

Beech Leaf Disease Found in Virginia

By: Lori Chamberlin, Virginia Department of Forestry

The last thing Virginia needed was another tree disease, but it arrived nonetheless. Beech leaf disease (BLD) has been confirmed in Virginia. This disease affects our native American beech trees and can cause tree mortality after several years, mostly in smaller trees. Plantings of other beech species such as European, Oriental, and Chinese beech are also susceptible.

When BLD was first detected in Ohio in 2012, the causal agent was unknown. A wide variety of insects and pathogens were found on symptomatic trees, but none appeared to be directly associated with the disease. It was not until years later that nematodes were investigated.

Nematodes are small, non-segmented worms that are normally invisible to all but a few specialized scientists. They tend to be microscopic and transparent, and feed on bacteria, fungi, or other microscopic creatures. While they may be difficult to see, nematodes are numerically the most abundant animals on the Earth. *Four out of every five animals on Earth are a nematode worm.* A study by Hoogen et al. (2019) revealed that there are 57 billion soil nematodes for every single living human being! They are so abundant, according to nematologist Nathan Augustus Cobb in 1915, that if all the matter in the universe except nematodes disappeared, we would still see the outline of everything represented by a film of nematodes.

So it's not surprising that nematodes have been found on symptomatic beech trees. The newly recognized nematode subspecies *Litylenchus crenatae* ssp. *mccannii* (Anguinata) is associated with BLD symptoms. *Litylenchus crenatae* was originally described from Japan, but the new subspecies found in North America has slight morphological and host range differences. It is a foliar nematode that overwinters in buds and detached leaves.

The first symptom of BLD is interveinal greening; leaf tissue darkens and thickens between lateral leaf veins. This is best observed by looking up into the canopy so that the leaves are backlit from the sun above. Beech leaves tend to overlap which creates dark spots at overlapping leaf areas, but the banding caused by BLD always appears as striping between leaf veins. Impacted leaves are distributed unevenly on branches and trees, so you may only see a few symptomatic leaves on a branch/tree. Later symptoms include leaf crinkling, curling, and discoloration.



Interveinal greening on beech leaves, an early symptom of beech leaf disease. Photo credit: Lori Chamberlin, VDOF (left); Valerie Huelsman, Prince William County (right)

Reduced bud and leaf production lead to thin canopies, and tree mortality has been observed within 2-7 years, most commonly in smaller understory trees.

BLD has also been detected in Ohio, Connecticut, Massachusetts, New Jersey, New York, Pennsylvania, Rhode Island, West Virginia, and the Canadian Province of Ontario. In Virginia, the only known site to date is in Prince William County. If you see impacted beech trees with the symptoms listed above, please take photos and contact the Virginia Department of Forestry at foresthealth@dof.virginia.gov. Laboratory diagnosis may be necessary, in which case a local Virginia Cooperative Extension office can help obtain and submit samples. Find a local Extension office here: <https://ext.vt.edu/offices.html>.

Additional Information:

<http://www.dontmovefirewood.org/wp-content/uploads/2019/02/Beech-Leaf-Disease-Pest-Alert.pdf>

Sources:

Cobb, N. A. 1915. Nematodes and their relationships. Year Book of the Department of Agriculture 1914, pp. 457-90. Washington, DC: Department of Agriculture.

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