Chemical Control/New Products

CALYPSO AND INTREPID FOR CONTROL OF CODLING MOTH

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Objective. To evaluate the efficacy of two new insecticides, Calypso (thiacloprid, Bayer) and Intrepid (methoxyfenozide, Rhom and Haas), for control of codling moth in apple as compared to an industry standard insecticide, Guthion (azinphosmethyl, Bayer). In addition, to evaluate the influence of these materials on populations of phytophagous mites, predaceous mites, aphids, and their natural enemies.

Methods

This trial was conducted in a 10-year-old, 2 acre block with a mixture of apple cultivars (Dixiered, Gala, Idared, Jonathan, Mutzu, Prime Gold, Supreme, Ultrastripe) at the Utah State University research farm in Kaysville, UT. This was a large block trial with replications 3 rows wide and 7 trees long. Experimental design was randomized complete block with 4 treatments and 4 replications. Insecticides were applied by airblast sprayer at 70-80 gallons/acre.

Treatments. First cover applied at 250DD after biofix. Third cover (fourth cover Calypso) applied 1260 DD after biofix.

1) Calypso 4F (thiacloprid) @ 4 fl oz/acre, 6 cover sprays (ca. 14-d interval)
2) Guthion-Intrepid rotation: Guthion 50W (azinphosmethyl) @ 2 lb/acre (1st and 3rd cover sprays), Intrepid (methoxyfenozide) @ 1.1 lb/acre (2nd and 4th cover sprays)
3) Guthion 50W (azinphosmethyl) @ 2 lb/acre (standard program, 4 cover sprays)
4) Untreated

Populations of spider mites, predaceous mites, green apple aphids, and aphid natural enemies were surveyed. Fruit were evaluated at harvest maturity (ca. 100 fruit per cultivar/replication).

Results

All three insecticide treatments had significantly less codling moth damage than the untreated check (Table 1). Overall, percentage of fruit damaged was high in the untreated trees (22%, all cultivars combined), and damage levels differed among cultivars. There were no differences in performance of insecticides among cultivars.

Populations of twospotted spider mite (*T. urticae*) were significantly higher in the Calypso treatment than in other treatments (Table 2), but predaceous mite (*G. occidentalis*) populations were not different (Table 2). Populations of *Aphis pomi* (green apple aphid) were similar among treatments. The Calypso and Guthion treatments significantly reduced

populations of *Campylomma verbasci* and total aphid natural enemies versus Guthion/Intrepid rotation and Untreated.

Table 1. Percentage fruit injury at harvest for all cultivars and trees (center and border) sampled on 30 August and 12 September 2000

	Percentage of fruit*			
Treatment	Larval entries	Stings	Entries+Stings	# Fruit sampled
Calypso	1.34 b	0.28 a	1.62 b	3,015
Gut/Intrepid	0.67 b	0.28 a	0.95 b	2,932
Guthion	0.29 b	0.23 a	0.52 b	2,750
Untreated	21.83 a	0.68 a	22.51 a	2,972
P>F	<0.0001	0.150	<0.0001	11,669

*Means followed by the same letter within a column are not significantly different (P<0.05) using Tukey's studentized range test.

Table 2. Mean number of mites per 10 leaves on 26 July and 8 August, 2000 and ANOVA results for comparisons among insecticide treatments

		Mean number of mites per 10 leaves*				
Date	Treatment	TSM+	ERM	Typh	Zet	Prey:Pred Ratio
26 Jul	Calypso	88.5	7.8	39.6	0.8	2.38
	Gut/Intrepid	9.8	1.5	17.3	7.3	0.50
	Guthion	28.0	4.3	27.1	7.3	0.94
	Untreated	1.0	14.3	15.8	4.0	0.77
8 Aug	Calypso	11.8	9.3	17.5	2.3	1.07
	Gut/Intrepid	0.0	3.8	11.3	5.3	0.23
	Guthion	0.0	0.3	8.8	2.0	0.03
	Untreated	0.0	0.0	13.8	5.3	0.0
Repeated Measures ANOVA Source		*P* values for each variable				
Treatment		0.002	0.538	0.257	0.328	0.021
Date		0.005	0.411	0.046	0.385	0.052
Date x Trt.		0.152	0.482	0.797	0.755	0.666
Block		0.466	0.727	0.277	0.139	0.683

*Includes all life stages of mites (mobile immatures and adults and eggs).
+TSM=twospotted spider mite, ERM=European red mite, Typh=*Typhlodromus*, Zet=*Zetzellia* and Prey:Pred Ratio=Ratio of prey mites (TSM+ERM) to predaceous mites (Typh+Zet).