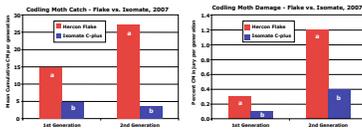


Codling Moth Mating Disruption Alternatives: Back to the Future?

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Hercon Disrupt-CM MicroFlake



Paired analysis of Hercon Flake and Isomate C-plus. (N = 7 pairs)

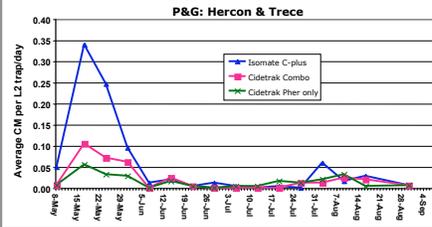
Treatment	Rate	Al/ac	First Generation		Second Generation	
			Mean Catch ¹ (SEM)	Mean % Damage ¹ (SEM)	Mean Catch ¹ (SEM)	Mean % Damage ¹ (SEM)
Flake	75-1 lb	47.3 (avg.)	14.7 (5.7) A	0.3 (0.14) A	27.2 (17.3) A	1.2 (0.39) A
Isomate	400 d/a	43.5	4.7 (1.3) B	0.1 (0.04) B	3.7 (2.1) B	0.4 (0.08) B

¹ - data transformed (log X) for ANOVA; mean separation Tukey-Kramer, alpha = 0.1

Pheromone treatments were applied to SEVEN ten-acre blocks at four locations, with four blocks located in the same orchard. In an analysis of pooled data from the seven paired blocks, traps in the Hercon Flake treatment caught significantly more codling moth adults and had significantly greater fruit injury than Isomate C-plus treatment.

Trécé Cidetrak

A new hand-applied pheromone technology under development by Trécé was compared with Isomate C-plus in a replicated large (10-acre) plot trial. Moth captures in the first 4-week period of the spring were lower in the Trécé treatment than the Isomate treatment. However, there were no differences in fruit injury in any of the treatments.



The number of traps in a treatment that exceeded established thresholds (accumulated moth captures) during different 4-week period throughout the first and second generation.

Treatment	First generation		Second generation	
	Period 1	Period 2	Period 3	Period 4
Isomate	19 a	0	0	8
Cidetrak CMPE	7 b	0	1	3
Cidetrak CM	4 b	0	3	4

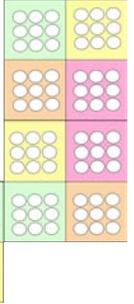
- The number of traps over threshold followed by the same letter are not statistically different ($\alpha = 0.1$)

The table above shows average number of traps, out of 36 in each treatment, that exceeded a treatment threshold in a 4-week period. In the first period there were more traps exceeding the threshold in the Isomate treatment than in the two Trécé treatments.

Isomate CTT rate study

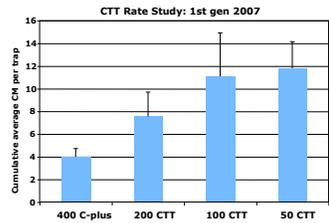
Four Isomate treatments were compared in a replicated large plot design.

Isomate CTT at 50 dispensers per acre (d/a)
Isomate CTT at 100 d/a
Isomate CTT at 200 d/a
Isomate C-Plus at 400 d/a



9 traps per replication used to monitor moth activity.

Fruit injury evaluated at end of each generation.



As the number of dispensers per acre decreased, slightly more moths were captured in traps, however, these differences were not statistically different. Five supplemental insecticides were applied to all plots in the first generation.

Challenges remain

Flake Deposition Test



Alternatives to hand-applied dispensers such as Flakes continue to have challenges with:

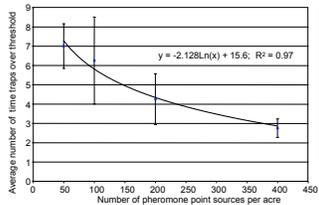
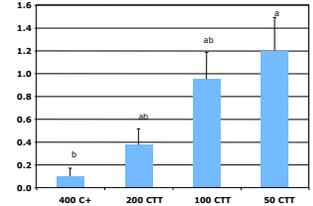
- Getting pheromone into the tree before moth activity in the spring.
- Efficiency of application.
- Reliability of application technology.
- Product longevity.

Conclusions

- Flakes (and other "sprayable" products), while having a place in pheromone control programs, have not proven yet to be as robust as hand-applied products in controlling codling moth.
- As the density of hand-applied dispensers declines the capture of adult CM increases and the risk of crop injury also seems to increase. Caution should be taken when reducing rates of hand-applied dispensers below 400 per acre, especially under moderate to high pressure situations.
- Trécé Cidetrak, a new hand-applied dispenser technology, showed promise as a control for CM under significant pest pressure.
- Growers testing any new pheromone technology should consider using a familiar hand-applied product as a relative comparison.

A sample of fruit injury at harvest revealed a difference between treatments, with the Isomate C-plus treatment having the least amount of injury. There was only one supplemental insecticide applied to one replicate in the second generation.

Percent CM damage, 2nd generation



The average number of times a pheromone trap exceeded a threshold in the first 4-week period of the first generation was lower in pheromone treatments where the number of point sources was higher.

These data suggest that more supplemental control treatments would be required because the risk of mating (and therefore fruit injury) might be higher where fewer dispensers were present.