

Comparison of Calypso with Standard Insecticides for Codling Moth Control

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Problem and its significance: Codling moth (CM) continues to be a serious pest in many pear orchards, especially those adjacent to abandoned or poorly managed orchards. Restrictions on Guthion and its eventual withdrawal from the market have made the search for safe and effective alternatives critically important. Imidan, another organophosphate insecticide, is less effective than Guthion and is not a stand-alone product where CM populations are moderate to high. Many growers are using the pyrethroid Warrior with Zeon, often in combination with Imidan or other insecticides, with relatively good success where populations are low to moderate. Other chemical insecticides include Brigade, Assail, and Intrepid. Organic insecticides include Entrust and Cyd-X.

Calypso 4F (thiacloprid) is a newly registered neonicotinoid insecticide produced by Bayer Crop Sciences. It is a broad-spectrum insecticide that also is labeled for pear psylla, leaf miner, and other pear pests. Calypso has a restricted entry interval of 12 hours but a pre-harvest interval of 30 days. It can be applied only twice per season.

Methods and Materials: We compared Calypso against various grower standard products in three orchards in the Sacramento River District that had moderate to high populations in 2006. Sprays were applied by the growers using orchard sprayers operating at <2 mph with a spray volume of 100 gal/acre in both orchards. Sprayed plots were 6 to 10 rows wide, and damage evaluations were conducted in the middle row(s). In orchard 1, four plots of grower standard (GS) and four plots of Calypso were used, and in orchard 2, two plots of each were used. A third orchard, which had high populations in 2006, was sprayed once but was then pulled from the trial because the grower became nervous about the high trap counts and sprayed the entire orchard with Guthion. The protocol used in the remaining two orchards is shown in Table 1. Isomate Twin Tube pheromone dispensers were hung in both orchards at a rate of 200/acre.

Table 1. Spray protocols used in the two orchards.

ORCHARD 1	
16 April 2007	Assail 70WP at 3.4 oz/acre + Warrior with Zeon at 5.12 oz/acre
	Calypso 4F at 8 oz/acre + Warrior with Zeon at 5.12 oz/acre + 1% horticultural type oil by volume
29 May 2007	Imidan 70W at 7 lb/acre
	Calypso 4F at 8 oz/acre + 1% horticultural type oil by volume
ORCHARD 2	
19 May 2007	Imidan 70W at 7 lb/acre
	Calypso 4F at 8 oz/acre + 1% horticultural type oil by volume
18 June 2007	Guthion 50WP at 3 lb/acre
	Calypso 4F at 8 oz/acre + 1% horticultural type oil by volume

CM damage was evaluated at the end of the first generation (2nd week of June) and shortly before harvest (2nd week of July). Damage evaluations were conducted in the center rows of each plot by inspecting 50 fruit/tree from 20 trees (1,000 fruit per plot). CM traps with 10-mg lures were placed high in random trees throughout the trial areas to determine general population trends.

Results: Because traps consistently caught few moths, trap counts from the respective pest control advisers were used. The total moth counts per trap for the entire season up to harvest are as follows: Orchard 1 (avg. of 3 traps) – 149 moths. Orchard 2 (1 trap) – 283 moths (see Figures 1 and 2).

Figure 1. Periodic trap counts at orchard 1 (average of 3 traps).

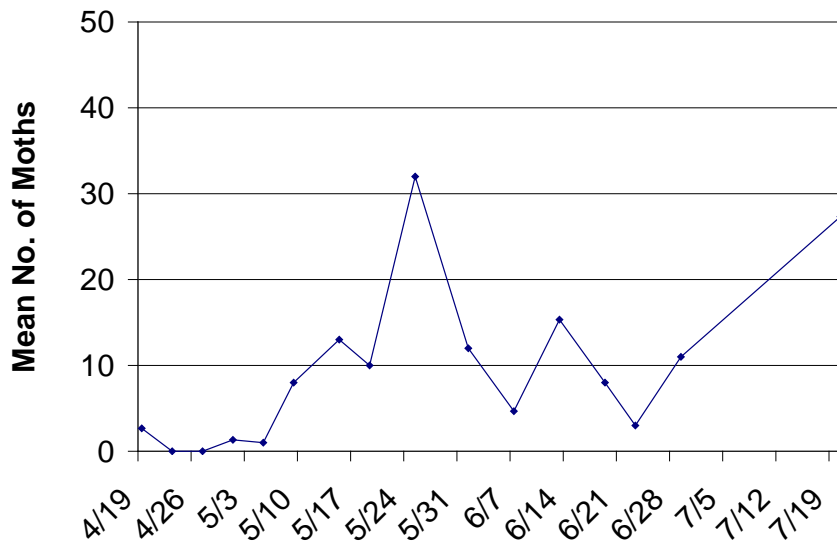
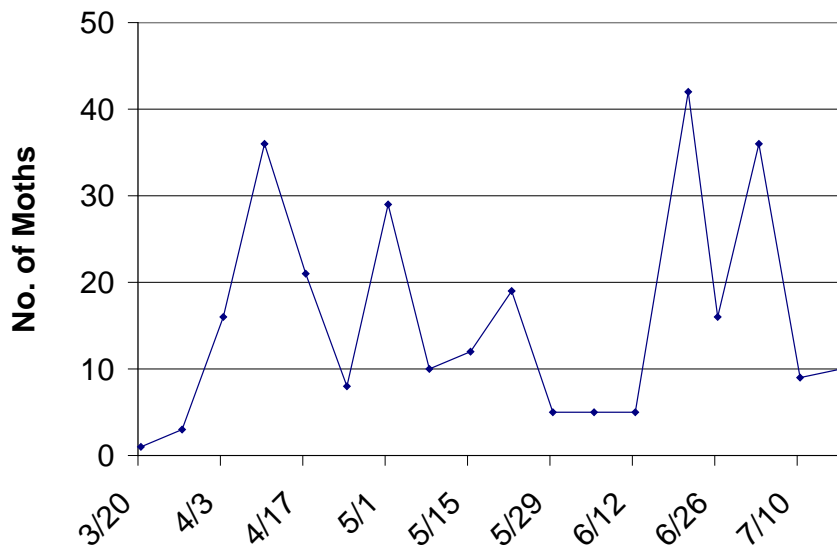


Figure 2. Weekly trap counts at orchard 2 (1 trap only).



There were no significant differences between GS and Calypso treatments (Table 2). In orchard 1, the pre-harvest mean for GS was numerically higher than that of Calypso, but only because of the effects of one plot, which had unusually high codling moth pressure (trap counts in this plot were >50% higher than in the other plots). Damage in the other side-by-side plots was virtually identical between treatments. In orchard 2, pre-harvest damage in both treatments was identical. From this study Calypso performed as well or better than the grower standard.

Table 2. Mean* CM fruit damage after the first generation and pre-harvest in Grower Standard and Calypso treatments.

	Orchard 1		Orchard 2		Combined	
	GS	Calypso	GS	Calypso	GS	Calypso
1 st Gen.	0.2	0.5	1.8	0.7	0.7	0.5
Pre-Harvest	3.2	2.4	2.1	2.1	2.9	2.3

*There were no significant differences between treatments (Fisher's LSD, P<0.05).

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