



### Asian Longhorned Beetle, *Anoplophora glabripennis*: An Emerging Success

**Economic and Ecological Impact:** The Asian Longhorned beetle (ALB) (Fig. 1) is an exotic pest that has become established in New York City, Chicago, New Jersey, and recently in Ontario, Canada. Over 7,500 shade trees in New York and Chicago have thus far been cut down in an effort to eradicate the pest and prevent its permanent establishment in the United States. In addition, over 100 high-value shade trees discovered infested in New Jersey in 2002 were cut down in early 2003. Infested cargo in warehouses has been discovered and eliminated in at least 17 states, including Alabama, California, Florida, Georgia, Indiana, Maine, Massachusetts, Michigan, New Jersey, North Carolina, Ohio, Oregon, Pennsylvania, South Carolina, Texas, Washington, and Wisconsin. If the ALB continues its advance, this invasive pest may potentially alter the makeup of North American hardwood forests. Losses to lumber, maple syrup and tourism industries—dependent on healthy hardwood trees—could reach \$670 billion by recent estimates.

**Significant Accomplishments: *Where to Survey and Control:*** Methods used by APHIS to determine ALB presence have depended solely upon visual surveys for the subtle signs of ALB infestation. However, these methods are time-consuming, costly and only 33-66% effective. Therefore, ARS scientists at the Beneficial Insects Introduction Research Laboratory in Newark, Delaware, conducted the first ALB dispersal research in the beetle's home territory of Gansu Province, China and generated new dispersal data that predicts how far and the pattern the beetle might spread once it begins to invade an area (Fig. 2). They found that the beetles fly much longer distances than originally thought—even females carrying eggs. This new dispersal data is being used by APHIS and CFIA (Canada) to establish more reliable survey and quarantine boundaries and to implement site-specific survey and control protocols, increasing the chances of successful control or eradication. ***When to Survey and Control:*** Scientists in Newark, Delaware developed the first degree day model for ALB that predicts when the adult beetles are present. Scientists at North Carolina State University and the ARS Newark lab then developed real-time prediction maps of beetle emergence that APHIS and CFIA are using to implement survey and control strategies. ***How to Survey and Control:*** Scientists in Newark, Delaware and at the Sino-American Biological Control Laboratory in China were the first to identify and demonstrate the attraction, based on host odors, of a sentinel tree species in China. ARS scientists in Beltsville, Maryland and Newark, Delaware, then collaborated to isolate various host tree odors from several highly attractive sentinel tree species. Scientists in Newark, Delaware and in China then evaluated the attractancy of these host tree odors under field conditions in China. The notable significance of this work is that it represents the first demonstration of an artificial lure that is attractive to beetles, and the initial development of an artificial lure/artificial tree attractant system that could be used by state and Federal agencies in detection/monitoring and attract-and-kill strategies for ALB. ARS Newark scientists, in cooperation with APHIS, CFS and CFIA, plan to test the use of the attractive sentinel tree in an Attract and Kill strategy for monitoring and eradicating the beetle in areas of low beetle density.



Fig. 1. Adult Asian longhorned beetle.



Fig. 2. Entomologist Michael Smith patiently listens and records sounds produced by Asian longhorned beetle larvae as they feed within an infested willow tree in Gansu, China.

**Future:** ARS field personnel will help coordinate research and action programs to assist in beetle eradication and to locate and test new biological control agents that can be released: (a) inundatively (repeatedly), as mass-reared natural enemies, in the eradication program, and (b) for establishment in the event that eradication is not feasible and long-term IPM becomes the primary project goal.

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