The Plant Doctor's LANDSCAPE TIPS

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Photo 1: A newly emerging shoot on Austrian pine killed by Diplodia. Although not seeds, these shoots represent the future survival of this particular tree.

Photo 2: Severe Diplodia infections may result in death of the tree. As trees become more and more stressed from Diplodia infections, secondary insects and diseases undoubtedly move in for the final coup de grace.

Photo 3: Pines become more susceptible to Diploida infections as they age. The increased incidence of Diplodia on older pines is largely due to stress and the fact that the fungus colonizes cones (black peppery like fruiting bodies) as trees reach the age of cone production.

Photo 4: Microscopic spores of Diplodia are released during the rainy spring season when newly emerging shoots of pines are very susceptible.

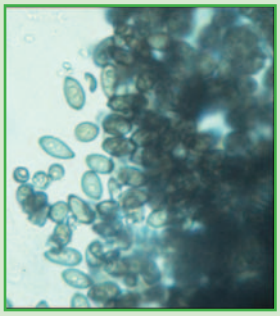

Photo 5: Two Austrian pines "touching": the one on the left is highly resistant while the one on the right is very susceptible. Unfortunately, it is very difficult to determine which trees are susceptible at an early age, such as when trees are transplanted to a landscape.

DIPLODIA TIP BLIGHT OF PINES

INTRODUCTION:

Tip Blight of pines is caused by the fungus Diplodia sapinea, formerly called Sphaeropsis sapinea. Two and three needle pines such as Scotch, Austrian, Mugo, Red and Jack are susceptible whereas the five needle pines such as white pine tend to be resistant. The fungus kills new shoots as they emerge in the spring (Photo 1). In severe cases, whole branches and eventually whole trees may be killed. Large trees, about 15 feet and larger, tend to be more susceptible due to stress as they age and also because the fungus tends to colonize cones, which increase the opportunities of infection. The fungus may also cause seedling blight in nurseries and Christmas tree farms.

DIAGNOSIS AND SYMPTOMS:

Initially, only buds and new shoots are killed (Photo 1). Often trees will survive for many years, losing a certain percentage of their shoots each year. In some cases, branches may be affected; in severe situations entire trees may be killed (Photo 2), usually with the help of some other secondary diseases and pests. The disease may be confused with some insect shoot borers, which hollow out the shoots; with Diplodia tip blight, shoots are not hollowed. Also, Diplodia tip blight is often found on Scotch Pines infected by the deadly Pine Wilt Nematode; Pine Wilt usually kills trees within a few months or a year.

DISEASE CYCLE:

The Diplodia fungal spores are released during spring rains. If conditions such as rainy/damp weather prevails during pine bud break and shoot expansion, the fungus may infect newly breaking buds and expanding shoots. Over the next several days after infection, the fungus slowly grows through the live shoot tissue, eventually girdling (killing) the new prospective branch. The Diplodia fungus over-winters on needles, cones and bark as small black reproductive structures (Photo 3), which may subsequently release microscopic spores (Photo 4) during the following spring's rainy periods. If elongating shoots escape infection and harden-off by mid summer, they may be largely resistant to infection. The disease incidence varies from year to year due to variable environmental conditions in the spring.

DISEASE MANAGEMENT:

Cultural: Because, two and three needle pines such as Austrian and Scotch are most susceptible, planting resistant evergreens such as cedars and five needle pines (white) may be advisable. Due to diversity within a species, for example Austrian Pine, some individuals are resistant to or tolerant of the disease (Photo 5); it is virtually impossible to determine if a particular pine is susceptible until the tree reaches the size/age of susceptibility. Avoid excessive and overhead irrigation in landscapes because abundant moisture favors disease development. Also avoid excess fertilization, which may make succulent new shoots more susceptible to infection.

Chemical: Several sprays of broad spectrum fungicides beginning at bud break in the spring and applied every 10-14 days until after shoots have expanded may help manage the fungus on individual trees. Some arborists use one to several sprays per season, depending on budget and the importance of the landscape trees. Timing is critical: fungicide sprays applied after an initial infection will not likely reverse the decline of the infected shoots. Hence, fungicides generally act to protect new shoots, not to cure infections. Professional arborists report varying success with management, ranging from excellent control to inadequate control. Failure of field applications to control Diplodia is likely due to missed timing of the prophylactic fungicide treatments. Every few years, switch chemistry of the fungicides to avoid fungal resistance development.

For more information, please feel free to email me at robertsd@msu.edu or contact a professional plant health care provider. The author, MSU or MGIA do not endorse any particular products. If using pesticides, be sure to read and follow label directions.

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