

Emerald Ash Borer

Agrilus planipennis Fairmaire

Coleoptera: Buprestidae

Francese, J. A.; Oliver, J. B.; Fraser, I.; Lance, D. R.; Youssef, N.; Sawyer, A. J.; Mastro, V. C. 2008. Influence of trap placement and design on capture of the emerald ash borer (Coleoptera: Buprestidae). *Journal of Economic Entomology* 101: 1831-1837.

Objective: To evaluate horizontal and vertical trap placement for flying *A. planipennis* in detection surveys; to evaluate trap color within and outside of an ash woodlot; to evaluate the efficacy of trap design.

Abstract: Emerald ash borer is an established, exotic woodborer attacking healthy green (*Fraxinus pennsylvanica* Marsh.), black (*F. nigra* Marsh.), and most importantly, white ash (*F. americana* L.) in northern North America. Tree mortality is high and rapid. Attempts at eradication appear to be failing, but nonetheless a useful survey system is required for this pest. There is evidence that other *Agrilus* spp. use color, sound, and semiochemicals to locate potential hosts. This study reports the effect of trap design, color, and placement height and distance in relation to an ash woodlot on catch rates of adult *A. planipennis*.

Purple traps caught significantly more *A. planipennis* than red or white traps. Purple traps caught significantly more *A. planipennis* in fields and along edges of woodlots than inside woodlots. Four-sided box traps caught more *A. planipennis* than crossvane traps, while two-panel traps and three-sided prism traps caught as many beetles as the other trap designs. The box, panel, and prism traps caught more beetles per square meter of flat trap surface than the crossvane traps. In general, the authors recommend the use of the prism trap for sturdiness, ease of construction, and economy. Prism traps hung at 13 m caught more beetles than those hung at 6 m, and traps hung at 13 and 6 m caught more beetles than those set at 1.5 m. Greater captures in traps hung at canopy height (13 m) likely reflect the adult activity of *A. planipennis* occurring predominately in the canopy. Placing traps at canopy height requires additional effort (e.g., the use of a bucket truck or tree-climbing equipment), but increases the chances of detecting the presence of *A. planipennis* within a stand.

Sampling Procedure: Purple is the most efficient color in trapping adult *A. planipennis*. Three-sided prism traps are recommended for sturdiness, ease of construction, and economy. Construct traps out of corrugated plastic panels (0.26 cm thick; Coroplast, Dallas, TX) (Fig. 2; also described in our review of Crook et al. 2008 in this volume). Attach a three-arm modified stainless steel umbrella rig spreader (Zing Products, Westport, MA) to the top of each trap using plastic cable ties (Fig. 2). Coat the outside of each panel with Pestick insect trapping glue (Hummert International, Earth City, MO). Set each prism trap at a height of 13 m in the midcrown of an ash tree. Traps can be checked easily if hung from a rope attached to

the umbrella spreader and using a pulley attached to an upper branch. Space traps by 15 m. Deploy traps before adult flight activity during the summer (or before June) and remove trapped adults each week.

Purple panel traps may be useful if traps are set at heights of 3 m or lower. Attach two 15.2 cm wide by 91.4 cm tall panels of corrugated purple plastic (0.26 cm thick; Coroplast, Dallas, TX) to a steel rebar pole (1.27 cm diam.) (Fig. 1). The top of the first panel should be hung at 0.91 m above ground and the top of the second panel should be hung above the first on the same pole at 3.0 m above ground, with 2.1 m in between the two panels. Coat each side of both panels with insect trapping glue. Set purple panel traps outside of woodlots containing ash trees, either along the edges of the woodlot or in adjacent fields. Deploy traps before adult activity during the summer (or before June) and remove trapped adults each week.

If using the four-panel box trap (described in our review of Francese et al. 2005 in this volume), hang traps at 1.5 m above ground using L-shaped steel rebar poles (1.27 cm diam.) in fields adjacent to woodlots. Coat the outside of each panel with Pestick insect trapping glue. Space traps by 15 m. Deploy traps before adult flight activity during the summer (or before June) and remove trapped adults each week.

Notes: Although not specified, consider deploying prism traps in the canopies of ash trees directly along the edges of a woodlot and not within the woodlot.

The results of a greater trap capture of *A. planipennis* at 13 and 6 m heights are in contrast with those of Francese et al. 2005, who reported that greater numbers of adults were caught at the 1.8 m height than at the 6.1 m height using purple-colored box traps (see our review in this volume).

References:

- # Crook, D. J.; Khrimian, A.; Francese, J. A.; Fraser, I.; Poland, T. M.; Sawyer, A. J.; Mastro, V. C. 2008. Development of a host-based semiochemical lure for trapping emerald ash borer *Agrilus planipennis* (Coleoptera: Buprestidae). *Environmental Entomology* 37: 356-365.
- # Francese, J. A.; Mastro, V. C.; Oliver, J. B.; Lance, D. R.; Youssef, N.; Lavalley, S. G. 2005. Evaluation of colors for trapping *Agrilus planipennis* (Coleoptera: Buprestidae). *Journal of Entomological Science* 40: 93-95.

Figures

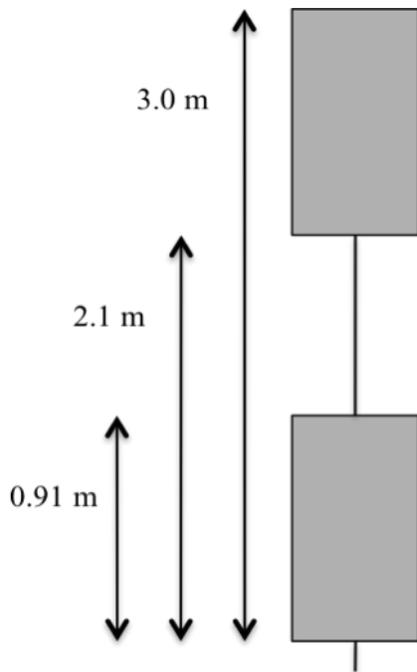


Fig. 1. Purple panel trap used for emerald ash borer. Figure modified from Fig. 1, Francese et al. 2008, *Journal of Economic Entomology* 101: 1831-1837.

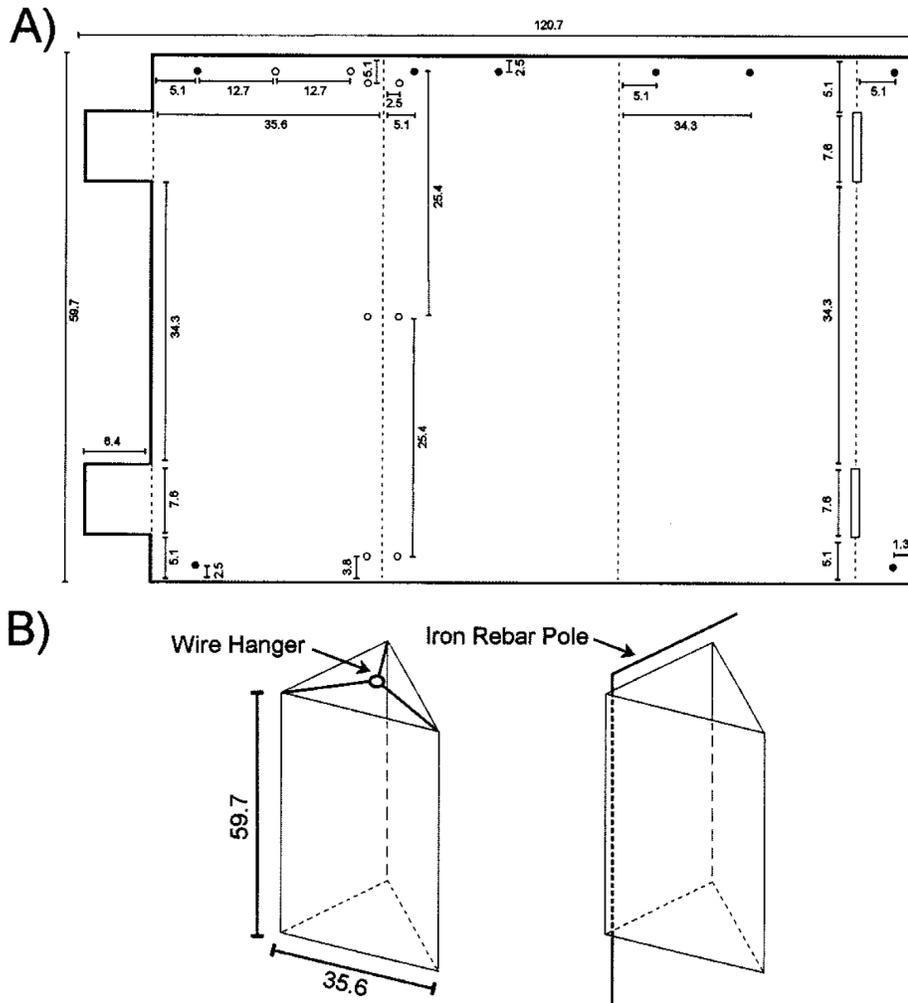


Fig. 2. Emerald ash borer prism trap used in 2006 and 2007. (A) Schematic of a prism trap cut from a single sheet of corrugated plastic. White circles represent holes to be used for attachment points to an iron rebar pole if the trap is to be hung at ground level. Black circles represent holes to be used for attachment points to a wire trap hanger if the trap is to be hung from a tree or other high place. (B) Diagram of the assembled trap showing both a high setup (left) and a low setup (right). All units are in centimeters.