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CODLING MOTH
PHEROMONE TRAPPING SYSTEM

GENERAL INFORMATION:

Monitoring traps helps identify not only the presence of certain insect pests but also what stage of their life cycle they are at in the field. This is extremely important information since it ensures that the insect control method can be made at the right time. Since the only stage of the insect that the trap will catch is the adult (moth) stage, growers must understand the life cycle to know when to expect the other stages (egg, larva and pupa). Regular recording of the trap catch is essential and will provide a reliable blue print over the years on which the grower can manage that pest properly. In addition, the grower must also be aware of the presence and scale of the larval infestations.

PEST – GENERAL:

The codling moth (*Cydia pomonella*) is a major pest of apple, apricot, cherry, peach, plum, crabapple, quince, walnut and pear trees. The adult moths are gray-brown with a white line and brown tips on the forewings. Adult male codling moths can be captured in traps using pheromone lures specifically developed for this insect. These catches indicate whether or not the amount of damage likely to occur will be greater or less than the cost of control measures, and, if the former, help with timing of sprays.

PEST – LIFE HISTORY:

The insect produces 1-2 generations (depending on locality) during the season and overwinters as a late stage larva under the rough bark of the tree trunk, or even in and around apple packing sheds. These overwintering larvae have good low temperature tolerance and those that are found under the tree bark are often between 30-60cm above the ground. During the period mid to late April, the larvae pupate within their protective cocoon, forming a hard brownish pupa which, depending on temperature will stay in that form between 2-4 weeks, when they will hatch into the adult moths. These grayish moths are moderately large, (with a wingspan of about 18mm) and will appear around the end of May or early June. They can be recognized by bronze chocolate-brown patches on the tips of the front wings, and faint wavy crossbands of brown on the rest of the wings. Mating activity takes place as the evening temperatures increases to about 16^{O}C. The female can lay 300 eggs or more, often singly, on the fruit or leaf surfaces. These eggs will hatch out after about 2 weeks (less in very hot weather) and the emerging larvae will attack the fruits. At first the larvae may feed on the fruit surface, but will eventually tunnel into the centre of the fruit (usually from the bottom) and eat the seeds. About 3 weeks later the mature larvae exit the fruit, drop to the ground and make their way to a suitably well protected place on the bark and spin a protective cocoon. The second generation of adult moths emerge from these cocoons about 2 weeks later (early August) and the life cycle is repeated.

Lure:

In the form of a treated rubber septa. It is recommended to use 2 to 3 lures per season. Extra lures can be stored in vapor-sealed pouch in freezer until use (3 to 5 years).

Trap:

A one season diamond trap (see right). The trap has sticky adhesive on all surfaces and has a catchment area of 600 cm^2 or 92 in^2.

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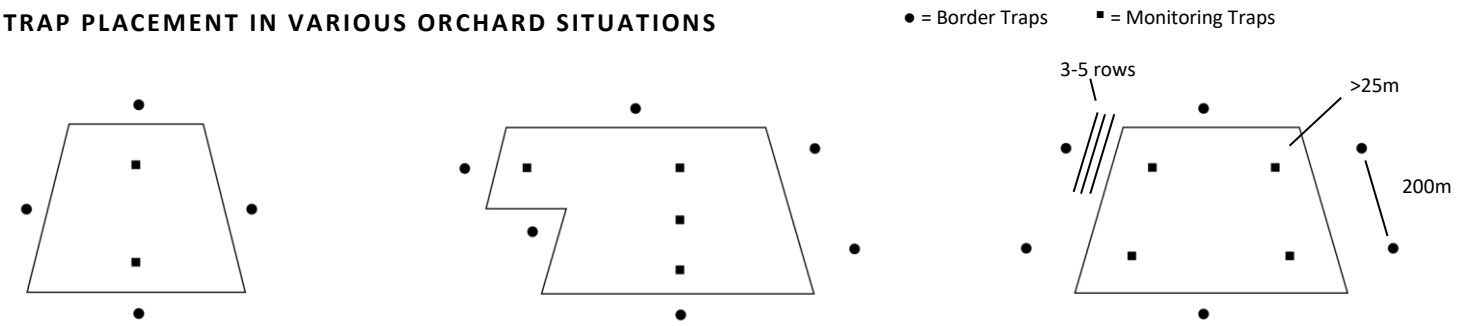
For Monitoring:
Use one trap per hectare (1 trap/2.5 acres) and place on trap in the centre of each hectare. There should be minimum of two traps/block, (a block is any continuous planting of apples or pears).

For Trapping:
Use 1 trap per full size tree.

TRAP PLACEMENT (see over):
Traps should be placed in the orchard before the first moths emerge (mid-late May). To assemble, pull trap apart to form a triangular tent and place one pheromone lure onto the sticky base of the trap. Hang the traps at head height slightly inside tree canopy on south side, spaced 30 metres apart. Make sure that the end flaps are folded inwards.
Border Trapping: In cases where there are host trees outside the fruit tree block you are monitoring, yet within 25m (75 ft) of the block, the traps should be placed three rows into the host trees. This should be repeated every 200m (650 ft). This is a good method for reducing the outside moths from moving into the fruit block and to indicate where border infestations are originating. If placing traps in the host trees is not possible, place traps on the outer most row of trees.

TRAP PLACEMENT IN VARIOUS ORCHARD SITUATIONS



HOW TO USE CATCH RESULTS FOR MONITORING:

First Generation May/June, Second Generation Late July to Mid September

Do not use the trap results from the first week of monitoring. Spray timing is based on the number of male moths that are captured over a two week period. If the average number of moths caught is 2 or greater in apples or 3 or great in pears, tehn damage will occur. See Example below:

Monitor regularly (twice a week) record the catch and each time SCRAPE OUT THE MOTHS so that you don't count the same ones next time. Plot the average number of moths caught from all the traps onto your graph chart and you will see the peak of population develop around end May and again in mid August. If you are spraying, the timing for the first generation spray should be 10-14 days after this peak is reached. In the second generation that period should be 3-4 days after the peak, since development is often faster. Keep your records each year and ALWAYS MONITOR ON THE SAME REGULAR 3 OR 4 DAY CYCLE ALL SEASON. Replace lure after 6 weeks. Keep lure in the freezer until ready for use.

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Week	Number of Moths	Moth Average / 2 Weeks	Recommendations
May 1 to May 7	5	---	---
May 8 to May 14	0	5 moths to date. Average = 2.5 moths	Spray at end of second week
May 15 to May 21	0	---	---
May 22 to May 28	5	5 moths to date. Average = 2.5 moths	Spray one week later to allow for egg hatch

The sprays are aimed at the larvae. In the first example (May 1 to May 14), there were a greater number of moths in the first week than in the second week. The spray timing is recommended for the end of the second week to allow egg hatch and larvae to be present. In the second example (May 15 to May 28) there were greater moths trapped in the second week, thus it was recommended that the spray be applied a week later to allow for egg hatch. If trap catches are above average in one area, but none in other areas, spray the high catch areas only.

Release Trichogramma wasps at first sign of moths. Spray Bt (*Bacillus thurengiensis*) as recommended above.

Notes:

- If fruit trees are on a slope, move traps to the uphill portion of the area being monitored. Catches in the upper area will indicate more accurately what is happening in the lower regions as well.
- Hang traps at eye level inside the tree canopy on the south side. Avoid placement in dusty or wet locations such as near roads or irrigation sprinklers.
- Traps can be placed in the border trees at bloom to collect moths before entering your orchard.

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