Chemical Control/New Products

EVALUATION OF POTENTIAL INSECTICIDES FOR USE IN ORGANIC APPLE PRODUCTION

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Recently there has been some discussion of possible organic pesticide alternatives in New York State. With the cooperation of several manufacturers, an experiment was conducted to test the efficacy of present materials that have the potential to be certified organic materials. Dilute sprays were applied to runoff with a hand sprayer (450 psi) at weekly and biweekly intervals. These applications were started at petal fall (15 May) and continued either on the weekly schedule or biweekly schedule on 22 May, 30 May, 7 June, 14 June, 21 June, 28 June, 6 July, 12 July, 18 July, 26 July, 1 August, 10 August, 16 August and 22 August. Treatments were replicated three times on single tree plots and arranged in a RCB design. The treatments were: 1) Surround WP (50 lb AI/100 gal) on a weekly schedule; 2) Orchex 796 (128 oz AI/100 gal) on a weekly schedule; 3) Aza-Direct EC (0.62 oz AI/100 gal) applied on a weekly schedule; 4) Imidan 70WP (11.2 oz AI/100 gal) applied on a biweekly basis; 5) untreated check. ERM and predaceous mites were sampled on 14 July. STLM tissue mines from the first generation were counted on 15 randomly selected fruit clusters on 6 July. Second generation mines were counted on 3-4 distal leaves on 25 randomly selected "hardened off" terminals per replication on 28 August. First generation internal lepidoptera and PC damage assessments were taken on 23 June. Fruit damage was evaluated on 100 'Macintosh' apples examined from each tree in each replication on 10 September.

ERM were not detected in any of the treatments, and the predator mite numbers ranged from 12.7/25 leaves to 36.0/25 leaves. The Surround WP treatment had the lowest amount of predators with the Orchex 796 slightly above it. PC fruit damage was significantly controlled by only two of the treatments. The Imidan 70WP standard and the Surround WP treatment reduced PC damage levels well below the check, but damage in the Orchex 796 and Aza-Direct treatments was comparable to the untreated trees. STLM populations in the Imidan 70WP treatment were higher than that found in the check trees and the Surround plots had almost the same infestation levels as the check plots. The Orchex and Aza-Direct plots reduced STLM damage below that found in the check. All treatments tested had some activity against the first generation of the internal lepidoptera complex (CM, OFM and LAW) as compared to the check. At harvest, the organophosphate plot provided the best control, but the physical barrier of Surround WP and the seasonal Aza-Direct also significantly reduced damage levels from that of

the check plot. The damage level found in the Orchex 796 treatment at harvest was comparable to the untreated check plot. OBLR populations were relatively low in the test orchards and damage from the summer brood was reduced numerically in all of the treated plots from that of the check, however they did not statistically separate. AM pressure was also quite low with none of the treatments statistically separating from each other. TPB was controlled well with both the Aza-Direct and Surround treatments. However, the Imidan and Orchex treatments were not significantly different from the check. Typically SJS is not uniformly distributed among trees in the research orchard. Therefore, it is difficult to determine the effectiveness of compounds assigned to randomly selected trees. In this trial, SJS fruit infestation was much higher in the Surround plots than in the other treatments, which indicates that this material is not effective against this pest. The other plots including the check had little or no SJS fruit damage.

Table 1. Evaluation of potential insecticides for use in organic apple production

		Mean % damaged fruit											
		STLM mines											
	Rate	/cluster	/term	AM	Internal lep[a]		PC		OBLR		SJS	TPB
Treatment	AI/100 gal	gen 1	gen 2	harvest	gen 1	harvest	30-Jul	harvest	early	late	harvest	harvest
Imidan 70 WP[b]	11.2 oz	4.0 b	11.8 c	0.0 a	0.0 a	0.0 a	2.0 a	7.3 a	0.67 a	1.3 a	0.0 a	0.3 ab
Surround WP[c]	50 lbs	2.3 ab	2.7 b	0.0 a	4.0 b	6.3 ab	4.0 a	4.6 a	2.3 ab	1.6 a	32.3 b	0.0 a
Orchex 796[c]	128 oz	1.6 a	0.2 a	1.0 a	1.0 ab	17.6 bc	57.7 b	31.3 b	1.0 a	2.3 a	0.0 a	1.0 ab
Aza-Direct EC[c]	0.62 oz	1.7 a	0.0 a	0.3 a	11.0 c	5.6 ab	54.7 b	26.6 b	2.6 ab	3.6 a	2.0 a	0.0 a
Check		3.8 ab	2.8 b	1.0 a	27.7 d	19.0 c	48.3 b	35.0 b	7.0 b	4.6 a	0.0 a	1.3 b

Means within a column followed by the same letter are not significantly different (Fisher's Protected LSD Test, P<0.05).
[a]complex of codling moth, oriental fruit moth and lesser appleworm.
[b]applied at petal fall and 1-7C.
[c]applied at petal fall and then every 7 days.

Table 1 (cont'd)

Compound	Mean ERM/leaf	Mean phytoseiid/25 leaves
Imidan 70 WP	0.0 a	30.7 b
Surround WP	0.1 a	12.7 a
Orchex 796	0.1 a	15.3 ab
Aza-Direct EC	0.1 a	24.0 b
Check	0.0 a	35.3 b

Means within a column followed by the same letter are not significantly different (Fisher's Protected LSD Test, P<0.05).