Leaflets News and Information for the Arborists of Michigan

The Plant Doctor's LANDSCAPE TIPS

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PINE WILT IN MICHIGAN

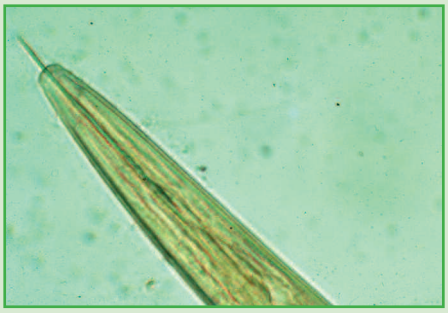

Photo 1: A nematode is a microscopic "worm" that, depending on species, lives in soil and/or plants. Some nematodes cause diseases in plants while others are highly beneficial. Note feeding stylet (needle) protruding from the head of this plant pathogen.

Photo 2: The Pine Wood Nematode is transmitted by long-horned Monochamus sp. beetles similar in appearance to these found on a declining white pine.

Photo 3: Typical symptoms of pine wilt include sudden death of Scots pine. Needles of a tree infected with the Pine Wood Nematode typically hang onto the tree for more than a year and appear orangish-tan.

Photo 4: Secondary beetles and fungi invade declining trees infected with the pine wood nematode. In this case, bark beetles have created many small exit holes as they emerged.

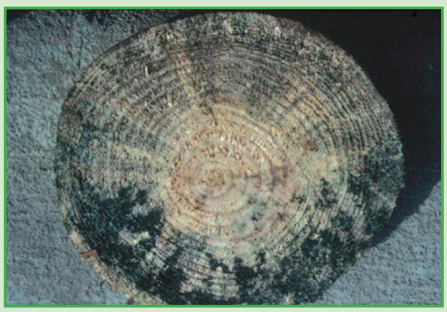

Photo 5: Cross sections of pine wood infected with the pine wood nematode usually show a blue stain, caused by a fungus (Ophiostoma) that is carried by bark beetles and the Pine Sawyer Beetle to pine trees.

INTRODUCTION:

Pine wilt, caused by the Pine Wood Nematode Bursaphelenchus xylophilus, a microscopic worm-like organism (Photo 1), is a serious disease in Michigan. Scotch pine (Scots Pine=Pinus sylvestris) is by far the most susceptible species, although Austrian, Mugo, Jack and, rarely, white pine may also be affected. There seems to be an increasing concern for Pine Wilt in Michigan; I suspect this increase is due to several factors. First, Scots Pine (Pinus sylvestris), the primary host affected by the disease, has been planted extensively (perhaps excessively) in many Michigan landscapes; the widespread planting of Scots pine dictates that any problems will be magnified when compared to sparse plantings. Second, pines are frequently planted in monocultures or dense stands of the same species; monocultures aid the buildup of specific disease and insect problems, particularly pine wilt. Third, many Scots pines are maturing into older age; older-aged trees tend to be more susceptible to pine wilt and other problems due to drought and other stress factors. Complicating these issues, many pines may encounter other environmental and cultural stresses that can make them more susceptible to disease such as pine wilt.

SYMPTOMS AND DIAGNOSIS:

Pine wilt starts as infections in individual twigs and branches from transfer of the pine wood nematode by the Pine Sawyer Beetle (Monochamus sp.) (Photo 2). Needles turn grayish- green and then eventually brown on affected branches. As the nematode populations build up in the tree, the vascular (water and nutrient conducting) system becomes plugged; trees wilt and often die very quickly, in a matter of weeks, which results in some individuals calling this disease, sudden pine death (Photo 3). Brown needles may hang onto the dead tree for a year or more. As pines decline from pine wilt, many other insects such as bark beetles (ex. IPS beetles) attack these trees (Photo 4). The blue stain fungus (Ophiostoma, formerly Ceratocystis) is also highly correlated with the occurrence of the pine wilt nematode (Photo 5).

Pine wilt may be mistaken for other problems commonly found on species of pine. These other problems include Diplodia tip blight and various weevils and beetles. Sometimes these diseases and insects occur in conjunction with pine wilt and with other site issues or stresses. To be certain of a diagnosis of pine wilt, samples should be sent to a diagnostic lab for confirmation.

PINE WILT MANAGEMENT:

There are several practices that can help manage pine wilt and keep the disease to a minimal incidence. Probably the most important tool in managing pine wilt is sanitation. Sanitation involves the prompt removal and destruction of infested trees; dead trees are reservoirs of insects and nematodes that can increase pine wilt and other problems in a community. Thorough chipping, burning or burying pine wood are techniques to minimize populations of the beetles and nematode. Chips should be mulched for several months to kill insect vectors and nematodes before being used as mulch. Because of the many serious diseases and insect problems on Scotch pines, some experts recommend not planting Scots pine in new landscapes. Maintain good vigor in established pine trees with adequate supplemental water and nutrients. Also, avoid stresses from too close plantings, shading and monocultures, etc. which tend to increase the incidence of pine wilt. Recently, trunk injections have shown some promise to provide some measure of pine wilt control in specific pine trees for two to three years.

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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