

Beech Bark Disease

Biology, Symptoms And Management Options

FOREST HEALTH FACT SHEET

Wisconsin Department of Natural Resources, Division of Forestry, Forest Health Program, Revised July 2023

Beech bark disease is a serious disease of American beech (*Fagus grandifolia*) that results in the death of many large trees. A non-native insect called beech scale (*Cryptococcus fagisuga*), and the *Neonectria* fungus are both required for the disease to occur.

Beech scale is native to Europe and Asia, and only infests beech trees. It was accidentally introduced to Nova Scotia, Canada, around 1890. Beech bark disease spread to Maine in the 1930s and has since caused heavy mortality of beech in eastern states and Michigan.

In Wisconsin, American beech is found only in the eastern counties. It is usually found in forests where sugar maple is the most common species, but beech is sometimes dominant.

Wisconsin's first detections of the scale and disease occurred in Door County in 2009. Beech scale is found across most of the Wisconsin range of beech, although populations are very low outside of Door County. As of 2021, beech bark disease has only been found in Door County.

Scale Biology

Beech scales are tiny, sap-feeding insects. The scale is only capable of movement during the immature stage ("crawler"), which can be spread through wind, birds and infested firewood or logs. Adult scales are immobile and covered



Immature beech scale (1/50th of an inch in length) inside 'wool.' **Photo:** Melody Melzer, University of Guelph

with a white, woolly material. Lookalikes include lichen, spider egg sacs, woolly aphids and native scale insects.

Lightly infested trees have scattered spots of white wool on the trunk, often in bark crevices. As an infestation grows, the bark becomes heavily covered in white wool (top photo). Beech scale is usually abundant on a tree for several years prior to the appearance of disease symptoms. Approximately 0.1 to 5% of beech are considered resistant to beech scale and will exhibit little to no scale. These trees are unlikely to develop beech bark disease.

Disease Symptoms

Neonectria fungi can enter the tree through numerous scale feeding wounds and will then kill living tissue. Cankers (sunken, dead areas) form on the stem and large



Individual beech scale and 'wool' in a small bark crevice.

branches. They can cause the entire tree to decline and die. Some beech may linger with cankers before dying from *Neonectria*, other fungi or opportunistic insects.

Cankers that ooze a tar-like liquid are a common, early symptom of *Neonectria* infection. However, they also may appear due to other causes.



Beech dying from beech bark disease.



Tar-like, oozing canker often seen on infected trees. Beech scale is also present.

Neonectria fruiting bodies (structures that produce spores) sometimes appear as small, red dots around the oozing spots or elsewhere on the trunk.

Trees declining from beech bark disease usually have small leaves and thin, pale crowns. These small leaves remain on the tree but can become a golden yellow in late summer, earlier than normal fall colors.

Impact

Beech bark disease kills many large beech trees and often leaves survivors in a weakened condition. Root systems may produce abundant sprouts that can interfere with the regeneration of other tree species. Beech bark disease also may cause many small trees to become cankered and deformed.

Fungal infection structurally weakens the trunk and may cause it to break (known as “beech snap”). In campgrounds and other areas where beech snap presents a danger to people and structures, beech trees are often removed when moderately infested with beech scale, even if the tree still has a healthy crown.

Forest Management

If beech makes up less than 20% of basal area in a stand, management goals will likely be met even after beech bark disease becomes established and most of the beech die or are harvested.



Infected beech shows premature golden yellow coloration among dead beech. Taken in Door County, September 2010.

DNR [Beech Bark Disease Silviculture Guidelines](#) recommend that if beech is more than 20% of a stand’s basal area, pre-salvage and salvage harvests should be considered based on the progression of the disease. Avoid damaging beech root systems to minimize sprout production.

It may be appropriate to coordinate harvesting activities to manage a stand for emerald ash borer and beech bark disease.

Retaining a beech component will be valuable for nut production, wildlife habitat, species diversity and potential scale/disease resistance. Consider retaining some dead, mature beech as important wildlife habitat.

Retention of resistant trees, with little or no scale, offers hope for a future healthy beech resource. Studies also suggest that smooth-barked trees with many lichens are more likely to be resistant.

Ornamental Trees

Several management options are available to reduce beech scale populations on high-value ornamental trees:

- Insecticides

- Insecticidal oil application when crawlers are present (summer and fall)
- Scrubbing the tree with a brush
- Using a strong stream of water

Treatments will often be labor-intensive and are not always successful.

Firewood Movement

Infested firewood can spread beech scale and beech bark disease over long distances. To prevent spread, obtain firewood close to where it will be burned, season the wood for at least two years, or use pest-free, certified firewood.



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