# Flatheaded appletree borer

## A pest of trees in nurseries and landscapes

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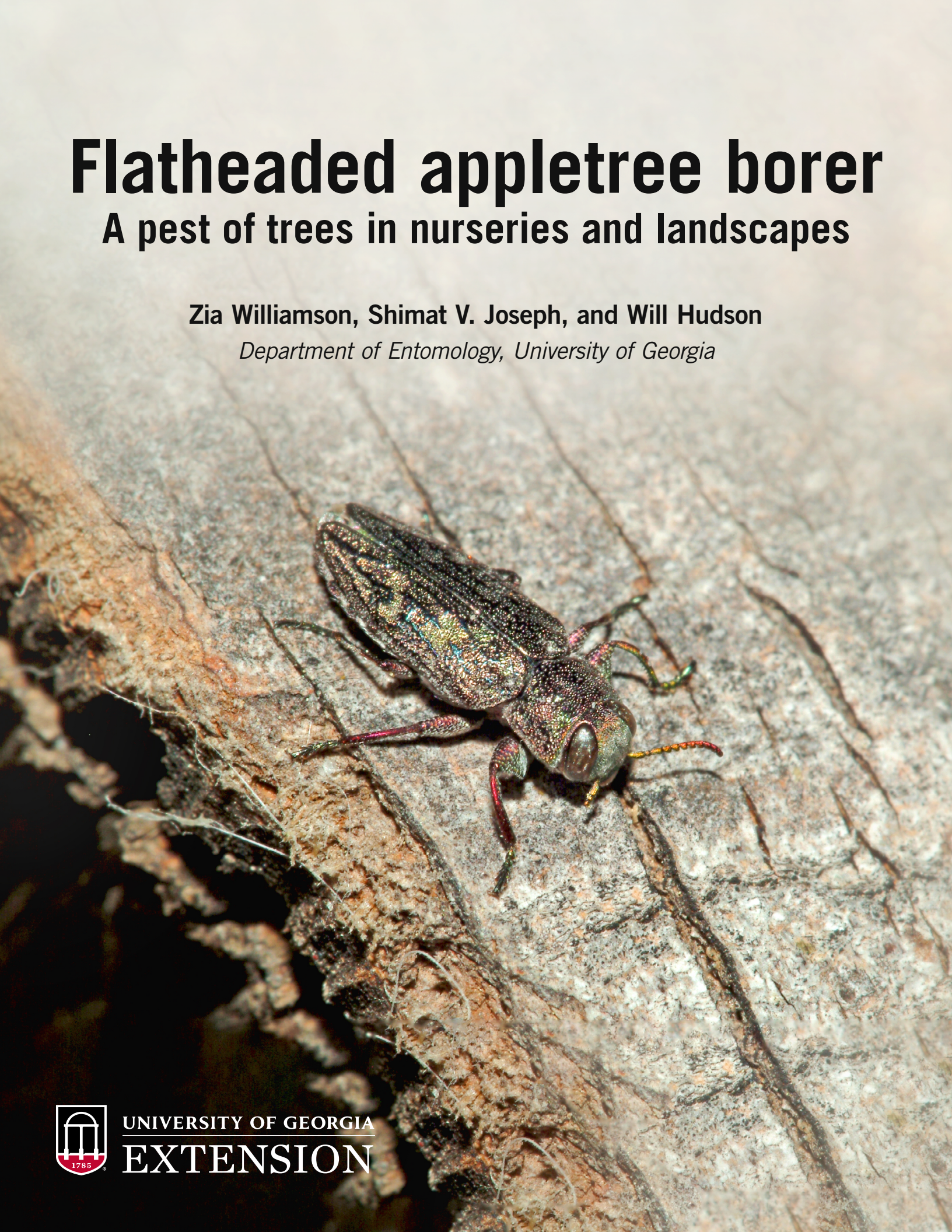

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The flatheaded appletree borer (FAB), *Chrysobothris femorata* (Coleoptera: Buprestidae), is a *polyphagous* pest—so called because it feeds on multiple tree species—native throughout North America. FABs impact specialty crops such as fruit, nut, and ornamental trees. Nursery growers in Georgia face mild to moderate levels of infestation depending on the local beetle population size and favorable environmental conditions. Adult FABs are metallic greenish-bronze and appear flattened in cross-section, which causes them to produce "D" or oval-shaped exit holes as they emerge from wood (Figure 1); these exit holes commonly are associated with buprestid beetles. The *elytra* or wing covers of FAB adults have markings that appear as light-colored zigzagging bands. Larvae are cream-colored and have an enlarged, flattened thoracic segment behind the darker true head of the insect—this is what gives them the flatheaded name (Figure 2).

Figure 1. Splitting of bark and "D" shaped exit holes (marked by white arrow), characteristic of buprestid beetle damage.

*Photo: Zia Williamson, University of Georgia.*

Figure 2. Flatheaded borer larva.

*Photo: Whitney Cranshaw, Colorado State University, Bugwood.org.*

## Biology

FABs have one generation per year. Adults emerge from wood during spring and summer. They mate and lay eggs in crevices in the bark of their host tree or other trees, primarily in the lower 2 ft of the trunk. Up to 100 eggs may be deposited at a time, either individually or in small groupings. After 15 to 20 days the eggs hatch and the larvae bore directly into the tree, feeding beneath the bark. The feeding produces a "pocket" tunnel that appears water-soaked from the outside, and a frothy liquid can be seen oozing out of the bark. The final larval stage overwinters in the sapwood or heartwood of the host tree. Larval feeding creates damaging tunnels within the cambium, phloem, and outer sapwood (Figure 3), which may cause girdling of the tree trunks. If the girdling continues in subsequent years, it can kill the tree.

## Damage

FABs pose a serious threat to several cropping systems, including ornamental tree production, fruit and nut tree production, and trees within landscapes. The FAB has a wide host range, and reportedly has attacked over 30 species of tree.

Most economic damage from the FAB is caused during the larval stage of the insect. The immature insect's tunneling disrupts a tree's vascular system (Figure 3), which prevents it from translocating water and nutrients. FAB larvae are especially deadly to small trees. Additionally, stressed trees release chemicals that attract adult borers, which may then lay eggs that hatch into damaging larvae. FABs are also a major concern in settings where aesthetics are important, such as ornamental production nurseries and landscapes, where the resultant damage—cankers (Figure 4), branch thinning, and browned foliage—is unsightly.

## Management

Because of the location of immature insects under the tree bark, spray applications using contact insecticide do not provide effective management of larval insects. However, if adults in flight are noticed in spring or early summer, a preventative drench application of systemic insecticide to the trunk may help prevent larval colonization of the tree. Furthermore, soil-drench applications of systemic insecticides (such as imidacloprid or thiamethoxam) surrounding the base of the tree may help manage existing larvae. Although it is difficult to detect the presence of larval insects before the damage becomes visible, studies are being conducted using lure traps for early detection of adult FABs. Check with your county Extension agent (1-800-ASK-UGA1) for the latest recommendations on insecticides that are effective against this pest and follow the insecticide label.

Another major component of FAB management is maintaining proper cultural practices. Stressed trees are more susceptibile to FAB attack. Recent planting, damage from equipment, and irrigation issues—such as an excess or lack of water—all can cause stress. Because of this, it is essential to provide proper irrigation, fertilization, and other necessary maintenance to trees.

Figure 3. Tunnels resulting from the larva of the flatheaded appletree borer.

*Photo: James Solomon, USDA Forest Service, Bugwood.org.*

Figure 4. Canker formed as a result of larval damage to tree trunk.

*Photo: John Ruter, University of Georgia, Bugwood.org.*

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