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Granulate Ambrosia Beetle

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The granulate ambrosia beetle is a small beetle that is a relatively new pest of woody ornamental, fruit and nut trees in Arkansas and can cause significant damage in nursery, landscape and orchard settings.

Granulate ambrosia beetles have many reported hosts. Among the most common are red maple, redbud, styrax, ornamental cherry, pecan, peach, plum, cherry, persimmon, Japanese maple, golden rain tree, dogwood, sweet gum, Shumard oak, Chinese elm, magnolia, fig and azalea.

THE GRANULATE AMBROSIA BEETLE
***Xylosandrus crassiusculus (Motschulsky)*, Coleoptera, Curculionidae**

This introduced pest was first detected in the U.S. in peach trees at Charleston, South Carolina, in 1974. Since then it has become widespread throughout most of the southeastern, Gulf Coast and surrounding states ranging from Texas through Oklahoma and east to Virginia. It has also been reported in coastal regions of Maryland.

It spreads by natural distribution and shipment of contaminated plant material.

Damage

Female beetles bore into the sapwood of stems and young trees. Though attracted to damaged, stressed or transplanted trees, the granulate ambrosia beetle also attacks seemingly healthy, thin-barked hardwoods or branches from 1.0 to 2.5 inches in diameter. Visible symptoms include wilted foliage and **strands of boring dust** protruding from small holes (see photo below).

These insects make galleries directly into the heartwood of the tree, which they inoculate with an ambrosia fungus (*Ambrosiella* spp.) which is used as their food source. In addition, they can introduce or create entry points for pathogenic fungi such as *Fusarium* spp. Death is more likely related to these pathogenic fungi that block xylem vessels.

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Young, infested trees often die, while more established landscape trees may sometimes survive.

Serious attacks that result in tree death usually occur during the leafing-out stage. Galleries into the sapwood may be observed by splitting a section of trunk or branch. Infested wood is distinctly discolored and may have a foul odor.

Description

These tiny blackish-brown beetles somewhat resemble the Southern pine beetle. Infestations can be identified by **toothpick-like strands** of boring dust protruding up to 1.5 inches from the host plant. The strands 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. The three pictures below show the attached toothpick strand of sawdust, the strand removed and the tunnel with sawdust removed.

Individual plants may contain from one to more than 50 individual beetles. There are also some reports of *Xylosandrus germanus* (Alnus ambrosia beetle) producing toothpick strands.

Life History

Researchers believe that in Arkansas beetles become active in March and the activity peaks in mid to late April. However, beetles remain active at low levels through the summer and into the fall.

There may be two generations in Arkansas. Females bore into twigs, branches or small trunks of susceptible hosts. They excavate tunnels in the wood, introduce a fungus and produce a brood. Beetles feed on the growing fungus, not the wood.

Eggs, larvae and pupae are found together. There are no individual egg niches, larval tunnels or pupal chambers. Attacks occur on stressed, transplanted, freshly cut hosts, and even on apparently healthy trees.

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 not seen in the nursery. This provides strong anecdotal evidence that they overwinter outside the nursery.

Control

Heavily infested plants or plant parts should be removed and destroyed. It may be best for large growers to wait three to four weeks after trees are attacked before removal so as to concentrate and destroy the greatest number of beetles, possibly sparing some healthy trees. Once trees are infested, the beetle cannot be killed within the plant and fungicides are ineffective against the fungus. Protective sprays on trunks may be attempted on susceptible nearby plants. Sprays of the older materials lindane and dursban have been shown to be largely ineffective. At this time, there are few registered chemical alternatives.

Homeowners may try trunk/limb sprays of a labeled insecticide that contains a pyrethroid

such as permethrin (e.g., Hi-Yield 38 Plus) but may have to make multiple applications during the time the beetles are active. Always read and follow label directions for the insecticide used. Keep trees healthy and avoid any unnecessary tree stress (drought, injury, nutrition, etc.). Check trees frequently beginning in early March and treat accordingly.

For **commercial operators**, permethrin (various formulations) is registered for use on tree trunks and may provide better protection. Larger spacing in nurseries may help slow the spread from plant to plant. Plants that survive attack can often recover with age. Onyx (bifenthrin) is often recommended as a trunk spray in landscapes but is not registered for use in greenhouses or nurseries.

Use traps to tell when beetles become active in your area. Use protective sprays of permethrin as soon as beetle activity starts.

These insects do not consume plant material as they create their galleries, so imidacloprid is not effective.

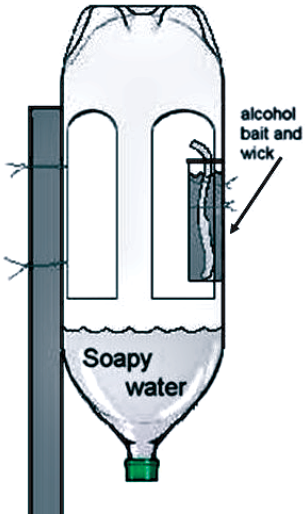
Trees become less attractive to beetles once leaves are fully expanded, so spray intervals can be extended or other pesticides may be used then. There is no need to spray once the beetle flights stop, nor are sprays recommended in the fall.

Once a tree is attacked, it becomes more attractive to further attack. Use this to your advantage by leaving these trees in place to serve as trap trees. So long as they are removed and burned before the 55-day life cycle is completed, they should not be a source of new beetles.

Activity Monitoring

Some growers find ethyl alcohol based traps helpful to monitor for adult beetles in the spring. These can be homemade soda bottle traps, commercial Lindgren funnel traps or modified Japanese beetle traps. While soda bottle traps are the least expensive, they are less durable. The ethanol release strip purchased for use with the funnel trap should provide the most consistent lure release.

Granulate Ambrosia Beetle Trap



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