

III. Stone Fruits

c. Biological control

1. Oriental fruit moth; peaches and nectarines

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Mating disruption research using sex pheromones of the oriental fruit moth and codling moth was continued at the Kearney Agricultural Center in 1988. Treatment of peaches and nectarines with only one application of OFM pheromone in February was successful (Table 1) in orchards where the resident OFM populations had previously been reduced to very low levels with pheromones. All six cultivars evaluated in these OFM treatments in 1988 had fruit damage lower than the untreated check fruit. Also, there was no increase in OFM damage with only the single pheromone treatment in 1988 compared to the same cultivars in the same blocks which had received two pheromone treatments in 1987. Thus, it appears that once OFM populations are reduced to low levels with pheromones and/or insecticides, subeconomic levels of control can be maintained with only one application of pheromone per season. Growers, however, are cautioned that continuous detection and survey trapping with pheromone and bait traps is required in pheromone treated blocks.

An increase in OFM damage occurred in a block of peaches at Parlier which was not treated for the second year in 1988. With pheromone treatments in 1985 and 1986, OFM damage was 0%. With no control in 1987, damage increased to 0.1%. In 1988, again with no OFM controls, damage in this block increased to 0.4%, approaching an economic level in fresh market varieties. Large increases of male moths were also detected mid-late season in pheromone traps, whereas only two moths were trapped in this block during the entire 1987 season.

Mating success of female OFM in pheromone treated blocks in 1988 was similar to that observed in previous years. Over 90% of the females collected in bait traps in untreated orchards were mated during the year. In treated blocks mating success in the first flight in March-April was less than 70%. By the middle of the second flight in May, however, mating success increased to about 80%, and following depletion of the pheromone dispensers in late May/early June, mating success increased to over 90% as observed in the untreated checks.

Fruit infestation by peach twig borer in the OFM pheromone treated orchards was also similar to that observed in previous years. As expected, PTB damage was much lower in dormant-sprayed blocks than in unsprayed check orchards. These results continued to confirm the value of dormant sprays for twig borer control, especially in orchards that are not sprayed with insecticides for OFM.

Mating disruption trials for codling moth in 1988 gave mixed results. Three trials in fresh market plums showed reductions of codling moth damage in pheromone treated blocks compared to untreated checks (Table 2). Fruit damage ranged from less than 0.1% in a young orchard with a low population of codling moth, to 2.8% in a mature orchard with a history of damage. While this latter figure is considerably less than the untreated check, it is still above the acceptable level for commercial orchards.

Two trials for CM mating disruption in apples failed to reduce fruit damage at harvest to acceptable levels compared to untreated checks (Table 2). The trial on Royal Gala apples in Delano was sprayed out following fruit evaluation in late July in order to protect the Granny Smith fruit also planted in the same block. The trial on Granny Smith apples in Arvin was sprayed five times over the season in both the check and pheromone treatments with no significant difference in fruit damage at harvest.

Table 1. Oriental Fruit Moth Mating Disruption with Pheromones - 1988¹

Location	Treatment	Cultivar	% Infested Fruit at Harvest		
			OFM	PTB	OLR
KAC Fld. 21	check	Fay Elberta	7.1	14.0	0.9
		Fay Elberta	0.2	1.0	1.1
	pheromone ²	Red Top	2.8	2.0	3.3
		Elegant Lady	0.05	0.1	0.1
	check	Independence	2.3	1.0	1.0
		Red Diamond	0.05	0.1	0.1
KAC Fld. 24	check	Fay Elberta	7.1	14.0	0.8
		Fay Elberta	0.4	2.4	0.4
KAC Fld. 72	check	Independence	2.3	1.0	1.0
		Flavor Top	0.4	0.0	0.1
	pheromone ²	Red Top	2.8	2.0	3.3
		Flamecrest	0.05	0.0	0.3
KAC Fld. 74	check	Fantasia	1.5	7.0	1.8
		Fantasia	0.1	0.1	0.5

¹Shin-Etsu 3-month pheromone dispensers @ 400/acre.

²One pheromone application on 2/18/88.

³2nd year without pheromone treatment, following 2 yrs. with treatment.

Table 2. Codling Moth Mating Disruption with Pheromones - 1988¹

Location	Treatment	Cultivar	% Infested Fruit at Harvest		
			CM	PTB	OLR
KAC Fld. 21	check	Casselman	28.7	0.0	0.5
		Casselman	2.8	0.0	0.1
KAC Fld. 52	check	Friar	2.35	0.05	0.3
		Friar	0.75	0.15	0.2
Parlier	check	Friar	0.0	0.0	0.35
		Friar	0.05	0.1	1.95
Delano	check	Royal Gala	14.1	-	-
		Royal Gala	9.7	-	-
Arvin	check	Granny Smith	4.7	-	-
		Granny Smith	5.3	-	-

¹Shin-Etsu 3-month pheromone dispensers @ 400/acre.