Section VII.
Foliage & Seed Feeding Pests

EVALUATION OF INSECTICIDES FOR THE CONTROL OF APHID & WORM PESTS IN FRESH MARKET TOMATOES IN CENTRAL CALIFORNIA
UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

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This trial was established at the Brooks Bauer Research Farm in Escalon, California in order to evaluate the effects of several products on aphid and worm pests in fresh market tomatoes. The tomato variety was Bobcat, spaced 18 inches between plants in 60-inch wide centers, by 30 feet long. The plot size was .017 acre, drip irrigated on flat beds, with four replications. Untreated areas equal to the treated test areas were established in between each replicate block in order to maintain high pest populations once the applications began.

All treatments were applied with a CO_2 powered backpack sprayer utilizing 3 nozzles per row. The applications were made with 3 flat fan, low-drift air induction type nozzles. The first two applications used a 1102VS nozzle over the center of the row and a 80025VS nozzle on each side of the plant operating at 40 PSI at 30 gallons/acre. The following 2 applications used a flat fan 11003VS on top of the bed with two 80025VS nozzles on each side operating at 60 psi for a finished volume of 45 gallons per acre. The boom was expanded in width from 40 inches to 60 inches so that the nozzles were at optimum distance from the plants as the plants grew larger. The plants were not staked so trimming of the outer edges of the canopy was done before each application with 30 inch machetes to assist in the penetration of materials into the center of the plants.

Materials were applied on 4 Aug, 18 Aug, 1 Sep and 15 Sep. The first application was for control of aphid species and the last three were primarily for worm pests. On the first application for aphids, control was difficult with the contact materials because a high percentage of the aphids were on the bottom of the compound leaf surfaces next to the ground. Even with the drop nozzles, it was difficult to penetrate the leaves where the aphids were. On the second application, many of the aphids had moved up to the mid-area of the plant and it was easier to reach them with the spray materials. We substituted four of the last treatments on the aphid list for worm materials as worm eggs were being deposited on the plants at that time.

Aphid evaluations were made by selecting one compound leaf per plant from 5 plants in each plot and examining the leaf surfaces. Worm evaluations were made by selecting 2 plants in each plot and shaking fruit onto a white tarp. Fruit was inspected and counted both for worm damage and worms present. Fruit was cut open, if any entry wounds were visible, to determine which species of worm was present. The white tarp was inspected for any worms that might have fallen off during the shaking process.

Mean Number of Potato Aphids, Macrosiphum euphorbiae per 5 Compound Leaves Following the First Application			
Treatment	Form	Lb ai/ ac	**13 Aug**
V10132	2.58 EC	0.12	205.0 bcdef
S1812	35 WP	0.15	373.3 fg
S1812	4 EC	0.15	282.5 defg
Kryocide	96 WP	8 lbs	254.5 cdefg
Capture	2E	0.06	1.5 a
F0570	.8 EW	0.018	221.8 bcdef
F0570	.8 EW	0.025	74.8 abc
Renounce w/o Break Thru	20 WP	0.044	144.3 abcde
Renounce with Break Thru	20 WP	0.044	213.5 bcdef
Assail	70 WP	0.088	17.3 a
Assail	70 WP	0.112	11.0 a
Assail	70 WP	0.112	42.0 ab
Avaunt + Lannate	30 WG	0.45	110.3 abcd
Avaunt	30 WG	0.45	300.0 efg
Avaunt	30 WG	0.065	305.3 efg
Hexacide	5%	1% of Vol	238.3 cdef
Activol	5.60%	2% of Vol	164.0 abcde
Proud	5.6 EC	1% of Vol	138.0 abcde
Untreated			422.5 g
Untreated			264.3 defg

*Means followed by the same letter in a column are not significantly different at 5% level. (Fisher's LSD)

Tomato Fruitworm, *Heliocoverpa zea*, Beet Armyworm, *Spodoptera exigua*, andCabbage Looper, *Trichoplusia ni* Evaluated from Two Plant Sample on September 24, 2003, Escalon CA

Product	Number of Damaged Fruits	Number of Undamaged Fruits	% Damaged Fruits	Number of Tomato Fruit Worms	Number of Beet Army Worms	Number of Cabbage Loopers
V10132	1.3ab	118abcd	0.9ab	0.0a	0.0a	0.3a
S1812	1.0ab	116abcd	0.9ab	0.0a	0.0a	0.0a
S1812	0.3a	114abcd	0.2a	0.0a	0.0a	0.0a
Kryocide	12.3abcd	103d	10.3bcdef	1.0abc	1.3ab	1.8abc
Capture	1.0ab	133abc	0.9ab	0.0a	0.0a	0.0a
F0570	3.3abc	112bcd	2.9abc	0.3ab	0.0a	0.0a
F0570	5.8abc	123abcd	4.4abc	0.0a	0.3a	0.0a
Renounce	7.5abc	123abcd	5.6abcd	0.3ab	0.3a	1.3abc
Renounce + Break Thru	8.8abc	129abcd	6.4abcde	0.0a	0.8a	0.3a
Assail	22.5d	141ab	14.3def	3.3d	3.3c	4.3d
Assail	14.5cd	108cd	11.3cdef	0.8abc	0.5a	2.5bcd
Assail alt w Kryocide	20.5d	107cd	15.5ef	1.5bc	2.5bc	1.8abc
Avaunt + Lannate	0.5a	144a	0.4a	0.0a	0.0a	0.0a
Avaunt	0.3a	123abcd	0.3a	0.0a	0.0a	0.0a
Avaunt	0.0a	115abcd	0.0a	0.0a	0.0a	0.0a
Intrepid	1.3ab	100d	1.2ab	0.0a	0.0a	0.0a
Success	4.8abc	120abcd	3.8abc	0.3ab	0.0a	0.0a
Proud	13.0bcd	104cd	10.4bcdef	1.0abc	0.0a	3.3cd
Warrior	22.5d	106cd	17.7f	1.3abc	0.8a	0.5ab
Untreated	37.8e	60e	39.2g	1.8c	1.5ab	4.3d

Means followed by the same letter not different at the 5% Level.

The Capture, the high rate of F0570, the low rate of Renounce, all of the Assail treatments, the Avaunt plus Lannate, Activol and the Proud provided the best control of the potato aphids following the first application on Aug 13. Following the second application when more of the aphids were higher on the plant, more of the materials were effective in reducing the numbers of aphids below the untreated control. Only the S1812, Kryocide, Avaunt and Intrepid did not reduce the numbers of aphids significantly below the untreated control in the second evaluation.

Control of damage from the three worm species was variable, but most of the materials provided excellent to moderate control of worms with the exception of the Assail, Kryocide, Proud and the Warrior. Many of the materials provided a very high level of control considering the 39% damage in the untreated control. In our last three years of work with Warrior, it has provided excellent control of worm pests in tomatoes. I do not know why we could not repeat those results this year also.

Mean # of Potato Aphids per 5 Compound Leaves Following the Second Application				
				26-Aug
V10132		2.58 EC	0.12	14.5 a
S1812		35 WP	0.15	295.0 bcde
S1812		4 EC	0.15	456.5 e
Kryocide		96 WP	8 .00	307.0 cde
Capture		2E	0.06	0.0 a
F0570		.8 EW	0.018	12.8 a
F0570		.8 EW	0.025	2.0 a
Renounce w/o Break Thru		20 WP	0.044	77.5 abc
Renounce with Break Thru		20 WP	0.044	66.8 ab
Assail		70 WP	0.088	.8 a
Assail		70 WP	0.112	.3 a
Assail alternate with Kryocide		96 WP	8.33	34.0 a
Avaunt + Lannate		30 WG + 90SP	.045 + 0.45	58.0 a
Avaunt		30 WG	0.045	195.3 abcd
Avaunt		30 WG	0.065	411.5 de
Intrepid		2 F	0.125	294.0 bcde
Success		2 SC	0.078	183.3 abc
Proud		5.6 EC	5	159.8 abc
Warrior		1 SC	0.03	3.8 a
Untreated				292.8 bcde

*Means followed by the same letter in a column are not significantly different at 5% level. (Fisher's LSD)