



July 8, 2010

# Beech Bark Disease

## Best Management Practices for Reducing the Movement of the Beech Scale

### Introduction

Beech bark disease, a disease of American beech (*Fagus grandifolia*), is caused by a scale insect (beech scale, *Cryptococcus fagisuga*) and one of several fungi in the genus *Neonectria*. The scale (Fig. 1) was first detected in Wisconsin in Door County, in August 2009. Beech scale was accidentally introduced from Europe into Nova Scotia, Canada around 1890. By the 1930s, the scale and associated *Neonectria* fungi were killing trees in eastern Canada and Maine. The disease has been moving west and south across the United States since that time and is now found as far south as Tennessee and North Carolina. In Wisconsin, American beech is only found growing naturally in eastern counties near Lake Michigan.



Figure 1. Beech scale (white specs) on beech bark. Photo by Linda Williams.



Beech bark disease represents a unique relationship between the beech scale insect, *Cryptococcus fagisuga*, and the fungal pathogens *Neonectria ditissima* or *N. faginata*. The beech scale feeds on the tree by inserting its mouthpart through the bark of the beech tree and into the underlying live tissues where it can suck up sugars and other nutrients. These feeding sites create tiny wounds where the *Neonectria* fungus can enter the tree and produce small cankers or areas of dead tissue (Fig. 2).

Figure 2. Cankers caused by the fungus *Neonectria*. Photo by Linda Williams.

### Best Management Practices

*Best management practices are actions that will reduce the rate of spread and impact of beech bark disease. These actions are considered guidelines but are very important steps you can take to help keep Wisconsin's forests healthy.*

### Preventing Spread – Firewood and logs

Trees that have died from beech bark disease within the last 12 months can still have scales or scale eggs present. If this wood is moved, beech bark disease may spread into areas currently unaffected. Beech that is infested with beech scale may be removed and utilized for firewood or other projects if certain conditions are met.

### Preventing Spread – Firewood for personal use

- *All firewood:* Obtain and use all firewood locally (within 25 miles) of where it was harvested.
- *All firewood:* Local, county, state and national firewood regulations could affect movement of firewood. Check with your local unit of government to determine the status of local regulations. For DNR and Department of Agriculture, Trade and Consumer Protection (DATCP) firewood regulations, visit: <http://emeraldashborer.wi.gov> and click on “Firewood Regulations”.
- *Beech firewood:* In addition to following the “all firewood” guidance and regulations, **do not** transport beech firewood between *July 15 and November 15*. This is when the crawlers (mobile stage of the insect) are present, could be blown off the wood and start additional infestations.
- *Beech firewood:* Firewood cut from trees that are dead with loose bark, or no bark, or firewood which has bark that is loose or has fallen off can be moved safely. Firewood in this condition is considered uninfested for beech bark disease but guidance for “all firewood” should still be followed.

### Preventing Spread – Firewood for commercial production

- *All firewood:* Obtain and use all firewood locally (within 25 miles) of where it was harvested.
- *All firewood:* Local, county, state and national firewood regulations could affect movement of firewood. Check with your local unit of government to determine the status of local regulations. For DNR and DATCP firewood regulations, visit: <http://emeraldashborer.wi.gov> and click on “Firewood Regulations”.
- *All firewood:* Consider becoming a certified firewood dealer. Certification requires treatment of firewood - yet once treated, firewood may be moved throughout the state. For more information, visit: [http://www.datcp.state.wi.us/arm/environment/insects/firewood\\_restrictions/firewood\\_dealer.jsp](http://www.datcp.state.wi.us/arm/environment/insects/firewood_restrictions/firewood_dealer.jsp)
- *Beech firewood:* In addition to following the “all firewood” guidance and regulations, **do not** transport beech firewood between *July 15 and November 15* when the crawlers are present, could be blown off the wood and start additional infestations. If moving firewood between *November 16 and July 14*, obtain a compliance agreement from DATCP.<sup>1</sup> The compliance agreement will outline steps that need to be taken to prevent the spread of this disease.
- *Beech firewood:* Firewood cut from trees that are dead with loose bark, or no bark, or firewood which has bark that is loose or has fallen off can be moved safely. Firewood in this condition is considered uninfested for beech scale but guidance for “all firewood” should still be followed.

### Preventing Spread – Logs

- **Do not** transport beech logs between *July 15 and November 15* when the crawlers are present and could be blown off and start additional infestations. If movement during this time cannot be avoided, contact DATCP<sup>1</sup>.
- If moving beech logs between *November 16 and July 14*, contact DATCP<sup>1</sup> to obtain a compliance agreement.

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<sup>1</sup> For information about compliance agreements or treatment options for movement of infested beech: 608-224-4573.

## **Control and Management**

- Guidance on preparing for beech bark disease, or managing your stand when beech bark disease is present can be found at: <http://dnr.wi.gov/forestry/FH/bb.htm>
- In forested areas, there is no practical control option other than the sanitation and salvage of dead and diseased trees. Contact your DNR forester to discuss options for silvicultural options.
- Don't remove all of the beech prior to beech bark disease being found in the stand, because some trees are resistant to the beech scale and will continue to provide wildlife and timber benefits. Truly resistant trees cannot be identified until they survive the initial beech bark disease assault with no or minimal damage.
- Report resistant trees to your regional DNR forest health specialist. Branch material may be collected from these trees to contribute to seed orchards established by researchers for promoting resistant beech. Candidate resistant trees should be all of the following: 1) > 9" inches dbh; 2) adjacent to trees heavily infested by beech scale; and 3) free of scales, or scales have remained scarce for > 1 year. Use white marking paint to place an "R" on two sides of the tree. After marking, protect candidate trees by leaving a buffer of other tree species to protect the tree from sunscald and possible wind throw.
- During forest management activities, favor smooth-barked trees, when choosing beech to retain. Observations suggest that they are less heavily infested by the scale.
- When harvesting, avoid damaging the root systems of the trees. Beech sprouts in response to root injury - producing susceptible stems and increasing the impact to the stand.
- High-value trees can be saved by killing the scales. A soft brush or strong stream of water can be used to remove the scales on small trees.
- In campgrounds and other areas where failure of beech may be a hazard to people and structures, remove the beech trees once they are moderately infested with the scale. Diseased trees are a safety hazard because they can snap in high winds.

## **Restoration**

Since 2002 the USDA Forest Service has been working to develop disease-resistant varieties of the American beech. None are currently available for reforestation but work is in progress. Restoration options will be site specific; work with your local forester to determine the options that are best for your property.

## **Sources**

Houston, D.R. and J.T. O'Brien. Beech Bark Disease. Forest Insect & Disease Leaflet 75. USDA Forest Service. <http://www.na.fs.fed.us/spfo/pubs/fidls/beechnbark/fidl-beech.htm> Revised Feb. 1983.

Wisconsin Department of Natural Resources. Beech Bark Disease. Forest Health Protection. <http://dnr.wi.gov/forestry/fh/exotics/exotic-bb.htm>