Why use insect traps?

The first step to integrated pest management (IPM) is the timely detection of pest infestation. Insect traps not only allow detection and monitoring of pest problem but also provides estimates regarding pest population density in the sample area. If conducted consistently over multiple years, insect traps can indicate critical changes in population dynamics and behavior of key pests. In commercial agriculture, commonly used monitoring traps (Figures 1 & 2) utilize natural insect mobility to lure insects into the trap by either using pheromones (= scents), shape and/or color. Effective deployment and routine checks can provide information for calculating economic thresholds; thus, money invested in long-term monitoring with multiple traps can potentially save thousands of dollars of insecticides and protect the environment.

Common types of traps – target insect determines size of trap!

Figure 1. Wing pheromone trap for small insects

Figure 2. Bucket trap for large moths
What are insect pheromones?

Pheromones are substances that in small amounts attract insects to the emitter. Pheromones are natural substances that are produced by special glands in the abdomen of insects and it attracts the opposite gender of the same species. Insects produce pheromones for attracting a mate (e.g., most moths), for marking foraging routes (e.g., ants) or to signal alarm to neighbors (e.g., aphids). In case of pheromone traps, the lure slowly releases synthetic attractants that helps in detection of a single species of insect. Pheromone traps are very effective monitoring devices and are relatively cheap to purchase. Product assembly is very easy. Once you purchase a kit that comes with plastic tops and assembly materials, you only need to purchase fresh lures and trap bottoms from year to year (a negligible cost compared to expensive insecticides). Store the unopened lures in cool dark place and they will be usable for a long time. Remember that the accuracy of traps depends on their number and correct deployment in field. Traps do not indicate actual crop injury but can be used as reliable indicator of insect activity, and in some cases, for estimating action threshold.

What are the basic parts of a wing pheromone trap?

1. **Top section:** plastic pheromone traps last longer than paper traps. The top part of trap is the non-sticky portion of a wing trap. Once assembled, this tip portion doesn’t need to be changed. Several inches of steel wire or plastic tie could be used to suspend the top of the trap from a wooden or metal support above a certain height over the crop canopy or traps could be set at field margins. You may put information like setup date, location, and GPS coordinates under the top section, as well as maintain separate records in your scouting book.

2. **Bottom section:** the bottom portion of a wing trap needs regular maintenance because it consists of the sticky bottom. There may or may not be a square grid on the sticky surface that is designed to assist estimating the number of insects during large trap catches. The bottom, if made of paper, last longer and provides rigidity to the trap. In delta or triangular traps, the sticky bottom is postcard sized that is more easily replaced and stored than wing trap bottoms. It is a good idea to write the location, sampling date and time on the sticky bottom during servicing. Trap bottoms can be stored for a long time in Ziploc bags if air is excluded from inside the plastic before sealing.

3. **Lure:** the pheromone lure is generally a cylindrical piece of foam that is designed to gradually release the insect pheromone into the air. Lures can also be cube-shaped and filamentous for extended release. Lure may be held by a card-board or plastic lure-holder or the lure can be gently put on the sticky bottom of traps. Each lure should be handled with fresh gloves in order to maintain purity of the product. It is a good idea to change the lure at least twice a month, and especially after severe weather events like excessive precipitation and storms. Regular replacement of lure maintains the attractiveness of traps. Lures come in easy packing
that can be stored for several months away from sunlight in a cool, dry place.

**How to Monitor Insect Populations Using Traps?**

One of the major advantages of using insect pheromone traps with lure is that they are designed to attract single species of insect. Some other flying insects may accidentally visit the trap but their numbers will be lower than the target pest. Therefore, insect identification is automatic with lure-based traps and this trap data can significantly complement field scouting. Most manufacturers provide informative brochure that provides information about trap installation, trap placement, replacement of sticky bottom, identification of target insect, and record keeping. If you wish to monitor two different insects, then individual traps should be separated by at least 150-300 feet apart or follow specific product directions. *Remember that monitoring traps do NOT provide information about real crop injury and this fact makes field scouting an indispensible tool for the progressive grower.* Only in some cases, insect pest numbers from pheromone traps can be used for supporting treatment decisions. For example, if tomato fruitworm moth numbers exceed 7 per trap during fruit formation, then scouting should be intensified for egg masses on the actual crop. Treatment decision should be made after insect monitoring and scouting efforts indicate economic threshold.

**Common Problems with Insect Traps and How to Prevent Them**

Many problems can disrupt the proper functioning of traps, for example,

- Curious neighbors should be informed about location and relevance of traps to keep them away!
- Lures should be replaced once every month. Always wear disposable gloves when handling pheromones. Change gloves before handling different pheromones.
- Make sure you check the entire trap after rough weather events like wind storm and hail.
- Place the traps on field edges and mark with fluorescent paint when possible in order to increase their visibility to farm workers.
- Dust can severely reduce efficacy of trap. Follow product guidelines for placing traps over crop canopy.
- In rare cases, birds and other small animals can accidentally get trapped in wing and bucket traps. Too many non-target insects could also be problematic. Change location of
trap to prevent these mishaps.

- Accuracy of insect traps increases with the number of traps used. Experience with traps over multiple seasons can also increase your confidence in using trapping techniques. Always remember to scout crops directly for determining crop injury from insect pests.

**Suppliers of Insect Pheromone Lures and Traps/Trap Kits**

A standardized list of target insects and pheromone trap suppliers is provided in Table 1. Check with multiple suppliers for comparing the best rates and to get supplies in adequate quantities. Some suppliers may provide economical starter kits that you can purchase to gain experience in correct deployment and servicing the insect traps.

Contact information:
Dr. Ayanava Majumdar
Extension Entomologist
Gulf Coast Research and Extension Center
8300 State Hwy 104, Fairhope, Alabama 36532
Tel.: 251-331-8416
E-mail: azm0024@auburn.edu
Table 1. Suppliers of insect pheromone lures and traps.

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SC = Scentry Biologicals, Montana (1-800-735-5323)
PH = Pherocon Traps (Trece, Inc.), Oklahoma (1-866-785-1313)
GL = Great Lakes IPM (wholesale IPM suppliers located in Michigan, 1-800-235-0285)
AR = Arbico Organics (suppliers of mini-kits located in Arizona, 1-800-827-2847)

Disclaimer: the above list of products may change over time. Please inquire directly with the company about available products and package units. Mention of company name and products does not mean endorsement of those products.