MARKET WATCH

LAWN/TREE CARE

The killer in *black* and *white*

How to detect and manage Asian longhorned beetle infestations.

By JOE BOGGS, AMY STONE *and* DAN HERMS

Unless you live where the Asian longhorned beetle (ALB) (*Anoplophora glabripennis*) has been found in North America, you may view this huge beetle as just another non-native pest on what seems to be an ever-lengthening list of alien invaders. However, this exotic import is very different from anything that's ever arrived on our shores. Unlike other devastating pests and diseases of foreign origins such as the emerald ash borer (EAB) (*Agrilus planipennis*), Dutch elm disease, and chestnut blight that kill trees in one genus, ALB kills trees belonging to 13 plant genera. This non-native tree killer has the potential to cause a catastrophic loss of trees in North America like nothing we've ever seen before. Infested trees do not recover and they are continually reinfested until dead.

Because ALB is confined to relatively small and distinct infestations that spread slowly, eradication remains a viable strategy. However, successful eradication of ALB depends upon early detection.

DETECTION

Here are some of the key identification and diagnostic features for ALB:

- **The beetle:** ALB is a large, striking-looking beetle; adults measure 1 inch to 1.5 inches long. The beetle belongs to the family Cerambycidae; beetles in this family are commonly called "longhorned" because of their extremely long antennae.
- **Oviposition pits:** Every ALB infestation starts with female beetles chewing circular to oblong-shaped pits, around 0.5 inch in diameter, through the bark and down to the white wood of host trees. The pits remain evident for about a year, until wound tissue seals the pits. They are often more obvious in the spring and fall, when sap oozes out of the wounds and runs down the bark. The beetles will only lay eggs on *living* stems; new pits will not appear on firewood. Beetles will lay eggs throughout the tree, and pits are as likely to be seen at eye-level as they are to be found high in trees. Trees of all sizes are selected as long as stem size can support complete larval development.

ALB is a large, striking-looking beetle.

PHOTO: JOE BOGGS

- **The larva:** It's the larval stage of ALB that kills trees. The immature stages are found inside infested trees, which is why it's important not to move wood (e.g. firewood, logs, etc.) outside ALB quarantine zones. Cerambycid larvae are commonly referred to as "roundheaded borers," and ALB larvae look like typical cerambycid larvae. So, when roundheaded borers are found in the living stems and branches of a preferred ALB host such as maples, the find should trigger concern and further investigation. ALB larvae tunnel into the xylem (white wood) of the tree, which weakens stems, causing branch breakage.
- **Coarse frass and wood shavings:** The larval wood-boring activity produces coarse white frass that's exuded from the infested stems. The frass looks like "wood wool" or excelsior packing material. Adult female beetles also produce similar wood shavings as they chew their oviposition pits. Both the larval frass and beetle wood shavings collect in branch forks and on the ground beneath infested trees.
- **"Pencil test:"** Adult emergence holes are 3/8 inch to 1/2 inch in diameter and the holes extend deep into the xylem. The holes are large enough to easily insert a No. 2 pencil and this "pencil test" is effective in separating phloem-feeding borers from ALB; emergence holes of phloem feeders are much shallower. Of

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course, ALB holes are on *living, healthy* branches and trunks; there are a number of native longhorned beetles that infest dead or dying stems.

- **Branch breakage:** ALB larval feeding activity in the white wood (xylem) causes substantial structural weakening of infested branches, leading to branch breakage. Always look at the ends of broken branches to see why the branch broke. Look for heavy tunneling across the rings of the white wood. In fact, an infestation in Worcester, Mass., was discovered by U.S. Department of Agriculture personnel examining the ends of branches broken after an ice storm.
- **Heavy woodpecker damage:** ALB larvae bore into the white wood (xylem); woodpeckers must excavate deeply to extract these larval meat morsels.
- **Tree dieback and death:** ALB infestations eventually kill trees, however, death comes very slowly. While infested trees will show canopy thinning, this symptom on maple sometimes does not occur until the main stem is riddled with emergence holes. Canopy decline is *not a reliable indicator* of an ALB infestation.

» WEB EXTRA

For more information on ALB, including its history in North America, visit Landscape Management.net and click on Web Extras.

Clockwise from top left: It's the larval stage of ALB that kills trees; ALB larvae produce frass, and adult female beetles generate wood shavings; adult ALB emergence holes are large enough to easily insert a No. 2 pencil into; infestations lead to woodpecker damage.

MANAGEMENT

Managing ALB with insecticides alone can be problematic, because insecticides do not make trees "immune" to ALB. Once the larvae bore into the xylem, they are out of the reach of systemic insecticides that do not translocate effectively within the xylem. If a tree already has ALB larvae in the xylem, those larvae will successfully complete their development and new adults will emerge and disperse even if the tree is treated.

Adults are more susceptible to insecticides as they feed on twigs and leaf veins, however, insecticide efficacy is not 100 percent, which is required for eradication. Insecticide trials conducted on small (2-inch to 4-inch diameter) uniform trees in China found that ALB density was reduced by 71 percent to 90 percent. Achieving high adult mortality is challenged by the extended period of time that adults are active during the season (April through December, with peak activity from May to July), limitations associated with product label restrictions, and the fact that size matters (efficacy is uncertain on large trees). This is why insecticides always have been used in a supporting role with other eradication tools and primarily outside of the core infested zones. The most effective eradication approach has been the removal and destruction of high-risk trees. Report suspected ALB infestations at **http://beetlebusters.info**.

Eradication can work if we all remain vigilant for new ALB infestations and remain informed and updated on new developments. Attend training programs on ALB and keep reading. Remember: Always ask yourself if your source is credible. Separate facts that are based on research from opinions that are based on speculation. Daniel Patrick Moynihan said it best: "Everyone is entitled to their own opinions, but not their own facts."

THREATENED SPECIES

The beetle kills all species of Acer (all maple species); Aesculus (horsechestnuts and buckeyes); Ulmus (elms); Salix (willows); Betula (birches); Platanus (Sycamore / Planetrees); Populus (Poplars); Albizia (Mimosa); Cercidiphyllum (Katsura); Fraxinus (ashes); Koelreuteria (goldenraintree); Sorbus (mountainash); and Celtis (Hackberry). While the first six in this list of genera are generally considered the trees most commonly attacked by ALB, all of the trees in this list can be attacked and killed by ALB. All are food for ALB; all are considered hosts.

Boggs is an assistant professor with The Ohio State University (OSU) Extension and OSU Department of Entomology. He works as a commercial horticulture educator for OSU Extension, Hamilton County. Reach him at boggs.47@cfaes.osu.edu. Stone is a horticulture educator and county director with OSU Extension, Lucas County. She is the statewide coordinator for the OSU Extension, EAB/ALB Team. Reach her at stone.91@osu.edu. Herms is professor and interim chairperson of the OSU Department of Entomology. Reach him at herms.2@osu.edu.

PHOTOS: JOE BOGGS (LEFT); CUTTING EDGE LAWN CARE