Saskatchewan Ministry of Environment

Forest Pest Fact Sheet

BRONZE BIRCH BORER, (*Agrilus anxius*)

BACKGROUND

The bronze birch borer is a metallic, flat-headed wood-boring beetle that is native to North America. Damage caused by this insect in natural birch forests, is usually in combination with other stress factors. The bronze birch borer can also be a serious pest of ornamental birches.

DISTRIBUTION

The bronze birch borer is distributed across the range of birches in Canada and most of the United States.

DESCRIPTION OF LIFE STAGES

Adult beetles have a slender body and are olive to copper-bronze in colour. Their length ranges from 6 mm to 12 mm, with females tending to be larger than males. The eggs are oval, flattened and 1.5 mm in length. Initially they are a whitish colour, but later become yellow. Larvae have a white, slender, segmented body. They are legless and have a light-brown head. There are two brown, pincer-like structures located at the tip of the abdomen. When mature, the larvae can be up to 35 mm long. Pupae are initially white like the larvae, but become darker and more similar to the adult colour as they age.

Bronze birch borer adult

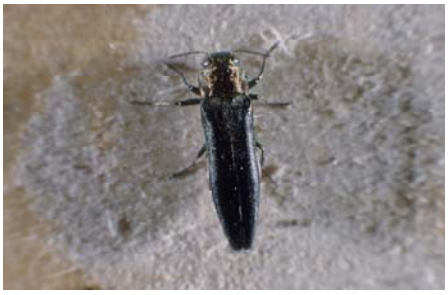

Image: Thérèse Arcand, Natural Resources Canada, Canadian Forest Service

Bronze birch borer larva

Image: Whitney Cranshaw, Colorado State University, Bugwood.org

Bronze birch borer pupa

Image: David G. Nielsen, The Ohio State University, Bugwood.org

HOST SPECIES

Bronze birch borer attacks all native and introduced species of birch. White birch, Alaska birch, and grey birch are preferred native species. Ornamental birch such as European white birch and cutleaf weeping birch are also very susceptible.

LIFE CYCLE

The bronze birch borer has one generation per year. Adults are active from June to August in most of Canada. Adults are strong fliers that can travel many kilometres in search of host trees. Adults feed on leaves of birch, poplar and alder. However, their feeding does not cause noticeable defoliation. After mating, females lay eggs in bark crevices and cracks. Eggs are often laid in clusters. Larvae emerge and initially mine in the cambium and phloem creating criss-cross galleries. Larvae later bore into the sapwood to spend the winter. Larval feeding occurs in the main stem and larger branches of the tree. The larval stage has four or five instars. In spring, mature larvae pupate in oblong cells in the bark, while immature larvae resume feeding. Following the pupal stage, emerging adults chew through the bark leaving a characteristic D-shaped exit hole. The life cycle of the bronze birch borer is one or two years long depending on the geographic location. In the warmer southern part of its range, the cycle is one year and two years in the more northerly areas of the range.

SIGNS, SYMPTOMS AND DAMAGE

The bronze birch borer tends to attack trees that are already weakened from other stresses such as drought, physical wounding or repeated defoliation. Older larger trees are generally preferred. Larval boring in the cambium eventually girdles larger limbs and the main stem, impeding the movement of water and nutrients throughout the tree. The first noticeable sign of infestation is sparse yellow foliage in the upper crown of the tree. As feeding continues, this symptom progresses to twig dieback and branch dieback. Over time, the dieback gradually spreads throughout the entire crown, eventually killing the tree. This period of decline and death can be rapid over one year, or take a number of years, depending on what other stresses are affecting the tree. Visible signs of attack on the limbs and main stem include D-shaped adult exit holes and swollen ridges where callus tissue has formed over the larval feeding galleries.

Widespread tree mortality from bronze birch borer has occurred in natural forests and in ornamental plantings. However, it has been associated with extended drought periods that occurred in the 1930's and 1980's. Birch trees are shallow rooted. As a result, during extended droughts, a slight rise in soil temperature can kill small rootlets, stressing trees and predisposing them to bronze birch borer.

Larval galleries in the cambium

Image: Manitoba Conservation

Callus tissue over larval feeding gallery

Image: Steven Katovich, USDA Forest Service, Bugwood.org

Bronze birch borer damage

Image: Manitoba Conservation

D-shaped adult exit hole

Image: Manitoba Conservation

MANAGEMENT PRESCRIPTIONS

In commercial forests, management of bronze birch borer may consist of harvesting stands prior to them becoming overmature and decadent. In smaller woodlot operations, salvaging individual infested trees at an early stage may slow the spread and ensure optimum utilization is achieved. In a landscape setting, control of bronze birch borer by direct injection or a soil drench of systemic insecticides has been attempted, but met with little success. Keeping ornamental birch trees well watered and fertilized during dry periods is the best preventative approach. Also, choosing an appropriate planting site for birch is important. Birch will thrive in cool moist locations where overheating of the soil does not occur.

REFERENCES FOR ADDITIONAL INFORMATION

Bronze Birch Borer
S.A. Katovich, A.S. Munson, J. Ball and D. McCullough
Forest Insect & Disease Leaflet 111
U.S. Department of Agriculture Forest Service
http://www.na.fs.fed.us/spfo/pubs/fidls/bbb/bbb.htm

The Bronze Birch Borer and Its Management
Robert P. Wawrzynski, Vera Krischik and Steve Katovich
University of Minnesota Extension
http://www.extension.umn.edu/distribution/horticulture/DG1417.html

Bronze birch borer (leaflet) 1994. Cerezke, H.F. Natural Resources Canada, Canadian Forest Service, Northwest Region, Northern Forestry Centre, Edmonton, Alberta. Forestry Leaflet 26.