

Chemical Control/New Products

Control of Codling Moth by Combination Programs of IGR and Organophosphate Insecticides in Pears

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**Methods and Materials**

A study was conducted in a commercial 'Bartlett' pear orchard planted on a 25 ft x 25 ft spacing (70 tree/acre) in Fairfield, California. Sixteen treatments were replicated four times in a randomized, complete block design. Each replicate was an individual tree. Foliar sprays were applied with a handgun operating at 200 psi with a finished spray volume of 200 gal/acre (2.87 gal/tree). Applications were scheduled based on degree days (DD). DD were calculated with a biofix of 20 April for the first generation and with a biofix of 11 July from the second generation. Flight activity of male codling moth (CM) was monitored with a pheromone trap placed high in the tree canopy. Control of the first CM generation (overwintering flight) was evaluated on 8 July and the second generation (summer flight) was evaluated at commercial harvest on 11 August by inspecting a maximum of 250 fruit per replicate for CM infestation. Control of pear psylla nymphs, motile twospotted spider mites and European red mites was evaluated by sampling 10 exterior and 10 interior leaves per replicate weekly from 26 May through 27 July. Pear psylla nymphs and motile twospotted spider mites and European red mites were brushed from the sampled leaves and counted under magnification (20X).

**Results and Discussion**

**First Generation Evaluation**

All insecticide treatments had significantly lower CM infestation compared to the untreated control. At the time of the first generation evaluation, only the first two insecticide applications had been applied to the trial. The only insecticide treatment that had significantly higher CM infestation compared to the grower standard was the high rate of DPX-062.

**Harvest Evaluation**

The CM infestation in the untreated control was extremely high (50.2%) and was significantly higher than all the other treatments. Both rates of application of DPX-062 had elevated rates of CM infestation. However, only the high rate of DPX-062 had a significantly higher CM infestation than the other insecticide treatments which did not differ from one another. It appears that excellent CM control can be achieved with two applications of Guthion followed by one application of Confirm or Success combined with Volck oil and acceptable CM control can be achieved with one application of Guthion followed by two applications of Confirm or Success combined with Volck oil.

### **Secondary Pest**

Twospotted spider mites and European red mites were increased with two or more applications of Guthion. However, there was no difference in mite populations between the untreated control and one application of Guthion followed by two applications of Confirm or Success combined with Volck oil.

Pear psylla populations were increased with two or more applications of Guthion. There was no difference in psylla populations between the untreated control and DPX-062 or one application of Guthion followed by two applications of Confirm or Success combined with Volck oil. However, psylla populations were suppressed when Esteem was applied early in the season and followed by three applications of Confirm or Success combined with Volck oil or two applications of Confirm, Dimilin combined with Volck oil.

**Table 1.** Mean percent codling moth infested fruit from the first generation and harvest evaluation and twospotted spider mite, European red mite and pear psylla in Fairfield, CA, 1998.

Treatment	Rate lb (AI)/ac	No. appl.	Mean* % CM infested fruit		Season mean*		
			1 <sup>st</sup> Gen.	Harvest	TSSM	ERM	Psylla
1) Guthion 50WP (grower standard)	1.5	3	0.2ab	0.7ab	17.0c	24.5c	164.5e
2) DPX-MP062 30WG	0.09	3	0.5abc	6.2cd	1.5ab	0.8a	101.5cd
3) DPX-MP062 30WG	0.11	3	1.8c	12.7d	2.3ab	4.0ab	96.3bcd
4) Guthion 50WP Success 2SC**	1.5 0.141	2 1	0.0a	1.4abc	2.3ab	12.0abc	151.0de
5) Guthion 50WP Confirm 2F**	1.5 0.28	2 1	0.0a	0.3a	13.3bc	17.5bc	231.0f
6) Guthion 50WP Confirm 2F** + Dimilin 25W	1.5 0.28 0.5	1 2	0.0a	2.8abc	1.0ab	3.3ab	82.0abc
7) Guthion 50WP Success 2SC**	1.5 0.094	1 2	0.1a	2.7abc	0.8ab	1.5a	72.5abc
8) Guthion 50WP Success 2SC**	1.5 0.141	1 2	0.0a	1.9abc	1.8ab	1.5a	89.0abc
9) Guthion 50WP NAF-443 37.6WP**	1.5 0.094	1 2	0.6abc	2.7abc	1.3ab	1.0a	102.5cd
10) Guthion 50WP NAF-443 37.6WP**	1.5 0.141	1 2	0.4ab	3.5bc	1.5ab	2.0a	89.3bc
11) Guthion 50WP Confirm 2F**	1.5 0.28	1 2	0.0a	3.7c	1.0ab	1.3a	75.0abc
12) Esteem 2.9EC** Confirm 2F**	0.113 0.28	1 3	0.0a	2.1abc	0.0a	0.5a	38.3ab
13) Esteem 2.9EC** Success 2SC**	0.113 0.094	1 3	0.0a	2.5abc	0.5ab	0.5a	38.0ab
14) Esteem 2.9EC** Success 2SC**	0.113 0.141	1 3	0.1a	4.2c	0.3ab	0.3a	31.0a
15) Esteem 2.9EC** Confirm 2F** + Dimilin 25W	0.113 0.28 0.5	1 2	0.9ab	3.5bc	0.0a	0.3a	41.0abc
16) Untreated	----	0	12.6d	50.2e	1.8ab	1.0a	75.8abc

\*Means followed by the same letter within a column are not significantly different (Fisher's protected LSD,  $P \leq 0.05$ ). Data analyzed using an arcsin transformation.

\*\*All treatments contained 1.0% Volck oil by volume.