Section VII.
Foliage & Seed Feeding Pests

CONTROL OF APHID & WORM PESTS IN FRESH MARKET TOMATOES UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION- 2002

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Products	Formulation	Lb ai/ acre
Novaluron	0.83 EC	0.04
Novaluron	0.83 EC	0.08
S-1812	35 WP	0.15
S-1812	35 WP	0.2
Decis	1.0 EC	0.012
Decis	1.0 EC	0.028
F0570	0.8 EW	0.018
F0570	0.8 EW	0.025
BASF	Formulation A	0.25
BASF	Formulation B	0.25
Hexacide	5% EC	0.16
BASF	Formulation D	0.25
Dipel	10.3% DF	0.2
Proclaim	5 WG	0.0075
Acetamiprid	70 WP	0.054
Avaunt	30 WG	0.065
Confirm	2 F	0.12
Intrepid	80 SP	0.125
Success	2 SC	0.039
Warrior	1 CS	0.03
Untreated		

This trial was established at the BASF Experimental Farm in Farmington, California in order to evaluate the effects of several products on aphid and worm pests in fresh market tomatoes. The tomato variety was QualiT 23, spaced 18 inches between plants in 60-inch wide beds by 36 feet long. The plot size was .021 acre, furrow irrigated, with four replications.

All treatments were applied with a CO_2 powered backpack sprayer utilizing 3 nozzles per row. The first two applications were directed at aphids and used 3 TXVS 6 nozzles operating at 36 PSI using 18 gallons/acre. The following 2 applications used a flat fan nozzle, 11002 on top of the bed with a TXVS 8 on each side operating at 45 psi using 35 gallons per acre. The last application used an 11003 on top of the bed and an 11002 on each side at 60 psi and 48 gallons/acre. The flat fan nozzles were the low-drift air induction type. The booms were gradually expanded in width from 18 inches to 60 inches so that the nozzles were at optimum distance from the plants as they developed.

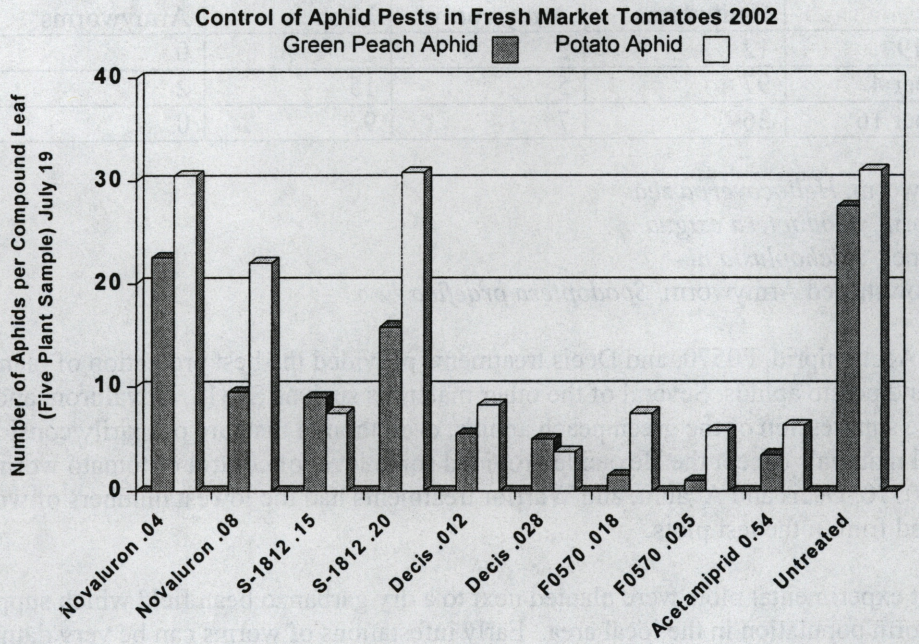
Materials were applied on 10 Jul, 22 Jul, 7 Aug, 19 Aug and 4 Sep. The first two applications were for control of aphid species and the last three were for worm pests.

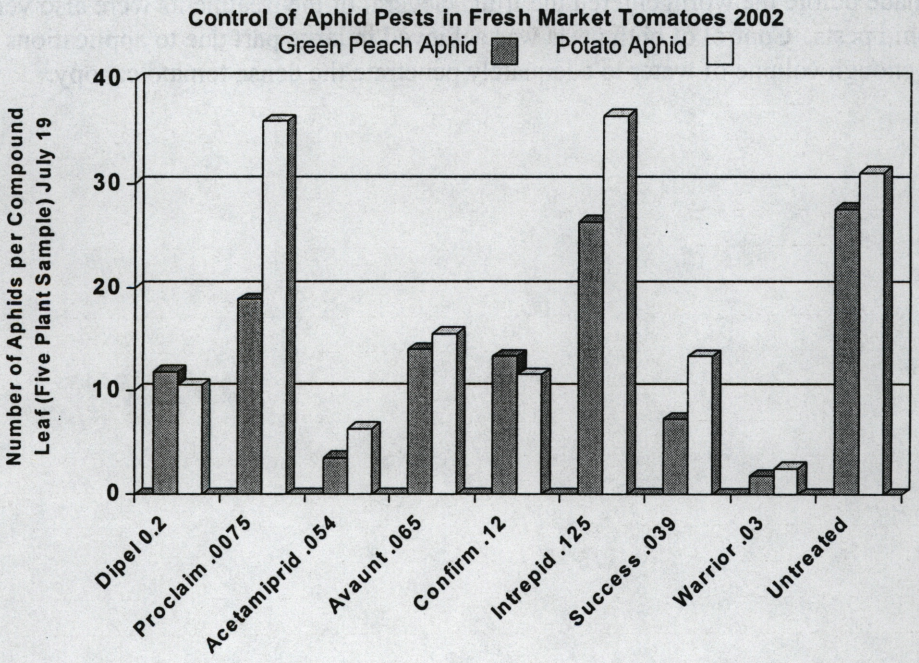
Aphid evaluations were made by selecting one compound leaf per plant from 5 plants in each plot. Worm evaluations were made by selecting 1 plant in each plot and shaking fruit into a yellow plastic grape lug held over a white tarp. Fruit was inspected and counted on a table both for worm damage and worms 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.

Table 1. Green Peach Aphid, *Myzus persica;* Potato Aphid, *Macrosiphum euphorbiae*

			Number of Aphids per Compound Leaf (5 Plant sample)		
			July 07	July 19	
	Treatment	Lb ai/ acre	Pre Treatment Counts- All Aphids	Green Peach Aphids	Potato Aphids
1.	Novaluron 0.83 EC	0.04	59.5 ab	22.5 cde	30.5 bc
2.	Novaluron 0.83 EC	0.08	67.0 ab	9.5 abcd	22.0 abc
3.	S-1812 35 WP	0.15	87.8 abcd	9.0 abcd	7.5 ab
4.	S-1812 35 WP	0.20	77.3 abc	15.8 abcde	30.8 bc
5.	Decis 1.0 EC	0.012	84.5 abcd	5.5 abc	8.3 ab
6.	Decis 1.0 EC	0.028	111.0 abcd	5.0 abc	3.8 a
7.	F0570 0.8 EW	0.018	101.5 abcd	1.5 ab	7.5 ab
8.	F0570 0.8 EW	0.025	69.0 ab	1.0 a	5.8 a
9.	BASF A	0.25	93.3 abcd	13.3 abcde	8.0 ab
10.	BASF B	0.25	98.8 abcd	14.3 abcde	23.8 abc
11.	BASF D	0.25	138.3 d	13.5 abcde	36.0 c
12.	Dipel 10.3% DF	0.20	97.0 abcd	11.8 abcde	10.5 ab
13.	Proclaim 5 WG	0.0075	114.5 bcd	18.8 bcde	36.0 c
14.	Acetamiprid 70 WP	0.054	76.0 abc	3.5 ab	6.3 a
15.	Avaunt 30 WG	0.065	113.0 abcd	14.0 abcde	15.5 abc
16.	Confirm 2 F	0.12	101.0 abcd	13.3 abcde	11.5 ab
17.	Intrepid 80 SP	0.125	136.0 cd	26.3 de	36.5 c
18.	Success 2 SC	0.039	94.3 abcd	7.3 abc	13.3 abc
19.	Warrior 1 CS	0.03	107.3 abcd	1.8 ab	2.5 a
20.	Untreated Control		82.3 abcd	27.5 e	31.0 bc

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


Control of Aphid Pests in Fresh Market Tomatoes 2002
Green Peach Aphid
Potato Aphid
Number of Aphids per Compound Leaf (Five Plant Sample) July 19
40
30
20
10
0
Novaluron .04
Novaluron .08
S-1812 .15
S-1812 .20
Decis .012
Decis .028
F0570 .018
F0570 .025
Acetamiprid 0.54
Untreated


Control of Aphid Pests in Fresh Market Tomatoes 2002
Green Peach Aphid
Potato Aphid
Number of Aphids per Compound Leaf (Five Plant Sample) July 19
40
30
20
10
0
Dipel 0.2
Proclaim .0075
Acetamiprid .054
Avaunt .065
Confirm .12
Intrepid .125
Success .039
Warrior .03
Untreated

Worms Identified From Single Plant Samples:

Date	Tomato Fruitworms	Beet Armyworms	Cabbage Loopers	Western Yellowstriped Armyworms
August 19	12	2	1	0
September 4	97	5	15	2
September 16	36	7	9	0

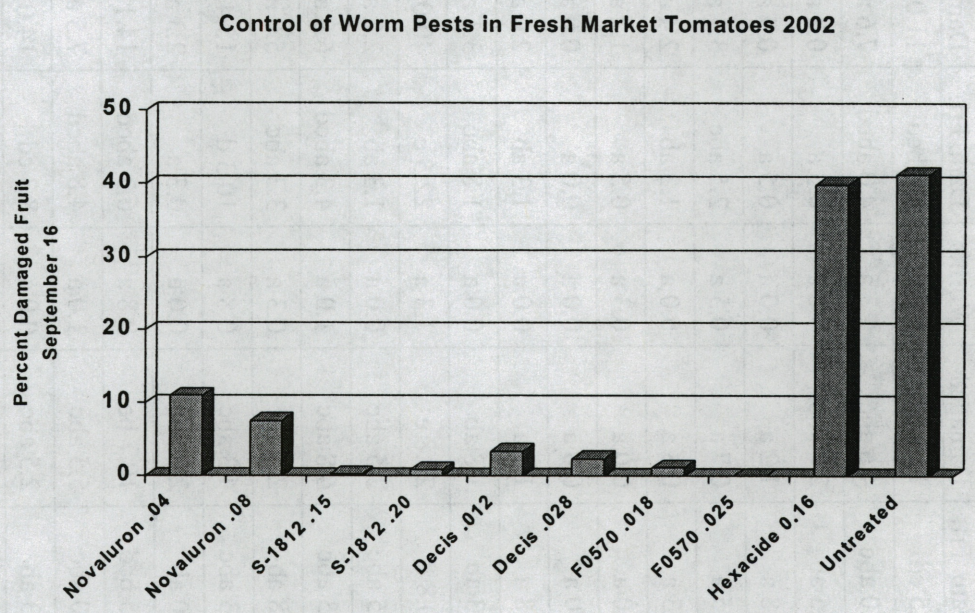
Tomato Fruitworm, *Heliocoverpa zea*
Beet Armyworm, *Spodoptera exigua*
Cabbage Looper, *Trichoplusia ni*
Western Yellowstriped Armyworm, *Spodoptera praefica*

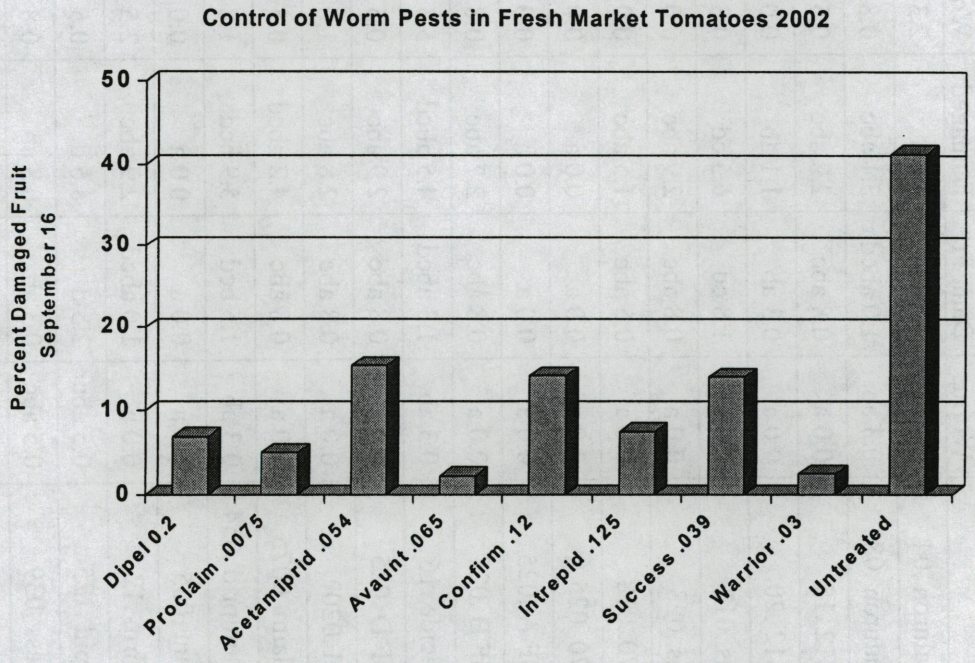
The Warrior, Acetamiprid, F0570, and Decis treatments provided the best protection of plants from the green peach and potato aphids. Several of the other materials such as S1812, Novaluron, and Success provided some suppression of the green peach aphids, even though they are primarily considered worm materials. All materials except the Hexacide provided some level of control of tomato worm complex. The S1812, F0570, Decis and Avaunt, and Warrior treatments had the lowest numbers of worms and worm-damaged fruit in the test plots.

This years test experimental plots were planted next to a dry garbanzo bean field which supported a high tomato fruitworm population in the local area. Early infestations of worms can be very damaging to tomatoes with many of the tomato fruitworms remaining in the fruit at harvest time. Excellent control of this year's worm complex, consisting of primarily tomato fruit worms, in fresh market tomatoes was achieved by multiple applications during the critical period of fruit development. Applications for fruit worms were made before the worm entered the fruit. Several of the treatments were also very effective in controlling aphid pests. Control of both pests was achieved in large part due to applications with drop nozzles using enough volume of water to adequately penetrate the dense tomato canopy.

Table 2. UCCE Tomato Worm Trial-2002									
	August 19			September 4			September 16		
	# of Worms	# of Dam. Frt	% Damaged	# of Worms	# of Dam. Frt.	% Damaged	# of Worms	# of Dam. Frt.	% Damaged
Novaluron .04	0.0 a	0.0 a	0.0 a	2.3 bc	7.5 cd	11.5 cd	0.5 a	7.8 bcd	11.0 abcd
Novaluron .08	0.3 ab	1.0 abcd	3.1 abc	0.8 abc	3.0 abc	4.6 abc	0.3 a	4.0 abcd	7.6 abcd
S-1812 .15	0.0 a	0.8 abc	2.2 abc	0.5 abc	1.5 ab	2.8 abc	0.0 a	0.3 a	0.3 a
S-1812 .20	0.0 a	0.3 ab	1.1 ab	0.0 a	0.8 a	1.2 a	0.0 a	0.5 a	0.9 a
Decis .012	0.3 ab	1.8 cd	6.5 cd	0.3 ab	0.5 a	0.7 a	0.5 a	2.5 abc	3.4 abc
Decis .028	0.0 a	0.8 abc	2.9 abc	0.0 a	0.3 a	0.3 a	0.0 a	1.3 ab	2.4 abc
F0570 .018	0.0 a	0.5 abc	1.5 abc	0.0 a	0.0 a	0.0 a	0.3 a	0.5 a	1.2 a
F0570 .025	0.0 a	0.0 a	0.0 a	0.0 a	0.0 a	0.0 a	0.0 a	0.0 a	0.0 a
BASF A .025	0.0 a	0.0 a	0.0 a	0.0 a	0.8 a	1.2 a	0.0 a	1.3 ab	2.0 a
BASF B .025	0.0 a	0.8 abc	2.7 abc	0.8 abc	1.3 ab	1.8 ab	0.0 a	1.8 abc	3.1 abc
Hexacide .16	0.3 ab	1.3 abcd	4.5 abcd	5.3 d	10.8 d	20.8 e	1.3 a	22.5 e	40.0 e
BASF D .025	0.0 a	0.8 abc	2.9 abc	0.5 abc	2.5 abc	3.5 abc	0.0 a	1.3 ab	2.2 ab
Dipel .020	0.0 a	0.8 abc	2.8 abc	1.0 abc	3.3 abc	6.8 abc	1.0 a	4.3 abcd	6.9 abcd
Proclaim .0075	0.0 a	0.8 abc	4.2 abcd	0.5 abc	1.8 ab	2.5 abc	0.3 a	3.3 abc	5.0 abcd
Acetamiprid .054	0.3 ab	1.5 bcd	5.9 bcd	1.8 abc	3.3 abc	4.3 abc	0.8 a	10.3 d	15.4 d
Avaunt .065	0.0 a	0.0 a	0.0 a	0.0 a	1.0 ab	2.5 abc	0.0 a	0.3 a	2.3 abc
Confirm .12	0.0 a	1.0 abcd	2.9 abc	2.5 c	6.5 bcd	10.7 bc	0.8 a	6.3 abcd	14.1 cd
Intrepid .125	0.5 abc	2.3 d	8.6 d	0.5 abc	3.0 abc	5.5 abc	1.0 a	4.8 abcd	7.5 abcd
Success .039	0.5 abc	0.3 ab	0.8 ab	0.8 abc	1.3 ab	2.5 abc	0.0 a	8.3 cd	14.0 bcd
Warrior .03	0.0 a	0.3 ab	0.8 ab	0.5 abc	2.0 abc	2.8 abc	0.0 a	2.0 abc	2.5 abc
Untreated	0.8 bc	4.5 e	16.0 e	6.0 d	16.5 e	33.5 f	6.8 b	18.0 e	41.3 e

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


Control of Worm Pests in Fresh Market Tomatoes 2002
Percent Damaged Fruit
September 16
50
40
30
20
10
0
Novaluron .04
Novaluron .08
S-1812 .15
S-1812 .20
Decis .012
Decis .028
F0570 .018
F0570 .025
Hexacide 0.16
Untreated


Control of Worm Pests in Fresh Market Tomatoes 2002
Percent Damaged Fruit
September 16
50
40
30
20
10
0
Dipel 0.2
Proclaim .0075
Acetamiprid .054
Avaunt .065
Confirm .12
Intrepid .125
Success .039
Warrior .03
Untreated