The Plant Doctor's LANDSCAPE TIPS

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WHITE PINE BLISTER RUST

INTRODUCTION:

White Pine Blister Rust (WPBR) is a lethal disease of five needle pines, caused by the fungus Cronatium ribicola. The fungus was introduced into the United States, and hence North America, around 1900. Like most rust fungi, which are obligate parasites, the fungus has a relatively narrow host range; eastern white pine (Pinus strobus) (Photo 1), limber pine (Pinus flexilis), western white pine (Pinus monticola), etc. The disease was recently found on bristlecone pine (Pinus aristata). As with many rust diseases, the WPBR fungus also has an alternate host that is required to complete its life cycle. The primary alternate hosts include currant and gooseberry, otherwise collectively categorized as Ribes species (Photo 2).

During the 1930s, President Franklin D. Roosevelt created the Civilian Conservation Corps (CCC) to assist in the recovery of the U.S. economy from the Great Depression. Because white pine was considered such a valuable natural timber resource throughout the northern states, one of the aims of the CCC was to manage this introduced and devastating disease on white pine. To accomplish this goal, thousands of people were hired under the government CCC program to trample throughout the northern states to eliminate Ribes species from the natural forests containing white pine. The obvious objective was to prevent the WPBR fungus from completing its life cycle; otherwise, the fungus would build up its populations and threaten our native white pine forests in North America. This CCC endeavor was highly successful in the eastern states but less so in the western states. The success of the program is the primary reason why the disease is witnessed only occasionally today in forests and landscapes. Incidentally, concern for this disease was so prevalent that the vast plantings of pine stands in rows by the CCC contained red pine rather than white pine.

SYMPTOMS AND DISEASE CYCLE:

The WPBR fungus invades pine tissues, whether they be needle, branches or stems. Typically, spores of the fungus first infect needles and small branches of pine, creating a girdling canker. As the canker expands and moves into the main trunk, the entire tree may be girdled and killed. Branches affect by WPBR generally become yellow first and, eventually, turn brown. The most conspicuous evidence of white pine blister rust is the yellowish, blister-like canker on pine (Photo 2). Spores produced in these pustules are blown to Ribes sp., where infections create other specialized spores that are carried by insects and wind to pines in the late summer. Infections of pines generally produce the blisters the following spring and summer. The disease cycle incorporates a variety of specialized spores whose understanding is beyond this brief publication. It is important to know that the fungus cannot spread from pine to pine, but must first infect Ribes before returning to pine.

MANAGEMENT:

Obviously, one of the most important management tools for WPBR is to eliminate either one of the host plants. Because spore phases are hardy, not prone to desiccation and may travel many miles, the elimination of the alternate or less-preferred host may be a difficult, if not controversial, endeavor, depending on which host is preferred by whom. In the case of pine, if blister cankers on branches are not within several inches of the main trunk, the fungus may be eliminated from the tree by simply pruning the branch from the tree. Properly dispose of the branch by burning, burying, etc. Scientists have been working for many decades to incorporate resistance to WPBR into new varieties of five needle pines with varying degrees of success.

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Photo 1. Eastern white pine is a valuable forest and landscape species of conifer. Along with some other five needle pines, this tree is susceptible to the white pine blister rust fungus which was introduced on pine seedlings from Europe around 1900.

Photo 2. Yellow blisters are diagnostic for white pine blister rust. Trees can be saved from destruction if affected branches are pruned before the fungus enters the main trunk. Because this blister canker occurs on the trunk of this white pine, it cannot be saved. Note the alternate host, Ribes, directly adjacent to the lower (left of) trunk.