Entomology Program Traps

Insect traps are the most efficient way to effectively trap a large area within a limited amount of time, with limited staff and resources. Each of the insect surveys conducted by the Pennsylvania Department of Agriculture's Entomology Program utilizes one or many trapping methods to passively collect the targeted insect species. The insect traps currently utilized by the PDA Entomology Program are listed below, along with a picture and brief description. In all of our trapping and non-trapping methods, the Department of Agriculture and its representatives make every attempt to inform affected land owners of their intent, to ask permission for their presence on the property, and to provide any necessary information or contacts requested by the individual.

Trap Identification

All PDA traps that are placed for an extended period of time are identified the PDA Logo and the Entomology Program's contact information (see below). Unmarked traps may have been hung by cooperating agencies, university researchers or private collectors. Please report all downed or destroyed PDA-marked traps to the Entomology Program and leave your name, contact information , trap number (if applicable) and location (street address, town and county).

Tree Band Trap

Tree bands are made from weather resistant paper and are coated with a light adhesive. Insects that walk up and down trees become entangled in the glue and are collected. The Spotted Lanternfly program will make use of thousands of tree bands.

Jug or Bottle Trap

A Jug Trap, sometimes referred to as a Sugar-Bait Trap, is a plastic container hung from a tree or post and baited with a pheromone lure, volatile plant compounds, sugar or other sweetener, or a combination of any of these, along with a dispatching agent and/or preservative, such as propylene glycol or ethyl alcohol. Jug Traps have been used in the Exotic Wood-boring Beetle (EWBB) survey and Western Bean Cutworm (WBC) surveys.

A new survey, using a smaller version called a bottle trap, will focus on collecting hornets and yellow jackets in wooded settings throughout Pennsylvania. The bottle will be suspended in a tree and filled with fermenting fruit juice or other sweetened liquid. The Hornet and Yellow Jacket Survey only occurs in late August.

Lindgren Funnel Trap

Lindgren Funnel Traps are a series of stacked funnels with a cup of preservative, such as propylene glycol or ethyl alcohol, attached to the bottom-most funnel. Black funnels are often used so that the trap has a rough tree trunk-like appearance, an apparently attractive form for wood- and bark-feeding beetles, wasps and other insects. The Lindgren funnel trap is suspended from a tree or pole and is usually baited with pheromone lures or attractive volatile plant compounds to draw the targeted insects to the trap, where the insect hits or lands on one of the funnels and slips downward to the cup. The Department of Agriculture and other state and federal agencies have used these traps in the Sirex Wood-wasp Survey, Early Detection and Rapid Response (EDRR) - Bark Beetle survey, and EWBB surveys, as well as in the testing of Asian Longhorned Beetle (ALB) lures.

Purple Panel Trap

Purple Panel Traps are three-sided, three-foot high panel traps covered in sticky glue that captures and holds the target insects. The traps are equipped with a lure made of oils from the Manuka and Phoebe trees, which have been shown, in combination with the purple color of the traps, to be highly attractive to the Emerald Ash Borer (EAB), an introduced pest of ash trees. These traps are currently being used intensively in the western counties of Pennsylvania and in high risk areas around the rest of the Commonwealth as part of the Emerald Ash Borer National Survey.

Intercept Trap

The Intercept Trap is a four-veined panel trap with a base that funnels into a cup of propylene glycol or ethanol. This trap is hung from a tree branch or suspended from a string between trees and is another trap designed to mimic a tree trunk. The cut-out at the center of the trap can hold a pheromone lure, packet of tree volatiles, or other attractant, enticing a variety of wood- or bark-feeding pests, particularly bark beetles and longhorned beetles. The veins are often coated with a slippery substance that causes the insects to slide or fall into the cup at the base of the trap. This trap has been used as part of the EWBB surveys, particularly as a monitoring tool in the Asian Longhorned Beetle survey. (Image obtained from http://www.forestryimages.org/images/768x512/5025064.jpg)

Pan or Bowl Trap

The Pan Trap, or Bee Bowl, is used in collecting visually-oriented flying insects, such as bees. Visually-oriented insects are often attracted by color, so traps encountered in Pennsylvania may be found in white, yellow, blue, or, possibly, purple. The bowl or pan is variable in size, and is most often filled with water and a mild, biodegradable detergent, which is used to break the water's surface tension. These traps are set out in series of one or more bowls of each color in open areas near wildflowers, and remain up for 8 to 24 hours at a time. Currently, we are using pan traps as part of the Pennsylvania Native Bee Survey (PANBS).

UniTrap

UniTraps are highly versatile traps used to collect a wide range of agricultural and lawn pests, including Japanese beetles, ladybugs and moths. UniTraps usually contain a lure suspended from the underside of the middle of the trap, with an insecticidal strip inside the collection container to dispatch the insects. These traps are being used in the Western Bean Cutworm survey.

Girdled Trap Tree

Girdled Trap Trees are used to lure insects that aggregate on weakened and dying trees. The trap tree is one that falls within the optimum range for the targeted tree species of a target insect pest. The bark of the trap tree is removed in a large swath, often between 12 and 18 inches long, all the way around the trunk of the tree. The trunk is wrapped in sticky plastic above the girdled section, trapping insects that land on the trunk and move up or down the tree. Girdled tree traps are not used in PDA surveys, but are being used by the USDA and Pennsylvania Department of Conservation of Natural Resources – Forest Pest Management Program.

Delta Trap

Jackson Traps,

Delta Traps are often used in the detection of orchard and nursery pests. The trap consists of a single sheet of stiff, white cardboard folded into a triangular "tent". The inside floor of the trap is gridded and painted with sticky glue used to entrap the target pest. A pheromone lure or other attractant is suspended inside the trap. Jackson Traps have been used in various orchard and nursery pest detection programs, the current program being the Light Brown Apple Moth (LBAM) detection survey.

Wing Trap

Wing Traps are also hanging sticky traps, also used in the detection of orchard and nursery pests. These traps consist of two sticky boards attached to a wire, forming an opening between the boards, around the sides of the trap. A pheromone lure is suspended from the upper panel in the middle of the trap. We currently do not use these traps in our pest surveys.

Blacklight Trap

Blacklight Traps, used to collect night-flying insects, consist of a bucket suspended from a tree and uses an ultraviolet light bulb as the primary attractant to the trap. Blacklight traps may be equipped with veins, which knock the insects into the bucket, while others use an insecticide to kill the insects as they fly into the trap. These traps are not currently being used in any PDA surveys, though they are used by the Pennsylvania Department of Environmental Protection's West Nile Surveillance Program to monitor mosquito populations throughout the Commonwealth.

Entomologists may also be encountered at night using a blacklight trap hanging near a white sheet, on which night-flying insects land and are captured. This collection method may cause some noise, as an electric generator is often necessary to power the lamps.

Non-trapping Methods

The Entomology Program's Entomologists and seasonal field staff also utilize more active survey methods while out in the field. Visual survey, actively looking for insects on plants, or using an insect net are the most common non-trap methods utilized in the field and can be equal or better methods of survey for certain insect pests. In some cases, destructive sampling, such as peeling back bark, clipping plant materials or whole plants, or removing structural materials from buildings may be necessary to identify or confirm signs of insect presence or to remove individuals, colonies or nests.

For more information or to report downed or destroyed traps, please call the automated Invasive Species Hotline at 1-866-253-7189, or send an email to BadBug@state.pa.us and someone will contact you.