

MONITORING GUIDE

STORED PRODUCT PESTS

Plodia interpunctella (Indian Meal Moth)

Ephestia kuehniella (Mediterranean Flour Moth) & other *Ephestia* spp.



Adult Moths

Wingspan approx. 15mm. Front wings are grayish-white next to the body, and bronze red at the tips. Active from late spring to fall. Females mate and lay 200-400 eggs soon after emergence.

Eggs

Small, whitish and ovate. Laid singly or in clusters of 20 or more. Hatch into larvae in 5-10 days.

Larvae

Initially whitish with light brown head, becoming pink, brown or green. 10-15mm in length at maturity. Larvae spin a dirty silken cocoon of webbing on the surface of food, in which it pupates.

Period of larval development varies according to conditions – often 2-3 weeks in warm buildings.

Pupae

Visible only as a web of threads on the surface of the food. Adult moths emerge 4-20 days later to start the next generation.

GENERAL INFORMATION

The use of pheromone-baited traps is now well recognized as an essential part of pest management in the professional pest control industry. The following is a guide for those who may be facing an Indian Meal Moth (IMM) or *Ephestia* infestation for the first time in any situation.

STEP 1. THE INITIAL INVESTIGATION

The initial detective work is one of the most important stages of setting up a monitoring program.

A. Determine that the insect problem is in fact Indian Meal Moth.

There are a number of different warehouse moths, so familiarize yourself with the main characteristics of IMM and understand its life cycle and typical behaviour.

B. Search the area carefully and try and find out where the problems are.

- Survey the entire area, both inside and outside the building and make a detailed diagram that shows the access points and where the different foods or food ingredients are stored.
- Look for damaged packaging, spillage and for poor sanitation areas.
- Check that doors into the storage and manufacturing areas fit tightly and that ventilation ducts are all properly screened to prevent insects entering from outside.
- Inspect pallet storage areas and garbage disposal bins and check what adjacent industries surround the plant location, since these might be a source of infestation.
- Ask managers where raw material products are received from and where they are placed within the plant once they are received.
- Also verify the condition of incoming trucks and pallets and check whether empty pallets are stored inside the plant.
- Find out how long products remain in storage, and ask about seldom used ingredients, such as spices, which could have been open for many weeks. Product samples are often kept for years, so check storage rooms carefully.
- Familiarize yourself with the entire production process of the plant and the storage routines.

STEP 2. SETTING UP THE TRAPPING PROGRAM

Being well organized from the outset will save hours of frustration and wasted time later on.

A. Measure the location and make a map.

B. Look for suitable hanging or placement sites for the traps and draw them on your site plan.

C. Assemble and number the traps, place the pheromone lure on each of them and record the location and date on your map/chart.

D. Position the traps where they are easily accessible.

The rate of application will depend on the individual location, but as a guideline, start off with traps positioned about 10 metres apart throughout the storage/production areas, at a height that allows for easy inspection. Prepare an inspection record chart on which to record the catch each visit and if required, leave a copy with the plant manager, so you can discuss the situation on each visit.

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Suggested Traps**Pink**

Product No.2050203

Delta 1

Product No. 2050201

Diamond Trap

Product No. 2050204

Stealth Trap

Product No. 2050600

Black Stripe

Product No. 2050208

During the warmer periods of the year, make sure that several traps are placed outside the building, near loading bays or other entranceways.

STEP 3. MONITORING AND UNDERSTANDING THE RESULTS

Your objective is to make a sweep of the entire premises in order to establish likely areas of infestation, and then gradually concentrate more traps in high catch areas. The most important part of monitoring is to maintain a regular interval trap inspection procedure otherwise the information collected will be of little use when you try to diagnose the trends. The frequency of your inspection will depend on many things, but you should aim for a maximum of 7 days between visits initially, making sure that the period between visits always remains the same.

Every trap should be checked on a visit, and the insect catch counted and recorded for each trap. After counting the catch - **SCRAPE OUT** the caught moths, so that you start each new period with an empty trap. Pheromone lures will need to be replaced after 4-6 weeks - change all the lures on the same visit.

After about 4 -6 visits you will start establishing some data showing where catches are most frequent. Move more traps into those areas to verify the situation and start looking for signs of spillage, broken packaging or any item that has been stored in the area for a longer than usual time. If you can't locate a problem area, but nevertheless suspect one, place additional traps in corners or blind alleyways between pallets where there are fewer air currents. This may help to locate the problem. Discuss your findings with the plant manager, and establish what new product movements may have occurred in that area of the plant that could have created the problem.

HANDLING AND ASSEMBLY OF TRAPS AND LURES

The best choice of trap for stored product pests is the **Delta II** style trap (Pink Trap) with end flaps that fold inwards to make a small triangular opening at each end. The **Diamond Trap** is quicker to assemble initially, but is smaller and can be more prone to dust contamination, which affects the stickiness of the glue. For very dusty inside areas or outdoors, the **Funnel Trap** is another good trap choice, and if those areas are well lit, the **Black Stripe Trap** will perform even better because it also incorporates a strong visual attraction.

Pheromone lures should be kept sealed until ready for use, preferably in a refrigerator or in a freezer for long storage periods. The lures can be damaged under extremely hot conditions. Do not handle lures unnecessarily after they have been taken out of their foil pouches - simply drop them onto the sticky floor of the trap. Replace the lures every 4-6 weeks, and remove the old lure from the trap.

The manner in which a pheromone is detected by an insect is a very precise process and it is therefore important that improper handling or storage does not cause the monitoring traps and pheromones to become contaminated. Many pesticides are repellent to insects and therefore monitoring traps should not be stored in areas where they might be contaminated by vapour transference. Working vehicles are often contaminated with chemicals, so it is wise to keep traps and lures in the cab, or in a sealed box, where they are not subjected to any repellent chemical fumes.

Once a regular monitoring program has been established, it is wise to look at the channels of distribution and transportation of all raw materials and end products in and out of the plant. Cross-contamination can easily occur if products are in contact with infested products while in transit. The longer you maintain a monitoring program, the lower the population of moths will usually become, and in many situations, continuous monitoring will eliminate the need for additional treatment. There is always a risk of accidentally bringing in new infestations, especially if sanitation and structural plant maintenance are neglected, so stay on top of IMM problems by keeping a continuous monitoring program in place.

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