

# Forecasting Pest Activity

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The theme of this issue of *Nursery Notes* is "Forecasting." Forecasting the presence of arthropod pests would be a valuable tool in nursery production and landscape maintenance. Just imagine if you knew exactly when a particular pest was active so it could be treated before plant damage or customer complaints occurred.

In some cases we have the means to do this. For example, research has shown

that euonymus scale crawlers emerge the same time Oregon grape (*Mahonia*) begins to bloom and red maple is in 50% bloom (Hodges and Braman 2004). Likewise, first flight of Japanese beetle occurs when *Tilia cordata* is in 50% bloom (Mussey and Potter 1997). Many other examples exist. These relationships exist because plants and insects rely on heat accumulation, calculated as degree days, for development. Insects and plants

develop fast in warm weather and slow in cool weather. Thus, plant phenology can be used to predict insect activity with good consistency. However, a lot more research is required to identify these relationships in ornamentals and ground truth them in multiple regions.

Another valuable forecasting tool is trapping. In many cases pheromone or other types of traps are available to indicate exactly when pests are active. A

prime example of this is the Granulate Ambrosia Beetle (GAB) (Figure 1). Yes, I remember (barely) that I wrote about GAB last January. However, as one of the most damaging pests of nursery crops in the Southeast it warrants a brief recap.

Granulate Ambrosia Beetles emerge in early spring and attack trees such as styrax, ornamental cherry and other fruit trees, Japanese maple, golden rain tree, dogwood, and oak, though it



Figure 1 Granulate Ambrosia Beetle. Photograph by Jim Sklar & Stephen Bambara

has been reported to attack over 100 tree species. Female beetles bore into trees, excavate a gallery, and lay eggs. In addition to boring damage, female beetles inoculate trees with ambrosial fungus on which they feed. Infested plants often die from boring damage, ambrosial fungus, or infection by a secondary pathogen. This fungus cannot be killed with fungicide applications.

As beetles bore into trees they push out sawdust and frass in the shape of toothpicks that stick out of the trees (Figure 2). Infested nursery stock should be left in place until after peak emergence because they may serve as "trap trees" to attract beetles away from other trees. Infested nursery stock should be burned or chipped to prevent new adults from emerging. Landscape trees may survive attacks but should be monitored for debark and removed if necessary.

Preventative applications of pyrethroid insecticides can protect trees by preventing Granulate Ambrosia Beetles from excavating

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Figure 2. Photograph by Jim Baker & Stephen Barstow

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galleries. However, once beetles are inside trees they cannot be killed with insecticides. Thus, the timing of preventative insecticide applications is crucial to protect trees from damage by this pest. Applications that occur too early waste time and money. Applications made too late may fail to protect trees from damage.

This is where forecasting becomes important. Granulate Ambrosia Beetle emergence time varies between years and geographic locations throughout the state. Therefore, trapping is the only way to determine when beetles emerge and preventative insecticide applications are required. Traps can be constructed easily from 2 liter soda bottles. GAB is attracted to ethanol (grain alcohol not rubbing or isopropyl alcohol) so lures can be made with a vial or pill bottle filled with ethanol and a wick. Design plans can be found at

in spring 2009 I set up a pilot monitoring and alert program to determine when Granulate Ambrosia Beetle is active in different growing regions of the state and to inform growers when preventative treatments are appropriate. In 2009 we had 18 monitoring sites around the state at nurseries, arboreta, and extension offices. Nursery and landscape professionals were notified by email when Granulate Ambrosia Beetle is captured at each monitoring site. Last year almost 100 people signed up to receive email alerts. I will be continuing this program in 2010 and encourage growers to sign up for email alerts. I also encourage growers to set up their own traps as emergence varies by location. You may have beetles emerge in your nursery before they

emerge at one of the monitoring locations.

If you would like to sign up for email alerts when Granulate Ambrosia Beetle emerges send me an email at [steven\\_frank@ncsu.edu](mailto:steven_frank@ncsu.edu) with "alert signup" in the subject line and I will add you to the list. I promise you will not be bombarded with email. You will only receive email when Granulate Ambrosia Beetle emerges in a different part of the state. Thank you in advance for your interest and participation.

Steve Frank can be reached by email at [steven\\_frank@ncsu.edu](mailto:steven_frank@ncsu.edu) or by phone at 919-515-8880. Insect Notes on ornamental pests can be found at <http://insects.ncsu.edu>.

**References:**

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