CALYPSO & 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: *1st cover applied at 250DD after biofix. 3rd cover (4th 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 & 3rd cover sprays), Intrepid (methoxyfenozide) @ 1.1 lb/acre (2nd & 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	TSSM+	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).
+TSSM=twospotted spider mite, ERM=European red mite, Typh=*Typhlodromus*, Zet=*Zetzellia* and Prey:Pred Ratio=Ratio of prey mites (TSSM+ERM) to predaceous mites (Typh+Zet).