Pine Diseases

Pine trees (*Pinus* species) are important to South Carolina not only for the ornamental value but also for lumber, watershed management, resin, turpentine and Christmas trees. There are over 100 species of the genus *Pinus* world wide, of which 36 are native to the United States. Pines grow best in full sun on well-drained, acid soil. Maintaining healthy pine trees by following recommended cultural practices (see HGIC 1020, *Pine*) is the first line of defense in preventing most of these diseases.

**Fusiform Rust**

*Fusiform* rust, caused by the fungus *Cronartium fusiforme*, is one of the most economically important diseases affecting pines in the Southeast. Symptoms consist of purplish spots at the site of stem infection. Stems begin to swell four to six months after infection, resulting in spindle-shaped galls. Dieback of small stems or cankers on larger stems often occur. Galls slowly enlarge each year.

During the spring blister-like fruiting bodies break through the pine bark releasing yellow spores, which are spread by wind and infect the leaves of oaks, the alternate host. Orange specks develop on the underside of the oak leaves. In early spring spores are spread back to pines by wind. Temperatures between 65 and 80° F, a relative humidity above 98 percent, and wet needles and shoots favor dispersal of spores and infection of pines.

**Prevention & Treatment:** Removal of all infected plant material may aid in reducing the spread of the fungus. *P. echinata* and *P. alustris* are resistant to fusiform rust. Chemical control is usually neither necessary nor practical.

**Pine-Oak Gall Rust (Eastern Gall Rust)**

This disease is caused by the fungus *Cronartium quercuwm*. Hard pines - such as jack, Scotch, Austrian, pitch, loblolly and shortleaf - generally are more susceptible than soft pines. On Southern pines the disease is sometimes confused with fusiform rust. Infection results in the formation of spherical galls, which completely surround the stem. The galls disrupt the sap flow, often girdling and killing the part of the tree above it. Trees are greatly weakened and subject to wind damage. Young saplings may be killed. Red and black oaks are the most important alternate hosts. Infection on oak leaves causes small necrotic or chlorotic areas. On the underside of the leaves, yellow to orange spores may be visible. All spores, which infect both pine and oak, are primarily windborne. High humidity during spore dissemination increases the incidence of infection.
Eastern pine gall rust (*Cronartium quercuum*)
Robert L. Anderson, USDA Forest Service, Bugwood.org

**Prevention & Treatment:** Pruning out galled branches and trees may be effective. Chemical control is usually neither necessary nor practical.

### Pine Needle Rust
Needle rusts in North America are caused by more than 20 species of the fungus *Coleosporium*. Symptoms consist of yellow spots on the needles, which appear during the spring. They are followed by whitish blisters and orange spores. Infection may be serious enough to cause defoliation. This fungus requires an alternate host (another plant species) to complete its life cycle. The fungus infects aster or goldenrod during the summer and is able to overwinter in these plants, before it is carried to the pine again in the spring.

**Prevention & Treatment:** Remove wild asters and goldenrods near valuable pines. Chemical control is usually not necessary.

### White Pine Blister Rust
This disease is caused by the fungus *Cronartium ribicola*. It is only a problem in ornamental pines when currants or gooseberries (*Ribes* species) are growing nearby. Currants or gooseberries are alternate hosts and are needed to complete the life cycle of the disease organism. The fungus attacks the living bark of white pine, first breaking out in blisters, which exude a secretion, later forming larger, bright orange-colored dots. These orange dots are filled with fungal spores that are carried to the alternate host, where it develops during the summer. Spores from the currants re-infect healthy pines. The disease spreads rapidly up and down the tree, killing the branches and the main trunk.

**Prevention & Treatment:** Remove all currant plants within a one-mile radius. Prune out cankered branches and excise stem cankers by removing bark at least 4 inches above and below, and 2 inches on either side of discolored bark.
**Pitch Canker**
Pitch canker, named for the large flow of resin from infected parts, is caused by the fungus *Fusarium lateritium*. The disease deforms or kills trees, suppressing the height and growth of survivors. Death is more often due to multiple branch infections than to girdling trunk lesions. Diseased bark turns dark reddish brown, and the underlying sapwood is light yellowish brown or darker where infiltrated with resin. Resin-soaked wood beneath cankers may extend to the pith. Resin usually exudes from the lesion and may run down the bark or drip on the needles. Needles on girdled branches turn yellow, then brown. Dead needles, glued in place by crystallized resin, often hang from killed shoots for more than a year, slowly weathering to a dull, grayish brown.

**Prevention & Treatment:** If the canker can be completely removed surgically or through pruning, this may stop the disease. If the canker is too extensive for removal, then the tree should be removed. Or if branches are infected 10 inches or more from the main stem, remove and destroy them. Replant with a resistant variety, such as loblolly or Eastern white pine.

**Tip Blight**
The fungus *Diplodia pinea* can be a serious problem on seedlings or young trees. It causes a rot which extends upward from the collar below the surface of the soil. The disease may be recognized by the deep red color of the bark and by the black streaks that occur in the wood. The fungus also causes a dieback of branches of older trees. The new growth of such branches is stunted, the needles turn brown and the terminal buds exude an excessive amount of resin. With a hand lens, tiny black fruiting bodies may be seen at the base of diseased needles. Cankers may be formed at the nodes. The following pines are very susceptible to tip blight: Ponderosa, Austrian, red, white, Scotch, and scrub.

**Prevention & Treatment:** Control is possible for the tip blight phase of the disease on older trees. As soon as the blight is noticed, the infected needles, twigs, and cones should be pruned and destroyed. Pruning should be done when the branches are dry, because there is less danger of spreading the spores. Where infection has been particularly severe, preventative fungicides may be recommended. No cure is possible for seedlings or young trees that are infected at the base.

**Littleleaf**
This highly destructive problem is a root rot disease, caused by the fungus *Phytophthora cinnamomi* and occurs on shortleaf and loblolly pines. It is most easily recognized in its advanced stages when the foliage is sparse and ragged in appearance. Needles are only half their normal length and trees die prematurely.

**Prevention & Treatment:** Shade tree appearance can be improved by the application of fertilizer high in nitrogen content. Use strict sanitation to avoid introduction of the fungus and improve drainage. Plant varieties that are less susceptible to littleleaf. Loblolly pine is less susceptible than shortleaf pine.

**Note:** Chemical control of diseases and insects on large trees is usually not feasible since adequate coverage of the foliage with a pesticide cannot be achieved.

**Needle Cast**
This disease is caused by one of several fungi, such as *Lophodermium* species, *Ploioderma* species or *Rhizosphaera* species. It is most severe on young pine trees. Brown spots with yellow margins develop on the needles in March and April. Tips of older needles turn brown and premature shedding occurs. Infected needles are covered with spores, which are transported by wind and rain and infect...
healthy needles. *Rhizosphaera* species produce fruiting bodies (black pin dots, capped by a bit of white wax) on stalks in rows, on all faces of the needles. *Lophodermium* fruiting bodies are dark brown specks, and *Ploioderma* fruiting bodies appear as black lines on the needles.

**Prevention & Treatment:** Chemical control is usually not necessary. If trees are shaded, remove any shade-producing structures or plants, where practical, to allow increased light penetration and air movement.

---

Pine needle cast (*Lophodermium nitens*)
USDA Forest Service Archive, USDA Forest Service, Bugwood.org