

Mating Disruption/SIR

Pheromone Release Rates

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Keywords: codling moth, Isomate, Checkmate, CIDeTRAK, apple

Control failures using CIDeTRAK or Checkmate could be due to dispenser application rates being too low, reliance on a single pheromone component (codlemone), degradation of codlemone in the dispenser, or low release rates in aged dispensers. The rate of pheromone loss in field-aged dispensers was determined by residual analysis. Five dispensers of each type were collected biweekly and brought back to the lab for analysis. In addition, release rates from Isomate C+ dispensers were estimated by a gravimetric method. This consisted of weighing twenty-five dispensers and placing them in the field in a manner that provided uniform exposure to sunlight. This initial placement of dispensers was followed by collecting, weighing, and reapplying them weekly over a period of 140 days.

Preliminary results indicated major differences in release rates from the three products. The Checkmate dispenser released an average of 2.7 to 3.4 mg of pheromone per day (mg/d) during the first CM generation (Table 1). Due to this high rate of pheromone loss, the dispenser was empty by about day 60. Release of pheromone from the Checkmate dispenser appeared to increase with increasing daily temperatures, suggesting that dispensers applied for control of the second CM generation may have released codlemone for less than 60 days. The CIDeTRAK dispenser initially released pheromone at a high rate (2.9 mg/d between day 1 and 14), but the release rate declined sharply and only about 0.5 mg/d was being released between day 42 and 56 (Table 1). The peak release rate from the Isomate C+ dispenser was about half that provided by the other two dispensers (Table 1). However, this dispenser continued to release a substantial amount of pheromone throughout the season. The amount of product released fluctuated between 0.6 and 1.5 mg/d, depending on weather conditions. The highest release rates occurred during the hottest part of the summer, between days 42 and 98 post-application. Checkmate and CIDeTRAK dispensers with release characteristics better suited to Washington conditions are being engineered for next season. Release rates of new dispensers should be determined in the laboratory or in field-aged studies before they are used in commercial orchards.

Table 1. Gravimetric and residual analysis of pheromone release in three types of dispensers.

Day	Pheromone remaining per dispenser ¹ (mg)			Pheromone lost per dispenser/day (mg)		
	Isomate	Checkmate	CIDeTRAK	Isomate	Checkmate	CIDeTRAK
0	203	180	235			
14	192	142	194	0.75	2.68	2.93
28	182		171	0.74		1.64
42	168	59	161	1.00	2.89	0.70
56	154	12	154	0.98	3.38	0.50
70	137			1.18		
84	117			1.47		
98	103			1.00		
112	94			0.61		
126	86			0.62		
140	75			0.79		

¹Isomate=gravimetric analysis of total pheromone (three component blend) remaining in the dispenser; Checkmate and CIDeTRAK=residual analysis of codlemone remaining in the dispenser.