



Researcher Studies Tree Rings to Learn Ash Borer's Patterns

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In coming months MSU researchers could know how fast emerald ash borer populations move, how fast their populations grow and even when the beetles first arrived in the United States.

Nathan Siegert, a visiting research associate in forest entomology, began sampling tree rings in 2004 over an area of 5,800 square miles in southeast Michigan with the goal of mapping the ash borer's spread.

Siegert, with the help of a handful of students, uses dendrochronology — or the study of tree ring patterns — to compare the tree rings in the trunks of healthy trees with the rings of trees that were infected with emerald ash borers.

The emerald ash borer is an Asian beetle that was first discovered in 2002 near Detroit. Its larvae damage and usually kill ash trees by feeding on the inner bark and disrupting the flow of water and nutrients, according to www.emeraldashborer.info, a Web site run by a collaboration of groups including the Michigan Department of Agriculture and MSU.

Siegert said he expects to know how long it takes a population of the beetles to grow and spread in about two months. Once that question is answered, it will be easy to develop methods of slowing or even preventing ash borers from spreading further, he said.

Frank Telewski, professor of plant biology and curator of the Beal Botanical Garden and the MSU campus arboretum, worked with Siegert to design the experiment.

"By using his tree ring research, (Siegert) was able to work his way backwards with trees that have died years ago to figure out when they died," Telewski said.

Since its arrival, the species has been found in ash trees in various parts of Indiana and Illinois, but is most common in southeast Michigan and northern Ohio, Siegert said.

Determining how long ago trees infected with emerald ash borers died is instrumental in understanding how long it takes a population to spread to an area and kill the trees they inhabit.

Siegert said he has concluded that a population of ash borers typically occupies an area for about four years before the population is big enough to be detected. The research also uncovered that the bigger the population of ash borers, the greater distance it spreads out per year, he said.

"One of the really exciting things (uncovered by) the tree ring research is that an ash borer can be in a larvae stage inside a tree for up to two years — it was previously thought to be just one year," Telewski said.

Understanding biological characteristics such as this is necessary before researchers can hope to contain the ash borer more efficiently, Telewski said.

Out of 83 counties, there are 21 counties in Michigan — most in southeastern Michigan — where ash trees have been quarantined because of ash borer infestation. Quarantining trees — or banning the removal of firewood from these areas — is less expensive than removing the trees completely, Siegert said.

The incentive to stop the spread of emerald ash borers can be seen in cities, where ash trees are prominent in the landscape, Siegert said.

"There are some neighborhoods that are completely void of trees because they only had ash trees," he said.

Emerald ash borers have even made an appearance in East Lansing, Telewski said. Trees along Grand River Avenue began showing symptoms of infestation last year, along with trees near Spartan Stadium on campus.

"If we can't get the emerald ash borer under some kind of control, it could wipe out our entire population of ash trees," Telewski said.