

# Brown Crumbly Rot

## Common saprot of conifers

**Pathogen**—Brown crumbly rot is caused by *Fomitopsis pinicola* (= *Fomes pinicola*). The fungus is a very common decayer of conifers and is known as the red-belt fungus.

**Hosts**—*Fomitopsis pinicola* is found on dead conifers and aspen. Occasionally, it may be found on dead parts of living trees.

**Signs and Symptoms**—The red-belt fungus forms perennial conks that are corky and shelf-like. Tops of conks are leathery to woody and range in color from cream, gray-brown, reddish brown, and dark brown to almost black. They often have a reddish orange growing margin (red belt) and a whitish to cream-colored pore surface (figs. 1-2). Conks vary in size and can be slightly over a foot (30 cm) in diameter.

Young conks are amorphous masses of white or cream-colored tissue (fig. 3). Later, the fruiting body develops into the typical perennial shelf conk from 3-18 inches (7.6-45.7 cm) wide with a light lower surface of minute pores filled with reproductive spores. A reddish orange band typically forms just inside the white to cream-colored edge of the conk's upper surface—the point where a new pore layer is produced annually.

Initially, the wood becomes yellowish to pale brown and later develops into the crumbly brown cubical rot (fig. 4). In later stages, the wood develops cubical cracks, in which white sheets of mycelium can develop.

**Disease Cycle**—Spores are disseminated by wind. The spores typically germinate on and colonize dead trees, but the airborne spores can infect and colonize living trees through wounds and broken tops.

**Impact**—Brown crumbly rot is one of the most common and important wood decays in North America. It performs an important ecological role in the degradation of woody material necessary for nutrient recycling in a forest. It is almost exclusively a saprobe, rotting dead trees and stumps. Both sapwood and heartwood are readily decayed. Rarely, this fungus causes a heartrot of living conifers where a large wound has allowed this very weak pathogen to enter the heartwood. Ponderosa pines killed by fire or beetles are often invaded by *F. pinicola* and decay rapidly, reducing salvage potential.



Figure 1. Red belt conks often have a distinctive red band along the perimeter when mature. Photo: Susan K. Hagle, USDA Forest Service, Bugwood.org



Figure 2. The distinctive red band might also be absent. Photo: James T. Blodgett, USDA Forest Service.



Figure 3. The distinctive band is usually absent on immature conks. Photo: John W. Schwandt, USDA Forest Service, Bugwood.org.



Figure 4. Brown cubical rot with white mycelial mats, caused by *Fomitopsis pinicola*. Photo: James T. Blodgett, USDA Forest Service.

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**Management**—Injuries caused by falling trees or mechanized equipment during thinning can offer the fungus an opportunity to become established in standing trees. Therefore, injury prevention can reduce volume loss.

*Fomitopsis pinicola* is an important component of the coniferous forest ecosystem because it decays dead trees and logging slash, leaving a lignin-rich residue that is a major organic component of the upper soil layers. This residue enhances water-holding and cation-exchange capacities of soil. The residue is also very resistant to further decomposition and, therefore, enhances carbon sequestration by forests. Decayed snags and fallen trees are habitat for many amphibians, birds, and mammals.

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