

# Protocol for Monitoring Diamondback Moth with Pheromone-Baited Traps



## Purpose of Monitoring the Adult Stage

Diamondback moths (*Plutella xylostella*) can be serious pests of canola and cruciferous vegetables. It is the larval stage that is damaging to the plants, however the adult stage appears before the larvae are present. Monitoring the adult moths provides an opportunity to assess in advance the potential for high levels of larvae, provided natural controls are not sufficient.

The pheromones used by female diamondback moths to attract male moths are known and are synthesized for use in monitoring programs. These synthetic pheromone lures are effective at attracting male moths to traps, which have been designed to capture the moths. Use of these traps provides a relatively simple method of detecting an influx of the moth in advance of the damaging larval stage of diamondback moth. This gives farmers, agronomists, chemical dealers, and others involved in pest management some advanced warning of potentially damaging levels of larvae, and enables them to place proper emphasis on monitoring for the larvae.

## Proper Data Interpretation and Decisions

This monitoring program helps predict risk on a regional, but not field specific basis. At no time should a decision to use insecticides to control diamondback moth be made based only on information from the traps for adults of this insect. Such decisions need to be made after sampling for the damaging (larval) stages of diamondback moth and determining if the levels of larvae present in the field are above the threshold. Weather can affect the success of mating and laying eggs, and many mortality factors could reduce the numbers of eggs and larvae before they develop to the damaging stage. Unnecessary insecticide applications (when pest levels are low) can harm naturally occurring populations of parasitoids and predators of diamondback moth and other potential pests. Unnecessary killing of beneficial insect populations can increase the risk of future insect problems.

## When to Monitor

Diamondback moth do not overwinter in the Canadian prairies in significant numbers, but high populations may be blown in on winds from the south. They are at a higher risk of being a problem in years when high populations blow in and establish early (May or early June). Thus the primary goals of this monitoring program are to determine when diamondback moth populations arrive, in what regions and in what numbers. This, combined with considering what the environmental conditions are like when they arrive and levels of natural enemies, will determine the risk of them being a significant problem.

Diamondback moth traps should be placed in fields during **the first week in May, or as close to this time as possible. This may be before fields are even seeded. First moth counts should be made the following week.**

Traps for diamondback moth can be placed in fields regardless of whether canola, or other cruciferous crops, have been seeded into the field. Having traps near fields that are or will be seeded to a cruciferous crop is ideal, but it is more important to place the traps at the proper time than to wait and see where canola and other cruciferous crops are seeded.

## Assembling the Traps

The type of trap recommended for monitoring diamondback moth in the Canadian prairies is called a delta trap. Assemble this style of trap as follows:

1. Fold open the trap so it is tent shaped (Figure 1).
2. Insert the pin through the middle of one side of the trap roof (Figure 2).



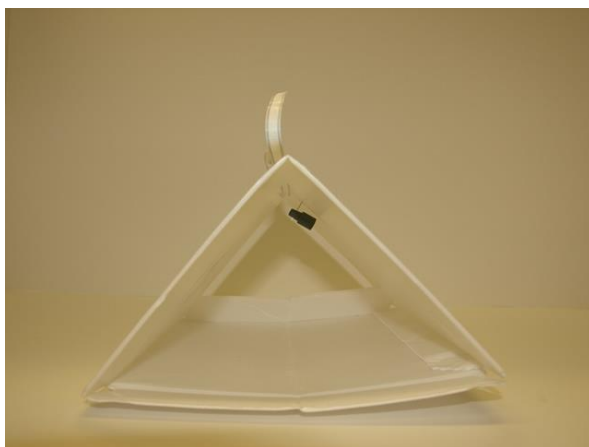
**Figure 1. Trap components: Delta trap, insert, pin, and lure.**



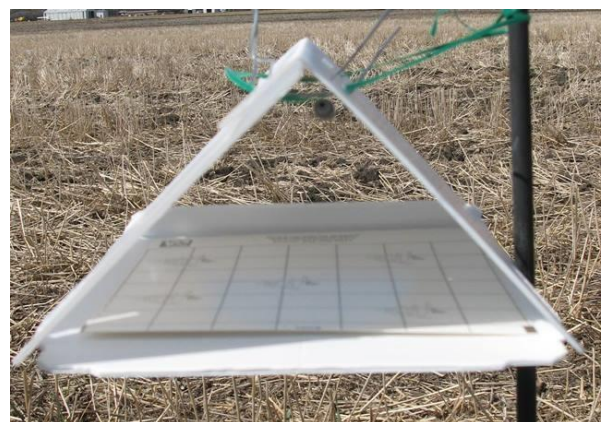
**Figure 2. Pin inserted.**

3. Pin the rubber lure so the pin extends through the narrow top of the lure (Figure 3). The rubber stopper containing the pheromone should hang from the top of the trap. Do not handle the lures with your bare hands. Wear rubber or latex gloves or use tweezers to handle the lures. Store lures below 0°C when they are not in the trap.

4. Remove the covering from the sticky insert, and place it on the bottom of the trap so the sticky surface faces up (Figure 4).



**Figure 3. Lure containing the pheromone placed in trap.**



**Figure 4. Sticky insert placed in trap.**

5. Press in the front and back flaps until they clip into the slits in the sides of the trap. This secures the sticky bottom in place.

6. A T-shaped bar can be inserted into a hollow metal pole, which is hammered into the ground, so there is a horizontal surface to hang the trap from. Or a bent piece of rebar, or other horizontal surface, can be used to suspend the traps from. Alternatively, a hooked stake, which can be purchased from stores selling garden supplies, can be used to suspend the traps from. (Figure 5).



**Figure 5. Completed trap set-up, showing 2 methods of securing trap.**

7. Depending on the supplier, the delta trap will either have a plastic twist tie at the top, or come with a bendable metal wire that can be secured into holes at the top of the trap. The twist tie or wire can be wrapped around a stake or one of the horizontal ends of a T-shaped bar to secure the trap in place.



**Figure 6. Delta trap secured in place using twist tie.**

### Trap Height:

Place the traps 50 cm above ground level or at canopy height.

## Checking Traps

### Length of trapping period:

Traps should be checked and the number of diamondback moths counted once a week over a six-week period. If a late influx of diamondback moths appears, the diamondback moth traps may be left out for a period longer than six weeks, but lures must be replaced every 8 weeks.

### Replacing inserts:

If there are only a few diamondback moths on the insert when they are checked, these moths can be removed from the sticky surface with tweezers, or the number of diamondback moths recorded and subtracted the following week, and the insert reused. If the insert is heavily covered with insects or dirt the sticky surface will not retain moths for future monitoring and should be replaced with a new insert.

### Identification:

The adult moth is approximately 8 to 9 mm long. At rest, the moth folds its wings over the abdomen in a tent-like manner. In the male, the forewing margins have a series of white wavy markings. When the wings are folded while the moth is at rest, these markings come together to form three white diamond-shaped patterns, hence the name diamondback moth. Make sure to count only diamondback moths, as a lot of other insects may be trapped on the insert.

For additional information on the identification, lifecycle and management of diamondback moth see:  
<https://www.gov.mb.ca/agriculture/crops/insects/pubs/diamondback-moth-factsheet-revised-may2023.pdf>



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