

Sooty-Bark Canker

Normally the No. 1 killer of Rocky Mountain aspen

Pathogen—Sooty-bark canker is caused by the fungus *Encoelia pruinosa* (formerly known as *Cenangium singulare*). It is sometimes called Cenangium canker.

Hosts—Sooty-bark canker is found primarily on aspen. Other *Populus* species may be attacked occasionally in other areas.

Signs and Symptoms—Sooty-bark canker begins as a small, sunken, oval patch of dead bark. It may grow as much as 3.28 ft (1 m) long and 12 inches (30 cm) wide each year. Each year's canker growth typically has an alternation of light and dark zones, caused by the appearance of the thin, light layer of outer bark contrasting with the black inner bark where the outer bark is gone (figs. 1-2). The black inner bark becomes dry and powdery, leading to the term "sooty." Eventually, the canker girdles the tree and it dies.

The fruiting bodies are apothecia and often appear in large numbers on killed bark. They are cup-shaped, up to 1/8 inch (3 mm) in diameter, and have very short stalks (fig. 3). They are gray with a fine granular surface (pruinose). When dry, they are shriveled and inrolled.

When the bark is completely weathered away, a final sign of sooty-bark canker is small patches (several millimeters in diameter) of black fungal material on the wood, separated by plain wood. The pattern is often likened to that on a leopard's fur (fig. 4).

Disease Cycle—Cankers can be initiated at points with no apparent wounds, but the fungus does infect stem wounds. However, the type, season, and size of wounds that are suitable infection courts are not known. The inner bark and cambium are rapidly invaded and killed. As described under "Signs and Symptoms" above, vertical growth is somewhat faster than horizontal growth. Callus is not produced unless the disease is stopped, which is unusual.

The pathogen fruits within a year or two of bark death. Ascospores are forcibly shot from apothecia into the air under moist conditions. Spores germinate and infect through suitable infection courts.

Impact—Sooty-bark canker is the most lethal canker on aspen in the West, and it is the most widespread canker in Colorado and probably other areas of the West. Under normal circumstances, it is the primary killer of aspen in Colorado and probably other parts of the West. This is not the case during unusual events such as sudden aspen decline, a mortality event of 2004-2009 that was associated with drought stress.

The disease usually affects the larger trees in a stand. It kills trees in only 3-10 years unless its development is arrested, which is uncommon. Damage from this canker is most common in stands where the incidence of wounding is high.



Figure 1. The barber-pole pattern of sooty-bark canker. Each light and dark pair represents one year of growth. Photo: Thomas Hinds, USDA Forest Service.



Figure 2. Another example of the barber-pole pattern of sooty-bark canker. The pattern may be more obscure than these examples. Photo: Jim Worrall, USDA Forest Service.

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Figure 3. Apothecia (fruiting bodies) of *Encoelia pruinosa*, the sooty-bark canker pathogen. Apothecia are light gray, cup-shaped, and inrolled and shriveled during dry weather. Photo: Jim Worrall, USDA Forest Service.



Figure 4. The "leopard spotting" that often remains on wood after the bark is weathered away from the sooty-bark canker. Photo: Jim Worrall, USDA Forest Service.

Management—As with the other aspen cankers, few practical approaches to preventing infection and canker development are known. Vigorous trees can be attacked and killed, so maintaining host vigor will not affect the disease. Avoiding wounds should reduce the likelihood of infection.

Silvicultural approaches can reduce the long-term impact. Because sooty-bark canker tends to attack older, larger trees, managing aspen in rotations of 80-100 years should be effective. Clearcutting, prescribed fire, and wildfire can all improve aspen condition by stimulating dense suckering before diseases like sooty-bark canker lead to gradual stand deterioration and, in some cases, conversion to other vegetation types.

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