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OUTSIDE RESEARCH OR DEVELOPMENT GROUPS

FRUIT INSECT AND MITE CONTROL STUDIES IN EASTERN NEW YORK

1987

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TABLE OF CONTENTS

	<u>Page Number</u>
Materials Tested.....	1
Weather Data.....	2
Apple, Insect Control, Insecticide Block, HVL.....	3-6
Apple, Mite Control, Insecticide Block, HVL.....	7-9
Apple, Mite and Insect Control, Miticide Block, HVL.....	10-13
Pear, Insect and Mite Control, HVL.....	14-16
Apple, Mite Control, Modena.....	17-18
Apple, Mite Control, Clintondale.....	19-21
Apple, Danitol EUP Studies, Middlehope, New Paltz.....	22-23
Apple, Dimilin EUP Studies, Champlain Valley.....	24-25
Pear, Dimilin EUP Studies, Milton.....	26-27

MATERIALS TESTED

Abamectin .15EC	Merck, Sharp & Dohme Res. Lab.
AGB 6162A .14F	Abbott Laboratories
Apollo 50SC	Nor-Am America, Inc.
Asana 1.9E	E.I. duPont de Nemours & Co.
Brigade 10WP	FMC Corp.
Carzol 92SP	Nor-Am America, Inc.
Danitol 2.4EC	Chevron Chemical Co.
Dimilin 25W	Uniroyal Chemical Co.
DPX-EY059 5% EC	E.I. duPont de Nemours & Co.
EF-667 .4EC	Dow Chemical U.S.A.
Fenoxycarb 25WP	Abbott Laboratories
Guthion 50WP, 3F	Mobay Chemical Corp.
Imidan 50WP	Stauffer Chemical Co.
Kelthane 4F, 35WP	Rohm and Haas Co.
Lorsban 50WP	Dow Chemical U.S.A.
Mitac 50WP	Nor-Am America, Inc.
Morestan 25W	Mobay Chemical Corp.
Omite 6EC, 30WP	Uniroyal Chemical Co.
Plictran 50W	Dow Chemical U.S.A.
Pounce 3.2EC	FMC Corp.
PV870114-2A 50WP	Dow Chemical U.S.A.
RH-3486 50WP	Rohm and Haas Co.
Savey 50WP, 50DF	E.I. duPont de Nemours & Co.
Sevin 50WP	Rhone Poulenc, Inc.
Zolone 3EC	Rhone Poulenc, Inc.

APPLE: *Malus domestica*
 Apple aphid: *Aphis pomi* De Geer
 Apple maggot: *Rhagoletis pomonella* (Walsh)
 Codling moth: *Laspeyresia pomonella* (L.)
 European apple sawfly: *Hoplocampa testudinea* (Klug)
 Green fruitworm: *Lithophane antennata* (Walker)
 Plum curculio: *Conotrachelus nenuphar* (Herbst)
 Rosy apple aphid: *Dysaphis plantaginea* (Passerini)
 San Jose scale: *Quadraspidiotus perniciosus* (Comstock)
 Spirea aphid: *Aphis citricola* Van der Goot
 Spotted tentiform leafminer: *Phyllonorycter blancardella* (Fabr.)
 Tarnished plant bug: *Lygus lineolaris* (P. de B.)
 Variegated leafroller: *Platynota flavedana* Clemens
 White apple leafhopper: *Typhlocyba pomaria* McAtee

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APPLE, INSECT CONTROL, HUDSON VALLEY LAB, HIGHLAND, NY, 1987:

Treatments were applied to eight tree plots replicated three times in a randomized complete block design. All treatments were applied dilute to runoff using a high-pressure handgun sprayer at 400 psi delivering from 3.8 to 4.2 gal spray/tree or 364 to 403 gal/acre. Trees were 23 years-old, 10 ft high, spaced 15 by 30 ft, and on the EMII rootstock. A Pounce spray was applied on 21 Apr (pink); Brigade was applied 13 May (petal fall), and 29 May (first cover); and Imidan was applied 14 Jun, 30 Jun, 17 Jul, 4 Aug, and 18 Aug as the first treatment. Danitol treatments were applied 21 Apr, 13 May, 14 Jun, and 4 Aug, followed by Guthion in the remaining cover sprays 29 May, 30 Jun, 17 Jul, and 18 Aug. Danitol was also applied at a very high rate along with Spray oil on 13 May and this treatment was followed with Guthion applications in the remaining cover sprays commencing 6 Jun. DPX-EY059 was applied at three different rates on 21 Apr, 13 May, 14 Jun, and 4 Aug. EF-667 and EF-667 plus Lorsban were applied starting 13 May, while Fenoxycarb and Guthion treatments were initiated 21 Apr, with all four treatments applied in cover sprays 29 May, 14 Jun, 30 Jun or 1 Jul, 17 Jul, 4 Aug and 18 Aug. Additional applications over the entire block included: Difolatan 80S 15.5 lb/acre, 12 Apr; Cyprex 65W 1.5 lb/acre, 13 and 23 May; and Rubigan 1EC .7 lb/acre, 14 Jun. Naphthaleneacetic acid was applied in thinning sprays on 23 May using from 0 to 10 ppm depending upon the cultivar. White apple leafhopper was evaluated by counting the no. of nymphs on 25 leaves from one "Greening" and one "Empire" tree/plot on 15 Jul. Apple and spirea aphids were evaluated by examining 25 terminals on one "McIntosh" tree/plot on 10 Jun, and one "McIntosh" and one "Cortland" tree/plot on 23 Jun. European apple sawfly and plum curculio were evaluated prior to Jun drop by examining all of the fruits in 25 fruiting clusters on one "McIntosh" tree/plot on 8 Jun. Spotted tentiform leafminer was evaluated 6 Aug by counting the no. of mines on 25 spurs (125 leaves) from one "McIntosh" and one "Greening" tree/plot. Insect damage to the fruit was assessed at harvest by examining 100 fruits/cultivar/plot from "Jersey Mac" 31 Jul, and "Golden Delicious" 25 Sep. "Golden Delicious" finish was also evaluated 25 Sep using a russet rating from 0 (best finish) to 3 (worst finish) to grade each fruit. An early Spring resulted in an early and prolonged bloom period. Rainfall was above average throughout most of the season, while temperatures were generally normal for the area. Excessive and frequent rainfall during the "McIntosh" harvest resulted in the inability to harvest the fruit in a timely fashion with the result being that a considerable portion of this crop ended up on the ground.

The Pounce/Brigade, Danitol and DPX-EY059 treatments provided excellent white apple leafhopper control. Only the Danitol treatments provided effective control of the apple and spirea aphid complex found at this site. The Pounce/Brigade, Danitol, Lorsban, and Guthion treatments all provided good plum curculio and European apple sawfly control. The forementioned treatments, with the exception of Guthion, also provided good control of the rosy apple aphid. Spotted tentiform leafminer was controlled by all treatments with the exception of the Pounce/Brigade (which was applied too early for second brood control) and Guthion. Tarnished plant bug control was most evident where pyrethroid (i.e., Pounce/Brigade, Danitol) treatments were applied prebloom. A small amount of Lepidoptera injury from either codling moth, green fruitworms, variegated leafrollers, cutworms or all of the above was found in the growth regulator treatments (i.e., DPX-EY059, EF-667, and Fenoxycarb). San Jose scale was found in most treatments at a low level, at a moderate level in the DPX-EY059 treatments, while the EF-667 treatment appeared to actually favor this pest. Apple maggot injury (tunnels) was found in all of the growth regulator treatments. The finish on the EF-667 plus Lorsban treatment was noticeably worse than the other treatments.

Treatment	Rate form. /100 gal.	Application Date	% injured fruit (Jersey Mac)								% Clean fruit
			Tarnished plant bug	Plum curculio	European apple sawfly	Green fruitworm	Codling moth	San Jose scale	Cutworm	Apple maggot	
1. Pounce 3.2EC Brigade 10WP Imidan 50WP	1.5 oz 3.2 oz 16.0 oz	21 Apr 13 May, 29 May 14 Jun, 30 Jun, 17 Jul, 4 Aug, 18 Aug.....	2.7 a	5.3 a	3.3 ab	0.0 a	0.0 a	0.3 a	0.0 a	0.0 a	88.7 d
2. Danitol 2.4EC Guthion 50WP	4.0 oz 8.0 oz	21 Apr, 13 May, 14 Jun, 4 Aug 29 May, 30 Jun, 17 Jul, 18Aug.....	4.3 ab	2.0 a	6.7 abc	0.0a	0.0 a	1.0 a	0.0 a	0.0 a	86.7 d
3. Danitol 2.4EC Guthion 50WP	5.3 oz 8.0 oz	21 Apr, 13 May, 14Jun, 4 Aug 29 May, 30 Jun, 17 Jul, 18 Aug.....	3.0 a	4.0 a	1.7 a	0.0 a	0.0 a	2.7 a	0.0 a	0.0 a	90.3 d
4. Danitol 2.4EC + Superior Oil 6EC Guthion 50WP	10.0 oz 32.0 oz 8.0 oz	13 May 6 Jun, 30 Jun, 17 Jul, 4 Aug, 18 Aug.....	14.0 e	16.0 a	7.0 abc	0.0 a	0.0 a	0.3 a	0.0 a	0.0 a	65.0 c
5. DPX-EY059 5%EC	1.0 oz	21 Apr, 13 May, 14 Jun, 4 Aug.....	9.3 bcde	46.7 b	19.3 bcde	0.0 a	2.0 ab	8.0 a	1.0 a	0.7 a	23.3 b
6. DPX-EY059 5%EC	2.0 oz	21 Apr, 13 May, 14 Jun, 4 Aug.....	6.3 abcd	60.0 bc	26.7 de	0.0 a	1.0 a	4.3 a	0.0 a	0.3 a	14.3 ab
7. DPX-EY059 5%EC	4.0 oz	21 Apr, 13 May, 14 Jun 4 Aug.....	4.7 abc	49.7 bc	21.3 cde	0.3 ab	0.0 a	3.7 a	0.0 a	0.3 a	24.7 b
8. EF-667 .4EC	4.8 oz	13 May, 29 May, 14 Jun, 1 Jul, 17 Jul, 4 Aug, 18 Aug.....	5.3 abc	64.0 bc	32.7 e	0.7 b	2.0 ab	38.3 b	1.0 a	0.0 a	3.7 a
9. EF-667 .4EC + Lorsban 50WP	2.4 oz 6.0 oz	13 May, 29 May, 14 Jun, 1 Jul, 17 Jul, 4 Aug, 18 Aug.....	10.7 de	8.3 a	4.3 abc	0.0 a	0.0 a	0.0 a	0.0 a	0.0 a	79.0 d
10. Fenoxycarb 25WP	2.1 oz	21 Apr, 13 May, 29 May, 14 Jun, 1 Jul, 17 Jul, 4 Aug, 18 Aug.....	9.7 cde	56.3 bc	13.3 abcd	0.0 a	2.0 ab	0.7 a	0.7 a	0.0 a	27.0 b
11. Guthion 50WP	8.0 oz	21 Apr, 13 May, 29 May, 14 Jun, 30 Jun, 17 Jul, 4 Aug, 18 Aug.....	6.3 abcd	3.7 a	6.0 abc	0.0 a	0.0 a	0.0 a	0.0 a	0.0a	84.7 d
12. Check.....			9.3 bcde	67.7 c	26.3 de	0.0 a	4.0 b	1.0 a	1.7 a	0.0 a	8.0 a

Treatment means followed by the same letter are not significantly different ($p \leq 0.05$; DMRT).

1987 MAXIMUM AND MINIMUM TEMPERATURES AND PRECIPITATION Hudson Valley Laboratory, Highland, NY

All readings were taken at 0800 EST on the dates indicated

Date	April			May			June			July			August			September		
	Max	Min	Precip	Max	Min	Precip	Max	Min	Precip	Max	Min	Precip	Max	Min	Precip	Max	Min	Precip
1	65°F	30°F	1.42 in.	53	34		89	66	0.02	90	77		79	55		77	57	0.30
2	45	24		64	35		87	66	0.62	79	65		82	57		72	48	
3	60	36	0.04	68	43		77	62	0.02	68	62	1.01	71	58	0.57	67	48	
4	51	39	0.55	58	42	0.43	66	60	0.08	83	64		88	63		70	44	
5	61	39	2.55	55	42	0.13	68	61	0.08	87	57		90	68		72	45	
6	53	44	0.06	49	45	0.14	77	50		83	61	0.28	78	60	0.08	73	54	
7	48	44	0.58	60	40		72	46		80	58	0.22	79	62		77	58	0.08
8	51	36	0.04	75	45		71	54	0.04	72	61	0.80	80	66		75	65	0.09
9	52	40		65	36		82	61		83	70		86	64		73	66	1.71
10	58	35		78	50		79	54		90	70		70	61	0.27	81	58	
11	71	36		86	53		73	43		92	69		72	56		79	58	
12	76	45		78	54		77	63		91	68	0.67	80	51		76	61	0.65
13	68	43	1.18	74	39		76	62	0.16	92	68		79	53		65	61	
14	51	36	0.05	69	33		85	57	0.01	88	73		82	55		66	62	1.17
15	67	42		73	48		92	55		86	56	0.86	82	58		77	47	
16	65	42		75	40		87	58		75	52		88	62		75	50	
17	52	44	0.17	68	47		78	50		72	49		92	68		78	53	0.06
18	65	47	0.40	89	52		78	50		81	55		94	73		67	59	2.27
19	70	57		78	49	0.48	83	56		90	70		91	57		60	52	0.82
20	73	54		57	49		90	64		81	65		90	59	0.25	56	53	0.03
21	74	57		59	49		86	62	0.25	84	77	0.08	83	50		60	55	
22	80	48		72	50		68	63	0.14	90	66		85	58		68	57	
23	61	44		80	63		74	69	0.08	93	66		82	59	0.01	71	51	0.38
24	56	47		83	56	0.02	75	53		92	74		74	47		68	55	
25	60	40	0.26	74	54		84	59		93	70		70	44		72	41	
26	60	35		65	53		90	60		92	68	0.39	77	47		60	37	
27	65	31		67	52	0.46	66	62	0.16	84	58	0.05	78	55	0.45	68	44	
28	62	33		62	52	0.01	71	57	0.01	88	58		66	56	1.09	70	45	
29	50	35	0.14	85	62		76	55		81	53		59	56	1.00	72	53	
30	58	43		92	63		86	66		77	53	0.15	76	51	0.01	81	55	
31				94	67					81	61		77	50				
Total ppt.	7.44			1.67			1.67			4.51			3.73			7.56		

APPLE: *Malus domestica*
Apple rust mite: *Aculus schlechtendali* (Nalepa)
A predatory phytoseid: *Amblyseius fallacis* (Garman)
European red mite: *Panonychus ulmi* (Koch)
Twospotted spider mite: *Tetranychus urticae* Koch
A predatory stigmatid: *Zetzellia mali* (Ewing)

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APPLE, MITE CONTROL, INSECTICIDE BLOCK, HUDSON VALLEY LAB, HIGHLAND, NY, 1987: Treatments were applied to eight tree plots replicated three times in a randomized complete block design. All treatments were applied dilute to runoff using a high-pressure handgun sprayer at 400 psi delivering from 3.8 to 4.2 gal spray/tree or 364 to 403 gal/acre. Trees were 23 years-old, 10 ft high, spaced 15 by 30 ft, and on the EMII rootstock. A Pounce spray was applied on 21 Apr (pink); Brigade was applied 13 May (petal fall), and 29 May (first cover); and Imidan was applied 14 Jun, 30 Jun, 17 Jul, 4 Aug, and 18 Aug in the first treatment. Danitol treatments were applied 21 Apr, 13 May, 14 Jun, and 4 Aug, followed by Guthion in the remaining cover sprays 29 May, 30 Jun, 17 Jul, and 18 Aug. Danitol was also applied at a very high rate along with Spray oil on 13 May, and this treatment was followed with Guthion applications in the remaining cover sprays commencing 6 Jun. DPX-EY059 was applied at three different rates on 21 Apr, 13 May, 14 Jun, and 4 Aug. EF-667 and EF-667 plus Lorsban were applied starting 13 May, while Fenoxycarb and Guthion treatments were initiated 21 Apr, with all four treatments applied in cover sprays 29 May, 14 Jun, 30 Jun or 1 Jul, 17 Jul, 4 Aug and 18 Aug. Additional applications over the entire block included: Difolatan 80S 15.5 lb/acre, 12 Apr; Cyprex 65W 1.5 lb/acre, 13 May, and 23 May; and Rubigan 1EC .7 lb/acre, 14 Jun. Naphthaleneacetic acid was applied in thinning sprays on 23 May using from 0 to 10 ppm depending upon the cultivar. Mite populations were evaluated by sampling 25 leaves from one "Red Delicious" tree/plot at biweekly intervals throughout the summer. The leaves were brought into the laboratory where they were brushed with a mite brushing machine, and the mites and eggs examined and counted using a binocular scope. An early Spring resulted in an early and prolonged bloom period. Rainfall was above average throughout most of the season, while temperatures were generally normal for the area.

Virtually no mite control was found with the EF-667 and Guthion treatments, while the Lorsban added to the EF-667 treatment resulted in greater mite suppression similar to that found with the Pounce/Brigade treatment. The seasonal applications of Danitol provided good spider mite suppression, but the single high rate of Danitol plus oil gave better overall suppression since it permitted apple rust mite and the predator, *Zetzellia mali*, to build up which outcompeted or preyed successfully upon the spider mites. DPX-EY059 provided good mite control and a rate response was noticed, especially with the apple rust mite (i.e., higher the rate, greater the control). Rather low mite populations were also found in the fenoxycarb plots, and may be indicative of miticidal activity. Almost all plots contained populations of *Zetzellia mali*, *Amblyseius fallacis*, or both predatory species by the end of the season.

Treatment	Rate form. /100 gal.	Application Date	Mean no. nymphs / 25 leaves		Mean no. infested terminals/ 25				Mean no. infested clusters/ 25				Mean no. mines /25 spurs (125 leaves)	
			White apple leathopper Greening	Empire	Apple aphid/ spirea aphid 19 Jun McIntosh	McIntosh	Cortland	Plum curculio 8 Jun McIntosh	E. apple sawfly 8 Jun McIntosh	Rosy apple aphid 19 Jun Golden Delicious	Spotted tentiform leathminer 6 Aug McIntosh	Greening		
1. Pounce 3.2EC Brigade 10WP Imidan 50WP	1.5 oz 3.2 oz 16.0 oz	21 Apr 13 May, 29 May 14 Jun, 30 Jun, 17 Jul, 4 Aug, 18 Aug.....	7.7 ab	0.0 a	6.0 a	8.7 a	7.3 abc	2.3 a	6.3 ab	0.0 a	9.0 bc	10.0 b		
2. Danitol 2.4EC Guthion 50WP	4.0 oz 8.0 oz	21 Apr, 13 May, 14 Jun, 4 Aug 29 May, 30 Jun, 17 Jul, 18 Aug.....	1.7 a	0.0 a	9.3 ab	4.3 a	1.7 a	1.7 a	6.0 a	0.3 a	0.3 ab	1.7 a		
3. Danitol 2.4EC Guthion 50WP	5.3 oz 8.0 oz	21 Apr, 13 May, 14 Jun, 4 Aug 29 May, 30 Jun, 17 Jul, 18 Aug.....	0.0 a	0.0 a	12.0 abc	1.0 a	1.0 a	2.3 a	3.7 a	0.7 a	1.0 ab	0.0 a		
4. Danitol 2.4EC + Superior Oil 6EC Guthion 50WP	10.0 oz 32.0 oz 8.0 oz	13 May 6 Jun, 30 Jun, 17 Jul, 4 Aug, 18 Aug.....	2.3 a	0.0 a	16.3 cd	9.7 a	5.0 ab	5.0 a	6.7 ab	7.0 bc	2.0 ab	4.7 a		
5. DPX-EY059 5%EC	1.0 oz	21 Apr, 13 May, 14 Jun, 4 Aug.....	3.0 a	0.3 a	20.3 d	10.7 a	16.7 c	19.3 b	19.0 d	8.7 cde	2.3 ab	2.3 a		
6. DPX-EY059 5%EC	2.0 oz	21 Apr, 13 May, 14 Jun, 4 Aug.....	0.3 a	0.7 a	20.3 d	12.7 a	9.7 abc	21.0 b	18.7 d	13.0 ef	1.0 ab	3.3 a		
7. DPX-EY059 5%EC	4.0 oz	21 Apr, 13 May, 14 Jun 4 Aug.....	0.0 a	0.0 a	21.0 d	10.3 a	14.0 bc	16.0 b	19.3 d	12.0 def	0.7 ab	1.3 a		
8. EF-667 4EC	4.8 oz	13 May, 29 May, 14 Jun, 1 Jul, 17 Jul, 4 Aug, 18 Aug.....	99.7 d	50.3 c	19.7 d	11.3 a	14.0 bc	19.7 b	15.3 cd	16.3 f	0.0 a	0.0 a		
9. EF-667 4EC + Lorsban 50WP	2.4 oz 6.0 oz	13 May, 29 May, 14 Jun, 1 Jul, 17 Jul, 4 Aug, 18 Aug.....	20.3 abc	11.0 a	13.0 bc	5.7 a	6.7 ab	3.0 a	6.0 a	3.0 ab	0.3 ab	0.0 a		
10. Fenoxycarb 25WP	2.1 oz	21 Apr, 13 May, 29 May, 14 Jun, 1 Jul, 17 Jul, 4 Aug, 18 Aug.....	89.7 d	52.7 c	19.3 d	6.7 a	11.7 bc	17.7 b	20.0 d	8.3 cd	0.7 ab	0.0 a		
11. Guthion 50WP	8.0 oz	21 Apr, 13 May, 29 May, 14 Jun, 30 Jun, 17 Jul, 4 Aug, 18 Aug.....	33.0 bc	17.3 ab	12.0 abc	4.3 a	10.3 abc	2.3 a	11.7 bc	7.7 cd	15.0 cd	12.3 b		
12. Check			45.7 c	35.3 bc	22.0 d	7.3 a	7.0 abc	19.0 b	20.7 d	10.3 cde	17.0 d	13.3 b		

Treatment means followed by the same letter are not significantly different ($p \leq 0.05$; DMRT).

Treatment	Rate form. /100 gal.	Application Date	% injured fruit (Golden Delicious)								% Clean fruit	Mean russet rating* /fruit
			Tarnished plant bug	Plum curculio	European apple sawfly	Green fruitworm	Codling moth	San Jose scale	Variegated leafroller	Apple maggot		
1. Pounce 3.2EC Brigade 10WP Imidan 50WP	1.5 oz 3.2 oz 16.0 oz	21 Apr 13 May, 29 May 14 Jun, 30 Jun, 17 Jul, 4 Aug, 18 Aug.....	7.7 a	2.0 a	8.0 a	0.0 a	0.0 a	1.0 a	0.0 a	0.0 a	83.0 cd	0.14 a
2. Daniel 2.4EC Guthion 50WP	4.0 oz 8.0 oz	21 Apr, 13 May, 14 Jun, 4 Aug 29 May, 30 Jun, 17 Jul, 18 Aug.....		1.3 a	3.3 a	0.0 a	0.0 a	3.3 a	0.0 a	0.0 a	88.3 d	0.16 a
3. Daniel 2.4EC Guthion 50WP	5.3 oz 8.0 oz	21 Apr, 13 May, 14 Jun, 4 Aug 29 May, 30 Jun, 17 Jul, 18 Aug.....	4.3 a	4.3 a	4.3 a	0.0 a	0.0 a	1.3 a	0.7 a	0.3 a	86.7 d	0.11 a
4. Daniel 2.4EC + Superior Oil 6EC Guthion 50WP	10.0 oz 32.0 oz 8.0 oz	13 May 6 Jun, 30 Jun, 17 Jul, 4 Aug, 18 Aug.....	14.3 a	12.3 a	8.7 a	0.0 a	0.0 a	0.3 a	0.0 a	0.0 a	66.3 c	0.14 a
5. DPX-EY059 5%EC	1.0 oz	21 Apr, 13 May, 14 Jun, 4 Aug.....	11.3 a	57.3 b	12.3 a	0.3 a	3.3 ab	34.0 ab	0.7 a	20.3 b	15.0 a	0.32 a
6. DPX-EY059 5%EC	2.0 oz	21 Apr, 13 May, 14 Jun, 4 Aug.....	9.3 a	52.7 b	15.7 a	2.0 a	8.3 b	20.7 a	1.7 a	11.7 ab	20.0 ab	0.13 a
7. DPX-EY059 5%EC	4.0 oz	21 Apr, 13 May, 14 Jun 4 Aug.....	9.3 a	59.7 b	17.3 a	0.0 a	3.3 ab	30.7 ab	0.3 a	11.7 ab	10.3 a	0.25 a
8. EF-667 .4EC	4.8 oz	13 May, 29 May, 14 Jun, 1 Jul, 17 Jul, 4 Aug, 18 Aug.....	4.3 a	55.7 b	14.7 a	0.0 a	0.7 a	66.7 b	0.3 a	8.7 a	5.7 a	0.09 a
9. EF-667 .4EC + Lorsban 50WP	2.4 oz 6.0 oz	13 May, 29 May, 14 Jun, 1 Jul, 17 Jul, 4 Aug, 18 Aug.....	12.7 a	7.0 a	4.7 a	0.0 a	0.0 a	0.3 a	0.0 a	4.3 a	73.0 cd	0.76 b
10. Fenoxycarb 25WP	2.1 oz	21 Apr, 13 May, 29 May, 14 Jun, 1 Jul, 17 Jul, 4 Aug, 18 Aug.....	8.3 a	49.3 b	9.7 a	1.0 a	0.0 a	2.7 a	0.3 a	10.0 ab	34.0 b	0.24 a
11. Guthion 50WP	8.0 oz	21 Apr, 13 May, 29 May, 14 Jun, 30 Jun, 17 Jul, 4 Aug, 18 Aug.....	7.3 a	2.0 a	7.0 a	0.0 a	0.0 a	0.0 a	0.0 a	0.0 a	84.0 cd	0.18 a
12. Check.....			8.0 a	66.7 b	12.7 a	3.3 a	24.3 c	3.0 a	8.7 b	32.7 c	3.7 a	0.20 a

Treatment means followed by the same letter are not significantly different ($p \leq 0.05$; DMRT).
 * 0 = best, 3 = worst.

Mite counts (cont.)

Mean number of mites* or eggs/leaf**

Treatment	29 Jun										14 Jul									
	ERM	ERME	TSM	TSME	ARM	ZM	ZME	ERM	ERME	TSM	TSME	ARM	AMB	ZM	ZME					
1.....	1.3a	29.0a	0.1a	8.8a	206.0a	0.0a	0.0a	11.6a	29.4c	0.2a	8.3b	235.0ab	0.07a	0.0a	0.0a					
2.....	0.6a	0.9a	0.0a	0.2a	86.0a	0.0a	0.0a	0.2a	3.0ab	0.1a	1.5a	375.0bc	0.07a	0.0a	0.0a					
3.....	0.0a	1.0a	0.0a	0.1a	86.0a	0.0a	0.0a	0.8a	2.1a	0.0a	0.7a	428.0bc	0.00a	0.0a	0.0a					
4.....	0.1a	0.2a	0.0a	0.0a	277.0a	0.0a	0.0a	1.1a	0.8a	2.7a	0.9a	536.0c	0.01a	0.2a	0.2a					
5.....	0.4a	4.1a	0.0a	1.0a	65.0a	0.0a	0.0a	1.0a	4.1ab	0.1a	2.7a	89.0a	0.01a	0.0a	0.0a					
6.....	0.1a	0.6a	0.0a	0.1a	64.0a	0.0a	0.0a	0.2a	2.9ab	0.0a	1.4a	62.0a	0.00a	0.0a	0.0a					
7.....	0.0a	0.7a	0.0a	0.1a	24.0a	0.0a	0.0a	0.2a	3.3ab	0.0a	1.3a	19.0a	0.01a	0.0a	0.0a					
8.....	12.9a	70.1a	0.2a	13.6a	26.0a	0.1a	0.1a	59.7a	20.7bc	0.0a	0.2a	44.0a	0.04a	0.7a	0.2a					
9.....	2.4a	20.0a	0.1a	3.6a	25.0a	0.3ab	1.4a	16.8a	6.1ab	0.0a	0.3a	43.0a	0.03a	1.1a	0.9a					
10.....	1.8a	6.4a	0.0a	0.5a	137.0a	0.1a	0.2a	2.2a	4.0ab	0.0a	0.2a	211.0ab	0.00a	0.7a	1.5a					
11.....	28.4a	50.7a	0.1a	2.3a	18.0a	0.3ab	0.6a	31.6a	2.7ab	0.0a	0.0a	79.0a	0.00a	0.9a	1.3a					
12.....	0.0a	0.1a	0.0a	0.1a	175.0a	0.7b	1.2a	0.0a	0.4a	0.1a	0.4a	21.0a	0.00a	0.7a	1.9a					

Treatment	28 Jul										12 Aug									
	ERM	ERME	TSM	TSME	ARM	AMB	AMBE	ZM	ZME	ERM	ERME	TSM	TSME	ARM	AMB	AMBE	ZM	ZME		
1.....	2.7a	16.7cd	0.2a	1.9a	91.0a	0.08a	0.03a	0.1a	0.0a	0.1a	0.9a	0.1a	0.0a	64.8a	0.01a	0.01a	0.1a	0.0a		
2.....	5.4a	14.4bc	1.0a	1.0a	300.0b	0.08a	0.00a	0.0a	0.1a	0.4a	1.5a	1.3b	2.2a	66.5a	0.03a	0.00a	0.1a	0.0a		
3.....	5.9a	26.8d	1.1a	3.8a	326.0b	0.01a	0.00a	0.1a	0.1a	0.3a	1.1a	0.3a	0.4a	44.8a	0.01a	0.00a	0.4a	0.2a		
4.....	1.0a	8.3abc	0.5a	1.3a	105.0a	0.00a	0.00a	1.3a	1.0a	0.4a	0.9a	0.1a	0.2a	25.6a	0.03a	0.00a	1.3a	0.9a		
5.....	2.3a	6.7abc	0.2a	0.4a	100.0a	0.11a	0.00a	0.0a	0.0a	0.1a	0.1a	0.0a	0.0a	10.1a	0.03a	0.00a	0.0a	0.0a		
6.....	0.8a	3.6abc	0.1a	0.1a	63.0a	0.01a	0.00a	0.0a	0.0a	0.2a	0.8a	0.0a	0.1a	7.1a	0.04a	0.00a	0.1a	0.0a		
7.....	1.0a	2.3ab	0.0a	0.4a	24.0a	0.05a	0.00a	0.0a	0.0a	0.1a	0.4a	0.0a	0.0a	8.0a	0.07a	0.00a	0.0a	0.0a		
8.....	3.9a	13.8abc	0.3a	0.9a	54.0a	0.19a	0.00a	0.2a	0.1a	0.0a	1.8a	0.0a	0.0a	9.7a	0.08a	0.00a	1.3a	0.4a		
9.....	0.5a	6.7abc	0.0a	0.4a	14.4a	0.16a	0.01a	0.9a	1.6a	0.0a	2.3a	0.0a	0.0a	5.8a	0.00a	0.00a	0.8a	0.2a		
10.....	0.3a	2.1ab	0.0a	0.0a	67.0a	0.00a	0.00a	1.4a	0.7a	0.0a	0.1a	5.0a	0.04a	0.00a	0.00a	1.2a	0.5a	0.2a		
11.....	0.0a	2.8ab	0.0a	0.1a	24.0a	0.08a	0.00a	1.1a	0.8a	0.0a	1.7a	4.3a	0.00a	0.00a	0.00a	0.8a	0.2a	0.2a		
12.....	0.0a	0.4a	0.0a	0.0a	24.0a	0.00a	0.00a	1.1a	1.7a	0.0a	0.1a	8.6a	0.01aa	0.00a	0.00a	0.8a	0.4a	0.4a		

Treatment means followed by the same letter are not significantly different ($p \leq 0.05$; DMRT).

* ERM = European red mite, ERME = ERM eggs, TSM = Twospotted spider mite, TSME = TSM eggs, ARM = Apple rust mite, AMB = *Amblyseius fallacis*, AMBE = AMB eggs, ZM = *Zetzellia mali*.

** Based on 25 leaves/ tree, from one Red Delicious tree in each of three replicates/ treatment.

Treatment	Rate form. /100 gal.	Application Date	Mean number of mites* or eggs/leaf**												
			11 May				27 May				11 JUN				
			ERM	ERME	ZM	ZME	ERM	ERME	ZM	ERM	ERME	TSM	TSME	ZM	ZME
1. Pounce 3.2EC Brigade 10WP Imidan 50WP	1.5 oz 3.2 oz 16.0 oz	21 Apr 13 May, 29 May 14 Jun, 30 Jun, 17 Jul, 4 Aug, 18 Aug	0.2 a	0.0 a	0.1 a	0.0 a	0.0 a	1.0 a	0.0 a	1.7 a	5.5 a	0.0 a	0.0 a	0.0 a	0.0 a
2. Daniel 2.4EC Guthion 50WP	4.0 oz 8.0 oz	21 Apr, 13 May, 14 Jun, 4 Aug 29 May, 30 Jun, 17 Jul, 18 Aug	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	0.0 a	0.0 a	0.0 a	0.0 a
3. Daniel 2.4EC Guthion 50WP	5.3 oz 8.0 oz	21 Apr, 13 May, 14 Jun, 4 Aug 29 May, 30 Jun, 17 Jul, 18 Aug	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	0.0 a	0.0 a	0.0 a	0.0 a
4. Daniel 2.4EC + Superior Oil 6EC Guthion 50WP	10.0 oz 32.0 oz 8.0 oz	13 May 6 Jun, 30 Jun, 17 Jul, 4 Aug, 18 Aug	0.4 a	0.0 a	0.1 a	0.0 a	0.0 a	0.0 a	0.0 a	0.0 a	0.1 a	0.0 a	0.0 a	0.0 a	0.0 a
5. DPX-EY059 5%EC	1.0 oz	21 Apr, 13 May, 14 Jun, 4 Aug	0.0 a	0.0 a	0.1 a	0.0 a	0.0 a	0.2 a	0.1 a	0.1 a	0.2 a	0.0 a	0.0 a	0.0 a	0.0 a
6. DPX-EY059 5%EC	2.0 oz	21 Apr, 13 May, 14 Jun, 4 Aug	0.0 a	0.0 a	0.2 a	0.1 a	0.0 a	0.0 a	0.0 a	0.0 a	0.2 a	0.0 a	0.0 a	0.0 a	0.0 a
7. DPX-EY059 5%EC	4.0 oz	21 Apr, 13 May, 14 Jun 4 Aug	0.0 a	0.0 a	0.1 a	0.0 a	0.0 a	0.0 a	0.0 a	0.0 a	0.1 a	0.0 a	0.0 a	0.0 a	0.1 a
8. EF-667 .4EC	4.8 oz	13 May, 29 May, 14 Jun, 1 Jul, 17 Jul, 4 Aug, 18 Aug	0.3 a	0.0 a	0.0 a	0.0 a	0.1 a	2.0 a	0.0 a	3.6 a	10.6 a	0.0 a	0.0 a	0.0 a	0.0 a
9. EF-667 .4EC + Lorsban 50WP	2.4 oz 6.0 oz	13 May, 29 May, 14 Jun, 1 Jul, 17 Jul, 4 Aug, 18 Aug	0.6 a	0.3 a	0.1 a	0.0 a	0.1 a	2.3 a	0.0 a	1.6 a	10.5 a	0.1 a	0.1 a	0.1 a	0.7 a
10. Fenoxycarb 25WP	2.1 oz	21 Apr, 13 May, 29 May, 14 Jun, 1 Jul, 17 Jul, 4 Aug, 18 Aug	0.1 a	0.0 a	0.1 a	0.0 a	0.0 a	0.5 a	0.0 a	0.3 a	0.2 a	0.0 a	0.0 a	0.0 a	0.0 a
11. Guthion 50WP	8.0 oz	21 Apr, 13 May, 29 May, 14 Jun, 30 Jun, 17 Jul, 4 Aug, 18 Aug	0.1 a	0.1 a	0.2 a	0.0 a	0.0 a	0.9 a	0.0 a	2.8 a	13.4 a	0.0 a	0.0 a	0.2 ab	1.2 a
12. Check			0.1 a	0.0 a	0.8 b	0.4 b	0.0 a	0.0 a	0.1 a	0.1 a	0.4 a	0.0 a	0.0 a	0.4 b	0.1 a

Treatment means followed by the same letter are not significantly different ($p \leq 0.05$; DMRT).

* ERM= European red mite, ERME= ERM eggs, TSM= Twospotted spider mite, TSM= TSM eggs, ARM= Apple rust mite, AMB= *Amblyseius fallacis*, AMBE= AMB eggs, ZM= *Zetzellia mali*, ZME= *Zetzellia mali*.

** Based on 25 leaves/ tree, from one Red Delicious tree in each of three replicates/ treatment.

APPLE: *Malus domestica*

Apple rust mite: *Aculus schlechtendali* (Nalepa)

A predatory phytoseid: *Amblyseius fallacis* (Garman)

European red mite: *Panonychus ulmi* (Koch)

Twospotted spider mite: *Tetranychus urticae* Koch

A predatory stigmaeid: *Zetzellia mali* (Ewing)

Apple maggot: *Rhagoletis pomonella* (Walsh)

European apple sawfly: *Hoplocampa testudinea* (Klug)

Green fruitworm: *Lithophane antennata* (Walker)

Lesser appleworm: *Grapholita prunivora* (Walsh)

Plum curculio: *Conotrachelus nenuphar* (Herbst)

San Jose scale: *Quadraspidiotus perniciosus* (Comstock)

Tarnished plant bug: *Lygus lineolaris* (P. de B.)

Variegated leafroller: *Platynota flavedana* Clemens

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Highland, New York, 12528

APPLE, MITE AND INSECT CONTROL, MITICIDE BLOCK, HUDSON VALLEY LAB, HIGHLAND, NY, 1987: Treatments were applied to eight tree plots replicated three times in a randomized complete block design. All treatments were applied dilute to runoff using a high-pressure handgun sprayer at 400 psi delivering from 3.8 to 4.2 gal spray/tree or 364 to 403 gal/acre. Trees were 23 years-old, 10 ft high, spaced 15 by 30 ft, and on the EMII rootstock. Three different Guthion formulations were compared in applications commencing at Petal Fall, 16 May, and continuing in cover sprays on 7 Jun, 30 Jun, 17 Jul, 4 Aug, and 18 Aug. Guthion 50W at Petal Fall followed by a Guthion plus Sevin combination applied in the forementioned cover sprays was also tested, as was a Morestan plus Guthion treatment applied at Petal Fall. The Morestan plus Guthion and the Guthion plus Sevin treatments were also treated with Apollo on 13 Jul, while the Guthion 50W and the Guthion 35W treatments received 24 Jun and 13 Jul applications of Plictran or PV870114-2A. The ABG-6162A treatments were applied at two different rates at Pink, 21 Apr, or at Pink and Petal Fall. The RH-3486 treatments were applied 24 Jun at three different rates. All ABG-6162A and RH-3486 treatments received a Petal Fall application of Sevin on 16 May. Additional materials applied over the entire block for disease control included: Dithane M-45 80W 4.5 lb/acre, 27 Apr; Rubigan 1E 9 oz plus Dithane M-45 80W 3.0 lb/acre, 7 May; Rubigan 1E 6 oz plus Dithane M-45 80W 3.0 lb/acre, 14 May, 23 May; Captan 50W 5.0 lb plus Bayleton 50W 3.0 oz/acre, 4 Jun; and Dithane M-45 80W 4.0 lb/acre, 1 Jul. Naphthaleneacetic acid was applied in thinning sprays on 23 May using from 0 to 10 ppm depending upon the cultivar. Mite populations were evaluated by sampling 25 leaves from one "Red Delicious" tree/plot at biweekly intervals throughout the summer. The leaves were brought into the laboratory where they were brushed with a mite brushing machine, and the mites and eggs examined and counted using a binocular scope. Insect damage to the fruit was assessed at harvest by examining 100 fruits/plot from the "Golden Delicious" cultivar on 2 Oct. Fruit finish was also evaluated on this cultivar using a russet rating from 0 (best finish) to 3 (worst finish) and grading each fruit. An early Spring resulted in an early and prolonged bloom period. Rainfall was above average during the months of Apr, Jul, and Sep, but below average during May and Jun, while temperatures were generally normal for the area.

The ABG-6162A treatments provided good mite control at all the rates and timings tested. The RH-3486 treatments applied after mite populations were established all provided excellent spider mite control while allowing for the later build-up of apple rust mite and predatory *Zetzellia mali* populations. The PV870114-2A formulation was more effective than the Plictran 50W formulation it was compared with. The postbloom Morestan application provided mite suppression until mid-Jun. The Apollo applications applied in mid-Jul were very effective in reducing spider mite populations. The single Sevin insecticide application was quite effective in reducing Plum curculio damage when compared with that found in the check. Likewise the seasonal Guthion or Guthion/Sevin applications provided commercially acceptable fruit. Comparing San Jose scale populations in the Check and ABG-6162A treatments with those in the RH-3486 treatments indicated that the RH-3486 treatments may have had some scale activity which should be investigated further. Fruit finish was notably poorer in plots treated with Guthion 50W/Plictran 50W and those treated with the highest rate of RH-3486.

Mite counts, West block, cont.

Mean no. of mites* or eggs/leaf**																
Treatment	4 July							22 July								
	ERM	ERME	TSM	ISME	ARM	AMB	ZM	ZME	ERM	ERME	TSM	ISME	ARM	AMB	ZM	ZME
1.....	1.9 a	5.4 ab	0.3 a	1.0 ab	32.3 ab	0.00 a	2.8 c	0.4 a.....	0.1 a	0.4 a	0.0 a	0.1 a	15.3 ab	0.04 a	1.7 b	1.1 b
2.....	4.5 a	5.8 ab	2.3 a	0.6 ab	9.0 a	0.05 a	0.0 a	0.0 a.....	1.3 a	1.0 ab	0.1 a	0.1 a	24.1 ab	0.05 a	0.0 a	0.0 a
3.....	0.6 a	1.2 a	0.1 a	0.1 a	4.3 a	0.00 a	0.0 a	0.0 a.....	0.9 a	0.8 ab	0.1 a	0.2 ab	5.2 a	0.01 a	0.0 a	0.0 a
4.....	0.8 a	5.5 ab	5.0 a	2.1 abc	65.5 b	0.04 a	0.0 a	0.0 a.....	0.4 a	1.8 ab	0.2 a	0.5 ab	33.2 ab	0.11 a	0.0 a	0.1 a
5.....	1.8 a	3.1 ab	0.6 a	0.3 a	5.0 a	0.07 a	0.3 ab	0.1 a.....	0.5 a	1.5 ab	0.6 a	0.5 ab	9.7 a	0.04 a	0.5 a	0.3 a
6.....	1.1 a	23.1 b	0.6 a	3.1 bc	9.7 a	0.04 a	0.0 a	0.0 a.....	4.7 a	6.9 c	0.6 a	0.9 b	75.8 bc	0.05 a	0.1 a	0.1 a
7.....	0.3 a	5.6 ab	0.8 a	0.9 ab	15.1 a	0.00 a	0.0 a	0.0 a.....	0.4 a	1.7 ab	0.1 a	0.7 ab	94.5 c	0.03 a	0.1 a	0.0 a
8.....	17.5 b	96.2 c	1.5 a	3.0 bc	0.0 a	0.01 a	0.0 a	0.0 a.....	1.8 a	22.9 d	0.5 a	2.6 c	0.0 a	0.05 a	0.0 a	0.0 a
9.....	1.4 a	20.9 ab	0.9 a	3.5 c	1.1 a	0.19 a	0.1 ab	0.1 a.....	0.9 a	3.9 bc	0.1 a	0.2 ab	41.3 abc	0.04 a	0.2 a	0.2 a
10.....	1.4 a	3.9 ab	1.9 a	0.7 ab	1.3 a	0.04 a	0.1 ab	0.0 a.....	0.5 a	1.4 ab	0.2 a	0.2 ab	25.4 ab	0.03 a	0.1 a	0.1 a
11.....	0.8 a	5.9 ab	0.3 a	0.6 ab	1.5 a	0.03 a	0.0 a	0.0 a.....	0.7 a	1.0 ab	1.1 a	0.3 ab	24.5 ab	0.04 a	0.0 a	0.1 a
12.....	0.7 a	4.3 ab	0.2 a	0.8 ab	30.4 ab	0.00 a	0.7 b	0.1 a.....	0.5 a	1.4 ab	0.1 a	0.2 ab	10.3 a	0.00 a	1.2 b	0.5 a

Treatment	10 August						
	ERM	ERME	ARM	AMB	ZM	ZME	
1.....	0.0 a	0.3 a	13.1 ab	0.00 a	0.7 a	0.1 a	
2.....	0.1 a	0.5 a	12.7 ab	0.03 a	0.0 a	0.0 a	
3.....	1.2 b	2.8 a	14.4 ab	0.01 a	0.0 a	0.0 a	
4.....	0.0 a	0.2 a	20.3 ab	0.00 a	0.0 a	0.0 a	
5.....	0.1 a	2.1 a	70.0 abc	0.00 a	0.4 a	0.1 a	
6.....	0.1 a	1.0 a	124.7 bc	0.01 a	0.4 a	0.7 a	
7.....	0.1 a	1.0 a	109.4 abc	0.07 a	0.2 a	0.1 a	
8.....	0.1 a	29.9 b	1.1 a	0.04 a	0.0 a	0.0 a	
9.....	0.1 a	1.0 a	154.2 c	0.03 a	0.6 a	0.7 a	
10.....	0.1 a	1.2 a	122.3 bc	0.01 a	0.3 a	0.3 a	
11.....	0.2 a	1.8 a	104.0 abc	0.01 a	0.3 a	0.3 a	
12.....	0.0 a	0.3 a	19.6 ab	0.01 a	0.6 a	0.2 a	

Treatment means followed by the same letter are not significantly different ($p \leq 0.05$; DMRTT).

*Treatment means followed by the same letter are not significantly different ($p \leq 0.05$; DMRT).

ERM = European red mite, ERME = ERM eggs, TSM = Twospotted spider mite, ISME = TSM eggs, ARM = Apple rust mite, AMB = Amblyseius fallacis, AMBE = AMB eggs, ZM = Zeizellia mali.

**Based on 25 leaves/tree, from one Red Delicious tree in each of three replicates/treatment.

Treatment	Rate form. /100 gal.	Application Date	Mean no. of miles* or eggs/ leaf**													
			ERM	ERME	ISME	ARM	ZM	ZME	ERM	ERME	TSM	ISME	AMB	AMBE	ZM	ZME
1. Guthion 3F	10.7 oz	16 May, 7 Jun, 30 Jun, 17 Jul, 4 Aug, 18 Aug	0.6 a	1.1 a	0.0 a	0.0 a	0.4 a	0.1 a	3.5 ab	13.2 ab	0.0 a	0.0 a	0.05 a	0.19 a	0.7 a	0.3 a
2. Guthion 50WP	8.0 oz	16 May, 7 Jun, 30 Jun, 17 Jul, 4 Aug, 18 Aug	4.2 a	9.5 a	0.0 a	0.0 a	0.0 a	0.0 a	24.9 c	98.5 c	1.9 a	0.0 a	0.03 a	0.19 a	0.2 a	0.0 a
3. Guthion 35WP	8.0 oz	16 May, 7 Jun, 30 Jun, 17 Jul 4 Aug, 18 Aug	4.8 a	6.6 a	0.0 a	5.6 a	0.1 a	0.0 a	16.9 bc	45.3 b	0.2 a	0.0 a	0.00 a	0.00 a	0.1 a	0.0 a
4. Morestan 25WP + Guthion 50WP Apollo 50 SC	8.0 oz 8.0 oz 0.5 oz	16 May 13 Jul	0.3 a	0.9 a	0.0 a	14.2 a	0.0 a	0.0 a	2.3 a	7.5 ab	2.5 a	0.1 a	0.05 a	0.13 a	0.0 a	0.0 a
5. ABG-6162A .14F Sewin 50WP	32.0 oz 32.0 oz	21 Apr 16 May	0.0 a	0.0 a	0.0 a	0.0 a	0.2 a	0.0 a	0.1 a	0.9 a	0.0 a	0.1 a	0.01 a	0.00 a	0.0 a	0.1 a
6. ABG-6162A .14F Sewin 50WP	48.0 oz 32.0 oz	21 Apr 16 May	0.1 a	0.2 a	0.0 a	0.0 a	0.1 a	0.0 a	0.5 a	6.2 ab	0.9 a	0.3 a	0.03 a	0.00 a	0.0 a	0.0 a
7. ABG-6162A .14F Sewin 50WP	32.0 oz 32.0 oz	21 Apr, 16 May 16 May	0.1 a	0.0 a	0.0 a	0.0 a	0.1 a	0.0 a	0.2 a	1.1 a	0.1 a	0.0 a	0.00 a	0.00 a	0.0 a	0.0 a
8. Guthion 50WP Sewin 50WP + Guthion 50WP Apollo 50SE	8.0 oz 16.0 oz 4.0 oz 1.0 oz	16 May 7 Jun, 24 Jun, 30 Jun, 13 Jul, 17 Jul, 4 Aug, 18 Aug 13 Jul	2.9 a	6.3 a	0.1 b	0.0 a	0.0 a	0.0 a	5.1 ab	41.7 ab	0.2 a	0.0 a	0.00 a	0.00 a	0.0 a	0.1 a
9. Sewin 50WP RH-3486 50WP	8.0 oz 2.0 oz	16 May 24 Jun	0.3 a	0.8 a	0.0 a	0.0 a	0.0 a	0.0 a	1.9 a	20.2 ab	0.1 a	0.0 a	0.00 a	0.00 a	0.0 a	0.1 a
10. Sewin 50WP RH-3486 50WP	32.0 oz 4.0 oz	16 May 24 Jun	0.6 a	0.3 a	0.0 a	0.0 a	0.0 a	0.0 a	3.2 ab	13.1 ab	0.3 a	0.0 a	0.00 a	0.01 a	0.1 a	0.0 a
11. Sewin 50W P RH-3486 50WP	32.0 oz 8.0 oz	16 May 24 Jun	1.6 a	2.5 a	0.0 a	0.0 a	0.2 a	0.1 a	7.5 ab	34.5 ab	0.3 a	0.0 a	0.00 a	0.00 a	0.1 a	0.2 a
12. Check			1.0 a	0.7 a	0.0 a	0.0 a	0.4 a	0.0 a	4.5 ab	15.8 ab	0.1 a	0.0 a	0.00 a	0.00 a	0.5 a	0.2 a

Treatment means followed by the same letter are not significantly different ($p \leq 0.05$; DMRT).

*ERM = European red mite, ERME = ERM eggs, TSM = Twospotted spider mite, TSME = TSM eggs, ARM = Apple rust mite, AMB = *Amblyseius fallacis*, AMBE = AMB eggs, ZM = *Zetzellia mali*, ZME = *Zetzellia mali*.

** Based on 25 leaves/ tree, from one Red Delicious tree in each of three replicates/ treatment.

Treatment	Rate form. /1100 gal.	Application Date	% injured fruit (Golden Delicious)										% Clean fruit	Mean russet rating*/fruit
			Tarnished plant bug	Plum curculio	European apple sawfly	Green fruitworm	Lesser appleworm	San Jose scale	Variegated leafroller	Apple maggot				
1. Guthion 3F	10.7 oz	16 May, 7 Jun, 30 Jun, 17 Jul, 4 Aug, 18 Aug	9.0 abc	1.0 a	5.0 ab	0.0 a	0.0 a	0.3 a	0.0 a	0.0 a	85.3 cd	0.7 ab		
2. Guthion 50WP	8.0 oz	16 May, 7 Jun, 30 Jun, 17 Jul, 4 Aug, 18 Aug												
Plictran 50WP	4.0 oz	25 Jun, 13 Jul	7.7 abc	0.7 a	3.3 ab	0.0 a	0.0 a	1.0 a	0.0a	0.0 a	88.3 cd	1.3 c		
3. Guthion 35WP	8.0 oz	16 May, 7 Jun, 30 Jun, 17 Jul 4 Aug, 18 Aug												
PV870114-2A 50WP	4.0 oz	24 Jun, 13 Jul	9.3 abc	1.3 a	3.3 ab	0.0 a	0.0 a	0.3 a	0.0 a	0.3 a	85.3 cd	0.9 abc		
4. Moreslan 25WP + Guthion 50WP Apollo 50 SC	8.0 oz 8.0 oz 0.5 oz	16 May 13 Jul												
5. ABG-6162A .14F Sevin 50WP	32.0 oz 32.0 oz	21 Apr 16 May	13.0 c	7.7 ab	5.3 b	0.0 a	8.0 ab	12.7 a	3.0 b	8.0 a	52.0 b	0.8 abc		
6. ABG-6162A .14F Sevin 50WP	48.0 oz 32.0 oz	21 Apr 16 May	6.0 ab	11.0 ab	0.7 a	0.3 a	11.3 bc	13.7 a	2.0 ab	5.7 a	56.3 b	0.7 ab		
7. ABG-6162A .14F Sevin 50WP	32.0 oz 32.0 oz	21 Apr, 16 May 16 May	6.7 abc	11.3 ab	2.0 ab	0.0 a	13.3 bc	15.3 a	3.3 b	2.0 a	51.3 b	0.9 abc		
8. Guthion 50WP Sevin 50WP + Guthion 50WP Apollo 50SE	8.0 oz 16.0 oz 4.0 oz 1.0 oz	16 May 7 Jun, 24 Jun, 30 Jun, 13 Jul, 17 Jul, 4 Aug, 18 Aug 13 Jul	12.3 bc	26.3 b	3.3 ab	0.7 a	9.7 bc	6.3 a	1.3 ab	2.0 a	46.7 ab	0.6 a		
9. Sevin 50WP RH-3486 50WP	8.0 oz 2.0 oz	16 May 24 Jun	7.3 abc	0.3 b	1.7 ab	0.3 a	0.0 a	0.3 a	0.0 a	0.0 a	90.0 d	0.9 abc		
10. Sevin 50WP RH-3486 50WP	32.0 oz 4.0 oz	16 May 24 Jun	12.7 bc	13.7 ab	3.0 ab	0.0 a	10.7 bc	2.0 a	1.3 ab	5.3 a	58.3 b	0.5 a		
11. Sevin 50WP RH-3486 50WP	32.0 oz 8.0 oz	16 May 24 Jun	12.3 bc	22.7 b	1.3 ab	0.3 a	12.0 bc	1.0 a	3.0 b	5.0 a	49.7 b	0.8 abc		
12. Check			4.7 a	11.7 ab	0.7 a	0.0 a	12.7 bc	2.0 a	2.7 b	3.7 a	64.7 bc	1.2 bc		
Treatment means followed by the same letter do no differ significantly (p≤ 0.05; DMRT)			4.7 a	46.3 c	3.7 ab	0.7 a	18.3 c	14.0 a	3.0 b	8.0 a	25.0 a	0.8 abc		
0 = best, 3 = worst														

Treatment means followed by the same letter do no differ significantly ($p \leq 0.05$; DMRT)
 * 0 = best, 3 = worst

PEAR: *Pyrus communis*
Codling moth: *Laspeyresia pomonella* (L.)
Green fruitworm: *Lithophane antennata* (Walker)
Pear Psylla: *Psylla pyricola* Forester
Pear rust mite: *Epitimerus pyri* (Nalepa)
Plum curculio: *Conotrachelus nenuphar* (Herbst)
San Jose scale: *Quadraspidiotus perniciosus* (Comstock)
Spirea aphid: *Aphis citricola* Van der Goot
Tarnished plant bug: *Lygus lineolaris* (P. de B.)
Variegated leafroller: *Platynota flavedana* Clemens

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PEAR, PEAR INSECT AND MITE CONTROL, HUDSON VALLEY LAB, HIGHLAND, NEW YORK, 1987: Treatments were applied to 8 tree plots replicated 3 times in a randomized complete block design. Each plot contained 4 'Bartlett' and 4 'Bosc' cultivars, spaced 12 x 18 ft., 12 ft. in height and 13 years old. Treatments were applied by high-pressure handgun sprayer dilute to runoff at 350 psi using from 1.9 to 2.9 gal/tree (380 to 583 gal/acre, dependant upon time of season and leaf canopy present). Treatments were applied at white bud, 20 Apr, petal fall, 8 May, and in cover sprays on 23 May, 7 Jun, 24 Jun, 13 Jul, and 7 Aug. An additional application over the entire block for fire blight control consisted of Agri-Strep, 8 oz/100 gal, 13 May. Applications were made for *Fabraea* leafspot control on 11 Jun and 1 Jul. Each replicate was treated with a separate fungicide at these applications and fungicidal activity was evaluated. One replicate received Manzate 200 80W 1.5 lb/100 gal, another Captan 50W 2 lb/100 gal, and the third Benlate 50W 2.0 oz/100 gal plus Manzate 200 80W 1.5 lb/100 gal. Pear psylla were evaluated by collecting 5 Bartlett spurs (25 leaves) from each plot on 7 May, 18 May and 4 Jun, and thereafter 5 Bartlett shoots (25 leaves) from each plot on 15 Jun, 3 Jul, 20 Jul, 4 Aug, and 13 Aug. All live nymphs and eggs on each leaf were counted in the laboratory using a binocular scope. Mite populations were assessed by examining 5 Bartlett leaves per plot from the 20 Jul pear psylla sample. These leaves were viewed with the aid of a binocular scope and all live mites counted. Insect injury was evaluated by examining 50 Bartlett fruits per plot which were harvested on 4 Sep. Fruit finish and *Fabraea* leafspot were also evaluated on the Bartlett fruit using the following indices: for *Fabraea*, No *Fabraea* = 0, 1-25% = 1, > 25% = 2; for finish, 0-10% russet = 0, 10-40% = 1, 40-75% = 2, > 75% = 3. Rainfall during the months of May and June was less than normal while during April and July rainfall was above normal. April and July temperatures were above normal whereas temperatures in May and June were below normal. Pest pressure, especially pear psylla and pear rust mite, was greater than usual due to the early onset of warm weather in the spring.

Applications of the pyrethroids Danitol or Asana greatly reduced fruit injury from the plum curculio, tarnished plant bug and green fruitworm. All treatments controlled codling moth, while a small amount of San Jose scale and/or variegated leafroller infested fruit was found in most treatments. Danitol treatments provided immediate but not especially long-lasting control of pear psylla and the spirea aphid. Danitol did not control the pear rust mite whereas the other treatments did. Control of the spirea aphid was most effective with abamectin plus oil applications. A rate response (higher the rate, more effective the control) was found with pear psylla and spirea aphid control with abamectin. The Zolone plus Sevin combination looked good initially against pear psylla. Summer treatments which utilized Mitac alone or in combination were also very effective for pear psylla control. *Fabraea* leafspot infested fruit was greater in plots which had highest pear psylla and pear rust mite populations. The severity of russeted fruit was highest in the Danitol plots where pear rust mite populations were not controlled. A small percentage of the fruit in the treatment where the highest rate of abamectin plus oil was applied, showed small russet rings. These were similar to injury resulting from poor drying conditions and has been observed previously with Mitac and Dimilin plus oil.

Treatment	Rate form. /100 gal.	Application Dates	Mean number Pear psylla nymphs or eggs/ 5 spurs (shoots)							
			7 May		18 May		4 Jun		15 Jun	
			Nymphs	Eggs	Nymphs	Eggs	Nymphs	Eggs	Nymph	Egg
1. Danitol 2.4EC	5.3 oz	20 Apr, 8 May, 23 May, 7 Jun, 24 Jun, 13 Jul.....	14.3 a	129.7 a.....	34.7 ab	8.7 a.....	0.0 a	213.0 a.....	40.0 a	373.3 a
2. Danitol 2.4EC	5.3 oz	20 Apr, 8 May, 7 Jun, 13 Jul.....	12.0 a	119.7 a.....	27.0 ab	7.0 a.....	534.3 a	1300.0 ab.....	40.0 a	373.3 a
3. Danitol 2.4EC + Superior Oil 6EC Guthion 50WP Mitac 50 WP	10.0 oz 32.0 oz 8.0 oz 12.0 oz	8 May 23 May, 7 Jun, 24 Jun, 7 Aug 13 Jul.....	45.7 a	192.0 a.....	41.3 abc	7.0 a.....	44.0 a	1208.3 ab.....	119.3 a	2887.3 b
4. Abamectin .15EC + Superior Oil 6EC	1.1 oz 32.0 oz	8 May 7 Jun, 24 Jun, 13 Jul, 7 Aug.....	69.7 a	140.7 a.....	96.0 c	29.0 a.....	445.3 b	2507.3 b.....	134.7 a	692.7 a
5. Abamectin .15EC + Superior Oil 6EC	2.1 oz 32.0 oz	8 May 7 Jun, 24 Jun, 13 Jul, 7 Aug.....	60.7 a	167.3 a.....	83.3 bc	15.3 a.....	368.7 ab	1646.7 ab.....	56.7 a	283.3 a
6. Abamectin .15EC + Superior Oil 6EC	5.3 oz 32.0 oz	8 May 7 Jun, 24 Jun, 13 Jul, 7 Aug.....	46.3 a	159.3 a.....	81.7 bc	17.7 a.....	190.0 ab	1401.0 ab.....	45.3 a	358.0 a
7. Asana 1.9EC Zolone 3EC + Sevin 50WP Zolone 3EC + Mitac 50WP	1.5 oz 16.0 oz 16.0 oz 16.0 oz 16.0 oz	20 Apr 8 May 7 Jun, 24 Jun, 13 Jul, 7 Aug.....	46.7 a	282.7 a.....	5.7 a	9.7 a.....	141.7 ab	2726.3 bc.....	48.0 a	975.0 a
8. Check.....			87.3 a	214.3 a.....	176.0 d	17.0 a.....	1477.3 c	4203.0 c.....	350.0 b	956.7 c

Treatment	Mean number Pear psylla nymphs or eggs/5 spurs (shoots)								Mean no. Pear rust mites/leaf		Mean no. infested terminals/5 Spirea aphid	
	3 Jul		20 Jul		4 Aug		13 Aug		20 Jul		Jul 3	
	Nymphs	Eggs	Nymphs	Eggs	Nymphs	Eggs	Nymphs	Eggs				
1.....	115.7 a	14.7 a.....	24.0 a	8.3 a.....	10.0 a	208.0 a.....	12.7 a	38.0 a.....	59.8.....		0.3 ab	
2.....	142.0 a	203.3 a.....	22.0 a	15.7 a.....	15.0 a	58.7 a.....	63.7 a	410.0 a.....	29.9.....		2.0 c	
3.....	921.3 b	1739.0 b.....	44.7 a	56.3 a.....	3.3 a	65.0 a.....	5.0 a	170.0 a.....	2.7.....		3.3 d	
4.....	42.3 a	17.3 a.....	13.0 a	22.7 a.....	11.7 a	119.0 a.....	44.3 a	49.7 a.....	0.0.....		1.0 abc	
5.....	15.0 a	9.7 a.....	17.3 a	6.7 a.....	10.7 a	100.0 a.....	28.0 a	30.7 a.....	0.0.....		0.0 a	
6.....	20.0 a	16.7 a.....	17.3 a	23.0 a.....	13.7 a	36.0 a.....	2.0 a	22.7 a.....	0.1.....		0.0 a	
7.....	137.0 a	47.3 a.....	23.0 a	30.0 a.....	4.0 a	76.7 a.....	4.3 a	73.7 a.....	0.0.....		1.7 c	
8.....	88.0 a	72.7 a.....	10.7 a	48.3 a.....	13.7 a	181.3 a.....	38.7 a	46.7 a.....	29.8.....		1.3 bc	

Treatment means followed by the same letter are not significantly different ($p \leq 0.05$; DMRT).

Treatment means followed by the same letter are not significantly different ($p \leq 0.05$; DMRT).

Treatment	Rate form. /100 gal.	Application Dates	% injured fruit							Mean fabraea rating*/fruit	Mean Russet rating**/fruit
			Plum curculio	Codling moth	Tarnished plant bug	Green fruitworm	Variegated leafroller	San Jose scale	% Clean fruit		
1. Dantrol 2.4EC	5.3 oz	20 Apr, 8 May, 23 May, 7 Jun, 24 Jun, 13 Jul.....	4.3 a	0.0 a	1.3 a	0.0 a	0.7 a	0.7 a	86.7 c	0.61 a	1.66 a
2. Dantrol 2.4EC	5.3 oz	20 Apr, 8 May, 7 Jun, 13 Jul.....	3.3 a	0.0 a	1.0 a	0.0 a	0.0 a	0.0 a	91.3 c	0.12 a	2.11 a
3. Dantrol 2.4EC + Superior Oil 6EC Guthion 50WP Miac 50 WP	10.0 oz 32.0 oz 8.0 oz 12.0 oz	8 May 23 May, 7 Jun, 24 Jun, 7 Aug 13 Jul.....	3.7 a	0.0 a	1.3 a	0.0 a	0.3 a	0.3 a	88.7 c	0.09 a	1.33 a
4. Abamectin .15EC + Superior Oil 6EC	1.1 oz 32.0 oz	8 May 7 Jun, 24 Jun, 13 Jul, 7 Aug.....	31.3 b	0.3 a	0.3 a	1.0 a	1.3 a	0.7 a	34.0 b	0.12 a	0.50 ab
5. Abamectin .15EC + Superior Oil 6EC	2.1 oz 32.0 oz	8 May 7 Jun, 24 Jun, 13 Jul, 7 Aug.....	35.0 c	0.3 a	2.3 a	1.3 a	1.0 a	0.3 a	22.7 a	0.05 a	0.19 abc
6. Abamectin .15EC + Superior Oil 6EC	5.3 oz 32.0 oz	8 May 7 Jun, 24 Jun, 13 Jul, 7 Aug.....	34.0 c	0.0 a	3.0 a	0.7 a	0.0 a	1.0 a	30.0 ab	0.05 a	0.11 abc
7. Asana 1.9EC Zolone 3EC + Sevin 50WP Zolone 3EC + Miac 50WP	1.5 oz 16.0 oz 16.0 oz 16.0 oz 16.0 oz	20 Apr 8 May 7 Jun, 24 Jun, 13 Jul, 7 Aug.....	5.3 a	0.0 a	0.7 a	0.0 a	0.7 a	0.0 a	86.7 c	0.33 a	0.09 bc
8. Check		7 Jun, 24 Jun, 13 Jul, 7 Aug.....	24.0 b	2.3 b	2.3 a	2.0 a	6.0 b	3.3 a	32.0 ab	0.25 a	0.93 c

Treatment means followed by the same letter are not significantly different ($p \leq 0.05$; DMRT).

* 0 = none, 1 = 1-25%, 2 = >25%.

**0=best, 3=worst.

APPLE: *Malus domestica*

European red mite: *Panonychus ulmi* (Koch)

Twospotted spider mite: *Tetranychus urticae* Koch

Phytoseid predator: *Amblyseius fallacis* (Garman)

Apple rust mite: *Aculus schlechtendali* (Nalepa)

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APPLE, MITE CONTROL, MODENA, NEW YORK, 1987: A ten acre block of 'Red Delicious' and 'Empire' apple cultivars on the M7a rootstock was divided into four unreplicated plots ranging in size from 1.9 to 3.7 acres. The trees had been planted in 1978, were spaced 15 by 22 ft and were approximately 12 ft in height. Twelve trees (.09 acre) in the Northwest corner of the block received no miticide treatments and were used as a check. All treatments were applied with a Swanson® airblast sprayer, delivering 100 gal/acre (4X), at a speed of 2.5 mph. Treatments, rates formulation/acre, and application dates included: Omite 6E 35 oz, 25 May, 18 Jun, 25 Jun; Kelthane 35W 6.4 lb, 25 May, Kelthane 4F 4.0 pt, 18 Jun, 25 Jun; Omite 30W 5.0 lb, 4 Aug; Omite 30W 5.0 lb, 25 May, 18 Jun, 25 Jun; Plictran 50W 1.3 lb, 25 May, Carzol 92SP 1.5 lb., 18 Jun, 25 Jun, Omite 30W 5.0 lb, 4 Aug. Additional sprays and their rates (formulation/acre) applied over the entire block included: Benlate 50W 6 oz, 4 Aug; Manzate 200 80W 4.4 lb, 16 Apr, 4 May, 16 May, 30 May, and 11 Jun; Manzate 200 80W 3.0 lb, 21 Apr, and 25 Jun; Pydrin 2.4E 10.6 oz, 21 Apr; Guthion 50W 1 1/2 lb, 16 May, 30 May, 11 Jun, 25 Jun, and 4 Aug; Captan 50W 4 lb, 14 Jul; Phosphamidon 8E 1/2 pt, 25 Jun; and Imidan 50W 3 lb, 14 Jul. On dates which coincide with miticide applications the forementioned materials were tank mixed with the miticides. Mite populations were evaluated at 1-2 week intervals throughout the season by collecting 25 leaves/tree from 4 Red Delicious trees/plot. These leaf samples were brought back to the laboratory where they were brushed with a mite brushing machine and all live mites and eggs counted with the aid of a binocular scope.

The Omite 6EC and 30W formulations gave slow but long lasting control of both European red mite and twospotted spider mite. Kelthane treatments gave initial knockdown but populations of the European red mite tended to return, while during July a twospotted spider mite population was also found increasing in the plot. Thus Omite was applied to the plot reducing both populations. Plictran was found to be initially ineffective, thus Carzol was substituted for it and gave moderate initial control. The European red mite population began increasing in the Carzol plot during late July and Omite was applied which prevented further buildup. Both the apple rust mite and predatory phytoseid, *Amblyseius fallacis*, were found in very low numbers, with the predator reaching a peak on the last sample date in the check long after complete bronzing of the leaves had taken place.

Mean number mites¹ or eggs/leaf²

Treatment	Rate per acre	Application Dates						
			ERM	ERME	TSM	ERM	ERME	ERM
1. Omite 6EC	35.0 oz	25 May, 18 Jun, 25 Jun.....	1.0 a	15.1 a	0.1 a.....	3.5 a	13.9 a.....	2.2 a
2. Kelthane 35WP	6.4 lb	25 May						13.2 a
Kelthane 4F	4.0 pt	18 Jun, 25 Jun,						
Omite 30WP	5.0 lb	4 Aug.....	4.1 a	43.4 ab	0.0 a.....	6.1 a	5.1 a.....	9.3 a
3. Omite 30WP	5.0 lb	25 May, 18 Jun, 25 Jun.....	2.9 a	25.0 a	0.0 a.....	5.6 a	10.6 a.....	6.9 a
4. Plictran 50WP	1.3 lb	25 May						22.6 a
Carzol 92SP	1.5 lb	18 Jun, 25 Jun						
Omite 30WP	5.0 lb	4 Aug.....	8.6 b	88.2 b	0.0 a.....	11.6 a	14.5 a.....	31.2 a
5. Check.....			1.2 a	28.2 a	0.1 a.....	50.0 b	20.4 a.....	18.0 a
								32.7 a
								10.9 a

Treatment	24 Jun			1 Jul			15 Jul		
	ERM	ERME	TSM	ERM	ERME	TSM	ERM	ERME	TSM
1.....	0.3 a	2.9 a	0.0 a	0.0 a	1.8 ab	0.0 a	0.2 a	2.2 a	0.0 a
2.....	1.0 a	39.5 c	0.4 a	0.1 a	10.8 bc	0.5 a	0.5 a	0.3 a	0.3 a
3.....	1.6 a	8.8 ab	0.0 a	0.0 a	4.6 ab	0.0 a	0.1 a	0.0 a	0.0 a
4.....	11.4 b	27.3 bc	0.0 a	0.0 a	1.1 a	0.0 a	0.0 a	0.0 a	0.0 a
5.....	24.8 c	32.8 c	0.1 a	0.0 a	11.1 b	13.1 c	0.3 a	1.1 a	0.0 a
									32.8 a
									31.6 b
									0.7 ab
									0.3 bc

Treatment	29 Jul			1 Aug			11 Aug		
	ERM	ERME	TSM	ERM	ERME	TSM	ERM	ERME	TSM
1.....	0.1 a	0.2 a	0.0 a	0.0 a	16.0 a	0.00 a.....	0.2 a	0.8 a	0.1 a
2.....	1.1 a	22.4 a	7.5 a	52.6 b	1.0 a	0.03 a.....	0.2 a	6.5 a	0.6 a
3.....	0.1 a	2.6 a	0.0 a	0.3 a	2.2 a	0.00 a.....	0.2 a	2.4 a	0.0 a
4.....	2.4 a	32.8 ab	0.5 a	1.4 a	0.7 a	0.00 a.....	1.2 b	8.4 a	0.4 a
5.....	18.3 b	60.3 b	3.1 a	1.8 a	0.0 a	0.00 a.....	0.3 a	3.6 a	0.1 a
									0.7 a
									0.1 a
									0.12 a

Treatment means followed by the same letter are not significantly different ($p < 0.05$; DMRT).

¹ ERM= European red mite, ERME= ERM eggs, TSM= Twospotted spider mite, TSME= TSM eggs, ARM= Apple rust mite, AMB= *Amblyseius fallacis*.
² Based on 25 Red Delicious leaves/ tree from four trees in each plot.

APPLE: *Malus domestica*
European red mite: *Panonychus ulmi* (Koch)
Twospotted spider mite: *Tetranychus urticae* Koch
Phytoseid predator: *Amblysieus fallacis* (Garman)
Apple rust mite: *Aculus schlechtendali* (Nalepa)

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APPLE, MITE CONTROL, CLINTONDALE, NEW YORK, 1987: This trial was set up to compare Savey treatments applied to different sized trees using tree-row-volume measurements to calculate rates. Two adjacent blocks of fruit were chosen. Block A consisted of 'Red Delicious', 'McIntosh', and 'Golden Delicious' cultivars, approximately 25-years-old, on the standard rootstock, spaced 18 by 36 ft, 19 ft in height, and 27 ft in width. Using the tree-row-volume formula this block required 435 gal of dilute spray per acre. Thus Savey applied at the rate of 2.5 oz per acre (based on standard trees requiring 400 gal of dilute spray) would be applied at the rate of 2.72 oz per acre to account for the increase in tree-row-volume. The block was divided into a row (0.57 acre) of untreated check trees, while Savey treatments were applied to two row unreplicated plots of from 0.36 to 0.42 acre in size. Block A treatments were applied 31 May by a truck-mounted Agtec sprayer delivering 85 gal of spray per acre at a speed of 2.0 mph. Block B consisted of the 'Stayman' cultivar, on the M7 rootstock, four-years-old, spaced 14 by 21 ft, 11 ft high, and 11 ft wide. This size tree required 176 gal spray per acre on a tree-row-volume basis, or 1.09 oz of Savey per acre to be equivalent to the standard 2.5 oz per acre. Two untreated check rows of 0.57 acres were used while three row, unreplicated plots of 0.32 acres each received the Savey treatments. Treatments were applied 31 May by the Agtec sprayer delivering 122 gal spray per acre at a speed of 1.6 mph. Additional sprays (with rate of formulation per acre) over the entire orchard included: Oil 6E 8 gal plus Lorsban 4E 1 qt, 10 Apr; Manzate 200 80W 4.5 lb, 11 Apr, and 16 Apr; Manzate 200 80W 2.4 lb, 22 Apr, 4 May, 14 May, 28 May, and 11 Jun; Benlate 50W 6.4 oz, 22 Apr, 4 May, 14 May, 28 May, 12 Aug, and 26 Aug; Guthion 50W 1.5 lb, 22 Apr, 14 May, 28 May, 11 Jun, 28 Jun, 9 Jul, 27 Jul, and 26 Aug; Phosphamidon 8E 6.4 oz, 28 Jun; Dimilin 2S 12 oz, 28 Jun; Captan 50W 4 lb, 28 Jun, 9 Jul, 27 Jul, and 2 lb, 26 Aug; Solubor 1.5 lb, 22 Apr, and 14 May; Epsom salts 20 lb, 11 Jun, and 28 Jun; Lannate 1.8L 6 pt, 9 Jul, and 3 pt, 26 Aug; PennCap 2M 2.3 qt, 12 Aug. Omite 6E 1 qt, was applied to the check plots in both blocks along with the 12 Aug application. Mite populations were evaluated at approximately 2 week intervals throughout the season by collecting 25 leaves/tree from 4 'Red Delicious' trees or 4 'Stayman' trees per plot. These leaf samples were brought back to the laboratory where they were brushed with a mite brushing machine and all live mites and eggs counted with the aid of a binocular scope.

The oil application provided excellent control into Jul, but by Aug the European red mite was quite abundant in the check plots. The Omite application controlled the mites in the check plots but might have also drifted onto the Savey plots in block A since counts had not built up in these plots by the 4 Sep sample. An alternate explanation for the lack of mite populations in the Savey block A plots would be that the Savey was still providing control of the mites in this plot over 100 days after the application. Mite populations were found in the block B plots on the 4 Sep date and there were differences between the high and low rate but not between the formulations at the same rate. The higher (2.5 oz per acre) rate had no twospotted spider mites present and approximately 1/4 the number of European red mites as compared to the lower (1.09 oz per acre) rate. The apple rust mite and predatory phytoseid mite were virtually nonexistent in the plots due primarily to the usage of carbamates or other chemicals which are toxic to these species.

BLOCK A¹

Treatment	Rate form. oz./acre	Application Date	Mean number of mites ² or eggs/leaf ³					
			ERM	ERME	ERM	ERME	ERM	ERME
1. Savey 50WP	1.63	31 May	0.0 a	0.2 a	0.0 a	0.4 a	0.1 a	0.0 a
2. Savey 50WP	2.72	31 May	0.1 a	0.1 a	0.0 a	0.1 a	0.1 a	0.0 a
3. Savey 50DF	2.72	31 May	0.1 a	0.1 a	0.0 a	0.5 a	0.0 a	0.0 a
4. Check			0.1 a	0.3 a	0.6 b	1.1 b	0.4 b	0.4 b

Treatment	Mean number of mites or eggs/leaf					
	ERM	ERME	TSM	TSME	ARM	AMB
1.....	0.0 a	0.2 a	0.0 a	0.0 a	0.7 a	0.00 a
2.....	0.0 a	0.9 a	0.0 a	0.0 a	0.1 a	0.00 a
3.....	0.0 a	0.8 a	0.0 a	0.1 a	0.4 a	0.00 a
4.....	1.2 b	22.4 b	0.2 b	7.6 b	0.0 a	0.01 a

Treatment means followed by the same letter are not significantly different ($p \leq 0.05$; DMRT).

¹ Treatments applied by Ag-Tech Sprayer using 85 gal. spray per acre (5.1x) on trees spaced 18 x 36 ft., 19 ft. high and 27 ft. wide (Tree Row Volume dilute base of 435 gal./acre).

² ERM= European red mite, ERME= ERM eggs, TSM= Twospotted spider mite, TSME= TSM eggs, ARM= Apple rust mite, AMB= *Amblyseius fallacis*.

³ Based on 25 leaves/ tree, from four Red Delicious trees/ plot.

APPLE: *Malus domestica*

Apple rust mite: *Aculus schlechtendali* (Nalepa)

European red mite: *Panonychus ulmi* (Koch)

a predatory stigmaeid: *Zetzellia mali* (Ewing)

a green fruitworm: *Orthosia hibisci* (Guenee)

Spotted tentiform leafminer: *Phyllonorycter blancardella* (Fabr.)

Tarnished plant bug: *Lygus lineolaris* (P. de B.)

Variegated leafroller: *Platynota flavedana* Clemens

White apple leafhopper: *Typhlocyba pomaria* McAtee

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APPLE, DANITOL EUP STUDY, MIDDLEHOPE AND NEW PALTZ, NEW YORK, 1987: Two sites were chosen with the major objective being to conduct wildlife studies. At each site a large portion of the orchard was treated with Danitol starting approximately 1 Jun and continuing on a 7 day schedule until the end of Jul. For our evaluations we compared trees in these blocks with those treated with the grower's standard program. All treatments were applied by airblast sprayer. Our evaluation of the mite population at each site was conducted on 6 Aug by sampling 25 leaves per tree from four 'Red Delicious' trees in each plot. Leaves were kept in plastic sacks and brought into the laboratory where they were brushed and counted using a binocular scope and mite brushing machine. Spotted tentiform leafminer populations were evaluated also on 6 Aug by counting the number of mines on all the leaves on 25 clusters (fruiting spurs) on six 'Red Delicious' trees per plot. A final fruit evaluation was made at harvest 23 Sep, by examining 100 fruits per tree from six 'Red Delicious' trees in each plot. Observations of mite and white apple leafhopper populations were also made on 23 Sep.

Conversations with the growers indicated that both had recently (within one week) applied a miticide to the standard blocks prior to our counts, thus this would explain the high egg counts but low nymph and adult counts found in these plots. The Danitol plots were virtually free of mites at this time and the foliage looked very good compared to the standard plots which had sustained rather high European red mite populations earlier. Leafminer counts were similar, and below the second brood threshold of two mines per leaf, in both grower standard plots, while in the Danitol plots the populations were even lower. Fruit injury at harvest was mainly due to tarnished plant bug, which would not have been affected by the Danitol sprays since they were applied after the damage had occurred. The green fruitworm injury may have also occurred prior to the application of the Danitol sprays. The variegated leafroller injury was a problem at the Middlehope site. The variegated leafrollers at this site are organophosphate resistant and thus were not controlled by the grower's standard program, whereas the Danitol appeared to provide excellent control. Observations made on the 23 Sep harvest date found that the Danitol had provided excellent control of the white apple leafhopper, which was a problem at both sites in the growers' standard plots. In addition it was also noted that the European red mite population had started to come back in the Danitol-treated blocks at both sites. Overwintering-egg oviposition in the calyx ends of the 'Red Delicious' apples appeared to be the greatest threat posed by this late-developing population.

Mite control, Clintondale blocks (Cont.)

BLOCK B¹

Treatment	Rate form. oz./acre	Application Date	Mean number of mites ² or eggs/leaf ³					
			ERM	1 Jun ERME	ERM	17 Jun ERME	ERM	10 Jul ISME
1. Savey 50WP	2.50	31 May	0.1 a	0.4 a	0.0 a	0.2 a	0.0 a	0.1 a
2. Savey 50WP	1.09	31 May	0.1 a	0.7 a	0.0 a	0.2 a	0.1 a	0.0 a
3. Savey 50DF	1.09	31 May	0.3 a	1.1 a	0.1 a	0.9 a	0.2 a	0.0 a
4. Check			0.1 a	0.2 a	0.0 a	0.3 a	0.5 a	0.1 a

Treatment	Mean number of mites or eggs/leaf					
	ERM	ERM	ERM	ERM	ERM	ERM
1.....	0.0 a	0.2 a	0.0 a	0.0 a	0.0 a	0.0 a
2.....	0.0 a	0.6 a	0.2 a	0.0 a	0.0 a	0.0 a
3.....	0.0 a	2.1 ab	0.2 a	1.3 a	0.7 a	1.6 a
4.....	0.2 b	4.3 b	0.2 a	0.0 a	4.3 b	8.4 b

¹ Treatment means followed by the same letter are not significantly different ($p \leq 0.05$; DMRT).

² Treatments applied by Ag-Tech Sprayer using 122 gal. spray per acre (1.4x) on trees spaced 14 x 21 ft., 11 ft. high and 11 ft. wide (Tree-Row-Volume dilute base of 176 gal./tree).

³ ERM= European red mite, ERME= ERM eggs, TSM= Twospotted spider mite, TSM= TSM eggs, ARM= Apple rust mite, AMB= *Amblyseius fallacis*.
Based on 25 leaves/ tree, from four Spartan trees/ plot.

New Paltz Site

Treatment	% Injured fruit			% Clean Fruit	Mean No. STM Mines/25 clusters	Mean No. Mites or Eggs leaf			
	TPB	GFW	VLB			ERM	ERME	ARM	ZM
1. Danitol 2.5 EC	2.3	0.0	0.0	97.7	0.0	0.0	0.2	0.8	0.1
2. Grower Standard	3.2	0.2	0.0	96.7	21.8	1.0	94.4	0.0	0.0

Middlehope Site

	% Injured fruit			% Clean Fruit	Mean No. STM Mines/25 clusters	Mean No. Mites or Eggs leaf			
	TPB	GFW	VLB			ERM	ERME	ARM	ZM
1. Danitol 2.5 EC	6.5	0.0	0.0	93.5	2.5	0.1	0.3	0.3	0.0
2. Grower Standard	1.7	0.2	0.7	97.5	25.3	0.2	36.6	0.0	0.0

TPB= Tarnished plant bug; GFW= green fruitworm; VLB= variegated leafroller; STM= Spotted tentiform leafminer; ERM= European red mite nymphs and adults; ERME= European red mite eggs; ARM= Apple rust mite; ZM= Zeitzellia mali nymphs and adults.

APPLE: *Malus domestica*
Spotted tentiform leafminer:
Phyllonorycter blancardella (Fabr.)

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APPLE, DIMILIN EUP STUDIES, CHAMPLAIN VALLEY, NEW YORK, 1987: Two sites were chosen for trials comparing rates and timing of Dimilin for leafminer control on apple. The Peru site consisted of 12-year-old 'McIntosh', 'Cortland', and 'Paula Red' trees on the M7 rootstock, spaced 14 by 22 ft and approximately 14 ft in height. Treatments were applied by airblast sprayer delivering 83 gal spray/acre at late pink, 24 May, and/or for second brood control 18 Jul. Plots were unreplicated and six acres in size, except the untreated check of 0.5 acres. The Valcor site contained the same cultivars, on the same rootstock, spaced 15 by 22 ft and approximately 12 ft in height. Treatments were applied to five acre unreplicated plots by airblast sprayer delivering 100 gal spray/acre at a speed of 2.5 mph. Untreated check areas of approximately 20 trees were left in the Northeastern corner and at the Western end of the block. The treatments were all applied during the peak of second brood flight on 26 Jun. At both sites all plots received the growers' standard schedule of insecticides and fungicides to control other pests. Treatments were evaluated 26 Aug at both sites by examining all of the leaves and counting all of the leafminer mines on them from 25 bourse shoots/tree from six trees/plot.

The plot receiving two dimilin applications at the Peru site had very few mines at the time of the rating, indicating good control of both broods. The single application against second brood resulted in a mine reduction compared with the untreated plot, however, the application was apparently timed too late to provide optimal control since mines were already evident when the application was made. There was a rather large difference between the untreated control plots at the Valcor site, with the northeastern corner having the larger infestation. Possible reasons for this may have been greater spray drift on the western plot or a differential in infestation pressure from east to west. The forementioned differential could also explain differences in rate response since the 8.0 oz rate was eastern-most and the 4.0 oz rate western-most. Differences were so slight, however, that one could just as well conclude that at least for this timing, the low rate was just as effective as the high rate.

Peru Site

<u>Treatments</u>	<u>Rate formulation</u> per acre	<u>Application</u> dates	<u>Mean no. Spotted tentiform</u> <u>leafminer mines/ 25 shoots</u> 26 Aug
1. Dimilin 25WP	8.0 oz 4.0 oz	24 May 18 Jul.....	1.3
2. Dimilin 25WP	4.0 oz	18 Jul.....	18.3
3. Untreated Check.....			40.2

Valcor site

	<u>Rate formulation</u> per acre	<u>Application</u> date	<u>Mean no. Spotted tentiform</u> <u>leafminer mines/ 25 shoots</u> 26 Aug
1. Dimilin 25WP	16.0 oz	26 Jun.....	2.5
2. Dimilin 25WP	8.0 oz	26 Jun.....	2.8
3. Dimilin 25WP	4.0 oz	26 Jun.....	1.7
4. Untreated (east).....			18.3
5. Untreated (west).....			5.8

APPLE: *Malus domestica*
PEAR: *Pyrus communis* L.
Pear psylla: *Psylla pyricola* Foerster

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APPLE, PEAR, DIMILIN RESIDUE STUDIES, MILTON, NY, 1987: A block of 15-year-old pear trees containing 'Bartlett' and 'Bosc' cultivars at a spacing of 20 by 20 ft was divided into three plots. Plots included an untreated check of 4 trees located in the southeast corner of the block, a Dimilin plus oil plot of 14 trees, and a Dimilin plot of 147 trees. An adjacent block of 30-year-old 'McIntosh' and 'Rome beauty' apple trees were arranged in a similar plot configuration except that fewer trees received Dimilin and more received Dimilin plus oil. Apple trees were spaced 20 by 36 ft and were approximately 16 ft in height. All treatments were applied by PTO powered airblast sprayer delivering 100 gal/acre at 2.5 mph. Treatments were applied to both apples and pears on 20 May, 7 Jun and 17 Jun, while pears received a final application 10 Aug and apples 21 Aug. Pear psylla was evaluated by sampling five shoots/tree from four trees in each plot on 19 May, 9 Jun, 25 Jun and 20 Jul. All samples were taken into the laboratory where five leaves from each shoot were examined and the psylla nymphs and eggs counted on these leaves. All pear plots received an application of Mitac plus Captan on 27 Jul, while the apples received the grower's normal schedule of fungicides and insecticides for the control of scab and other pests. Residue samples were collected from the pears on 24 Aug and from the apples ('McIntosh') on 4 Sep. Leafminer mines were searched for and fruit finish examined on the apples 16 Sep.

Adequate pear psylla suppression was found with the Dimilin treatments, although on the 9 Jun count greater psylla populations were found in the Dimilin plus oil than in the untreated plot. No finish problems were noted on pears, however, the 'McIntosh' apples had larger lenticels and some 'bleaching-out' of the color in the plot which received Dimilin plus oil applications. No leafminer mines were found in any of the plots which received Dimilin.

Treatment	Rate form. per acre	Application dates	Mean no. pear psylla nymphs and eggs/5 shoots (25 leaves)					
			19 May nymphs	eggs	9 Jun nymphs	eggs	25 Jun nymphs	eggs
1. Dimilin 25WP	16.0 oz	20 May, 7 Jun 17 June, 10 Aug.....	30.0	6.0	9.3	496.5	50.0	154.0
2. Dimilin 25WP	16.0 oz	20 May, 7 Jun						
+ oil 6EC	128.0 oz	17 Jun, 10 Aug.....	48.3	7.0	103.5	2770.3	20.0	112.0
3. Check.....			60.3	10.8	52.8	1552.3	86.5	375.8
							7.8	63.8