

## THE GRANULATE AMBROSIA BEETLE

*Xylosandrus crassiusculus* (Mot.), Coleoptera, Scolytidae [or Curculionidae Scolytini] Formerly known as the Asian ambrosia beetle.

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Granulate ambrosia beetle was introduced to South Carolina from Asia in the early 1970's. It has since spread throughout the southeast, gulf coast and as far north as Maryland. This tiny beetle is a pest of woody ornamental, fruit, and nut trees throughout North Carolina and can cause significant damage in nursery, landscape, and orchard settings. Ornamental nursery stock seems particularly susceptible.

Granulate ambrosia beetles emerge in early spring and attack thin barked, deciduous trees. They have been reported to damage over 100 species of trees. However, species most commonly reported to be damaged in North Carolina nurseries are styrax, dogwood, redbud, maple, ornamental cherry, Japanese maple, and crepe myrtle. Other reported hosts include pecan, peach, plum, persimmon, golden rain tree, sweet gum, Shumard oak, Chinese elm, magnolia, fig, and azalea.



**DAMAGE:** Female beetles bore into the trunks and branches (1.0-2.5 inches in diameter) of young trees and excavate galleries in the heartwood. In addition to boring damage, female beetles inoculate trees with ambrosia fungus which can block xylem vessels and interfere with vascular transport. In addition they can introduce or create entry points for pathogenic fungi such as *Fusarium* spp. Infested plants often die from boring damage, ambrosia fungus, or infection by a secondary pathogen.

Although tree health likely plays a role in susceptibility to these beetles, little is known about how trees are selected by female granulate ambrosia beetles. They attack seemingly healthy trees as well as stressed or unhealthy trees. Visible symptoms include wilted foliage and strands of boring dust protruding from small holes. Serious attacks that result in tree death usually occur during leafing-out stage.

Infested nursery stock typically dies or is unmarketable and should be burned or chipped to prevent new adults from emerging. Landscape trees may survive attacks but should be monitored for dieback and removed if necessary.

**DESCRIPTION:** These tiny blackish brown beetles somewhat resemble the Southern Pine Beetle. Infestations can be identified by toothpick-like strands protruding up to 1.5 inches from the host plant. The strands of boring dust are produced by the female beetle as she excavates her gallery. The strands are fragile and are easily broken off by wind or rain leaving only pencil-lead sized holes. Individual plants may contain from one to more than 50 individual beetles. (There are also some reports of *Xylosandrus germanus* producing toothpick strands.)



**LIFE HISTORY:** The best available records indicate that granulate ambrosia beetles become active around the first of March in Raleigh, North Carolina and peak around early April. However, they remain active at low levels through the Summer and into the Fall. There may be two generations in North Carolina.

Females bore into twigs, branches, or small trunks of susceptible hosts. They excavate tunnels in the wood, introduce ambrosia fungus and produce a brood. It is the growing fungus on which the beetles feed, not the wood. Eggs, larvae and pupae are found together. There are no individual egg niches, larval tunnels or pupal chambers. High humidity is required for successful reproduction.

Females remain with their brood until maturity. Males are rare, small, and flightless and probably remain within the gallery. New females mate with their brothers, if present, before emerging to attack a new host. Research at Tennessee nurseries determined that it took an average of 55 days for the insect to complete one generation in that climate. Thus beetles enter trees in early spring, oviposit, develop through to adulthood, and emerge 55 days later. Beetle flight is observed in the fall via traps but tree entry is typically reported in nurseries.

**CONTROL:** Preventative applications of pyrethroid insecticides can protect trees by preventing Granulate Ambrosia Beetles from excavating galleries. However, once beetles are inside trees they cannot be killed with insecticides and fungicides are ineffective against the ambrosia fungus. Thus, the timing of preventative insecticide applications is crucial to protect trees from damage by this pest. Apply sprays after beetles are first detected in [monitoring traps](#).

Heavily infested plants or plant parts should be removed and destroyed. It may be best for large growers to wait 3-4 weeks after trees are attacked before removal so as to concentrate and destroy the greatest number of beetles, possibly sparing some healthy trees.

**Commercial growers and landscapers:** A landscape borer spray containing a pyrethroid such as permethrin or bifenthrin can be used and may have to be reapplied every two to three weeks while beetles are active. A surfactant or sticker may help the insecticide adhere to bark and provide longer protection.

Astro, Permethrin Pro (permethrins), and Onyx (bifenthrin) are registered for use on tree trunks in the landscape. For nursery sites Perm-Up (permethrin) is labeled for field grown nursery stock. OnyxPro (bifenthrin) is labeled for application to tree trunks in landscape and nursery sites. Generic equivalents to the above products are also acceptable.

Previously recommended sprays of lindane and dursban have been shown to be largely ineffective and these chemicals are no longer available or registered for this use. In addition, systemic products such as imidacloprid are also ineffective because the beetles do not feed on vascular plant tissue.

Keep trees healthy and avoid any unnecessary tree stress (drought, injury, nutrition, etc.). Check trees frequently beginning early March and treat accordingly.

### **Homeowners:**

Home owners have a few products available that contain the active ingredient permethrin or bifenthrin that may be sprayed on the trunk, such as certain Spectrum, Ortho, and Bayer Advanced products.† Examine the label for these active ingredients and for some type of borer listed on the label.† "Granulate Ambrosia" beetle will not specifically appear on the label.† You are better off doing everything that you can to reduce the stress of the tree or shrub in hopes that the plant will outgrow the attacks. Organic products such as Pyrenone or PyGanic may be used, but are expensive and may not be available in small amounts. Their effectiveness has not been well studied.

### **ACTIVITY MONITORING**

Some growers find ethyl alcohol based traps ([Example 1](#)) ([Example 2](#)) helpful to monitor for adult beetles in the Spring. These can be homemade soda bottle traps (Baker trap), [Lindgren](#) funnel traps, or modified Japanese beetle traps. Soda bottle traps are least expensive, but are less durable. The ethanol release strip purchased for use with the funnel trap tends to provide the most consistent lure release.

### **Useful References**

Jason Oliver *et al.* "[Comparison of Different Trap Types for Collection of Asian Ambrosia Beetles](#)". SNA Research Conference, 2004, vol. 49

Russ Mizell and T. Riddle "[Evaluation of Insecticides to Control the Asian Ambrosia Beetle, \*Xylosandrus crassiusculus\*](#)". SNA Research Conference, 2004, vol. 49



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