

5. Eastern and Western Gall Rusts

Glenn W. Peterson, William Merrill, and Darroll D. Skilling

Hosts

Eastern gall rust, caused by the fungus *Cronartium quercuum*, affects jack, Scotch, shortleaf, Virginia, and other hard pines. Primary alternate hosts, which are needed to complete its life cycle, are red and black oaks.

Western gall rust, caused by the fungus *Endocronartium harknessii* (syn. *Peridermium harknessii*), affects many native hard pines, including ponderosa, lodgepole, jack, Monterey, Jeffrey, Coulter, knob-cone, bishop, and Digger pines. It also affects exotic Scotch, Swiss Mountain, Aleppo, and Canary Island pines. It needs no alternate host to complete its life cycle.

Distribution

Eastern gall rust occurs east of the Great Plains from Canada to the Gulf of Mexico.

Western gall rust generally is found throughout the pine forests of the West, the northern Lake States, New England, New York, and Pennsylvania.

Damage

Although seedlings infected with eastern or western gall rust are not killed in the nursery, these seedlings are not salable and must be culled. Infected seedlings may die if outplanted, or the stem galls may weaken the main stem, eventually resulting in wind breakage or reduced wood quality.

Infected nursery seedlings may also serve as foci for new infections in plantations. This is especially true with *E. harknessii*, which spreads from pine to pine.

Diagnosis

Look for globose to irregular galls on the stems of seedlings (fig. 5-1). Galls rarely are evident until the summer following the year of infection.



Figure 5-1—Galls on pine seedlings caused by *C. quercuum*.

Galls formed by the two fungi are similar in size and shape and cannot be distinguished on the basis of gall type. However, the presence of the characteristic hair-like telial state on oak leaves in the vicinity of the nursery suggests infection by eastern gall rust, which requires oaks to complete its life cycle. The absence of infected leaves on nearby oaks suggests western gall rust, which can spread from pine to pine.

The presence of these two rusts on established pines in the vicinity

of the nursery is evidenced by numerous globose to elongate galls on stems and branches (fig. 5-2). These galls are particularly conspicuous in the spring, when they are covered by bright orange masses of aeciospores (fig. 5-3).



Figure 5-2—Branch galls caused by *E. harknessii*.

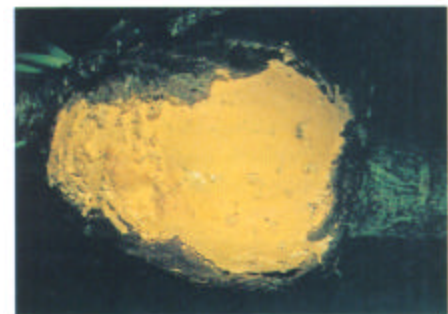


Figure 5-3—Aeciospores of *E. harknessii* on gall.

The aeciospores of the two fungi are morphologically identical but can be distinguished on the basis of germ tube characteristics when germinated in the laboratory.

Aeciospores of both rusts are only rarely seen on galls in the nursery.

Biology

Aeciospores of *C. quercuum* form on galls and disperse from April to June. These spores infect oak leaves, but they do not infect pines. Basidiospores produced throughout the summer on infected oak leaves infect pine needles. The fungus grows from the pine needles into the stem, where it produces galls.

Aeciospores of *E. harknessii* also form on galls and disperse from April to June. Unlike the spores of *C. quercuum*, however, which infect oaks, these spores directly infect current-year shoots of pines.

Control

Prevention—Remove all pines affected by western gall rust for a distance of one-half mile from the nursery. For eastern gall rust, remove oak hosts for a distance of one-half mile.

Cultural—Adopt stringent culling practices to minimize the outplanting of infected seedlings.

Chemical—Applying fungicides to nursery seedlings to control these rusts has seldom been attempted.

Selected References

- Anderson, G.W.; French, D.W. 1965. Differentiation of *Cronartium quercuum* and *Cronartium coleosporioides* on the basis of aeciospore germ tubes. *Phytopathology*. 55: 171-173.
- Skilling, Darroll D. 1975. Jack pine rusts. In: Peterson, G.W.; Smith, Richard S., Jr., tech. coords. *Forest nursery diseases, in the United States*. Agric. Handb. 470. Washington, DC: U.S. Department of Agriculture: 59-61.
- Smith, Richard S., Jr. 1975. Western gall rust. In: Peterson, G.W.; Smith, Richard S., Jr., tech. coords. *Forest nursery diseases in the United States*. Agric. Handb. 470. Washington, DC: U.S. Department of Agriculture: 56-58.