

Project Title: Studies to develop an emerald ash borer survey trap – Trap location

Participating Scientists:

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What question was addressed in this project?

Where is the optimal site to place a survey trap for emerald ash borer?

Why is this question important – how does it relate to EAB containment or management?

Traps may be used to indicate the presence or absence of EAB in a survey program. However, to be effective, traps must be placed in locations where EAB are likely to be captured.

Briefly summarize how you collected data:

To evaluate the effect of site placement on the trap collection of EAB, traps were placed along the edge of a woodlot, 25 meters into the woods, or 25 meters from the woodlot into an open field (repeated 4 times). Traps were constructed from purple-colored corrugated plastic panels (15 cm wide by 90 cm tall) covered with Pestick insect glue. Previous research has indicated violet colors are generally attractive to beetles in the family Buprestidae. At each trap site in the woods, edge, or field, a 1.3 cm rebar rod was used to suspend trap panels at heights of 0 to 0.9 and 2.1 to 3.0 meters. EAB were removed about weekly.

What do the preliminary results of your project indicate?

The preliminary results of this study indicate EAB visual-based traps should be located on the forest edge or in open areas, because no EAB adults were captured on traps placed in the woods. Total adult EAB collections were low (i.e., 36 EAB), but the population of EAB at the site was also unknown. On average, EAB collections were significantly higher on traps located along the forest edge (2.1 and 1.0 EAB/trap, respectively) than in the open field or woods (≤ 0.4 EAB/trap). The two trap heights tested did not significantly affect EAB capture. Despite low EAB captures during the test, EAB collection on the purple panels placed along the forest edge was comparable to captures of EAB in other studies we performed using the current Michigan Department of Agriculture trapping method (i.e., girdled ash tree with plastic sticky band above the girdle). However, unlike the MDA girdled trap tree method, the purple panels used in this study were not associated with damaged trees or other artificial lures. Light levels were much lower (40 to 60 times) in the wooded test sites than open field or edge sites. Therefore, EAB may not distinguish trap colors effectively in low light forested conditions due to reduced light reflectance.

Project Title: Studies to develop an emerald ash borer survey trap – Seedling Tree Damage

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What question was addressed in this project?

Can damaged seedling ash trees be used as trap trees for EAB adults?

Why is this question important – how does it relate to EAB containment or management?

Traps may be used to indicate the presence or absence of EAB in a survey program. To be effective for surveys, traps must be attractive to EAB adults. In addition, traps must be easy to deploy in a timely manner. The utilization of small trees in a survey program has the advantage of allowing traps to be placed easily at any location, unlike survey methods currently used by the Department of Agriculture, which rely on the girdling of mature ash trees to attract EAB to sticky bands. In addition, once girdled, mature ash trees can only be used one field season, and the damage to mature trees is often unpopular with landowners.

Briefly summarize how you collected data:

The attraction of EAB adults to sticky traps placed on damaged and undamaged ash seedlings was investigated. Bare-root green ash (*Fraxinus pennsylvanica* Marshall) in three varieties ('cimmaron', 'patmore', and 'urbanite') ranging from 1.3 to 2.5 cm caliper were planted on 21 April at a site in South Lyon, MI. Twenty trees per variety were planted at 1.5-m spacing in rows by variety type. Damage treatments consisted of severe root pruning (~ 30 %) at planting, or trunk scraping, crown decapitation, or girdling on 11 May 2004. Traps were purple-colored corrugated plastic triangles (with each side 30 cm long × 15 cm wide) attached to the tree at 15 to 45 cm. Purple had been found to be attractive to EAB in earlier testing. Traps were covered in Pestick insect glue and EAB removed weekly.

What do the preliminary results of your project indicate?

EAB collections were not significantly affected by damage treatment or variety of green ash. There was a trend towards more EAB being captured on girdled and trunk scraped trees than other treatments and on the 'urbanite' green ash over the other varieties. Total EAB collections were low (153 EAB), but the population of EAB at the site was also unknown. Among varieties, a total of 48, 37, and 17 EAB adults were collected over the summer on 'urbanite', 'patmore', and 'cimmaron' varieties, respectively. Among the twenty trees tested for each variety, 85% of the 'urbanite' and 'patmore' trap trees captured at least one EAB adult by the end of the field season, while only 60% of the 'cimmaron' trees captured at least one EAB adult.

Project Title: Studies to develop an emerald ash borer survey trap – Trap Design Evaluation

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What question was addressed in this project?

What is the best trap type design (shape, color, size, etc.) for trapping EAB adults?

Why is this question important – how does it relate to EAB containment or management?

The question relates to EAB containment, because traps may be used to indicate the presence or absence of EAB in a survey program. To be effective for surveys, traps must be attractive to EAB adults.

Briefly summarize how you collected data:

A trap design test evaluated multiple sizes, colors, and shapes of traps. All traps were placed in a wooded area with EAB damaged trees in close proximity. Most traps were made from purple or black corrugated plastic covered in Pestick insect glue. In addition, the following types of traps were tested: intercept flight traps (Lindgren funnel and IPM Tech Intercept Panel), Pherotech's purple version of the elm bark beetle trap, a purple colored wallpaper trap (3.75 cm wide), and the MDA program trap (girdled ash tree banded with a 37.5 cm strip of glue coated plastic stretch wrap). EAB adults were collected weekly from traps.

What do the preliminary results of your project indicate?

The MDA Program trap had significantly higher EAB collections (2.4 ± 0.7 [S.E.] adult EAB/trap/week) than other treatments, followed by the elm bark beetle trap (1.1 ± 0.6). All other trap treatments averaged < 0.3 EAB per trap per week. Total EAB (58) collections among traps were low, but the population of EAB at the site was also unknown. Unlike the other traps, the MDA Program and the elm bark beetle trap were both in association with ash trees. However, the MDA trap was the only trap in the study placed on damaged ash trees. In general, traps with larger surface areas were the most effective. Sticky traps were more effective than flight intercept traps; the black-colored Lindgren funnel and IPM Tech Panel traps caught zero beetles. Black-colored corrugated plastic crossvane traps also caught zero beetles. Light levels were 40 to 60 times lower in the wooded trap sites than adjacent open or edge areas. EAB attraction to the MDA Program trap, which is both a visual and olfactory trap, was greater than EAB attraction to the remaining traps, which were primarily visual traps in these low-light forested areas.