

Asian Wasps may help in fight against Emerald Ash Borer (EAB)



The Tetrastichus planipennis wasp (above) is one of three Asian wasp species being tested as a biological control for the emerald ash borer (EAB), which has killed an estimated 30 million of Michigan's ash trees.

July 14, 2010 - Researchers in Brighton Township, in partnership with the Michigan Department of Agriculture (MDA) and U.S. Department of Agriculture (USDA), have been working hard the last few years to develop a biological control for the emerald ash borer (EAB), an exotic invasive wood-boring beetle now prevalent throughout Oakland County.

"Oakland County has certainly been hit hard by EAB," said Ken Rauscher, director of the pesticide and plant pest management division of the MDA. "Their effect has been very devastating in that area. The objective of the biological control is to provide a long-term remedy for EAB. Realistically, we look to biological control as the only real, permanent solution to this problem. It's the only thing that will bring some balance back into the ecosystem."

Biological control is the practice of importing and releasing host-specific natural enemies from a pest's native range to control populations in the area of introduction. Rauscher said in Asia, where the EAB is native, there are several naturally-occurring predators.

"What USDA did is go to Asia, seek out those biological controls, bring them back to the United States, clean them up — removing any parasites — check them for host specificity, and start to rear them," he said.

Right now, there are three very small wasp species being used in research as biological controls for the EAB.

The first, *Spathius agrili*, was found parasitizing up to 90 percent of EAB larvae in ash trees in China. According to USDA documents, female *Spathius* parasitize EAB larvae by drilling through the bark and laying up to 20 eggs on its host. The hatching parasitoid larvae feed and develop on the EAB larvae, killing them. *Spathius* overwinter as pupae inside cocoons under the bark of ash trees and emerge as adults in the summer.

The second, *Tetrastichus planipennis*, is also a parasitoid of EAB from China, where it attacks and kills up to 50 percent of EAB larvae, the USDA states. The life cycle of *Tetrastichus* is similar to that of *Spathius*; however, the female parasitoid lays eggs inside EAB larvae where the parasitoid larvae grow, killing the EAB host. They survive the winter as larvae inside their host or host gallery under the bark of ash trees.

The third, *Oobius agrili*, kills up to 60 percent of EAB eggs laid during the summer. Tiny female *Oobius* search the bark of ash trees for EAB eggs, which are laid in bark crevices and between layers of bark. When the *Oobius* finds an EAB egg, it injects its own egg inside where it will hatch, grow and kill the host egg. *Oobius* spends the winter as larvae inside the EAB eggs and emerge the following spring as adults.

Sharon Lucik, public affairs specialist for the Brighton research facility, said biological control isn't something that will be readily available for use. Because the wasp species can't be artificially reared, it takes times to bring them over from Asia, clean them up, release them in control areas and have them establish a population through reproduction on their own.

"Biological controls are something that we are studying successfully, but should be used in conjunction with other forms of management and prevention, including quarantines, pesticides and public education," she said.

Since the project began in 2007, small numbers of each species have been released in Michigan field sites and survived the winter.

"We want to curtail the movement of the pest," she said. "It's the collective efforts of all those initiatives that helps us deal with the problem we have right now."

As of December 2008, EAB has been detected in 10 states, including Michigan, Indiana, Illinois and Ohio. The USDA states EAB is well-suited for climatic conditions on this continent. The larvae of EAB feed under the bark of ash trees, cutting off the transport of nutrients which results in tree death over a period of several years. In Michigan, where there are 693 million ash trees, it's estimated that more than 30 million of the state's ash trees have already succumbed to EAB.

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