‘Slow-moving crisis’ threatens beech trees in Bay region

Spreading from the Midwest, beech leaf disease now found in all Chesapeake states

By Whitney Pipkin

Craig Kuhn paused mid-sentence to apologize for “being depressing.” As manager of the forest pest program for the Maryland Department of Agriculture, he knows it comes with the territory — especially when a new forest malady arrives.

This time it’s beech leaf disease, one that affects all species of beeches, including American beech (*Fagus grandifolia*). Thought to have come from Japan, the disease is spread by a microscopic roundworm, or nematode, that makes its home in the tree’s leaves and buds. The nematode consumes tissues inside the buds, and its presence distorts and darkens the appearance of leaves, reducing photosynthesis by up to 60%.

That’s according to researchers in Ohio, where the disease was first found and identified in 2012. They have since found it to be a slow but steady killer of large numbers of the beeches. It can result in the loss of a young tree in a year but takes about 7 to 10 years to kill established trees. And the disease has since been identified in 15 states — including all of those in the Chesapeake Bay watershed — and in Ontario, Canada.

“This is a slow-moving crisis,” said David Burke, the vice president for science and conservation at Holden Forests & Gardens, which is leading research near the U.S. epicenter of the disease in Ohio. “Beech leaf disease doesn’t kill trees as quickly as some pests, but the cumulative impacts [add up]. Especially in a forest where beech is dominant, these effects will ripple out.”

In 2016, the disease was confirmed in some forests in Pennsylvania, according to a U.S. Forest Service map. In Virginia, beech leaf disease was first found in 2021 in Prince William Forest Park, a national park in Prince William County, bringing it to the attention of the National Park Service.

Since then, extensive monitoring at the park has found the disease spreading throughout the forests’ high density of beech trees. In 2024, it had been confirmed in almost 32% of the park’s 133 long-term monitoring plots containing American beeches. The first symptom of infection was faint leaf striping, but that turned into leaf loss, then dead branches and, now, thinning tree canopies.

“The impact could be serious,” park managers wrote in a statement to the *Chesapeake Bay Journal*. “Beech trees make up about one-quarter of all trees and more than one-third of saplings in Prince William Forest Park.”

American beeches are also the most common single species in national parks throughout the National Capital Area surrounding the District of Columbia, according to the Park Service. The disease has also been confirmed in several national parks in the region.

The Park Service is also involved in work to find potential treatments. In July, staff at Prince William Forest Park injected a fungicide with the brand name Arbotect 20-S into a pair of large, infected trees near the park’s historic cabin camps. The treatment has been shown to control the disease for up to two years.

Kuhn, from the Maryland Department of Agriculture, said treatments like these are available to landowners who find beech leaf disease on their properties and are willing to invest in saving specific trees. Treatment options also include a fungicide called fluopyram, which has been shown to kill more than 90% of live nematodes when applied during their movement from the leaves to the buds to overwinter.

Brianna Shepherd, a research specialist at Holden Forests & Gardens in Ohio, measures the diameter of a beech tree. Beech leaf disease can both kill and slow the growth of trees it infects. (Brandon Younan)

A leaf on a beech tree in central Maryland shows the dark stripes that indicate the presence of beech leaf disease. (Melanie Fischer/ MD Dept. of Agriculture)

Many of the available treatments must be applied by licensed pesticide applicators, which include some private tree services that operate in the region.

“If you have one or two trees you want to save, you can do that,” Kuhn said. “But we haven’t found any [treatments] that work on a forest scale.”

The disease was first confirmed in Maryland forests in 2023 and has been found in 14 of the state’s 23 counties. Kuhn is pretty sure it will reach the rest soon. In Hartford and Cecil counties, some of the beech trees are already “looking sad,” Kuhn said, with leaves that are stripey or curled, wilted or gray.

“It’s very ominous looking,” he said.

Kuhn said the impact of beech leaf disease could end up being like that of the emerald ash borer, an invasive insect that has devastated countless ash trees in forests of the eastern U.S. over the last two decades. Today, the ash borer has largely died out along with the host trees it killed.

One of the problems is that these introduced pest species don’t have natural predators to keep them in check when they arrive in a new environment.

Beech leaf disease works far more slowly than other tree-threatening pests, though. A study earlier this year found that the disease had killed 30% of the beech trees tracked in Cuyahoga County, OH, over the first decade since its arrival in 2014. The disease is much harder on saplings than it is on larger, more established trees.

Treatments that could be applied via aerial spray would likely need to be developed to save most beech trees on a large forest scale. That research is still underway.

Kuhn said beech leaf disease is not to be confused with the seasonal symptoms of a healthy beech tree’s leaves that begin to look papery or bug-eaten in fall. Beech trees can also suffer from beech bark disease, which first appears on the trunk as a white waxy coating, then becomes a rash of dark cankers.

Hikers and residents can identify beech leaf disease by looking for dark bands or stripes on leaves, particularly on the undersides, or for leaves that are beginning to curl up or look leathery. Notifying a local agricultural extension office can help states track the spread and connect residents with treatment options. ■