance for a less-than-perfect appearance, the value you place on preserving the tree, its structural integrity, and the amount of effort you are willing to invest in maintaining its overall health.