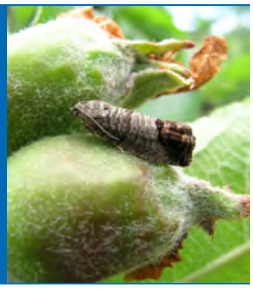
Section 2

Mating Disruption



Mating Disruption

Mating disruption, use of pheromones, should be considered a foundation of any apple pest management program. When using hand-applied dispenser products (Fig. 1), it provides season long control of the key pest, codling moth. In our experiences, mating disruption reduces the need for additional insecticide applications for codling moth, reduces crop injury, and, over time, reduces costs of pest control.

Figure 1. Various Hand-Applied Dispensers

Pacific Biocontrol
Isomate - C Plus
Full Rate - 400 dpa

Pacific Biocontrol
Isomate - C TT
Full Rate - 200 dpa

Scentry
NoMate
Full Rate - 400 dpa

Trece
Cidetrak CM
Full Rate - 400 dpa

Suterra
Checkmate CMXL 1000
Full Rate - 200 dpa

The mating disruption products that we believe are the most reliable and for which we have the most experience are the hand-applied dispensers. Full label application rates of these products are 200 to 400 per acre. There are other options for applying pheromones (Table 1), but, in general, their use increases the risk of crop injury or the need to apply more supplemental insecticides.

Table 1. A summary of the kinds of dispensing systems for pheromones.

Technology	Puffers	Meso-dispensers	Hand-applied dispensers	Mini-dispensers	Sprayable
Density/acre	1	16-20	400	10,000	A real lot
Release rate mg/disp./day	200	8-20	0.5-1.0	0.005-0.01	Very low
Longevity	Season	Season	Season	20-50 days	3-30 days

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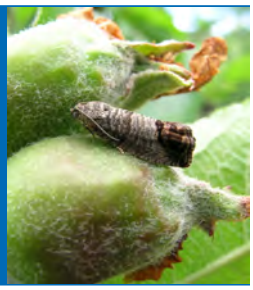
Codling Moth Mating Disruption



Mating Disruption

How pheromones work

In order to mate, codling moth males must locate females, usually from a significant distance. The female produces a pheromone, a specific chemical that she releases. The male is able to detect extremely small amounts of this pheromone and fly to the source where mating occurs.

How mating disruption works

The hand-applied mating disruption products release the same pheromone as the codling moth female, but they release 10,000 times more. The high amount of pheromone inhibits the ability of the male codling moth to locate and mate with the female.

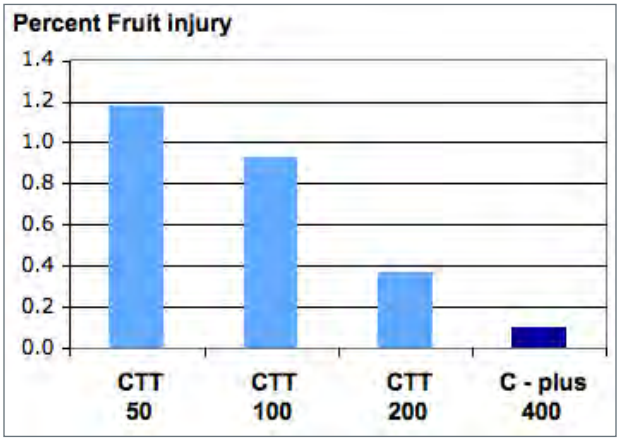
When to apply mating disruption

Pheromone treatments should be in place ***prior to the first moth flight***.

How many dispensers to apply

The ***full rate*** of any dispenser type should be used unless codling moth density is so low growers are already using a reduced supplemental insecticide program. Under a good pheromone-based codling moth control program it is possible to eventually reduce the number of dispensers per acre.

Reducing the number of dispensers per acre increases the risk of crop injury and consequently the need for supplemental insecticide sprays. The graph at the right shows data from a study conducted in 2007. As the number of dispensers per acre were reduced in this study the level of crop damage at harvest increased.



Monitoring mating disruption orchards

Pheromone traps baited with a high load lure (10X) or a combination of pheromone and host-plant kairomones (combo lure) should be used to monitor pheromone treated orchards. Use one trap every 2 to 3 acres. Using fewer traps will increase the chance of false negatives, that is, traps capture no moths but fruit injury occurs. Visual monitoring for fruit injury is also recommended, especially along orchard borders. Visual monitoring can be done quickly and adds confidence to decisions about the need to apply supplemental insecticides.