

Diplodia Tip Blight of Pine

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INTRODUCTION

Tip blight is a serious disease of landscape pines in Kentucky. Pines such as Austrian (*Pinus nigra*), Scots (*P. sylvestris*), and Mugo (*P. mugo*) are most commonly affected. Other landscape conifers occasionally may be affected by tip blight as well. Tip blight disease has not been found on eastern white pine (*P. strobus*).

SYMPTOMS

Symptoms of tip blight disease are not normally observed until pines reach 10 to 12 years old and begin to bear cones (FIGURE 1). Blighting of new shoots is the most easily recognized symptom since the young needles stop growing before they are fully expanded. Stunted needles eventually die and turn straw-colored (FIGURES 2 and 3).

As disease progresses internally in branches, additional needles are killed, and branches in the lower canopy turn brown and die. Excessive resin flows from infected twigs and branches (FIGURE 2). Blighted needles may become trapped in this resin "glue" and remain on trees. The lowest branches of old, well-established trees are the first to show disease, and dieback gradually spreads upward (FIGURE 1).

Severe infections that occur during consecutive years weaken and eventually kill affected pines. Furthermore, as branch dieback progresses upward, trees may become so disfigured that they should be removed from landscapes.



FIGURE 1. DIPLODIA TIP BLIGHT INFECTIONS OCCURRING YEAR AFTER YEAR RESULT IN DIEBACK OF LOWER LIMBS AND EVENTUAL DEATH OF MATURE PINES.



FIGURE 2



FIGURE 3

FIGURE 2. BROWN STUNTED NEEDLES, DEAD SHOOT TIPS, EXCESS RESIN FLOW, AND RETENTION OF THE DEAD NEEDLES ARE KEY DIAGNOSTIC SYMPTOMS OF TIP BLIGHT.

FIGURE 3. CLOSE-UP OF STUNTED, STRAW-COLORED NEEDLES INFECTED BY THE DIPLODIA TIP BLIGHT FUNGUS.

CAUSE & DISEASE SPREAD

Infection occurs in spring; however, disease symptoms become more conspicuous during mid-to late summer and fall. The fungus that causes tip blight (*Diplodia pinea*) produces small, black, pimple-like fruiting bodies (pycnidia) that break through tissue at the base of infected needles (FIGURE 4), just under the needle sheath. Pycnidia may also develop heavily on the cone scales (FIGURE 5).

Fungal spores (FIGURE 6) ooze out of fruiting bodies during wet weather in spring and early summer. These spores may be spread to trees by wind,

splashing rain, animals, and pruning equipment. Fungal spores infect and colonize green, succulent stems of newly expanding shoot tips and young needles. Spores can also infect more mature branch tissue through wounds, such as pruning cuts or hail injury. Sometimes, the invading fungus may not kill stems or needles right away, but instead survive within the tree with delayed symptom development (latent infection). Often, the pathogen will only produce symptoms after trees have been exposed to environmental stresses, such as drought.

MANAGEMENT

Managing tip blight in landscapes is challenging, and no single treatment is highly effective. Certain pines, such as Austrian pines, are extremely susceptible to disease, and they are not recommended for Kentucky landscapes. To manage or reduce the risk of tip blight disease:

- **Reduce tree stresses that enhance disease**

Choose tree species adapted to the landscape environment. Certain pines are poorly suited to Kentucky climate and soil conditions; other evergreen or deciduous trees may perform better in a particular landscape. Water existing trees as needed to prevent drought stress; avoid heavy nitrogen fertilization that may promote excessive, succulent shoot growth.

- **Sanitation**

Prune away and destroy dead twigs and branches to improve the affected tree's appearance. Do not prune when trees are wet. Remove and destroy diseased needles, twigs, and cones on the ground under the tree.

- **Fungicide treatment**

Protectant-type fungicides (Refer to UK Extension publication ID-88, listed in Additional Resources) may slow progression of disease symptoms in the short-term. Field experiments in Kentucky have **not** shown highly effective, long-term disease management with fungicide spray applications or injections. However, on high-value trees, fungicide treatment may be considered. Applications of appropriate fungicides should be made just as buds begin to swell in spring, again when the candles (new shoots) are about half elongated, and once more as needles begin to emerge from the needle sheaths.



FIGURE 4



FIGURE 5

FIGURE 4. FUNGAL FRUITING BODIES (PYCNIDIA) APPEAR AS BLACK SPECKS AT THE BASE OF INFECTED NEEDLES. THESE STRUCTURES CAN BE SEEN MORE READILY WITH A HAND LENS OR DISSECTING MICROSCOPE.

FIGURE 5. PYCNIDIA DEVELOP ON PINE CONE SCALES.

FIGURE 6. PYCNIDIA ON NEEDLES AND CONES CONTAIN LARGE NUMBERS OF MICROSCOPIC SPORES THAT ARE RELEASED DURING WET WEATHER.

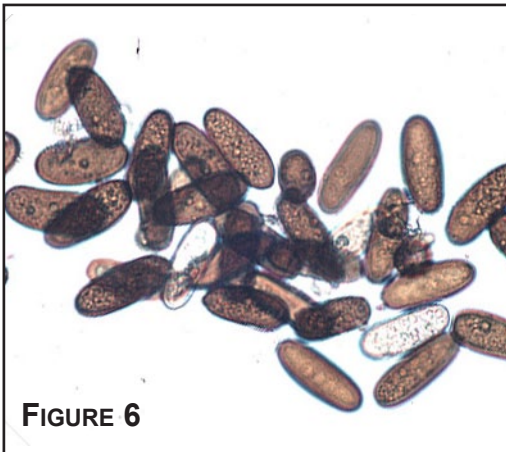


FIGURE 6

ADDITIONAL RESOURCES

- The Role of Shearing in the Management of Diplodia Tip Blight (UK research results)
http://www2.ca.uky.edu/agcollege/plantpathology/ext_files/PPFShtml/ManagingDiplodiaTB-ACTJ-2009.pdf
- Woody Plant Disease Management Guide for Nurseries and Landscapes (ID-88)
<http://www.ca.uky.edu/agc/pubs/id/id88/id88.pdf>

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