

Pome Fruits—Chemical Control

Alternative Programs for Control of Codling Moth

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Keywords: codling moth, twospotted spider mite, pear rust mite, horticultural oil, Biocontrol, pear

Alternative codling moth (CM) control programs utilizing mating disruption (MD) and/or horticultural oil sprays were evaluated at two sites in southern Oregon during 1992. In the Hanley Station orchard one block (0.5 ha) of mixed Anjou and Bartlett was treated with Biocontrol Ltd. dispensers at a rate of 1000/ha on March 26, just prior to CM biofix. The block was further divided and treatments of no oil sprays, 3 oil sprays, and 6 oil sprays were each applied to three replicated plots. A nearby block (approx. 200 meters distant) containing only Bartletts was treated with neither MD nor oil to serve as a check plot. At the Medford Station orchard a 1.0 ha block of mixed varieties was treated with pheromone dispensers as above. In this block only the 3- and 6-oil treatments were employed, again replicated three times. Another mixed block, 0.7 ha in size and approx. 100 meters distant, was not treated with MD but was divided into treatments of no oil (check) and 6 oil sprays. In all of these plots the only insect control materials applied in the foliar period were the pheromone dispensers at the beginning of the season and the oil treatments. The oil sprays were applied with an airblast sprayer calibrated at 250 gpa. The application timings for the three spray program were the standard CM cover spray timings. For the 6-spray program the same three timings as above were used along with additional follow-up sprays made 100°D after each of the three standard application timings. During first and second cover the oil was applied at 1.2%, while at third cover a 1.0% oil concentration was used. CM levels were monitored by placing a pheromone trap loaded with a 1 mg lure and another trap with a 10 mg lure in each block. The traps were rotated weekly. Fruit was sampled at the end of the first CM generation and at harvest. Beating tray and leaf brushing samples were also taken regularly.

Results

Trap catch indicated incomplete MD at the Hanley orchard while at the Medford Station orchard 1 mg traps were shut down until late July. This lack of complete MD at Hanley resulted in a 5.5% CM infestation in Bartletts after first generation and 12.8% CM infestation at harvest in the MD only plots. At the Medford Station even four months of MD was not long enough to entirely protect Bartletts and was certainly not enough to protect the longer season winter pears from CM damage.

The addition of oil applications improved CM control. Through first generation there was no difference between the 3- and 6-oil programs. However, at the Medford location significantly better CM control was recorded at harvest with 6 oils versus 3 oils. Since, in the absence of MD, the 6-oil program gave minimal control of second generation CM, it appears that in order for this combined MD and oil program to be effective and reliable, alternative or supplemental late season CM control measures are required. These measures could take various forms such as a

second pheromone application, improvements in the oil applications or the use of organophosphate materials.

The use of oil applications did not alleviate the marked edge effect associated with MD. For instance, at the Medford Station orchard, CM damage in Bartletts was four times greater along the edge of the plot than in the interior. This recurrent edge effect, particularly evident in sites with high neighboring CM populations, may account for the CM levels found in the MD block at the Hanley orchard which, at 0.5 ha, may not have been large enough to achieve effective mating disruption.

Oil applications were nondisruptive to predators but suppressive to secondary pests, especially twospotted and pear rust mites. Despite the positive effects of oil on controlling CM and other pear pests, fruit marking resulting from oil sprays may pose a concern on the Anjou cultivar, even though the observed phytotoxicity was not substantial enough to cause fruit downgrading.

Table 1. Codling moth damage to Bartlett pears and pheromone trap catch for first and second codling moth generations following application of pheromone and/or Orchem oil.

Program (application date)	Location	1 st generation (June 16)			2 nd generation (July 27)		
		1 mg trap	10 mg trap	% CM infestation	1 mg trap	10 mg trap	% CM infestation
Check	Hanley Rootstock Block	398	--	45.5	52	--	83.0
Pheromone (3/27)	Hanley Directional Block	6	12	5.5	3	19	12.8
Pheromone (3/27) 3 oil applications (5/6, 6/2, 7/2)	Hanley Directional Block	6	12	1.1	3	19	2.0
Pheromone (3/27) 6 oil applications (5/6+15, 6/2+15, 7/2+12)	Hanley Directional Block	6	12	1.1	3	19	2.3
Check	Medford Block 1E	45	35	15.0	21	18	70.0
6 oil applications (5/7+16, 6/3+16, 7/7+17)	Medford Block 1E	45	35	2.6	21	18	24.3
Pheromone (3/25-26) 3 oil applications (5/5, 6/1, 7/8)	Medford Hedgerow Block	0	3	0.2	1	3	5.8
Pheromone (3/25-26) 6 oil applications (5/5+14, 6/1+14, 7/8+18)	Medford Hedgerow Block	0	3	0.8	1	3	0.7