Implementation Programs

West Parker Heights Areawide Codling Moth Management Project—Second Year

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Areawide codling moth control, using pheromone mating disruption as the primary control method, was very successful in the West Parker Heights project in 1996, the second in an anticipated five year program. There were significant reductions in the number of moths trapped (Table 1), amount of fruit damage due to codling moth (Table 2), and number of insecticides applied for both codling moth and secondary pests (Table 3). Fruit damage from all insect pests was well below commercially acceptable levels and organophosphate insecticide applications were reduced by about 70%.

Although greater than conventional blocks, leafroller damage has been commercially acceptable, but is really pushing the limit in some areas, despite an aggressive Lorsban/Bt program. Leafrollers replaced codling moth as the most economically damaging pest in the project.

Secondary pests were generally not a problem, although nearly twice as many spray applications were made in areawide blocks in 1996 as were made for these pests in 1995. Aphid populations were primarily responsible for this increase with some blocks requiring two to three aphicide treatments.

We did experience some late second generation (late July-early August) codling moth trap activity, followed by larval entries in a small portion of the project with no definitive explanation. Dispenser performance, movement of bins, or a combination may be responsible for the increased trap captures, but we cannot be certain. This underscores our lack of knowledge about how the mating disruption system works, what rate of release is required for a given population density, and what weaknesses we can anticipate.

The difference gained in the areawide program in fewer codling moth and secondary pest applications is balanced by the number of treatments required for leafroller control. With leafroller management in mating disruption systems in a state of flux, this picture is likely to change. *Bacillus thuringiensis* accounts for the majority of treatments directed at leafrollers in the areawide project and contributes to the "soft" approach which presumably benefits natural enemies. If only organophosphate treatments are considered, the areawide project has applied about 30% of the total for conventional, comparison blocks. Although a detailed financial comparison has not been completed, if we roughly compare the two management systems, it appears that in the areawide program the costs of the dispensers, application, and monitoring are nearly offset by the reductions in treatments for codling moth and secondary pests. If a low cost program for leafrollers could be developed perhaps we can achieve a level of cost comparable to conventional systems. This is based only on information generated by the West Parker Heights

project and is certain to vary among sites.

Despite the success of the program thus far, lack of knowledge about the mechanisms of the mating disruption system fosters uncertainties about continued performance and potential weaknesses that may develop. Our experience so far indicates that a management package which features mating disruption and includes an effective supplemental control material for problem areas, along with an intensive monitoring program, can reliably control codling moth in an areawide approach.

Table 1. Mean pheromone trap captures.

	1st Gen. CM		2nd Gen. CM		1st Gen. PLR		2nd Gen. PLR	
	95	96	95	96	95	96	95	96
Areawide blocks	3.6	1.8	1.6	.9	102.5	71.9	124	52
95 Comparison blocks	46.6	56.8	46	14.1	77.5	63.8	93	25
96 Comparison blocks		37.4		11.5		71.3		23.2

Table 2. Fruit damage at harvest.

	% CM		% Leafroller	
	AW	CONV	AW	CONV
1995	0.2	0.8	0.23	0.13
1996	0.08	0.12	0.15	0.09

Table 3. Insecticide applications.

	CM		Leafroller		Secondary		Total	
	AW	CONV	AW	CONV	AW	CONV	AW	CONV
1995	3.1	5.6	5.9	0	1.0	5.7	10	11.3
1996	1.0	5.5	6.9	0	1.9	4.4	9.8	9.9
Total	4.1	11.1	12.8	0	2.9	10.1	19.8	21.2