



DISEASES OF LANDSCAPE PLANTS

Diplodia Tip Blight of Two-Needle Pines

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Diplodia tip blight (previously called Sphaeropsis tip blight) is a common fungal disease of stressed conifers caused by the fungus *Diplodia sapinea*. Two-needled pines are most commonly infected, including Austrian or black pine (*Pinus nigra*), Mugo pine (*P. mugo*), ponderosa pine (*P. ponderosa*), red pine (*P. resinosa*), and Scots pine (*P. sylvestris*).

The disease typically appears on trees as they reach cone-bearing age, with trees 20 to 30 years old being especially hard-hit. (Figure 1). Trees suffering from chronic drought stress and other site, environmental, and mechanical stress disorders are more prone to severe injury. The fungus kills current-year shoot tissue and branches.

This publication presents common symptoms of Diplodia tip blight, its cause, strategies for reducing disease severity, and steps for accurately diagnosing this disease.



Figure 1. Austrian or black pine showing extensive lower branch dieback caused by *Diplodia sapinea* infection (Tom Creswell)

Symptoms

The most common symptoms of *Diplodia* tip blight are stunting, discoloration, and dieback of current-year shoots in the lower branches (Figure 2). The *Diplodia* fungus kills the needles at the tips of branches.

Girdling cankers on infected branches are often coated with exuded resin, which dries and leaves white patches and droplets on the bark, and may be mistaken for insect damage (Figure 3). As the growing season progresses, tiny, black fungal fruiting bodies called pycnidia appear at the very base of the needle and on older, infected needles (Figure 4). The pycnidia may also be seen on the scales of second-year seed cones (Figure 5). Infected tissue from previous years will exhibit numerous black pycnidia.

Appearing first on lower branches, the pathogen eventually spreads to kill scattered branches throughout the tree. Symptoms on new shoots are often visible by early May, with dieback appearing through June or July. Dieback of the current season's growth that occurs year after year eventually results in dead limbs and severe stunting of tree growth.



Figure 2. Dieback of current-year shoots (Curt Campbell)



Figure 3. Dried, exuded resin on girdling canker caused by *Diplodia* (Curt Campbell)



Figure 4. Black, spore-producing structures (pycnidia) on needle (Tom Creswell)



Figure 5. Each small black pustule on this cone is capable of producing thousands of spores that can infect the host and neighboring trees. (Janna Beckerman)

Cause

Diplodia tip blight is caused by the fungus *Diplodia sapinea*. The fungus overwinters in the pycnidia on infected shoots, bark, and seed cones. Spores produced during wet, spring weather are carried by wind and rain from diseased tissue to infect young emerging needles during late April to mid-June. Young needles can only be infected by the fungus during elongation and become resistant when fully expanded.

Managing *Diplodia* Tip Blight

The lack of effective measures to control *Diplodia* tip blight and other fungal needle blights on large pines have caused many to forgo using two-needle pines in the landscape in favor of other trees.

Good tree care directed toward maintaining overall vigor of trees can reduce disease severity but will not prevent disease spread in years with wet spring weather. To maintain tree vigor, take the following steps:

- Prune out visibly infected branches during dry weather and remove infected cones to reduce the amount of fungus present.
- Disinfect pruning tools between cuts by dipping or swabbing with 70% rubbing alcohol or other disinfectant.
- Remove fallen needles and cones from the area.
- Water the root zone of affected trees during periods of drought stress. Use a soaker hose or water by hand. (Don't use an overhead sprinkler that will wet the foliage). Trees should receive about 1 inch of moisture every 10–14 days from rain and/or irrigation. A general recommendation is the 5+5 rule, which means provide 5 gallons of water plus 5 additional gallons per inch of trunk diameter.
- Mulch trees with a 3- to 4-inch layer of organic mulch (e.g., wood chips, shredded bark) to reduce soil evaporation and temperature fluctuations, and to conserve moisture. (Keep mulch from touching trunk.)
- Avoid pruning trees during spring and early summer as the fungus can also infect wounds.
- Avoid overfertilizing trees since excess nitrogen has been linked to increased disease severity.
- Avoid planting highly disease-susceptible pines.
- Avoid planting new pines in shaded or crowded areas.

Although high-value trees may be protected by applying fungicides to new growth as it emerges, this is impractical in most situations with larger trees.

Fungicides that have been shown to be effective include Cleary 3336® or OHP 6672™ (thiophanate-methyl), or Spectro™ 90 (chlorothalonil plus thiophanate-methyl).

Landscape professionals have access to additional fungicides for application including Concert® II (chlorothalonil plus propiconazole), along with many propiconazole-based products (Banner Maxx®, ProPensity®, etc.). Fungicide injections have not been shown to be effective in managing this disease.¹ Check with your Extension educator or specialist for current fungicide recommendations.

Accurate Diagnosis/Sample Submission

The first and most important step for managing a tree disease is to accurately diagnose the problem. Start by uploading photos of the tree and surrounding area to the Purdue Plant and Pest Diagnostic Laboratory (PPDL) website (<https://ag.purdue.edu/btny/ppdl/Pages/digitalimages.aspx>). Submission of a physical sample will be required for confirmation.

Physical samples mailed to the PPDL should be representative of the problem and include early and moderate stages of disease. For cankers, include healthy portions from above and below the diseased area on the branch. Complete a sample submission form, and include a description of the problem and other useful information about the site, the age of the tree or shrub, and the date of planting. A minimal sample-handling fee is assessed for digital and/or physical samples.

Refer to the PPDL sample submission page (<https://ag.purdue.edu/btny/ppdl/Pages/Submit-A-Sample.aspx>) for further information on how to collect and submit samples.

Ship to:

Plant & Pest Diagnostic Laboratory
Purdue University
915 W. State Street
LSPS Room 116
West Lafayette, IN 47907-2054

¹ Hartman, J. R., L. J. Vaillancourt, J. L. Flowers, and A. M. Bateman. 2009. "Managing Diplodia Tip Blight of Landscape Austrian Pines." *Arboriculture & Urban Forestry* 35 (1): 27–32.