Codling Moth

Codling moth, Cydia pomonella, is a ½ inch long moth with brown and gray bands. Since it is active at dawn and dusk, it is generally not seen.

Its larva is a small worm, creamy white to pink with a black head. The larva grows and develops within the apple or other host fruit.

The Damage
The worst part of codling moths is that they often work undetected until you harvest the fruit.

Larvae enter fruit and burrow to the center. There is usually one or a small number of larvae per fruit, which each leave one relatively large tunnel through the fruit (as opposed to apple maggots, which leave many small tunnels all through the whole fruit.) Unlike with apple maggot tunnels, the remaining flesh will be undamaged and can be eaten.

Life cycle
The first-generation moth emerges around the time flowering occurs. The second generation does the most damage to the crop.

After mating the female will deposit eggs on leaves or fruit so control needs to start immediately to be effective.

When the eggs hatch the larvae head to the fruit. Once inside the fruit, treatments will not affect the larvae. Larvae leave the fruit when they are mature and form cocoons which are typically found beneath loose tree bark or underneath debris around the base of the tree.

Management
Be sure to continually pick up all dropped fruit and leaves to reduce the chances of larvae to enter the ground and overwinter.

Applying nematodes to the soil around the tree can also reduce the number of adults that emerge the following year.

Treat or remove, when possible, alternative hosts for codling moth such as walnut, quince, crabapples, large-fruited hawthorn, loquat, and some stone fruits, mainly apricots.

In May, July, and late August set out pheromone traps for adults to determine when you need to treat them. There are several generations in a season, so continue monitoring and treatment through summer.

Also monitor for brown frass (larvae poop; it looks like dark sawdust) at small entry points on fruit. Remove and discard all fruit that may be infested. Place infected fruit in a black or clear plastic bag for a week to kill the larvae. Larvae can develop in fruit off the tree so **do not place fruit in compost without being sure to kill the larvae.**

After thinning fruit in late April or May, one strategy is to bag the individual fruits on the tree with paper bags or **Maggot Barriers**. If using paper bags, remove them two weeks prior to harvest to ensure color development. Or, spray with naturally occurring **kaolin clay** to form a barrier that repels pests. The fruit tree will look white from applying it. Repeat application every 10- 14 days depending on rain and avoid overhead watering.

Alternatively, you can apply **Spinosad** pesticide 17 to 21 days after full bloom (about 10 days after most of the flower petals drop from the tree). Follow with a second application 10 to 14 days later, and repeat sprays every 10 to 14 days throughout the summer. This method is easy, but you can miss when the first generation emerges and/or waste pesticide. Or, use Spinosad in conjunction with traps and start spraying when you start seeing the adult population.

In addition, place 2-inch bands of corrugated cardboard on the lower trunk of the tree to collect the pupating larvae when they search for a place to cocoon. Check regularly and destroy the cocoons.

Products and pesticides for management

Organic options:
Codling moth traps and lures.

Gonzo Goop Insect Barrier™ - a sticky material that traps adult flies.

Maggot Barrier - Nylon bags to cover fruit.

Surround Naturally occurring **kaolin clay.**

Nematodes are microscopic worms that prey on the larvae in the soil. Timing and soil temperature is important, so be sure to read the label included with the nematodes. You may need to repeat applications to establish a reproducing population.

Spinosad extract is an organic pesticide made from the fermentation broth of a naturally occurring bacteria. It is an organic option. One brand is **Bonide's Captain Jack's Dead Bug**.

Chemical options:
While there are non-organic pesticides to use against codling moth, all are highly toxic to bees, and none are recommended for homeowner use. *Bacillus thuringiensis*, pyrethrum, and pyrethrin/rotenone combinations are low toxicity materials that have been tested and haven't been found to be very effective at controlling codling moth.

Conclusion
Managing codling moth is an all-season task with more than one strategy. At best you will reduce the amount of codling moth damage but never eliminate populations entirely. Some years will be better than others, but you can get good fruit with some focused tools and persistence. Treatments are similar for Apple Maggot.