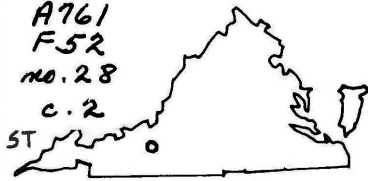


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Forest Tree Diseases of Virginia

April 1977

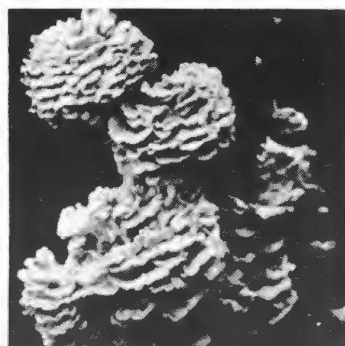
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White Pine Root Decline

by

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Eastern white pine (*Pinus strobus* L.) is a highly desirable tree species that is being widely planted for forest, Christmas tree, and landscape use. The species occurs naturally throughout the mountainous and Piedmont sections of Virginia and it is considered to be a major timber species in the western mountains and valleys of the state. Because of its rapid growth, soft needles, fullness, and excellent response to shearing, eastern white pine is a very popular species that is planted as Christmas tree stock. The species, in general, has fewer major disease and insect pest problems than other conifers that are planted for Christmas tree or timber production. However, during the past few years, a disease previously described in the 1930's has once again become evident throughout young stands and Christmas tree plantations.



Figure 1. Light colored white pine died in a 3 week period from first symptom being observed. Initial symptom involved light green coloration of foliage followed by wilt of needles.

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U. S. Department of Agriculture. W. R. Van Dresser, Dean, Extension Division, Cooperative Extension Service, Virginia Polytechnic Institute and State University, Blacksburg, Virginia 24061.

White pine root decline was initially described as "resinosus disease" involving abundant pitch flow and reddening of the root tissue. Very little further work has been accomplished on this particular disease due to its sporadic occurrence over periods of years.

Cause: The fungus Verticiladiella procera has been suggested as the causal organism involved in the disease and has been isolated from infected roots. Another species of this fungus (V. wagnerii) is known as a pathogen of ponderosa pine in California with similar symptom patterns associated with the disease complex. Some evidence has accumulated that the disease occurs most often on wet sites or on poorly drained soils. Such evidence was also reported when the disease was initially described in the 1930's.

Symptoms: White pine root decline is characterized by a sudden wilt and death of the entire tree in a short period of time (Figure 1). Usually only 4-8 weeks elapse between initial symptoms and tree death. Needles wilt (Figure 2A, B) and become pendant while still green and fade quickly to a uniform light tan color. Needles remain on the tree for an extended period of time after death. Some light green needles may remain pendant on the lower branches even though the remainder of the tree has turned brown. Needles are not shortened as in a decline or long term disease situation.

The bark of symptomatic trees has been noted as being deep red in color (particularly at the base of the trunk) and resin flow may be prominent (Figure 3). Patches of red colored bark and sunken areas may occur initially and precede foliage wilt and tree death. Excavated roots will appear deep red in color even during the wilting stage indicating that such reddening and death gives rise to the wilt symptoms. Red streaks have been noted to extend under the bark from the roots up into the stem for short distances (Figure 3).

Range: This disease probably occurs throughout the range of eastern white pine. Current reports of the disease in Pennsylvania, West Virginia, North Carolina, and Virginia have been made with some plantations in the latter three states being moderately affected.



Figure 2A. Rapid wilt and death of foliage over entire tree as a result of white pine root decline.



Figure 2B. Pendant needles are commonly found on all branches. White pine needles normally are produced around the entire branch. Here they hang in one direction.

Figure 3. Red or brownish red streaking of wood at base of stem. Streaks originate from infected roots. Pitch flows from infected stems and is also evident in photograph.



Control: Since little is known concerning the complete cause of this disease, specific chemical control recommendations cannot be presented. However, several good principles of root disease control should be followed.

Diseased trees and as much of the root system as possible should be removed and burned immediately after discovering the dying trees. The same species (i.e. white pine) should not be replanted if an alternative tree species is available. White pine should not be planted in extremely wet sites since this disease has been prevalent during periods of wet springs and on wet sites.

At least one other major disease will cause somewhat similar symptoms as white pine root decline. Caution should be used to insure that White Pine Blister Rust as described in MR-FTD-17, Virginia Cooperative Extension Service, Blacksburg, Virginia has not caused a basal stem canker leading to entire tree death.

Sudden tree death and wilting foliage should be used as the best diagnostic tool along with root discoloration before removing the tree. Such trees will not recover and should be removed.