II. Pome Fruits
c. Biological Control
Codling Moth (CM) - Pear

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CONTROL OF CODLING MOTH WITH PHEROMONE CONFUSION. In 1989, a commercial block of Bartlett pears located in southern Oregon was used to test the efficacy of pheromone confusion for control of codling moth on pear. Four treatments were compared: 1) one application of pheromone, 2) two applications of pheromone, 3) two applications of Dimilin and one application of pheromone, and 4) three applications of Dimilin. Each plot was 1.8 acres and the pheromone dispensers, provided by Biocontrol Ltd., were applied at the rate of 400 per acre and were placed in the upper portion of the tree. Pheromone traps in each plot were monitored throughout the season and fruit samples were evaluated after the first CM generation and at harvest (Table 1).

In 1990, the 1989 trial was repeated in the same location while additional blocks of winter pears were added to the study. A block of Red Anjous was treated with two applications of pheromone while in both a Comice and a Bosc block one application of pheromone was compared to two applications. The Comice block was subdivided further in order to evaluate a new type of dispenser, the E-4, designed to minimize UV degradation. Trap catch and fruit evaluations for first and second generation CM are shown for all the pheromone treated blocks in Table 2. All of the plots which had only been treated with pheromone were sprayed with azinphosmethyl at the end of July or beginning of August to prevent continued CM damage.

A closer look at the distribution of CM damage in the Bartlett plots in 1990 (Figure 1) shows a pronounced edge effect in the pheromone treated plots. This may indicate that mated females were flying into pheromone blocks. The fact that all the pheromone treated blocks were located near Dimilin blocks may have contributed to the lack of control experienced in 1990 since Dimilin only effects the egg stage and has no effect on adult moths. The success of the hybrid program utilizing two Dimilin applications for control of first generation CM and pheromone confusion for control of subsequent generations is noteworthy; although the long residual activity of Dimilin could account for a portion of that later season control. A prolonged period of extremely high temperatures in July of 1990 might have adversely affected the pheromone dispensers' release characteristics. While such a supposition is purely conjectural, it would help to explain the difference in results between 1989 and 1990.

In conclusion, the variability in CM control that exists with pheromone confusion dictates that very careful monitoring be employed in orchards where pheromone confusion is attempted. In conjunction with general considerations of orchard location and CM pressure, border spraying is a management option that should certainly be examined.

Table 1 1989 Pheromone Confusion Trial

	First CM Generation		Second CM Generation		
Treatment	Trap Catch	% Fruit with CM damage	Trap Catch	% Fruit with CM eggs	% Fruit with CM damage
Pheromone applied once (4/8)	0	0	0	0.25	0
Pheromone applied twice (4/8 and 6/27)	0	0	0	0	0
Dimilin applied twice (4/22 and 5/29) and pheromone applied once (6/27)	8	0	0	0	0
Dimilin applied three times (4/22, 5/29 and 7/3)	7	0.5	1	0	0

Table 2 1990 Pheromone Confusion Trial

	First CM Generation			Second CM Generation		
Pear Variety and Pheromone Treatment	Trap Catch	% Fruit with CM eggs	% Fruit with CM damage	Trap Catch	% Fruit with CM eggs	% Fruit with CM damage
Bartletts (2nd year)						
applied once	2	0	0	0	0	2.5
applied twice	0	0	0.5	0	0	4.5
Red Anjou	0	0	0	0	0.5	0
Bosc	0	0	0	0		
applied once					2.0	11.0
applied twice					2.0	4.0
Comice						
Standard dispenser	0	0	0	0		
applied once					1.5	1.5
applied twice					0	6.0
E-4 dispenser	0	0	0	0		
applied once					4.5	3.0
applied twice					0	1.5

Figure 1 Bartlett Plot Map - (2nd Year)
Location and Level of CM Infestation