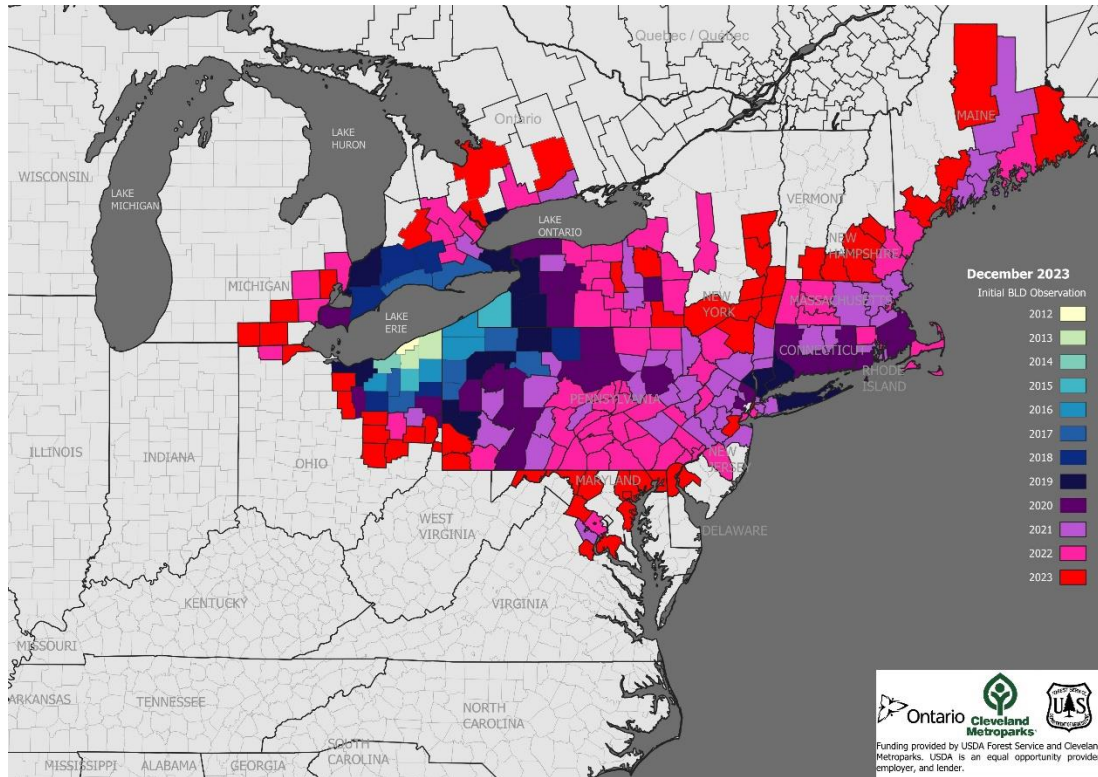


## Beech Leaf Disease in Rhode Island Update September 2024

Beech leaf disease (BLD) is a serious threat to our native American beech trees and the ornamental European beech. The disease has spread quickly from Ohio since first being detected in 2012. It is now found in 12 states and one Canadian province, Ontario. It's been found in all New England states. It was first found in CT in 2019, and in RI and MA in 2020.



Beech leaf disease is caused by a foliar nematode, *Litylenchus crenatae* ssp. *mccannii*. Nematodes are microscopic worms. We don't know where the nematodes came from or how it has spread so quickly, though birds may be involved with transporting the nematodes. We do know that the nematodes spend the winter in beech buds and beech leaves emerge in the spring showing damage.



Photo by Paulo Vieira, USDA, ARS

## SYMPTOMS

It's easy to determine if American beech trees are infected with BLD. In the spring when new leaves are emerging from buds, infected leaves will have dark bands between leaf veins, or the leaves will be very crinkled, smaller, and leathery. In severely infested trees, some buds won't open because the buds were killed. Banded leaf symptoms can best be seen by backlighting infected leaves against the sky.



Leaf banding symptoms



Crinkled leaf symptoms  
Symptoms on American beech



Dead beech buds

Symptoms are less obvious on European beech trees. Some leaves will be banded, but many of the leaves will look tattered or distorted.



Tattered leaves on infected European copper beech



Banded leaf symptoms on European copper beech

On heavily infected trees many buds will be killed, and severely damaged leaves will fall off soon after emerging in May. In late May or early June, many beech trees produce new leaves. The new leaves are formed in newly produced buds and do not show symptoms of BLD. This is because the BLD nematodes are only within the overwintering beech buds, where they damage the leaves inside of the buds. When the new, replacement buds are produced and new leaves emerge in May or early June, the new leaves don't have nematodes and don't have BLD symptoms. These new leaves are paler and wimpier than normal, healthy leaves.



Refoliated leaves are paler and less robust than normal, healthy beech leaves

In Ohio, researchers are seeing American beech trees die in 6 – 10 years after infection. I'm afraid we are finding some trees dying in fewer years in Rhode Island and southern New England.

## **MANAGEMENT**

What can be done about BLD? Researchers have been working diligently to develop management solutions for beech leaf disease. There are a few treatments available for landscape and high-value trees. Currently, there is no cost-effective strategy for forested environments.

### Phosphite products

In 2017, Ohio researchers started treating the soil around small beech trees (2-4 inches in diameter) with a phosphite product known as PolyPhosphite 30, which is a potassium fertilizer produced by the Plant Food Company. The researchers got encouraging results after the first year of treating twice, about one month apart, between May and August. After five years of treatment, treated trees were significantly healthier than untreated control trees; and fewer nematodes were found in the leaves of treated trees than in the control trees. These are preliminary results, and the research was conducted on small trees. Our hope is that we could see similar results in New England.

Phosphite products are known to stimulate plant defenses. Many phosphite products are sold as fungicides such as Agri-FOS, Fosphite, Reliant, Fungi-Phite, and Prophyt. Beech trees treated with either the fertilizer formulation (PolyPhosphite 30) or a fungicide formulation should respond similarly. These products can be purchased and used by homeowners. When using a fungicide formulation, you can not apply at a higher dose than what is listed on the label. The label is the law. Note: PolyPhosphite 30 may be difficult for homeowners to purchase. There is a similar product that may be easier to find – Foliar Phosphite Fertilizer 0-0-26, produced by Pendelton Turf Supply.

To use one of the phosphite fertilizers (PolyPhosphite 30 or Foliar Phosphite Fertilizer), plan to make two applications about one month apart between the months of May and August. Mix 2 fl. oz. of phosphite fertilizer plus 14 oz. of water per inch DBH (diameter at breast height). So, a 4-inch diameter tree will require 8 oz. of phosphite fertilizer in 48 oz. of water. Pour this around the base of the tree. If the soil is dry, moisten the soil first with water so that the solution can penetrate the soil.



### Foliar fungicide/nematicide

There is a pesticide that kills nematodes when sprayed on beech leaves. The pesticide, fluopyram, is a fungicide found in the product Broadform (labeled for ornamentals). Fluopyram has been shown to be very effective at killing nematodes and is something that landowners would need to hire an arborist to apply to their beech trees.

Since BLD nematodes spend the winter in buds, beech leaves would need to be sprayed with fluopyram before nematodes start migrating into the buds in late July. So, the fluopyram application should be made once the leaves have fully expanded, between late May and mid-July.

It's unknown at this time if more than one application of fluopyram is needed. Also, it may not be possible to protect beech trees that are too close to infected, untreated trees since nematodes can move on the outside of leaves and twigs when these surfaces are wet. Another important concern is pesticide resistance. It is possible that BLD nematodes will quickly develop resistance to fluopyram. Proximity to water bodies and ability to reach tall parts of large tree crowns are also limiting factors in the use of fluopyram.

### Systemic fungicide/nematicide injections (Arbotect 20-S)

The fungicide Arbotect 20-S with the active ingredient thiabendazole was given a 24(c) special local needs label in RI, MA, CT, ME, NY, NJ, OH, PA, and VA for the treatment of BLD. Thiabendazole is a chemical compound that has been used as an effective active ingredient in fungicides for the control of Dutch elm disease and sycamore anthracnose. Recently it has been found that it also has nematicidal properties. Recent research from Bartlett Tree Experts has demonstrated significant improvement of beech leaf disease symptoms in treated trees by reducing numbers of BLD nematodes within buds, with two seasons of protection.

Injections should be made low on the root flare only. Applications should be timed between June and early July to provide best efficacy with two seasons of suppression. A licensed pesticide applicator

experienced in this type of treatment should be hired by homeowners. This treatment may be a more appropriate tool for large trees or trees in proximity to water bodies where foliage treatments with fluopyram are impractical. Trees smaller than 5" DBH or trees with serious decay, girdling roots, or other conditions that may interfere with uptake may not be candidates for injections.

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