FACT SHEET

How to recognize

White pine blister rust cankers

Blister rust cankers on stems and branches of white pine are caused by the fungus *Cronartium ribicola* J.C. Fisch. The fungus was introduced to Vancouver on infected nursery stock in 1910, and from there it spread throughout the Pacific Northwest over the next 25 years where it continues to decrease stocks of native white pines. Many trees die from one or many blister rust cankers; only a few white pines remain canker free.

The ability to recognize blister rust cankers is a prerequisite to finding canker-free trees. In British Columbia, canker-free trees will be evaluated to determine if they are susceptible trees that have somehow escaped infection or whether they are genetically resistant. Resistant trees, particularly western white pine (*Pinus monticola* Dougl.), will be used in tree improvement programs. The purpose of this sheet is to facilitate recognition of blister rust cankers on western white pine so that candidate resistant trees can be chosen more assuredly.

The life cycle of the fungus involves two different hosts with two spore stages produced on white pine and three produced on the alternate hosts, currants and gooseberries.

Cankers on pine are observed best in the spring, when they produce the characteristic orange aeciospores in aecial blisters (Fig. 1). Branch cankers may be recognized at any time by the orange discoloration in the bark surrounding the swollen, elongated canker (Fig. 2). Initially, in stems with smooth bark, the orange discoloration is highlighted as a diamond-shaped pattern around the point of canker initiation (Fig. 3).

Before aecial blisters form, cankers are difficult to discern. Initially they are small, circular, orange-colored patches, frequently with a fascicle of dead needles in the center (Fig. 4). Small dark areas, pycnia (Fig. 5), develop and exude the first spores, pycniospores, in nectar-like droplets (Fig. 6) during the summer. Pycnia develop annually in the orange margins of cankers, however the pycniospore droplets often are consumed by insects so that little remains on the canker.

Older branch cankers are swollen and dark, with roughened bark between orange ends (Fig. 7). This roughened bark is produced by ruptured aecial blisters from former years. Aecial scars are invaded by various opportunistic organisms as evidenced by boring dust of insects or small, black, orange or red fruiting bodies of invading fungi. These organisms can cause branch die-back to the canker or to the stem. On stem cankers, they cause dead patches and increase resin flow, perhaps causing tree death. On dead branches, the swollen area with roughened bark is the only clue of past blister rust infection (Fig. 8).

Older stem cankers often do not produce pycnia or aecia and the orange margins may be difficult to discern, but they frequently produce resin flow (Fig. 9). Sometimes the canker may distort the stem (Fig. 10). Squirrels often feed on blister rust cankers which results in bark stripping, resin flow and girdling (Fig. 11). Symptoms similar to those of blister rust, such as distorted stems and resin flow, may also be produced by other agents, such as porcupines or sunscald; trees with such symptoms should therefore be rejected as resistant candidates.

Branch cankers of blister rust may be confused with cankers caused by *Atropellis pinicola* Zeller and Goodd. Black fruiting bodies or their black, circular bases are always present on live branches (Fig. 12). On dead branches, *Atropellis* cankers are typically swollen, similar to blister rust cankers, but are usually flattened on one side (Fig. 13) and lack the roughened bark characteristically produced by aecial ruptures of blister rust (Fig. 7 and 8). *Atropellis* cankers stain the bark and wood black (Fig. 14), whereas blister rust does not invade wood. *Atropellis* cankers are rare on white pine stems and, if present, are about the size of a quarter.

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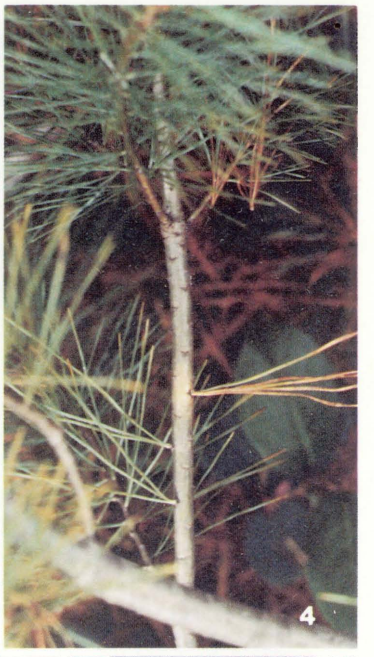

White pine cankers

Fig 1-11 *Cronartium ribicola*

Fig 12-14 *Atropellis pinicola*