European Corn Borer (ECB) Pheromone Trap Monitoring

Monitoring for European corn borer (ECB) using pheromone traps helps determine when moths are active in the area and when peak moth flight and peak egg laying will take place in the field. It is especially important for those regions where both ECB pheromone strains exist and/or where there are overlapping one-generation (univoltine) or two-generation (bivoltine) populations.

Trap Type: Hartstack or wire-cone traps are the most effective traps for ECB monitoring but are not available commercially, expensive to make and onerous to transport and store. The next best trap design is the Heliothis trap that is similar but made of nylon mesh and collapse for easy transport and storage. Several forms of sticky wing trap and bucket trap designs are also available for purchase but are not as effective as the Hartstack or Heliothis traps. See the ECB Trap Supply Companies Document.

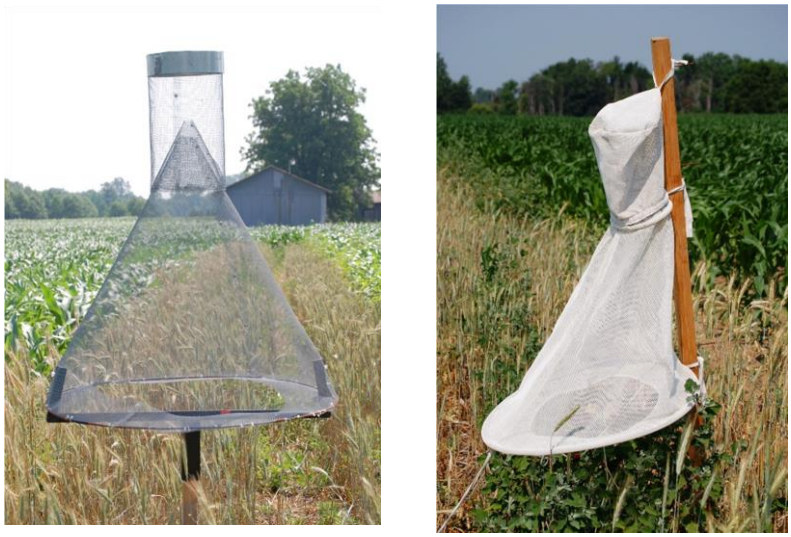

Figure 1. Hartstack (left) and Heliothis (right) traps are the most effective traps for monitoring ECB. Ontario CropIPM

Pheromone Strains and Lures: There are two different ECB populations or strains; one group with moths that respond to the E-strain (a.k.a. New York strain) pheromone lure, another group that responds to the Z-strain (a.k.a. Iowa strain) pheromone lure. The E-strain moths are not only attracted to corn but also other host crops including potatoes, wheat, peppers, hemp etc. The Z strain moths tend to only be attracted to corn. In some regions, both strains may co-exist and require separate traps to monitor for. There are also hybrid moths, with moths responding to hybridized blend of the E and Z lures. These individuals may be missed when trapping with the commercially available E or Z strain lures. Contact your provincial/state extension specialist to determine which strain of ECB lures to purchase for trapping in your area. Each lure needs to be changed every 2 weeks so 10 lures will need to be purchased per trap to monitor moth flight for 20 weeks of the summer season. Store unused lures in the freezer. Lures can last for two trapping seasons if stored properly in the freezer before use.

Trap Number and Placement: One Heliothis trap per field is adequate, except in regions where both the E and Z pheromone strains co-exist. In this case, two traps should be used per field, one for each lure strain. Always dedicate the same trap for the same lure strain to avoid cross contamination. Separate E strain traps from Z strain traps by a minimum of 30 metres (100 feet) apart so that the pheromones do not interfere with each other.

Trap placement is very important as it can influence the trap's effectiveness. Each trap should be placed among the grassy weeds growing along the field's edge, avoiding placing them directly over bare ground or along windbreaks or hedgerows that can impede wind flow. Pound a six- or seven-foot stake or metal T-bar into the ground and tie the Heliothis trap using the strings provided on the trap so that the bottom of the trap is no higher than 2 feet from the ground at the start of the season or 10 cm above the top of the grass canopy. If using wooden stakes, hammer nails at various heights to tie the trap to so that it doesn't slide down the stake. Pull the longer anchor string away from the trap and anchor it to the ground using a stake or rock to maintain the traps conical shape. Move the trap higher up the stake or T-bar as the vegetation grows taller. Always try to maintain about 10 cm of space between the bottom of the trap and the top of the grass vegetation. Using a small binder clip, attach the lure to the elastic band running across the opening at the bottom of the trap. Change the lure every two weeks.

Trap Timing and Monitoring:

Traps should be set up no later than once 150 GDDbase10* have been accumulated (approximately early to mid-May for some longer season regions until early June for shorter season regions) and should continue until the end of August. If GDD data are not available, then place traps no later than when the earliest planted corn in the region has reached six leaf stage.

*Starting on March 1st, accumulate ECB Growing Degree Days = [(maximum daily temperature + minimum daily temperature)/2] - 10^{o}C

Traps need to be monitored once a week. Carefully remove the mesh bucket at the top of the trap from the Velcro ring holding it on. Keep the bucket closed, inverting the cone inside the bucket and gently shaking its contents into a Ziploc bag. If moths are still alive, throw the Ziploc bag in the freezer for a few hours to kill the moths and make it easier to count. Try to check the traps on the same day each week, preferably no later than Monday or Tuesday so that the data represents the moth flights from the previous week (Monday to Sunday). Report trap counts by **Tuesday of each week** to the Great Lakes and Maritime Pest Monitoring Network at: https://arcg.is/0K5rnG

ECB Moth Identification

Adult ECB moths are light-brown, approximately 2 cm (0.8 in.) long with dark wavy lines running across each forewing like an echocardiogram. Male moths are darker and smaller than females. Only male moths will be captured in the traps. You might see female moths hanging out in the grassy areas where the traps are.

Figure 2. Female (left) and male (right) ECB moths. Note the jagged line pattern on the wings. Photo credit: Marlin Rice