

# Diplodia Tip Blight

Diplodia tip blight, previously known as Sphaeropsis tip blight, is a common fungal disease of stressed conifers, especially pines with needles in bunches of 2's and 3's. Austrian pine (*Pinus nigra*) is the most susceptible host, although the following pines are also susceptible: Scots pine (*Pinus sylvestris*), red pine (*Pinus resinosa*), Mugo pine (*Pinus mugo*), Ponderosa pine (*Pinus ponderosa*) and occasionally Eastern white pine (*Pinus strobus*). The disease sometimes attacks other conifers such as Douglas-fir (*Pseudotsuga menziesii*), Norway spruce (*Picea abies*), Colorado blue spruce (*Picea pungens*), American larch (*Larix laricina*), noble fir (*Abies procera*), silver fir (*Abies alba*), some true cedars (*Cupressus* spp.), arborvitae (*Thuja* spp.), and junipers (*Juniperus* spp.). Except for young seedlings, the disease rarely attacks trees under 15 years of age and most severely damages trees that are older than 30 years. It is seldom seen in forests, but prefers ornamental trees weakened by poor sites, drought, hail or snow damage, overshadowing, compacted soils, root restrictions, insect activity, or other mechanical wounding. The fungus kills current year shoots and sometimes branches, and can disfigure or even kill them under severe conditions.

## SYMPTOMS

Symptoms often start on the lower half of the tree and progress upwards. When the new needles (candles) are expanding, they become stunted, turn yellow, and then turn tan or brown. Generally all needles on the current season's shoot are killed.



Diplodia kills needles at the tips of branches

Often resin droplets are seen on the dead shoots. During summer and fall, tiny, black fungal fruiting bodies called pycnidia, which look like black pepper, will appear at the very base of the needle under the fascicle sheath. The pycnidia may also be seen on the scales of second year seed cones and on infected bark. As lateral shoots are killed, whole branches may die back to the trunk and the tree becomes disfigured. This disease can also form perennial cankers that can cause sudden branch death.



The black pepper-like structures are fungal fruiting bodies

Sometimes tip blight can be confused with damage caused by pine shoot moth larvae. However, if pine shoot moth larvae cause the damage, either the larvae or its tunnel will be found inside the shoot. Also, if shoot moth kills the tip, pycnidia will not be present on the needles.

## CAUSES AND DISEASE CYCLE

A fungus called *Diplodia pinea* causes the disease. The fungus overwinters in pycnidia (fungal fruiting bodies) in infected shoots, bark, and seed cones. Tiny spores called conidia erupt from the pycnidia in wet weather. Although they are produced from spring to early fall, they are especially abundant in spring and early summer, when the new shoots (candles) are expanding. Candles can only be infected by the fungus while they are elongating in the spring. After the needles have fully expanded, the shoot can no longer be infected by the fungus. Wind and rain disseminate the conidia. When the conidia land on a susceptible plant part, they infect it by penetrating the plant through wounds or stomates, usually in mid- to late spring. Once the fungus penetrates the plant, it quickly spreads throughout the needles, then to the stem and into nearby needles and cones. The needles begin to die several weeks after infection. Later in fall after the needles have died, the pycnidia appear on the base of the needles or on second year seed cones.

## CONTROL

### Cultural

Since cones and dead tips contain the fruiting bodies that produce millions of spores, remove and destroy all infected cones and dead and dying branches and shoots during dry weather. Pruning tools should be disinfected between cuts by dipping them in alcohol or bleach (one part bleach to nine parts of water). Maintain tree health because the disease is more severe on trees that are under stress. Keep the tree watered during dry periods. Maintain a layer of mulch under the tree to conserve moisture. Because the fungus can also infect wounded tissues, avoid pruning trees from late spring to early summer when they are most susceptible.

### Chemical

Registered fungicides should be sprayed at least three times beginning at budbreak, again at half candle, and third application at full candle. A spreader sticker should be applied with the fungicide.