Bronze Birch Borer

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Description

The bronze birch borer, Agrilus anxius,belongs to a group of beetles commonly referred to as the metallic wood boring beetles. This insect occurs throughout Canada and the United States wherever birch is grown.

Adults are typical metallic wood borers in appearance; hard-shelled, somewhat flattened on top and convex on the underside, and with a metallic sheen. They are elongate, slender, and range up to 1/2 inch in length. The overall color, as the name implies, is bronze, often with a greenish tinge. The green color is particularly noticeable on the front of the head in the males.

Full grown larvae (immatures) are about 1 inch long, white, elongate, slender, flattened, and have two forceps-like structures on the tail end. The larva is widest in the area just behind the head, which is somewhat flattened. For this reason, larvae of this family are sometimes called flatheaded wood borers.

Life Cycle

Adult emergence in most of Utah normally begins in late May or early June but varies somewhat with location and elevation. Beetles congregate on the host tree and feed on the foliage for 1-3 weeks before egg-laying begins. Eggs are deposited singly or in small groups in cracks and crevices of the bark or under loose bark. Eggs hatch in about 10 days and the hatched larvae bore directly into the cambium.

Larvae of various ages overwinter but only those that were full-grown before winter are capable of emerging as adults the following spring. Full-grown larvae overwinter in cells constructed at the ends of their tunnels. The following spring (late May and June in Utah), the larvae pupate and emerge as adults through D-shaped holes which are cut in the bark. Two years are required to complete the life cycle in the northern part of the country but a generation is produced every year in the South.

Hosts

The bronze birch borer breeds predominately in different varieties of birch, with a preference shown for cut-leaf, paper and yellow birches. Poplar, quaking aspen, willow, and cottonwood are also reported hosts. Cut-leaf varieties of birch seem to be are particularly susceptible to attacks by this insect. Regardless of the variety, trees that are injured, declining, or weakened by drought or other stress factors are most likely to be attacked.

Some varieties of birch are resistant to bronze birch borer attacks. These include river birches in general, with the river birch variety 'Heritage' being mentioned specifically. Another resistant variety is Betula platyphylla japonica variety 'Whitespire'. The use of these varieties (and the avoidance of susceptible varieties) is recommended in areas where bronze birch borer is a problem.

Damage

After hatching the larvae bore directly into the cambium and produce a series of winding galleries that generally go back and forth across the grain of the wood. Like all insects, the larvae must shed their skin (molting) between growth stages. To complete this process they leave the cambium, bore into the xylem, molt, and return to the cambium to feed.

Larval feeding results in the development of raised bumps or welts on the bark surface. An early symptom of attack by bronze birch borer is yellowing and thinning of leaves in the upper crown. Leaves on affected branches may show marginal burning, browning, or appear unusually small.

The major damage results from the larval feeding activities. Vascular tissue is severed, thus stopping the flow of water and nutrients. As portions of the infested tree become stressed and die, the tree becomes more susceptible to additional attacks. Heavily infested trees are eventually killed. Damage to the leaves caused by adult feeding is generally of no consequence (adults also feed on the leaves of alder).

Trees with more than 50% crown death are probably too far gone to be saved and are best removed. Wood from such trees should be disposed of, de-barked, or burned, to avoid being a source of reinfestations.

Control

Since trees that have been stressed by sunburn, drought, or other factors are the most likely to be attacked, the primary recommendation is to do everything possible to maintain the health of the tree. It is difficult to save a tree once bronze birch borer has infested it, so prevention by proper maintenance is they key to avoiding problems with this insect.

Water regularly during hot, dry periods and maintain a ground cover or mulch over the roots to protect against drought stress and root damage. Water heavily in late fall to provide a source of water when the soil thaws in the spring.

A common problem with birch is a condition known as birch die-back. It is associated with drought stress and/or root damage and results in the death of the top branches. If these dead branches become infested with birch borers, additional portions of the tree are injured and

become attractive to the beetles. The infested portions serve as brood areas from which the rest of the tree is infested. This can be prevented if the dead portions are pruned out as soon as possible. Prune dead and dying branches well below the point of any apparent damage.

Insecticidal control of bronze birch borer is aimed at killing the adults before they have the opportunity to deposit eggs and killing the young larvae before they enter the tree. Once the larvae enter the tree, control is virtually impossible. Chemical treatments should be applied just prior to adult emergence. The materials should be applied as complete cover sprays and repeated at two week intervals for a total of three applications. In a "normal" year, the first application should be made about May 21-24, the second from June 1-4, and the third about June 14-17. These dates may vary one to two weeks in either direction, depending on the environmental conditions.

Active ingredients in products homeowner-type products for bronze birch borer control include acephate, chlorpyrifos, diazinon, dimethoate, lindane, permethrin, phosmet, and rotenone. Products for professional-type use include formulations containing the above active ingredients as well as some containing bendiocarb, carbaryl, dicrotophos, imidacloprid, naled, or thiodicarb.

Not all products containing the above active ingredients are suitable for use on birch. Before purchasing or applying any insecticide, check the label to be sure birch is listed.

The most effective insecticide in control trials has been bendiocarb but it is not generally used by homeowners. One of the most widely-available and effective active ingredients for homeowners is chlorpyrifos. Lindane may also be used but is generally not as effective as chlorpyrifos. Information regarding the comparative effectiveness of the numerous other active ingredients is not available.

Hose end sprays (available at most garden supply stores) can be used to treat trees up to 25-30 feet tall. Power spray equipment will be required to obtain adequate coverage on larger trees.

Precautionary Statement

All pesticides have both benefits and risks. Benefits can be maximized and risks minimized by reading and following the labeling. Pay close attention to the directions for use and the precautionary statements. The information on pesticide labels contains both instructions and limitations. Pesticide labels are legal documents, and it is a violation of both federal and state laws to use a pesticide inconsistent with its labeling. The pesticide applicator is legally responsible for proper use. Always read and follow the label.