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## A NOTE ON FIRST TIME WIDESPREAD ATTACK OF STEM BLISTER RUST IN YOUNG BLUE PINE PLANTATIONS ON NARAN, UPPER KAGAN FORESTS

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A recent visit to Naran forests revealed the occurrence of stem blister rust (*Cronartium ribicola* Fischer) on young blue pine (*Pinus wallichiana* A.B.Jackson) crop planted during 1984-85 in Compartment Nos. 9 and 10, Naran Forest Range. The incidence of attack was found to vary from 20-30%. It was observed that most of the infected plants had already died while the remaining exhibited blisters, swellings and girdling of stem, death of small shoots, needles turnings to reddish brown, resin exudation and eventually leading to the death of entire plant. The dead wood was found attacked by the borers (insects).

*C.ribicola* attacks 5-needle pines and being macrocyclic heteroecious produces pycnia and aecia on pine and Uredinia and telia on *Ribes* spp. (dicot), the alternate hosts (Ainsworth, 1971). It causes stem blister rust on a number of pines in Asia, Europe and North America (Bakshi, 1976). In India, the earliest record of the fungus is by Nisbet (1895) who collected aecial stage on stems of blue pine. However, the rust is not common in India. In Europe, exotic eastern white pine (*Pinus strobus*) is highly susceptible (Boyce, 1961). In North America, the most important disease of Western white pine (*Pinus monticola*) is blister rust (Miller et al., 1968).

Stem blister rust has been reported by Ahmad (1956) in Pakistan from Kagan Valley; Shogran and Hazara infecting *Ribes rubrum*, a bush found common in the areas. In a general life cycle of this rust, pycnia are minute and

exude pycnosporos in a drop of honey. Aecia emerge on infected bark of pines in spring and continue to appear till the middle of July, Aeciospores are wind dispersed and infect *Ribes* during May and June. Uredinia are golden yellow and develop uredinospores which infect *Ribes*. Later, telial columns develop. Teliospores germinate in situ to produce sporidia which are wind dispersed and infect pines. None of the spore forms appears to overwinter (Bakshi, 1976).

This is for the first time that *C.ribicola* has been found damaging on young blue pine in the Naran forests although blue pine is reported (Bakshi, 1976) resistant and provides suitable material for breeding white pine resistant to the rust. In view of this, the possibility of the existence of more than one strain in *C.ribicola* may have to be examined. *C.ribicola* is regarded as a homogenous species (Boyce, 1961) and is not known to occur in more than one strain on *Ribes* (Hahn, 1949). However, to confirm this a critical morphological study of *C.ribicola* based on material collected from all over the World and cross inoculation experiments are necessary as this may have a bearing on the relative blister rust resistance of 5-needle pines (Bakshi, 1972).

To control, eradication of alternate host, breeding resistant pines and application of systemic fungicides is to be attempted (Boyce, 1961). Planting of fir (*Abies pindrow*), spruce (*Picea smithiana*) and deodar (*Cedrus deodara*) is suggested as these are found naturally



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growing in the area and are not hosts for stem blister rust.

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