

Yellow Pan Traps: A Simple Method for Trapping Parasitoids Released for Biological Control of the Emerald Ash Borer

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Many adult bee and wasp species are attracted to the color yellow. In Michigan field sites where the three introduced emerald ash borer (EAB) parasitoids are established, we found yellow pan traps (YPTs) are effective at trapping the three introduced EAB parasitoids: *Oobius agrili*, *Spathius agrili*, and *Tetrastichus planipennisi*. Other known EAB larval parasitoids are also trapped (e.g. *Atanycolus*, *Spathius*, *Phasgonophora sulcata*, *Balcha indica*) as insects in other groups (e.g. beetles, flies). YPTs are simple and inexpensive to make. For more information on parasitoid recovery methods refer to the “Biological Control Release and Recovery Guidelines” at www.mapbiocontrol.org.

What will I need to make one YPT?

1. two 12-oz yellow plastic bowls (color: yellow sunshine; manufacturer: Festive Occasion, East Providence, RI 01916)
2. one 6-inch right-angled shelf-bracket
3. three 1.25-inch long wood screws
4. weather-proof marking pen (e.g. Sharpie) and grease pencil (needed if bowls are wet)
5. three 6-inch zip-ties
6. 20% solution of clear (not pink) propylene glycol (non-toxic antifreeze) diluted with water
7. rechargeable portable electric screw-driver with bit and extra battery pack
8. unscented dish detergent

What will I need to collect the insect sample from the YPT?

1. one paint filter
2. one whirl pak or Ziploc bag that will fit the folded paint filter. You must be able to write on the bag.
3. pencils and paper
4. 70% ethanol

How are the YPTs mounted?

Using the electric screw-driver, attach a shelf-bracket to the trunk of a living ash tree infested with EAB. Attach the bracket ~5 feet above the ground with the three wood screws (Fig. 1).

What about those two yellow bowls?

One yellow bowl is used as a “holding-bowl.” It is attached to the shelf-bracket with zip-ties threaded through the three shelf-bracket holes (on the horizontal surface) and three pairs of holes (1-cm apart) punched on three side of the bowl positioned adjacent to the shelf-bracket holes with a hole-punch ~0.5 to

1.0 cm below the lip (Fig. 1). Do not pull zip-ties too tightly to avoid distorting the holding-bowl. To provide drainage in the holding-bowl, cut a hole (~1-inch-square) in the bottom with a utility knife. The second yellow bowl or “trapping-bowl” will hold the liquid that traps insects (Fig. 1). It rests inside the holding-bowl. To prevent overflow from the trapping-bowl after rainfall, punch at least 6 drainage holes just below the lip. Hot-glue a strip of fine-mesh screening (e.g. organdy) over the drainage holes to prevent loss of specimens during overflow. After the bracket and holding-bowl are mounted on the tree, set the trapping-bowl in the holding-bowl. Fill the trapping-bowl ~¾-full with the 20% propylene glycol solution. Add one drop of unscented dish detergent to break the surface tension of the solution. This will allow inquisitive insects to become entrapped in the liquid. You will need to empty the trapping-bowl after three to seven days to avoid possible loss of the sample due to weather, vandals, wildlife, decay, etc.

When should the YPTs be deployed?

Deploy YPTs at EAB biocontrol release sites at least one year following the last parasitoid releases. The adult parasitoids fly throughout the spring, summer, and early fall. Because their populations are highest in late summer and early fall, we recommend deployment of the YPTs in first two weeks of August and first two weeks of September.

How many YPTs should I deploy and where?

Deploy 12 YPTs at your EAB biocontrol release site. Place one YPT per living ash tree (at least 4-inch DBH) showing some symptoms of EAB infestation (e.g. fresh wood-pecker feeding, live epicormic shoots, weak crown).

A square 400-m x 400-m sampling grid, subdivided into 64, 50-m x 50-m grid-cells, is visible on each release site in mapviewer at www.mapbiocontrol.org (Fig. 2). This grid is also visible on the GPS units (GETACs or ARCHERS) issued to cooperators by the EAB Biocontrol Program (<http://www.mapbiocontrol.org/files/pdf/ArcGISMobileUserGuide10.0.pdf>).

Distribute the YPTs throughout the square sampling grid. However, if the release site does not fit within the grid, living ash trees are not available, or an EAB Biocontrol Program GPS unit is not available, place the YPTs in the vicinity of the release site. Take the GPS coordinate for each trap. Label each YPT holding-bowl with a unique ID number (include site code, grid-cell number) using a weather-proof pen (e.g. Sharpie) or grease pencil if bowl is wet. On a data sheet, record your state, YPT-ID number, trap-GPS coordinate, date, and initials of person collecting.

How long do I leave YPTs in the field?

The YPTs can be left on the trees for three to seven days. Samples left too long in the field may decay, overflow in a heavy rain, or dry up.

How is the insect sample collected from the YPT?

Label a paint filter with date, site name, and trap ID using a pencil. Strain the contents of the trapping-bowl by pouring the liquid through the paint filter, letting it drain onto the ground. Then, fold the top of the filter over, staple it shut, dip the entire paint filter in ethanol to preserve the insects during shipment, and place it into a zip-lock bag or whirl-pak. Store samples in the refrigerator and ship within one week. If shipment is delayed, store the samples in the freezer.

What do I do with these samples?

For sorting and parasitoid identifications, send the samples by overnight shipping to:

Juli Gould
USDA APHIS, PPQ, Otis PSDEL
1398 W. Truck Rd.
Buzzards Bay, MA 02542-1329
Tel: 508-563-0923

Fig. 1. Design of yellow pan trap (YPT) used for trapping EAB larval parasitoids.



Fig. 2. The 400-m x 400-m sampling grid, subdivided into 64 labelled 50-m x 50-m grid-cells, is visible on each release site in mapviewer at www.mapbiocontrol.org.

A1	A2	A3	A4	A5	A6	A7	A8
B1	B2	B3	B4	B5	B6	B7	B8
C1	C2	C3	C4	C5	C6	C7	C8
D1	D2	D3	D4	D5	D6	D7	D8
E1	E2	E3	E4	E5	E6	E7	E8
F1	F2	F3	F4	F5	F6	F7	F8
G1	G2	G3	G4	G5	G6	G7	G8
H1	H2	H3	H4	H5	H6	H7	H8