DETECTION AND MONITORING OF THE ASIAN LONGHORNED BEETLE: UPDATE ON SENTINEL TREE, ATTRACT-AND-KILL, AND ARTIFICIAL LURE STUDIES

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ABSTRACT

Survey for trees infested by the Asian longhorned beetle (ALB), *Anoplophora glabripennis*, is based upon visual inspection of known host trees within a specified radius from trees showing signs of attack. However, visual surveys have been reported by USDA-Animal and Plant Health Inspection Service (APHIS) to be 33 to 60 percent effective, depending upon the method of visual survey (i.e. ground survey, bucket-truck survey, or tree-climber survey). There are currently no methods designed specifically to detect and monitor adult *A. glabripennis*, such as sentinel trees or attractants. Therefore, the objectives of the research reported here are: 1) to develop sentinel trees for detection of adult ALB, 2) to develop an attract-and-kill strategy for monitoring adult ALB, and 3) to develop of an artificial lure for detection and monitoring of adult ALB.

SENTINEL TREES STUDIES

The objectives of the studies reported here were to: (1) evaluate the relative attractancy of ALB to five key tree genera utilized by ALB as hosts in China (*Tilia, Eleagnus, Salix*, *Populus*, and *Acer*), (2) to evaluate the effects of wounding on the attractancy of ALB to *Acer mono* and *Acer negundo*, (3) to evaluate the relative attractancy of ALB to *Acer mono, Acer platanoides,* and *Acer truncatum*, and (4) to evaluate the efficacy of *Acer mono* to attract ALB from ALB-infested *Acer negundo* landscape trees under varying ALB population levels. Results from replicated field studies showed, to date, that: (1) ALB are significantly more attracted to *A. mono* than to *Tilia paucicospapa, Eleagnus agustifolia, Salix babylonica*, and *Acer negundo*, (2) ALB are significantly more attracted to *A. mono* than to *Acer platanoides*, the key maple species attacked in the U.S., and (3) ALB are significantly more attracted to *A. mono* than to *Acer truncatum*, a sister species of *A. mono* in China. Results also showed that wounding *A. mono*, by adult feeding or artificial methods, significantly enhanced ALB attraction, particularly of female beetles, indicative of response to host odors. Studies also showed that ALB attraction to *A. mono* occurs during both peak and declining ALB population levels and that *A. mono* is capable of attracting adult beetles out of large *A. negundo* landscape trees. These results provide the basis for using *A. mono* for detection and/or monitoring of adult ALB.

ATTRACT-AND-KILL STUDIES

The objective of the studies reported here was to determine if potted *A. mono* trees treated with Scimitar® (an encapsulate pyrethroid) altered the attractancy of ALB to *A. mono.* Results from studies initiated in 2006 showed that ALB attraction, particularly of female ALB, was not altered by treating potted *A. mono* with Scimitar® at either 300mg a.i./L or 450mg a.i./L. Although studies will continue in 2007, these results provide the preliminary basis for using *A. mono* for monitoring of adult ALB.

ARTIFICIAL LURE STUDIES

The objectives of the studies reported here were: (1) to isolate and identify the volatiles emitted by *A. mono* that are electroantennographically active and (2) to identify blend(s) of *A. mono* host volatiles that are attractive to ALB in an olfactometer bioassay. Results from GC-EAD studies have identified a group of antennally active *A. mono* host volatiles. Additionally, results from initial olfactometer studies conducted in 2006 have identified blend(s) of host volatiles that are significantly attractive to adult female ALB. Olfactometer studies are continuing, and field studies will be conducted in 2007.