

Overview on the pest status and research plans on beech bark disease: A new exotic in Michigan

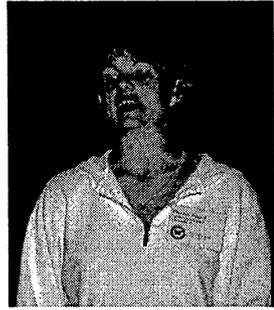
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Beech bark disease was first discovered in Michigan in spring 2000 in Ludington State Park and soon thereafter it was found in the upper peninsula in the Bass Lake campground. Since then, surveys have found it in six counties in Michigan. Beech bark disease involves two exotic organisms: the beech bark scale (*Cryptococcus fagisuga* Lind.; Eriococcidae) and fungal pathogens in the genus *Nectria*. Both the sap-feeding scale insect and one species of *Nectria* fungus originated from Europe and were accidentally introduced into Nova Scotia on ornamental beech imported from Europe in 1890. Since then the scale and the fungus have slowly spread through the New England states, Pennsylvania, West Virginia, Virginia, North Carolina, Tennessee, Ohio, Quebec, Ontario, and now Michigan.



year. Eggs are laid in midsummer and hatch by early fall. The first stage crawlers are mobile and feed on sap in the tree's inner bark through the fall. They overwinter as second stage crawlers, which are legless and secrete wax. In the spring they resume feeding and become immobile adults in late spring. Heavily infested trees appear to be covered by white wool. The minute feeding wounds caused by the scale insects enable *Nectria* fungi (both native species and European species) to enter the tree. The *Nectria* fungi kill areas of woody tissues, sometimes causing cankers on the tree stem and large branches. If enough tissue is killed, the tree becomes girdled and will die. Trees may become chlorotic with thin crowns and ragged leaves. Branches and trunks of some infected trees break off in heavy winds resulting in "beech snap."

Beech bark disease will likely continue to spread throughout Michigan killing up to 50% of the large beech trees in Michigan during the first wave of the disease. Another 25% may become infected but survive as weak, defective trees. Some beech trees escape infection or may be at least partially resistant to beech scale.

We initiated a study at Ludington State Park in May 2001 to evaluate techniques to control the beech scale including scrubbing scales off trees, spraying horticultural oil on the trunks of infested trees and treating infested trees with systemic insecticides including trunk injection with imidachloprid, a combination of imidachloprid and fungisol, or azadirachtin (the active ingredient of neem seed extract), and soil injection with imidachloprid. Initial results one month after application of treatments indicated that trees that were scrubbed remained free of scales, and spraying with horticultural oil resulted in approximately 50% mortality of scales present on the trees. Efficacy of the injected insecticides will be evaluated in early fall 2001 when first stage crawlers begin actively feeding.

The beech scale is parthenogenetic and has one generation a

The impact of non-native mosquitoes on medical entomology in the Great Lakes region

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The Asian tiger mosquito, *Aedes albopictus*, has spread rapidly throughout the southern and eastern United States since its initial discovery in Houston, Texas, in 1985. Successful colonizations in the Great Lakes geographical region include four states: Illinois, Indiana, Ohio and Pennsylvania. Another Asian mosquito, *Ochlerotatus japonicus*, appeared in New York and New Jersey in 1998. This species has now been found in eight states, including Ohio and Pennsylvania. Larvae of both species are found in a wide variety of natural and artificial containers. The international commerce in used automobile, truck and heavy equipment tires between communities has allowed for the rapid dissemination of both mosquitoes far in excess of normal flight range. Both species will feed on a variety of birds and mammals, including humans. An outbreak of West Nile Virus (WNV) in New York City, the first ever record of this disease agent in North America. WNV may be fatal to birds and mammals, including human. Both introduced Asian mosquitoes are highly susceptible to infection and transmit the virus by bite.



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