White Pine Blister Rust on Currants and Gooseberries

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White pine blister rust is not a serious disease of currants and gooseberries; however, it is a very serious disease of white pines (*Pinus strobus*). Currants and gooseberries serve as an alternate host for the rust fungus that causes white pine blister rust. Therefore, planting currants and gooseberries in areas where white pines are present can lead to serious losses of white pines. North American white pine species, including bristlecone, limber, sugar, eastern white, southwestern white, western white, and whitebark, are highly susceptible. White pine blister rust causes significant damage in pine forests by forming cankers on the branches of white pines. These cankers ultimately kill the trees. Black currant is the most susceptible of the *Ribes* species.

Figure 1. Symptoms of white pine blister rust on the lower surface of an infected black currant leaf.

To protect white pine forests, several states have enacted laws concerning planting of black currants.

The current Ohio law (Regulation AG-71-85.01) to suppress and control White Pine Blister Rust Disease is as follows:

(A) The European black currant, *Ribes nigrum* L. or any variety of this species is hereby declared to be a public nuisance, and it shall be unlawful for any person to possess, transport, plant, propagate, sell, or offer for sale, plants, roots, scions, seeds, or cuttings of these plants in this state.

(B) Recognized varieties, e.g., "Consort" produced by the hybridization of *Ribes nigrum* L. or a variety thereof with a resistant or immune species, known to be immune or highly resistant to the White Pine Blister Rust fungus, (*Cronartium ribicola,* Fischer) are exempt from the restrictions imposed by paragraph (A) above.

Note: Ohio law does not prohibit the planting of red currants or gooseberries within the state.

Symptoms

On *Ribes* in the spring, tiny yellowish spots become visible on the upper surface of the leaves, while on the underside, orange-yellow, blister-like fruiting bodies appear. By late summer, yellow to brown threadlike growths develop on or near these infection spots on the leaf. Bushes also will have premature defoliation.

On white pine, the symptoms include dead branches, chlorotic foliage, branch girdling by lesions that exude

Figure 2. Close up of telia and some uredia on the lower surface of a black currant leaf infected with white pine blister rust.

resin or sticky yellowish fluid (spermagonia), cankers that are diamond-shaped to elliptic with a dead center surrounded by a band of yellowish-green infected bark, light yellow-orange aecia, and death of the tree.

Causal Organism and Disease Development

White pine blister rust is caused by a fungus, *Cronartium ribicola*. The organism was introduced from Europe in the early 20th century. It has spread throughout the entire range of white pines in North America. The life cycle takes three to six years to complete. The initial infection of black currant bushes occurs in the spring, when aeciospores from diseased white pine land on the leaves of the bush. These spores can travel on the wind several miles. Moisture is needed for the germination of the aeciospores.

After one to three weeks incubation, the plants begin to show the first symptoms of disease. Yellowish spots appear on the top side of the leaves and fruiting bodies (uredia) appear on the underside of the leaves. The fruiting bodies (uredia) produce uredospores which reinfect *Ribes* leaves. This cycle can be repeated many times during a single growing season.

In late summer or early fall, when day length and temperature decrease, telia (another type of fruiting body) replace the uredia on the underside of the leaves. The telia produce teliospores, which germinate in place at night during wet weather and produce basidiospores. After telial formation, at least 60 hours of wet weather with temperatures not exceeding 20 degrees C are required for basidiospore formation, dispersal, and infection of white pine. These basidiospores are carried by the air currents to white pine trees. The basidiospores germinate on wet needles and enter through the stomata.

The only symptom initially is a yellow to reddish spot at the site of infection. Infected needles turn yellow and drop prematurely, but often not before the fungus has grown down the needle and entered the twig. This occurs late in the fall or early in the spring of the next year. About 12 to 18 months after infection, the fungus has grown from the needle into the bark of the stem, where it produces spermagonia. During the first or second year of infection, the spermagonia produce aecia. The aecia produces powdery bright yellow aecidiospores that may live for many months. The aecidiospores are carried by the wind to *Ribes* bushes, completing the cycle.

Control

1. Remove susceptible *Ribes* species and infected plants.
2. Plant only disease-free resistant varieties of *Ribes* approved by the Ohio Department of Agriculture. Some examples of resistant varieties of Black currant are Consort, Crusader, Coronet, Ben Sarek, and Ben Nevis. Red currants and gooseberries are not affected by Ohio law and are legal to plant.
3. There are no fungicides labeled on currants and gooseberries for control of white pine blister rust.

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