



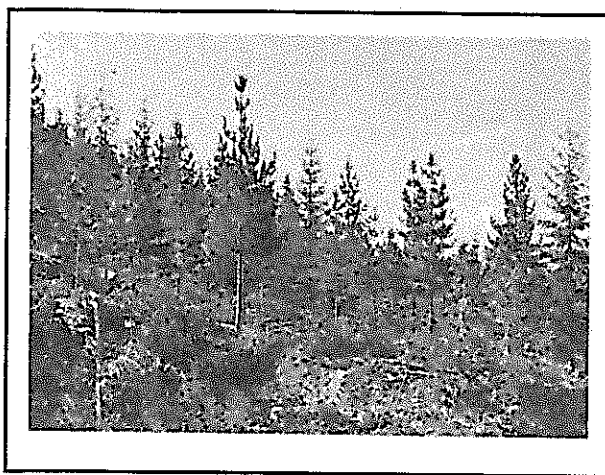
A BRIGHTER, LESS RUSTY FUTURE FOR WESTERN WHITE PINE IN BRITISH COLUMBIA

Until recently, western white pine *Pinus monticola* was dismissed as a commercially valuable tree species in most of British Columbia and the Pacific Northwest. The major reason for this was blister rust, a lethal canker disease (See PesTopic No. 8) caused by the fungus, *Cronartium ribicola*. A native of Asia, this fungus was introduced in 1911 when white pine seedlings were imported to B.C. from Europe. By the time the new disease was recognized in the late 1920's, it had spread widely and devastated many white pine stands. Although white pine trees have been and still are harvested occasionally, and sold at a premium, especially in southeastern B.C., regeneration of new white pine stands has been thwarted by the disease. Now, with recent developments such as pruning trials to protect young trees, and a tree selection and breeding program to develop genetically resistant varieties, the future for white pine in B.C. is brighter.

In addition to the quality of its lumber, western white pine has several other attributes which make it a desirable forest species. It grows very rapidly, usually faster than any other tree species in B.C., on a variety of sites, from rocky, southern slopes on Vancouver Island, to elevations of 1400 metres or more in the Kootenays. In contrast to Douglas-fir and other species, white pine appears to have a broad range of genetic

variation so that seeds collected from one locality can be planted in many other areas. However, white pine does require a soil rich in nutrients, especially calcium. On nutrient-poor sites, during drought, it is very susceptible to root dieback which results in the poleblight disease.

Interestingly, another disease, laminated root rot of Douglas-fir (PesTopic No. 3), has stimulated a renewed interest in the management of white pine in B.C. Laminated root rot is widespread in coastal second growth Douglas-fir forests, with diseased sites occupying 10 to 15% of the



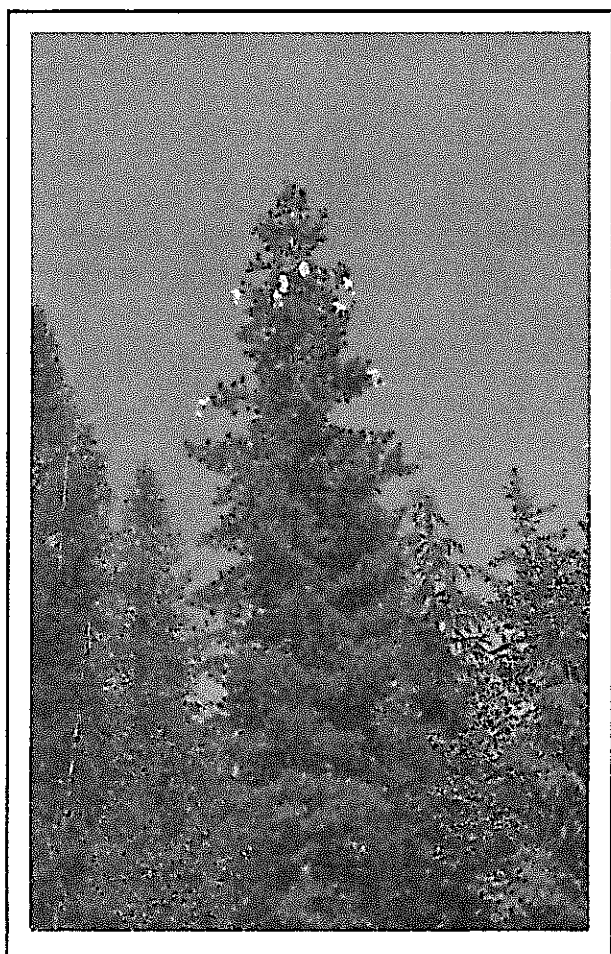
Young, spaced and pruned white pine in southeastern B.C.

productive forest area. Researchers have reported that white pine is less susceptible than Douglas-fir to this root disease, and is

seldom killed. Planting white pine on these root diseased sites could therefore improve forest productivity -- if white pines could be protected from blister rust.

A short-term blister rust protection strategy involves pruning off the lower branches on a tree to a height of 2 to 3 m. Most blister-rust cankers start on these lower branches, spread into the trunk, then girdle and kill the tree. For maximum protection, trees should be pruned first at 5 to 6 years of age and later at 10 to 12 years.

Ongoing American studies indicate that 80% or more of the trees can be protected through pruning. However, this approach



A rust-free white pine selected for breeding.

might not be successful near currant bushes or within 10 metres of a stream, lake, or swamp. Here, lethal cankers often occur even higher than 3 m on the tree. Where a small canker has developed on a young tree stem but has not girdled more than 25% of the circumference, American researchers have recommended peeling off the tree bark in a 2-3 cm strip around the canker. This method is being tested in B.C.

Although tree pruning is a relatively successful control method, it is also labour intensive and expensive. Long-term successful management of white pine will probably require white pine seedlings that are resistant to the blister rust. A cooperative program is being developed by Forestry Canada, B.C. Ministry of Forests, and forest companies to select and breed more resistant varieties. This program will be similar to the successful white pine breeding programs which have been underway for 30 years in the U.S.A.

One problem encountered so far in selecting resistant trees in B.C. is the low incidence of infected trees compared to areas in Idaho and Washington where much breeding work has been done. This makes the job of testing more time-consuming because many trees in B.C. have likely escaped infection by chance. On the other hand, the relatively lower incidence of disease in B.C. could make protection and breeding efforts more effective. Perhaps the trees which have survived blister rust since 1911 are becoming more resistant due to the natural selection resulting from the disease.

Although the success of western white pine as a commercial forest tree is not certain, these recent developments are very encouraging for its reinstatement as a valuable species in B.C.