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## **DIPLODIA BLIGHT**

Diplodia blight, formerly called Sphaeropsis tip blight, can be a destructive and devastating disease of pines, especially two- and three-needled species. Austrian, black, mugho, red, and Scots pine are very susceptible although many other species of pine are also affected, especially when growing under conditions of stress. Trees of all ages are susceptible although older trees frequently sustain greater damage and disfigurement.

### **SYMPTOMS AND DISEASE DEVELOPMENT:**

Diplodia blight is caused by the fungus *Diplodia pinea*. This fungus usually attacks mature trees, although it is more damaging to trees that have been under stress from drought, excessive soil moisture, root restriction, other site problems, or biotic stresses. Symptoms often first appear on the current season's needles, since the fungus rapidly kills infected young, succulent shoots before the needles are fully elongated (Figures 1 and 2). As a consequence, needles on such shoots are often stunted. Infected shoots turn yellow, gradually brown, and fruiting structures of the fungus are visible as small, black structures with conical beaks at the base of the infected needles (Figures 3 and 4). A diagnostic feature of Diplodia blight is the presence of

stunted, straw-colored shoots with short needles and excessive resin flow. In trees that are relatively free from stress, tip blight only kills the current-season buds, shoots, and second-year cones. Older twigs and branches are usually only damaged if trees are predisposed by stress, especially due to drought. This results in blighting and deformation of branches and limbs. In extreme cases, Diplodia blight can result in tree death.



Figure 1. Infected new shoots are stunted and killed before they elongate.

The Diplodia blight fungus can attack older shoots through wounds, including those caused by insect injury. These infections often result in perennial, bleeding twig and stem cankers but in severe cases can lead to

girdling, branch death, and significant disfigurement of the tree.



Figure 2. Infected needles are stunted and tan.

Recent research suggests that the fungus is capable of causing latent infections that can go undetected until the tree is exposed to periods of stress, at which time the fungus is activated and typical dieback symptoms develop.



Figure 3. Black fruiting structures breaking through infected needles..

Cones are also infected by *P. pinea*. This usually occurs during their period of rapid growth in spring. Although cone infections are inconsequential for the general health of the tree, they are important for their

contribution to the spread and severity of infections, since they contribute considerable fungal inoculum. Fruiting structures of the fungus are readily seen as small, black bodies on the cone scales.



Figure 4. Close-up of black, beaked fruiting structures emerging from symptomatic needles.

Diplodia blight is favored by wet spring weather, especially prolonged periods of budbreak, which promotes fungal growth and infection. Spores of the fungus are only spread during periods of rainfall and pines are particularly susceptible to infection in the early spring. Once again, trees which are predisposed by stress are much more susceptible than their stress-free counterparts.

### **DISEASE MANAGEMENT:**

The effects of Diplodia blight can be minimized by following a multifaceted approach to management that includes sanitary, cultural, and chemical methods. It is *very* important to prune and remove as many blighted twigs, branches, and cones as possible during dry weather in autumn. This helps to reduce the amount of the fungus available to infect the new growth in the spring. It is often necessary to sacrifice and remove severely symptomatic trees to reduce the amount of inoculum. Trees should also be kept as vigorous as possible by following sound cultural practices to maintain tree vigor, controlling insect infestations, and watering during periods of drought. All unnecessary stresses such as

soil compaction or equipment injuries should be avoided, if possible. Fungicide applications can also supplement other management strategies. Among the compounds registered for use in Connecticut are copper sulphate pentahydrate, mancozeb, mancozeb + copper hydroxide, propiconazole, and thiophanate-methyl. Consult the label for dosage rates and safety precautions. Since these fungicides act as protectant materials, they must be applied to the new growth as it emerges in spring. The first application should be made **before** any bud sheaths have broken and two or three additional applications can be made at label intervals, as necessary.

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