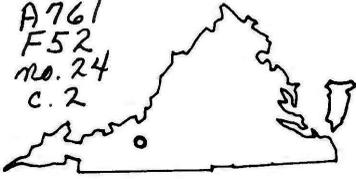


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Forest Tree Diseases of Virginia

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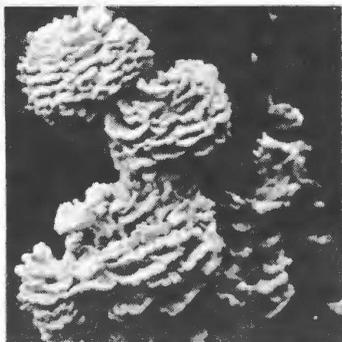
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RUST



DECLINE



DECAY



CANKER

Pine - Pine Rust of Scotch Pine Christmas Trees

by

John M. Skelly

Extension Specialist, Plant Pathology

Virginia Polytechnic Institute and State University

Blacksburg, Virginia 24061

Most rust fungi of major importance to forest trees or to Christmas trees require two hosts in order to complete their life cycle. Such is the case with the white pine blister rust fungus, Cronartium ribicola, the eastern gall rust fungus, Cronartium cerebrum

and the fusiform rust fungus, Cronartium fusiforme. These rust diseases are sometimes easily controlled by the removal of the alternate hosts from the immediate vicinity. Pine-Pine rust is appropriately named. In order for the fungus, Endocronartium harknessii, to complete its life cycle infection can take place directly on one pine from spores (aeciospores) produced on immediately adjacent or somewhat distant pines. This single factor poses a real need for early disease recognition and control practices. This disease is also called western gall rust and Woodgate rust but pine-pine rust best fits its most important feature in relation to control.



Figure 1. A slight witches broom has developed on the right side of this infected Scotch pine. Note branch tufts above branch gap and overall deformity of tree.

RANGE:

Western gall rust occurs throughout northern North America and severe damage on Scotch pine has been noted in midwestern states, New York, and Pennsylvania. It has recently been reported present in Maryland, West Virginia, Virginia, and North Carolina. This disease has been prevalent for many decades on western conifer species; particularly, ponderosa pine.

CAUSE:

Endocronartium harknessii is a rust fungus that is closely related to the other important rust disease causing fungi. This rust fungus is somewhat unique in that it does not need an alternate host and can spread from pine to pine by way of aeciospores produced on the galled tissue.

SUSCEPTS:

This disease occurs on many conifer species but Scotch pine is the only tree considered to be extremely susceptible in Virginia. Western species that are susceptible include Coulter, Jeffery, Digger, Lodgepole, Monterey, and Ponderosa pines. Jack pine, found throughout the Lake states, is also very susceptible.

Virginia and Loblolly pine are susceptible, but whether or not this disease will spread rapidly among these two southern species has yet to be determined.

SYMPTOMS AND SIGNS:

Pine-pine rust has several characteristic symptoms that are easily recognized. Infected trees usually develop a tuft of branches (witches broom) immediately above the gall and such a formation of branches is easily visible due to the extremely dense nature of the foliage. Such witches brooms often die after the gall tissue completely girdles the stem (Figure 1, 2). Another distinguishing characteristic of this disease is the presence of multiple galls within one area of a branch. Usually four galls are formed immediately adjacent to each other along a single branch (Figure 3). Trees have been found with hundreds of galls present, but fewer galls are more common (Figure 4).

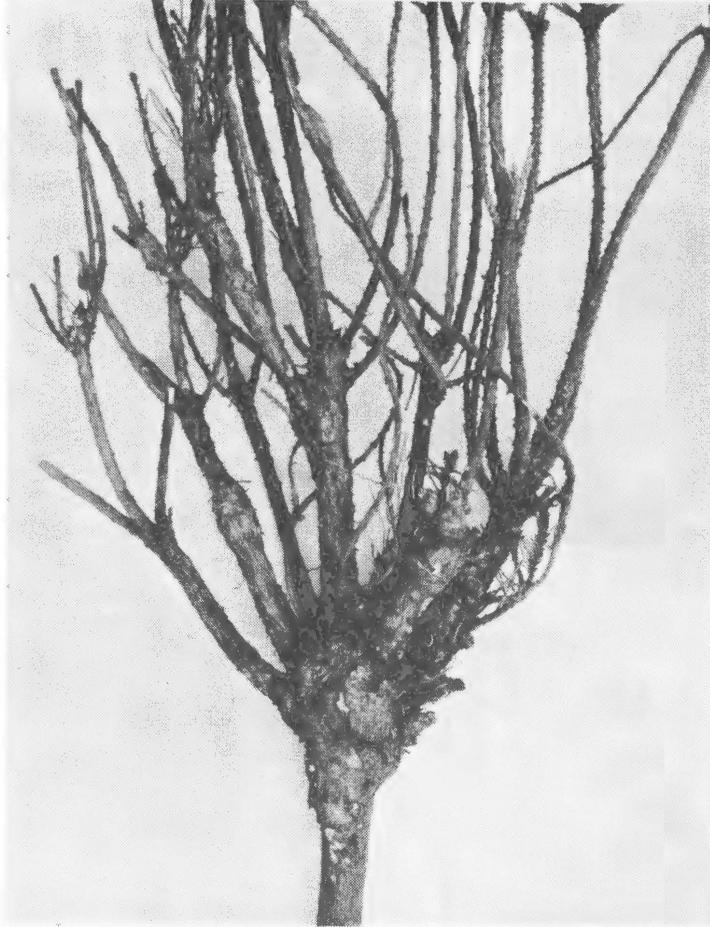


Figure 2. A witches broom with all the needles removed reveals numerous small galls on smaller branches above the larger infected area.

Jack pine, found throughout the Lake states, is also very susceptible.

Individual galls are globose to fusiform (spindle) shaped and may be found extending around the complete branch or small trunks, but are more commonly found only on one side of larger trunks. Newly formed galls are very smooth on small branches and become rough and cracked as they grow older. Numerous small galls look like beads of a necklace when they are formed close together.

During mid to late spring, the fruiting (aecial) stage of the fungus is produced directly on the surface of the older gall tissues. At first, only a slightly raised pale yellow-orange pustule is evident, but as the fungus continues to develop, a brighter orange spore mass becomes visible. Eventually, these aecia erupt and showers of aeciospores are emitted during periods of wind or other agitation of the tree. Orange clouds of spores are visible when a gall is shaken and similar clouds of spores have been noted around heavily infected trees and within plantations.

CONTROL:

Early disease detection is the key to disease control. Once numerous galls are formed, new multiple infections quickly follow. This disease organism needs no other alternate host as with other rust fungi, and eradication of infected trees prior to spore formation the next spring period is essential for control. The fungus fruits on larger galls, and hence, trees with such galls should be removed and destroyed. Branches with small galls can be removed and destroyed unless they are too numerous to maintain the shape of the tree following their removal. Christmas tree growers should be extremely careful in planting only clean, non-galled seedlings and careful inspection of the trees should follow in subsequent years. No tree should be harvested or sheared during the fungus spore production stage. Removal should be done only in the late summer, fall, or winter months.



Figure 3. Numerous galls on branch terminal. Note that four galls have occurred adjacent to one another.



Figure 4. Numerous galls that formed near the top of a single tree have made this tree non-salable. Such trees must be removed from the plantation to prevent spread.

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KEYS TO PROPER USE OF PESTICIDES

1. Read the label on each pesticide container before each use. Follow instructions to the letter; heed all cautions and warnings, and note precautions about residues.
2. Keep pesticides in the containers in which you bought them. Put them where children or animals cannot get to them, preferably under lock and away from food, feed, seed or other material that may become harmful if contaminated.
3. Dispose of empty containers in the manner specified on the label.

SEE YOUR DOCTOR IF SYMPTOMS OF ILLNESS OCCUR DURING OR AFTER USE OF PESTICIDES.