



Branching Out

from the Canadian Forest Service - Laurentian Forestry Centre

2025

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The Bronze Birch Borer

The bronze birch borer (*Agrilus anxius*) is an insect native to Canada and the United States that attacks all species of birch. While similar to the emerald ash borer, the bronze birch borer is not a major problem in North America. However, its introduction into Europe could prove problematic, since trees there have not developed any defence mechanisms. It is therefore important to be able to detect it and develop phytosanitary measures to ensure that wood exported to Europe is free from it.

About this pest

The bronze birch borer is an iridescent bronze-coloured beetle 6 mm to 12 mm long. The female feeds on foliage, mainly in the upper reaches of trees. It generally lays its eggs in cracks in the bark of branches where they meet the trunk. When they hatch, the larvae pierce the bark and dig feeding tunnels in the phloem and xylem of the wood. It is at this stage that larvae cause damage to the tree by interfering with sap flow. Adult birch borers emerge from the tree between May and July, leaving D-shaped exit holes in the bark. Although adults can fly, most will target nearby stressed birch trees. Trees may die after several years of decline, or sooner depending on their initial condition.

Trade challenges

In North America, the bronze birch borer feeds on native and non-native birch species. For native species, it is considered a secondary pest. It attacks trees damaged by other insects or stressed by drought. When a tree is healthy, it defends itself and prevents the insect from developing. The same cannot be said of species brought from Europe, such as the European white birch, which also host the bronze birch borer. In this case, the insect attacks both healthy and weakened trees, increasing



Adult bronze birch borer (*Agrilus anxius*)

mortality for these species. As a result, the European Union is concerned about the potential arrival of this insect, since European birch species in Canada are more vulnerable to it. Moreover, in 2019, the European Union declared it a quarantine pest. If the insect were to be introduced into Europe through international trade, it could cause considerable ecological and economic damage.

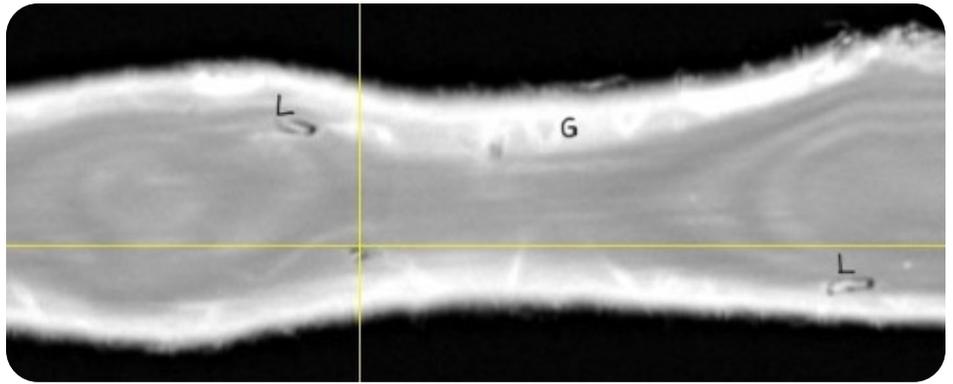


Winding tunnel on the wood surface of birch caused by the feeding of a bronze birch borer larva

A species under study by the Canadian Forest Service

Various research teams are working hard to develop detection, prevention, and control methods to reduce the spread of the bronze birch borer via exports. Work carried out by a research team at the Laurentian Forestry Centre has highlighted the effectiveness of larval detection using computed tomography scan (CT scan) and debarking, and has measured galleries depths to optimize detection of larvae under the bark. In order to increase the number of samples processed, the team also tested girdling, since it is known to increase oviposition on the tree and captures in traps. The team then tested logs for the presence of insects.

Phytosanitary measures are being studied to reduce the risk of the bronze birch borer spreading through wood products destined for export. Heat treatment is a fairly effective method and is available for this measure. A recent study led by the Pacific Forestry Centre showed that 30-minute heat treatments of wood at 53°C (or 15 minutes at 56°C) were effective in killing bronze birch borer prepupae.



A CT scan image of a longitudinal section of a wood sample showing bronze birch borer larvae (L) and their galleries (G)

What's next...

The use of CT scan imaging has proven to be a promising method for detecting bronze birch borer larvae. Work is underway to use artificial intelligence to detect larvae in these images. Other work is currently being done at the Laurentian Forestry Centre and the Great Lakes Forestry Centre to improve our understanding of the biology of this borer and its interactions with host trees.

This work illustrates the importance of conducting research on native insects that could be invasive when spread elsewhere. Collaborative international efforts are crucial to reduce pest damage and ensure market access for Canadian wood products.

Useful Links

<https://tidcf.nrcan.gc.ca/en/insects/factsheet/283>

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<https://www.nrcan.gc.ca/our-natural-resources/forests/13497>

Cat. no. PDF : Fo113-1/137-2025E-PDF Paper: Fo113-1/137-2025E
ISBN 978-0-660-79711-3 ISBN 978-0-660-79714-4 ISSN 1705-5806

Aussi disponible en français sous le titre: *Un nouvel intrus au Québec : le longicorne brun de l'épinette*

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