MSU AG FACTS
EXTENSION SERVICE
No. 84 Extension Bulletin E-964 April 1976

Diplodia Tip Blight of Pine

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DIPLODIA DISEASE primarily affects mature trees of introduced species (exotic) of pines. Species attacked in Michigan are Austrian, Mugho and Scots pine, with Austrian pines being most severely and frequently affected.

Symptoms and Effects

New, developing shoots and needles (the young candles) are the tissues which are primarily affected by this disease. Symptoms are usually first noticed in late summer when ½ to ¾ expanded needles die and become tan to yellow-brown (Fig. 1). Examination of dead needles at this time or in fall or winter reveals black specks and eruptions toward the base and under the sheath of some needles (Fig. 2). When the candle is killed, the host often initiates buds from the healthy tissue at the base of the dead shoot (arrow, Fig. 1).

Diplodia tip blight is primarily a disfiguring disease. Rarely, except in seedlings, does it kill its host. Only new growth is susceptible, and the disease is arrested when it reaches second-year or mature tissues. However, in instances where the new candles have been killed several years in succession, the affected branch is eventually killed due to lack of new shot growth and normal senescence (death) of old needles. Although rare, seedlings and young saplings may also be affected. Wilting and death of seedlings usually occurs as the fungus girdles the stem at or near the soil line. These attacks usually occur when seedlings have been stressed.

Fig. 1. Diplodia blighted tips of Austrian pine. Needles are usually ¼ to ¾ grown when death occurs. Buds are often initiated at the base of killed shoots (arrow).

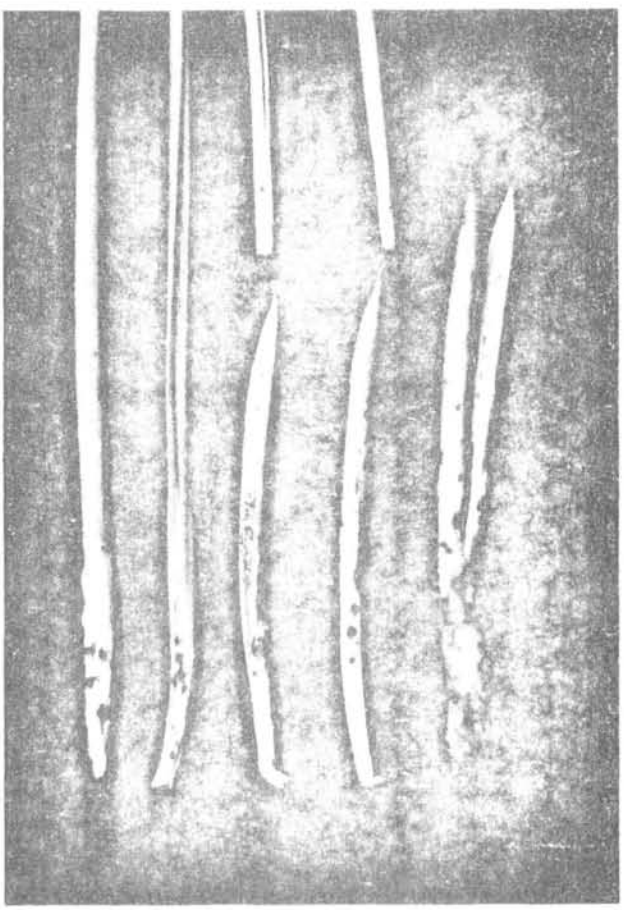

Fig. 2. Dead needles showing the black fruiting bodies of Diplodia. These structures develop under the needle sheath primarily, but may also be found on the exposed portion of the needle.

Cause and Life Cycle

Tip blight of pines is caused by the fungus, *Diplodia pinea*. The disease occurs throughout Michigan as well as throughout the world where exotic pines are grown. The fungus survives from year to year in the cones, needles and stem tissues of its hosts. It grows and matures in these tissues during late spring, summer and fall. The following season, spores are liberated in a soft mass when moisture conditions (rain or heavy dew) are favorable. The spores may be spread by rain, wind-borne rain or carried by insects to new tissues.

Infection of new growth occurs by stomatal penetration of needles or young shoots, or by invasion of new buds from adjacent diseased tissue. Wounds also provide entry points. The fungus grows rapidly through the young developing tissues, and dieback symptoms may appear as soon as three weeks after infection.

Control

The new shoots (current season's growth) of mature trees are most susceptible to infection. Previous year's growth (mature tissues) are resistant to attack. Poorly growing trees or trees stressed due to adverse environmental conditions are generally more susceptible to attack. Therefore, trees should be kept in good vigor with regular maintenance and feeding. Also the new growth must be protected from bud swell through early candle development.

The application of Bordeaux mixture (4-4-50) at bud swell and a second application about 10 days later (candle stage) will control this disease. These bud development stages usually occur in late April or early May in Michigan.

The pruning out of diseased tips is no longer recommended, as research has shown the disease can not be significantly reduced by this practice.

NOTE: Diplodia tip blight may be confused with European pine shoot borer injury (see Extension Bulletins 530 or E-353). The larvae of this moth burrow in and feed on the pith of new shoots. The resulting injury causes a tip dieback which appears very similar to tip blight. Examination of the dead shoots will show solid tissues in the case of tip blight, but a shoot having the pith eaten out and hollow if the pine shoot moth caused the damage.

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