

Implementation Programs

Codling Moth Mating Disruption Program Costs

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A survey conducted by this firm in 1993 showed that the purchase price of codling moth mating disruption (CMMD) product was the single largest deterrent to its commercial implementation. This study was sponsored by the California Pear Pest Management Fund to investigate the empirical cost of CMMD programs relative to conventional pest management costs.

Economic data on the field costs of CMMD were based on spray records from 1) one- to five-acre test plots in two orchards between 1988-93, one orchard in Lake County, CA, and the other in Mendocino County, CA, and 2) three orchards, totaling 212 acres in the Sacramento Delta, between 1991 and 1993. For standardization, all chemical prices were derived from a 1993 regional chemical retail price list. Cost-benefit analyses were adapted from a University of California model.

Out-of-pocket per-acre expenditures for chemicals and application almost doubled between the pre-CMMD year and the first year of CMMD in the Sacramento Delta orchards (Tables 1 and 2). Chemical costs in the Lake and Mendocino plots over the six-year period averaged 40% higher than the conventional program (Tables 3 and 4). The bulk of these tests was attributable to the purchase price and application costs of Isomate-C. By the second year in the Sacramento orchards, the trend in total control costs began to decline due to reduced codling moth levels and concurrent reductions in pesticide applications. However, average costs during the second year remained over \$200 per acre more than the pre-CMMD costs. Preliminary analysis of 1994 costs shows the downward trend continuing due to continued reduction in conventional pesticide.

Transition from conventional pesticide-based crop protection in pears to a CMMD based system is very expensive for the grower. Though the cost benefit of this transition can still be justified, the out-of-pocket "sticker shock" remains a substantial deterrent to grower implementation of CMMD technology in California Bartlett pears.

Table 1. Chemicals and application cost summary, 1991-93, Sacramento, Co., CA.

	Average cost (\$) per acre*		
	1991 Pre-MD	1992 Yr 1 MD	1993 Yr 2 MD
Chemicals	214	426	372
Application	113	231	197
Total	347	657	569

*212 acres, 3 orchards.

Table 2. Chemical costs by pest category, 1991-93, Sacramento Co., CA.

	Average cost (\$) per acre		
	1991 Pre-MD	1992 Yr 1 MD	1993 Yr 2 MD
Codling moth	46	268	226
Psylla/scale	82	108	81
Rust/blister mite	20	0	25
Twospotted/ European red mite	66	49	40
Total	214	425	372

Table 3. Materials and application cost comparison, conventional pesticide vs. pheromone mating disruption, Lake Co., CA, 1988-93.

	Average annual cost (\$) per acre*							% difference
	Pesticide			Pheromone			Difference	
	High	Low	Avg.	High	Low	Avg.		
Chemicals	293	222	253	374	243	315	-62	-20
Application	135	105	120	105	90	98	30	19
Total	428	327	373	479	333	412	-39	-9

*Plot size ranged from 1 to 5 acres.

Table 4. Chemical costs by pest category, conventional pesticide vs. CMMD, Lake Co., CA, 1988-93.

	Average annual cost (\$) per acre			
	Pesticide	MD	Difference	% difference
Codling moth	77	157	-80	-51
Psylla/scale	94	94	0	0
Rust/blister mite	51	56	-5	-9
Twospotted/European red mite	31	8	23	74
Total	253	0	19	-20