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FRUIT INSECT AND MITE CONTROL STUDIES EASTERN NEW YORK 1984

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Materials Tested

Advantage 50WP	FMC Corp.
Alsystin 4F	Mobay Chemical Corp.
Ambush 2E	ICI Americas, Inc.
Carzol 92SP	NOR-AM America, Inc.
Danitol 2.4EC	Chevron Chemical Co.
Dimilin 25WP	Uniroyal Chemical Co.
DPX Y5893 50WP	E. I. duPont de Nemours & Co.
FMC 54800 2EC, 10WP	FMC Corp.
Guthion 50WP	Mobay Chemical Corp.
Kelthane 4F, MF	Rohm and Haas Co.
Lannate L.	E. I. duPont de Nemours & Co.
Lorsban 4E, 50W	Dow Chemical U. S. A.
NC21314 FP	NOR-AM America, Inc.
Omite 6E	Uniroyal Chemical Co.
Plictran 50WP	Dow Chemical U.S.A., Chevron Chem. Co.
Pounce 3.2EC	FMC Corp.
Pydrin 2.4EC	Shell Chemical Co.
Spur 22EW	Zoecon Corp.
Vydate L	E. I. duPont de Nemours & Co.

1984 Weather Conditions - Hudson Valley Laboratory, Highland, NY

Date	Temp Max	Temp Min	Rain in.
Mar 1	31	17	
2	29	18	
3	35	24	
4	34	19	
5	38	24	
6	34	28	0.55
7	40	25	
8	35	9	
9	26	10	0.15
10	25	1	
11	28	13	
12	38	8	
13	26	10	
14	31	20	
15	43	21	
16	42	26	
17	56	32	
18	35	28	
19	37	28	
20	42	35	
21	53	37	
22	45	38	
23	48	38	
24	46	28	
25	51	25	
26	51	31	
27	47	26	
28	52	34	
29	42	31	
30	34	32	
31	38	32	
TOTAL:			0.7
Apr 1	48	27	
2	57	30	
3	59	36	
4	58	37	
5	54	40	
6	54	44	
7	52	40	
8	50	34	
9	48	30	
10	50	30	
11	50	38	
12	61	40	
13	64	35	
14	55	41	
15	44	42	
16	45	40	1.21
17	50	41	0.23
18	66	37	0.01
19	66	45	0.18
Apr 20	51	45	
21	57	42	
22	54	30	
23	55	37	
24	48	41	0.32
25	53	45	0.02
26	55	40	
27	64	46	
28	72	44	
29	71	50	0.02
30	78	49	
TOTAL:			1.99
May 1	72	50	
2	65	41	
3	63	37	
4	64	45	2.20
5	62	46	0.05
6	65	41	
7	70	41	
8	73	52	
9	59	47	1.08
10	60	40	
11	65	45	
12	71	53	0.04
13	70	42	0.11
14	68	47	0.24
15	58	34	
16	57	41	0.03
17	54	34	
18	62	36	
19	66	43	
20	72	51	
21	69	52	0.13
22	75	50	0.01
23	83	58	
24	81	48	0.22
25	74	45	0.01
26	82	56	
27	85	51	0.31
28	72	53	0.02
29	56	52	1.46
30	61	52	3.53
31	54	48	0.62
TOTAL:			10.06
Jun 1	59	38	
2	69	54	0.07
3	69	47	0.01
4	63	48	
5	82	54	
6	87	57	
Jun 7	82	62	
8	91	65	
9	93	67	
10	94	69	
11	94	68	
12	95	52	
13	86	61	
14	95	65	0.26
15	86	58	
16	72	43	
17	72	53	
18	71	62	
19	74	64	0.09
20	87	54	
21	81	50	
22	79	50	
23	83	54	
24	82	60	
25	75	60	0.53
26	81	55	
27	76	49	
28	83	64	
29	85	62	0.01
30	80	62	0.33
TOTAL:			1.3
Jul 1	71	64	0.30
2	72	61	0.86
3	85	65	
4	83	59	0.04
5	86	68	
6	84	68	0.25
7	78	66	1.96
8	78	55	0.02
9	73	49	
10	78	53	
11	79	67	
12	87	66	0.06
13	87	60	
14	87	59	
15	91	66	
16	89	71	0.10
17	88	60	0.01
18	83	63	1.27
19	77	56	0.33
20	79	55	
21	82	61	

1984 Weather conditions - continued

Date		Temp Max	Temp Min	Rain in.
Jul	22	72	59	0.12
	23	83	63	
	24	86	70	
	25	86	55	
	26	79	50	
	27	81	61	0.20
	28	63	59	0.42
	29	74	54	
	30	80	61	
	31	79	58	
		TOTAL:		5.94
Aug	1	85	62	
	2	89	66	0.01
	3	84	68	
	4	84	65	
	5	88	67	
	6	79	65	
	7	88	68	
	8	89	66	0.13
	9	88	70	
	10	81	70	
	11	76	69	0.06
	12	83	69	0.25
	13	82	70	0.12
	14	86	70	0.64
	15	89	71	0.01
	16	88	62	
	17	89	62	0.16
	18	80	60	
	19	76	57	
	20	81	71	0.85
	21	72	48	
	22	77	51	
	23	81	51	0.12
	24	81	57	0.06
	25	74	56	
	26	77	52	
	27	80	52	
	28	80	56	
	29	82	60	0.01
	30	80	70	
	31	84	66	
		TOTAL		2.42
Sept	1	84	54	
	2	77	54	
	3	70	55	0.18
	4	74	57	0.33
	5	70	46	
	6	69	40	
	7	64	38	

Date		Temp Max	Temp Min	Rain In.
Sept	8	71	41	
	9	73	47	
	10	75	54	
	11	77	62	0.03
	12	82	58	0.17
	13	73	49	
	14	77	55	
	15	74	52	0.05
	16	55	34	0.08
	17	65	38	
	18	67	37	
	19	71	43	
	20	77	49	
	21	82	49	
	22	72	41	
	23	77	50	
	24	82	49	0.01
	25	81	60	
	26	85	63	
	27	71	41	0.05
	28	56	43	
	29	53	44	0.01
	30	63	39	
		TOTAL:		0.91

APPLE: Malus domestica
Apple aphid: Aphis pomi De Geer
Rosy apple aphid: Dyaphis plantaginea (Passerini)
Codling moth: Laspeyresia pomonella (L.)
Plum Curculio: Conotrachelus nenupher (Herbst)
Tarnished plant bug: Lygus lineolaris (P. de B.)
San Jose scale: Quadraspidiotus perniciosus (Comstock)
European apple sawfly: Hoplocampa testudinea (Klug)
Redbanded leafroller: Argyrotaenia velutinana (Walker)
Spotted tentiform leafminer: Phyllonoryctor blancardella (Fabr.)
Apple maggot: Rhagoletis pomonella (Walsh)

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APPLE, INSECT CONTROL, HUDSON VALLEY, HIGHLAND, NY, 1984: Treatments were applied to eight tree plots replicated three times in a randomized complete block design. Treatments were applied at pink (May 7), petal fall (Jun 3 or 4), and in cover sprays (Jun 18, Jul 2, 16, 30 and Aug 15 or 16). Two Dimilin treatments were applied on May 7 and the Spur on May 7, Jun 4, Jul 2, and 30, with Guthion applied in those plots on the remaining sprays. Pounce was applied May 7 and June 4 while Advantage was used for the remainder of the season. Treatments were all applied dilute to runoff using a high-pressure handgun sprayer at 400 psi delivering 4.2 gal spray/tree (403 gal/acre). Trees were 20-years old, 12 ft. high, spaced 15 X 30 ft., and on the EM2 rootstock. Additional applications over the entire block included: Bravo 500, 3 qt/acre, Apr 18; Captan 50WP, 3 lb/acre, Jun 4, Jun 28; Vangard 10W, 30 oz/acre, June 28; Benlate 50W, 1 lb/acre, Jul 13, and Dithane M-45 78WP, 6 lb/acre, Jul 26, Aug 15. Plictran 50WP, 6 oz/100 gal dilute, was applied as a miticide in the Pounce and Dimilin/Guthion plots on Jul 26. Apple aphids were evaluated from one 'Greening' tree/plot on Jul 20, rosy apple aphids from one 'Cortland' tree/plot on Jun 8, European apple sawfly from one 'McIntosh tree/plot on Jun 12, and spotted tentiform leafminer from one 'Empire' tree/plot on Oct 17. Insect damage was assessed at harvest by examining 100 fruits/cultivar/plot from 'McIntosh' Sept 10, 'Empire', Sept 24, and 'Golden Delicious', Oct 4. A cool, wet spring resulted in a longer than normal bloom period. Unexpected insect activity along with continual rainfall during the final week of bloom prevented the petal fall spray from being applied until after some injury to the fruit, from plum curculio and European apple sawfly, had occurred.

A significant drop in control was found with the low rate of Danitol when compared with the higher rate. Danitol appeared unexpectedly weak on plum curculio and rosy apple aphid, but was exeptionally effective against European apple sawfly as well as most other pests. Plant bug control was better with the pyrethroids than with the other materials. Both insect growth regulators, Alsystin and Dimilin, were less effective than other materials in controlling San Jose scale. Very slight differences were found between treatments rated for fruit finish.

Treatment and oz form./100 gal	% injured fruit						% clean fruit	Mean russet rating/apple**
	Plum curculio	Tarnished plant bug	San Jose scale*	Codling moth	Apple maggot	Redbanded leafroller		
Alsystin 4F 4.0	51.7 c	12.4 bcd	27.8 b	0.3 a	1.2 a	0.4 a	23.6 a	0.6 ab
Danitol 2.4EC 4.0	22.2 ab	4.1 ab	8.3 ab	0.7 a	0.3 a	0.0 a	65.0 c	0.6 ab
Danitol 2.4EC 5.3	15.4 a	2.7 a	1.0 a	0.0 a	0.1 a	0.0 a	80.2 cde	0.6 ab
Dimilin 25WP 8.0 Guthion 50WP 8.0	7.9 a	16.9 d	0.0 a	0.1 a	0.0 a	0.0 a	70.2 cde	0.8 ab
Dimilin 25WP 16.0 Guthion 50WP 8.0	4.7 a	15.2 cd	1.3 a	0.0 a	0.0 a	0.0 a	75.1 cde	0.5 a
Dimilin 25WP 16.0	40.4 bc	9.8 abcd	13.2 ab	0.1 a	0.7 a	0.7 a	40.8 b	0.6 ab
DPX Y5893 50WP 1.0 Guthion 50WP 8.0	12.1 a	8.7 abcd	0.1 a	0.2 a	0.0 a	0.0 a	74.2 cde	0.8 ab
DPX Y5893 50WP 2.0 Guthion 50WP 8.0	7.4 a	7.0 abc	0.4 a	0.3 a	0.0 a	0.1 a	79.8 cde	0.9 b
Pounce 3.2EC 1.5 Advantage 25WP 8.0	5.3 a	4.7 ab	0.6 a	0.6 a	0.1 a	0.0 a	88.3 e	0.7 ab
FMC 54800 2EC 1.0	14.0 a	11.0 abcd	0.6 a	0.1 a	4.6 ab	0.0 a	68.3 cd	0.6 ab
Spur 22EW 4.8 Guthion 50WP 8.0	3.3 a	7.2 abc	0.1 a	0.3 a	0.6 a	0.6 a	87.3 de	0.8 ab
Check	50.5 c	8.0 abc	27.7 b	50.7 b	4.7 b	7.1 b	10.7 a	0.8 ab

Means followed by the same letter are significantly different by Duncan's Multiple Range Test, P=0.05

*Data transformed for analysis using arcsine $\sqrt{x}$ transformation.

**Based on 0 (best) -3 (worst) rating of finish on 'Golden Delicious' cultivar.

Treatment and oz form./100 gal		Mean no. infested fruit clusters/100 European apple sawfly	Mean no. infested terminals/50 Rosy apple aphid	Apple aphid	Mean no. mines/25 leaves Spotted tentiform leafminer
Alsystin 4F	4.0	28.0 e	31.7 bcd	44.7 de	0.0 a
Danitol 2.4EC	4.0	1.3 ab	11.7 a	1.7 a	0.0 a
Danitol 2.4EC	5.3	0.7 a	11.0 a	2.3 a	0.0 a
Dimilin 25WP Guthion 50WP	8.0 8.0	5.3 abc	29.0 bc	43.3 cde	0.0 a
Dimilin 25WP Guthion 50WP	16.0 8.0	5.0 abc	32.2 bcd	27.3 bc	0.0 a
Dimilin 25WP	16.0	17.0 cde	33.7 bcd	48.0 e	00. a
DPX Y5893 50WP Guthion 50WP	1.0 8.0	8.7 abc	40.0 cd	29.7 bcd	6.3 c
DPX Y5893 50WP Guthion 50WP	2.0 8.0	6.7 abc	23.7 b	30.3 bcd	2.0 b
Pounce 3.2EC Advantage 25WP	1.5 8.0	14.3 bcd	3.7 a	4.3 a	0.7 ab
FMC 54800 2EC	1.0	18.3 cde	0.0 a	0.0 a	0.3 a
Spur 22EW Guthion 50WP	4.8 8.0	27.7 de	0.0 a	15.0 ab	0.0 a
Check		84.3 f	42.3 d	33.7 cde	6.7 c

Means followed by the same letter are not significantly different by Duncan's Multiple Range Test, (P=.05)

APPLE: Malus domestica
Apple rust mite: Aculus domestica (Nalepa)
European red mite: Panonychus ulmi (Koch)
Twospotted spider mite: Tetranychus urticae Koch
a predatory mite Amblyseus fallacis (Garman)

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APPLE, MITE CONTROL, Hudson Valley Lab., Highland, NY, 1984. Treatments were applied to eight tree plots replicated three times in a randomized complete block design. Treatments were applied at pink (May 7), petal fall (Jun 3 or 4) and in cover sprays (Jun 18, Jul 2, 16, 30 and Aug 15 or 16). The DPX Y5893 treatments were only applied at pink, while Pounce was applied at pink and petal fall, Spur was applied at pink, petal fall, Jul 2 and 30. Dimilin treatments were applied May 7, Jul 2, and Jul 17. Plictran 50WP 6 oz/100 gal, was applied in the Dimilin/Guthion and Pounce/Advantage plots on Jul 26. Treatments were all applied dilute to runoff using a high-pressure handgun sprayer at 400 psi delivering 4.2 gal spray/tree (403 gal/acre). Trees were 20 years old, 12 ft. high, spaced 15 X 30 ft. and on the EM2 rootstock. Fungicide applications applied over the entire block included: Bravo 500, 8 qt/acre, Apr 18; Captan 50WP, 3 lb/acre, Jun 4 and 28; Vangard 10W, 30 oz/acre, Jun 28; Benlate 50W, 1 lb/acre, Jul 13; and Dithane M-45 78WP, 6 lb/acre, Jul 26 and Aug 15. A cool, wet spring was followed by a similar weather pattern during the summer. Mite populations were assessed by sampling 25 leaves from one 'Red Delicious' tree in each plot. Mites were brushed onto a plate and all live mites and eggs counted on the plate with the aid of a binocular scope.

The pyrethroids Danitol and FMC 54800 provided seasonal mite control. Spur provided excellent mite control for most of the season but because it was used fewer times than the other pyrethroids twospotted mite populations began to build up in the plots during August. The DPX Y5893 treatments provided excellent mite suppression through July. In August, however, twospotted mite populations were observed in both rates while European red mites were observed in the lower rate. On the final August count the predatory phytoseiid, Amblyseus fallacis was found in the IGR (Dimilin and Alsystin) plots as well as in the DPX Y5893 plots.

Treatment and oz form./100 gal		Mean no. mites* or eggs/leaf Jun 25 ERM	ERME	TSM	TSME	Jul 20 ERM	ERME	TSM	TSME	ARM
1. Alsystin 4F	4.0	0.0	0.6	0.1	0.2	0.7	2.7	1.1	2.2	97
2. Danitol 2.4EC	4.8	0.1	2.7	0.1	0.1	0.0	0.1	0.2	0.2	17
3. Danitol 2.4EC	5.3	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.1	8
4. Dimilin 25WP	8.0									
Guthion 50WP	8.0	4.1	34.4	1.8	2.0	3.7	11.1	1.1	0.5	21
5. Dimilin 25WP	16.0									
Guthion 50WP	8.0	0.3	2.0	0.0	0.3	5.5	10.9	2.4	5.0	18
6. Dimilin 25WP	16.0	0.0	0.0	0.1	0.3	0.6	1.7	4.5	4.0	5
7. DPX Y5893 50WP	1.0									
Guthion 50WP	8.0	0.1	0.2	0.0	0.0	0.8	2.7	0.8	1.2	36
8. DPX Y5893 50WP	2.0									
Guthion 50WP	8.0	0.0	0.1	0.2	0.2	0.2	0.9	1.9	4.0	52
9. Pounce 3.2EC	1.5									
Advantage 25WP	8.0	3.9	23.3	4.7	5.5	15.6	34.1	15.5	16.2	7
10. FMC 54800 2EC	1.0	0.0	0.5	0.0	0.2	0.0	0.1	0.0	0.0	51
11. Spur 22EW	4.8									
Guthion 50WP	8.0	0.0	0.2	0.0	0.0	0.0	0.0	0.8	2.5	33
12. Check		0.1	0.3	0.0	0.0	2.1	2.6	0.6	1.1	152

	Aug 17 ERM	ERME	TSM	TSME	ARM	Aug 27 ERM	ERME	TSM	TSME	ARM	AMB
1.	1.3	2.3	3.9	5.7	54	3.1	2.1	5.6	4.3	7	.08
2.	0.0	0.1	0.9	2.0	4	0.2	0.2	2.7	1.3	0	.0
3.	0.2	0.5	0.1	0.5	7	0.0	0.1	0.1	0.1	0	.0
4.	8.4	20.5	2.6	2.8	4	6.8	3.6	4.5	2.5	0	.01
5.	6.8	7.4	10.4	14.2	16	5.3	4.0	8.8	11.3	0	.09
6.	2.9	6.0	10.1	23.2	12	5.3	4.0	14.6	13.5	0	.69
7.	4.0	6.7	15.4	17.9	67	7.6	8.0	28.1	30.0	4	.01
8.	0.6	0.4	14.1	22.6	2	2.9	2.4	17.1	20.3	4	.01
9.	11.2	19.5	9.3	11.4	0	2.7	4.8	7.6	7.0	0	.0
10.	0.0	0.1	0.1	0.1	3	0.2	0.3	0.8	0.3	18	.0
11.	0.3	0.7	4.6	4.3	1	0.1	0.4	16.7	13.5	10	.0
12.	2.1	4.3	1.7	2.0	2	1.7	1.5	1.9	0.8	16	.0

*ERM = European red mite, TSM = Twospotted spider mite, ARM = Apple rust mite, AMB = Amblyscius fallacis.

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APPLE: Malus domestica
European red mite: Panonychus ulmi (Koch)
Twospotted spider mite: Tetranychus urticae Koch
Apple rust mite: Aculus schlechtendali (Nalepa)

APPLE, MITE CONTROL, HUDSON VALLEY LAB., HIGHLAND, NEW YORK, 1984: Miticide treatments were applied to unreplicated 8 tree plots at either the pink or petal fall stages, or in a seasonal program every two weeks. Treatments were applied by high pressure handgun sprayer at 400 psi, dilute to runoff, using 4.2 gal. spray/tree (403 gal/acre). Other sprays over all plots included the miticide Plictran 50WP, 1.5 lb./acre, 7/26, and the fungicides Bravo 500, 2 qt./acre, 4/18, 4/30; Captan 50WP 4.5 lb./acre and Bayleton 50WP 3 oz/acre, 5/18; Captan 50WP 4.5 lb/acre and Vanguard 7.5 oz/acre, 6/15, 6/28; Benlate 50WP, 3 lb./acre, 7/13; and Dithane M45, 6 lb./acre, 7/26, 8/15. Mites were evaluated by collecting 25 leaves from one 'Red Delicious' tree in each plot and brushing these leaves with a mite brushing machine. Mites were then counted with the aid of a binocular scope.

All treatments provided good initial mite control. Spider mite populations were more abundant earlier in the low rate of DPX Y5893 than in other treatments. The two applications of DPX Y5893 provided better mite control than a single application. Kelthane treatments all controlled the apple rust mite, while DPX Y5893 treatments did not, and Danitol treaments were erractic with the lower rate providing better control than the high rate. Fruit finish was very good, and no phytotoxicity was noted with any of the treatments.

Treatment	Oz form /100 gal.	Application date(s)	Mean No. mites* and eggs/leaf									
			June 28					July 17				
			ERM	ERME	TSM	TSME	ARM	ERM	ERME	TSM	TSME	ARM
1. DPX Y5893 50WP	0.5	5/6	0.9	0.8	0.8	2.1	127	0.3	0.8	0.3	0.3	236
2. DPX X5893 50WP	2.0	5/6, 6/19	0.3	0.7	0.3	0.6	53	0.0	0.1	0.0	0.0	257
3. DPX X5893 50WP	4.0	5/6	0.0	1.0	0.6	1.2	37	0.1	0.4	0.0	0.0	229
4. DPX X5893 50WP	4.0	5/6, 6/19	0.0	0.2	0.1	0.2	84	0.0	0.2	0.0	0.0	159
5. Kelthane 4F	16.0	6/3	0.0	0.0	0.0	0.2	8	0.0	0.0	0.3	0.2	6
6. Kelthane 4F and Guthion 50WP	16.0 8.0	6/3 6/3	0.0	0.3	0.0	0.0	2	0.1	0.2	0.1	0.0	5
7. Kelthane 4F and Dikar 72WP	16.0 32.0	6/3 6/3	0.2	1.5	0.0	0.3	3	0.4	4.3	0.0	0.0	2
8. Kelthane MF	16.0	6/3	0.2	1.2	0.1	1.0	1	0.3	4.9	0.0	0.1	4
9 Kelthane MF and Guthion 50WP	16.0 8.0	6/3 6/3	0.3	2.9	0.0	0.1	8	0.8	1.9	0.2	0.4	16
10. Kelthane MF and Dikar 72WP	16.0 32.0	6/3 6/3	0.3	2.4	0.6	0.9	5	0.6	1.7	0.0	0.0	21
11. Danitol 2.4ec	4.0	5/7,6/3,6/18,7/2 7/16,7/30,8/16	0.0	0.0	0.0	0.0	4	0.0	0.2	0.2	0.4	24
12. Danitol 2.4ec	5.3	5/7,6/3,6/18,7/2 7/16,7/30,8/16	0.0	0.0	0.0	0.0	68	2.0	4.0	0.4	0.1	240
13. Check			5.6	16.4	1.4	2.2	156	1.0	2.4	3.0	0.6	72

*ERM = European red mite, TSM = Twospotted spider mite, ARM = Apple rust mite.

PEAR: Pyrus communis
Pear Psylla: Psylla pyricola
Plum curculio: Conotrachelus nenuphar (Herbst)
Codling moth: Laspeyresia pomenella (L.)
San Jose scale: Quadraspidiotus perniciosus (Comstock)
a leafminer: Sparganothis sulfureana lemens
Pear rust mite: Epitrimerus pyri (Nalepa)

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PEAR, INSECT AND MITE CONTROL, HUDSON VALLEY, HIGHLAND, N.Y., 1984. 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 10 yrs-old. Treatments were applied by high-pressure handgun sprayer dilute to runoff at 350 psi using from 2.5 gal/tree (480 gal/acre) to 3.75 gal/tree (720 gal/acre). Treatments were applied at white bud, May 6, petal fall, May 22, and in 3 cover sprays, Jun 29, Jul 13, and Aug 22. Pear psylla were evaluated by collecting 4 spurs (20 leaves) from each plot and counting all of the live nymphs on each leaf using a binocular scope. Insect injury was rated at harvest (Sep 6) by picking 100 'Bartlett' fruits (25/tree) from each plot and examing them in the lab. Each fruit was also rated for the extent of russeting present.

Danitol provided the best pear psylla control during the season, while the FMC 54800 formulations also provided good control. The insect growth regulators, Alsystin and Dimilin, provided a moderate amount of pear psylla suppression during the 1st part of the season but not during the later part. The FMC 54800 looked very good against plum curculio and other insects, as did the Danitol, while the insect grwoth regulators were most effective against codling moth. The russet ratings were directly related to the extent of pear rust mite injury which the fruit received. Dimilin was the least disruptive material to the mites while the FMC 54800 was very disruptive and its application resulted in pear ust mite populations which russetted the pears completely on most of the trees.

Treatment and c... form./100 gal		Mean No. Pear psylla nymphs/20 leaves					
		May 21	Jun 11	Jun 5	Jul 25	Jul 17	Jul 30
Alsystin 4F	4.0	7.0	0.3	69.7	57.7	54.7	17.7
Alsystin 4F	8.0	8.0	1.7	59.7	31.0	44.0	13.7
Danitol 2.4EC	5.3	2.0	0.0	17.3	10.0	1.7	0.0
Dimilin 25WP	8.0	10.7	0.7	70.7	3.3	46.7	4.7
Dimilin 25WP	16.0	5.3	0.7	59.3	20.7	48.3	8.3
FMC 54800 2EC	1.0	0.0	10.3	25.7	12.1	6.7	8.7
FMC 54800 10WP	2.6	2.3	0.3	47.7	9.0	10.7	0.0
Check		25.0	12.0	125.7	140.7	52.7	7.0

% injured fruit				% Clean fruit	Mean russett rating/pear*
Plum Curculio	Codling moth	San Jose scale	S. sulfureana		
36.3 c	0.0 a	0.0 a	1.3 a	62.0 ab	1.4 c
25.3 bc	0.0 a	0.3 a	0.3 a	73.7 abc	1.1 bc
10.1 ab	0.0 a	0.0 a	0.0 a	89.3 cd	1.6 c
43.0 c	0.0 a	1.0 ab	0.3 a	55.3 ab	0.7 ab
23.3 abc	0.0 a	2.0 b	1.0 a	74.7 bcd	0.4 a
3.3 a	0.0 a	0.0 a	0.0 a	95.3 d	2.8 d
7.0 ab	0.0 a	0.0 a	0.0 a	93.0 cd	2.4 d
39.0 c	1.0 b	0.0 a	8.3 b	53.3 a	1.5 c

Means followed by the same letter are not significantly different by Waller and Duncan's BSD test, K=100 (P=ca 0.05)

*Based on 0 (best) - 3 (worst) rating of finish on 'Bartlett' cultivar.

APPLE: Malus domestica
European red mite: Panonychus ulmi (Koch)
Twospotted spider mite: Tetranychus urticae Koch
Tarnished plant bug: Lygus lineolaris (P. de B.)
San Jose scale: Quadraspidiotus perniciosus (Comstock)
Comstock mealybug: Pseudococcus comstocki (Kuwani)
Green fruitworn: Orthosin hibisci Guenee
Spotted tentiform leafminer: Phyllonoryctor blancardella (Fabr.)

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APPLE, INSECT, AND MITE CONTROL, OHIOVILLE ROAD, CLINTONDALE, NY, 1984. A 19 acre block of apples consisting of 'Red Delicious', 'Golden Delicious', 'Stayman', and 'McIntosh' cultivars, 20-30 yrs. old, and spaced from 20 X 32 to 40 X 40 ft. was divided into 4 plots ranging in size from 4 - 5.6 acres. Each plot received either a half-inch-green (Apr 26) treatment, or a tight cluster (May 3) treatment, or a pink (May 6) treatment, or a seasonal program of the new pyrethroid, Spur. A standard program followed the prebloom treatments in all plots except the Spur plot. Treatments, including miticides are listed in the table while additional fungicides include: Manzate 200 80WP, 4 lb/acre, 4/19, 4/23, 4/30, 5/4, 5/8, 5/18, 5/26, 6/3, 6/11; Benlate 50WP, 6 oz/acre, 5/4, 5/8, 5/26, 6/3, 6/11; Captan 50WP, 5 lb/acre, 6/25, 7/9, 7/24, 8/6, 8/20; and additional insecticides not included in the Spur plot were: Guthion 50WP, 1½ lb/acre, 5/26, 6/3, 6/11, 6/25, 7/9, 7/24, 8/6, 8/20; Phosphamidon 8E, 8 oz/acre, 7/9. Treatments were applied at 4X (100 gal/acre) with a Myers model A36 airblast sprayer at a speed of 2.5 mph. Mites were sampled on a weekly basis throughout the season by collecting, brushing, and counting the mites and eggs from 25 leaves/tree, from 4 'Red Delicious' trees in each plot. Spotted tentiform leafminer was evaluated Jul 25 by examining all the leaves on 25 spurs/tree, from 4 trees/plot. The fruit was evaluated for insect injury on Sept 10 by examining 100 fruits/tree from 5 trees of the 'McIntosh' and 5 of the 'Red Delicious' cultivars in each plot.

European red mite populations were first found in the plot which received only Lorsban prebloom. A Jun 19 Plictran application was ineffective in reducing this population. Both prebloom oil treatments were very effective against European red mite, but the twospotted spider mite began to increase in these plots during July. Both Keltane and Omite applications reduced twospotted mite populations where they were applied. Vydate was applied to several of the plots for 3rd brood leafminer control and these applications also reduced mite numbers. The Spur plot was virtually mite-free during the entire season. Tentiform leafminer 1st brood infestations were not found in the Spur plot and were erratic in plots treated with Lorsban. Tarnished plant bug caused the greatest amount of insect injury to the fruit and was present in all plots. The Comstock mealybug damaged 2% of the 'Red Delicious' fruit while the San Jose scale damaged 1% of the 'McIntosh' fruit in the Spur plot. All of the scale injury was confined to the top of a single, very tall tree, and probably resulted from a problem with coverage. One green fruitworm injured apple was found in the Lorsban-oil (half-ingh-green application) plot.

Treatment	Rate form. /acre	Application date(s)	Mean No. mites* or eggs/leaf											
			Jun 14				Jul 9				Jul 25			
			ERM	ERME	TSM	TSME	ERM	ERME	TSM	TSME	ERM	ERME	TSM	TSME
1. Spur 22EW	19.2 oz	5/6,5/26,6/11 6/26,7/9,7/24 8/6,8/20	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.0
2. Lorsban 4E	4 pt	4/26												
Oil 60 sec	6 gal	4/26												
Kelthane 4F	4 pt	7/9												
Vydate 2L	4 pt	7/24	0.0	0.0	0.2	0.0	0.0	0.1	1.3	1.1	0.1	0.2	0.4	3.2
3. Lorsban 4E	4 pt	5/3												
Oil 60 sec	4 gal	5/3												
Omite 6E	3 pt	7/9												
Vydate 2L	4 pt	8/6	0.0	0.0	0.0	0.0	0.0	0.1	1.1	1.4	0.3	0.4	0.5	0.3
4. Lorsban 50WP	3 lb	5/6												
Plictran 50WP	1 1/2 lb	6/19												
Omite 6E	3 pt	7/9												
Vydate 2L	4 pt	8/6	5.3	9.6	0.2	0.0	6.5	23.6	0.7	0.1	2.2	5.2	0.1	0.3

	Aug 2				Aug 27				Mean No. STLM infested Spurs/25	% Tarnished Plant Bug injury		% clean fruit	
	ERM	ERME	TSM	TSME	ERM	ERME	TSM	TSME		McIntosh	Red Delicious	McIntosh	Red Delicious
1.	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0	1.0	1.0	98.0	97.0
2.	0.0	0.0	0.6	0.5	0.0	0.0	4.5	1.8	4.3	0.6	0.4	99.2	99.6
3.	0.2	1.8	0.9	1.9	0.0	0.6	0.1	0.3	0.0	1.4	1.2	98.6	98.8
4.	1.4	9.8	0.2	1.4	0.0	1.7	0.0	0.0	1.0	1.2	1.0	98.8	99.0

ERM= European red mite, TSM= Two spotted spider mite.

APPLE: Malus domestica
European red mite: Panonychus ulmi (Koch)
Twospotted spider mite: Tetranychus urticae Koch
Plum curculio: Conotrachelus nenupher (Herbst)
Tarnished plant bug: Lygus lineolaris (P. de B.)
San Jose scale: Quadraspidiotus perniciosus (Comstock)
Spotted tentiform leafminer: Phyllonoryctor blancardella (Fabr.)

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APPLE, INSECT AND MITE CONTROL, NEW PALTZ, NY, 1984. An eight acre block of 40 yr.-old 'McIntosh' trees interplanted with 20 yr.-old 'McIntosh' trees was divided into 4 unreplicated plots ranging in size from 1.2 - 2.4 acres. Trees were spaced 20 X 40 ft. and were approximately 17 ft. in height. Treatments were applied at either 1/2 inch green (Apr 26) or tight cluster (Apr 30) with a Bean Speedsprayer delivering 200 gal/acre (2X) at a ground speed of 2 1/2 mph. Additional treatments over the entire block included: Cyrex 65W, 2 lb/acre, Apr 20, 26; Manzate 200 80WP, 6 lb/acre, May 8, 21, 3.5 lb/acre, May 26, Jun 5, 19; Captan 50WP, 4 lb/acre, Jul 9, 25, Aug 8, 24; Benlate 50WP, 9 oz/acre, May 26, Jun 5; Guthion 50WP, 2 lb/acre, May 26, Jun 5, Jul 25, Aug 24; Penncap M, 3.2 pt/acre, Aug 8; Lorsban 50WP, 3 lb/acre, Jun 19, Jul 9; Kelthane 4F, 2.4 pt/acre, Jul 9; and Vydate 2L, 3.2 pt/acre, Jul 25. Mites were sampled at 10 - 14 day intervals throughout the season. Mite samples consisted of 25 leaves/tree from four 'McIntosh' trees in each plot. The leaves were brushed in the lab and mites obtained by this method were counted on plates with the aid of a binocular scope. Leafminers were evaluated on Jul 24 by examining 25 fruit clusters/tree for the presence of tissue-feeding stage mines on the cluster leaves. Fruit was evaluated prior to harvest on Sept 12 by examining 100 'McIntosh' apples/tree from 5 trees in each plot.

Mites were first found at the end of Jun in the plot which received Lorsban alone at tight cluster. Mite numbers remained low for the entire season and it is likely that the Jul 9 Kelthane and Jul 25 Vydate applications were unnecessary from the standpoint of mite control. The Vydate application was required against 2nd generation spotted tentiform leafminer, however, since the Lorsban treatments provided no leafminer control. Tarnished plant bug injury was found in almost all plots at harvest and there appeared to be little difference among treatments. A trace of San Jose scale was found in 2 of the plots while plum curculio damage was found in one plot. Overall, very acceptable commercial insect and mite control was found with all treatments.

Treatment	Rate form. /acre	Application date(s)	Mean no. mites* or eggs/leaf June 21 ERM	ERME	TSM	TSME
1. Lorsban 4E	4 pt	Apr 26				
Oil 60 sec	6 gal	Apr 26	0.0	0.0	0.0	0.0
2. Lorsban 4E	4 pt	Apr 30				
Oil 60 sec	6 gal	Apr 30	0.0	0.0	0.0	0.0
3. Lorsban 50W	3 lb	Apr 30	0.0	0.7	0.1	0.1
4. Pydrin 2.4E	10.6 oz	Apr 30				
Oil 60 sec	4 gal	Apr 30	0.0	0.0	0.0	0.0

	Mean no. infested clusters/25	% injured fruit			%
	Spotted tentiform leafminer	Plum curculio	Tarnished plant bug	San Jose scale	Clean fruit
1.	22.0	0.0	0.4	0.2	99.4
2.	21.0	0.4	0.6	0.0	99.0
3.	22.0	0.0	0.0	0.0	100.0
4.	5.8	0.0	0.4	0.4	99.2

*ERM = European red mite, TSM = Twospotted spider mite.

APPLE: Malus domestica
European red mite: Panonychus ulmi (Koch)
Twospotted spider mite: Tetranychus urticae Koch
Plum Curculio: Conotrachelus nenuphar (Herbst)
San Jose scale: Quadraspidiotus perniciosus (Comstock)
Tarnished plant bug: Lygus lineolaris (P. de B)

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APPLE, INSECT AND MITE CONTROL, HURDS RD, CLINTONDALE, NEW YORK 1984. Treatments were applied at the pink (May 6) and/or petal fall (May 27) stage of bud development for the control of mites and insects present at that period. Treatments were applied over 5 acre unreplicated plots with a Meyers A2A2 airblast sprayer, delivering 100 gal/acre (4X), at a speed of 2.25 mph. The trees were approximately 35 years old, spaced 36 X 40 ft, and were 18 ft. in height. Additional pesticide treatments applied over the entire block included: Manzate 200 80WP, 5 lb./acre, 5/16, 1.5 lb/acre, 5/27, 6/3; Captan 50WP, 4-6 lb/acre, 5/27, 6/3, 6/21, 7/10, 7/26, 8/10, 8/24; Guthion 50WP, 1.5 lb/acre, 6/3, 6/21, 7/10, 7/26, 8/24; Phosphamidon 85 8 oz/acre, 7/10; Lorsban 50WP, 3 lb/acre, 8/10; and Plictran 50WP, 1.5 lb/acre 8/10; Mites were evaluated on 6/7, 6/27, 7/5, 7/24, 8/2, and 8/14, by collecting 25 leaves/tree from 4 'McIntosh' trees in each plot. Those leaves were then brushed and counted in the laboratory. Tentiform leafminers were evaluated on Jul 24 by examining the leaves on 25 clusters/tree from 4 'McIntosh' trees in each plot. The fruit was evaluated for insect injury on Sept 17, by examining 100 'McIntosh' fruits/ tree from 5 trees in each plot.

Mite populations did not develop until the last week of Jul, at which time approximately equal numbers of European red mites and twospotted spider mites were found in the plot receiving no miticide, while a greater number of twospotted spider mites were found in the plot which was treated with Carzol only. The Aug 10 Plictran application reduced mite numbers in most plots, with the exception of the check plot which had a considerable number of twospotted spider mites present on the final count. The NC 21314 treatments all looked very good and there was little difference between the various timings or combinations. Overall fruit injury was lowest where Ambush was used at both pink and petal fall, primarily because of the fact that this treatment had no tarnished plant bug injury.

Treatment	Rate form. /acre	Application date(s)	Mean No. mites* or eggs/leaf											
			July 24				August 2				August 14			
			ERM	ERME	TSM	TSME	ERM	ERME	TSM	TSME	ERM	ERME	TSM	TSME
1. NC 21314 50FP	8.0 oz.	5/6												
Ambush 2E	12.8 oz.	5/6												
Guthion 50WP	32.0 oz.	5/27	0.1	0.1	0.3	0.2	0.1	0.3	0.4	0.3	0.0	0.0	0.2	0.2
2. NC 21314 50FP	8.0 oz.	5/6												
Carzol 92SP	8.0 oz.	5/27												
Ambush 2E	25.6 oz.	5/6												
Guthion 50WP	32.0 oz.	5/27	0.1	0.0	0.1	0.1	0.0	0.2	0.2	0.1	0.0	0.0	0.1	0.3
3. NC 21314 50FP	8.0 oz.	5/27												
Carzol 92SP	8.0 oz.	5/27												
Ambush 2E	12.8 oz.	5/6												
	25.6 oz.	5/27	0.0	0.1	0.1	0.2	0.0	0.1	0.0	0.2	0.0	0.0	0.3	0.5
4. Carzol 92SP	16.0 oz.	6/16, 5/27												
Guthion 50WP	32.0 oz.	5/16, 5/27	0.1	0.3	1.0	0.7	0.2	3.3	7.9	1.6	0.0	0.0	2.2	2.0
5. Ambush 2E	12.8 oz.	5/6												
Guthion 50WP	32.0 oz.	5/27	0.4	1.3	0.8	0.3	0.4	2.8	1.0	1.3	0.2	0.0	2.7	12.8

	Percent Injured Fruit			
	Plum Curculio	San Jose Scale	Tarnished Plant Bug	Percent Clean Fruit
1.	0.0	0.0	0.8	99.2
2.	0.0	0.2	0.8	99.0
3.	0.2	0.0	0.0	99.8
4.	0.0	0.4	1.4	98.2
5.	0.2	0.0	0.6	99.2

*ERM = European red mite, TSM = Twospotted spider mite

APPLE: Malus domestica
European red mite: Panonychus ulmi (Koch)
Twospotted spider mite: Tetranychus urticae Koch

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APPLE, MITE CONTROL, CLINTONDALE, NY 1984. Miticide treatments were applied at tight cluster (May 2), pink (May 4), and/or petal fall (May 31 - Jun 1). These treatments were supplemented during the summer as mite populations increased. Treatments were applied to unreplicated plots ranging in size from 4.5 to 5.0 acres. Trees were approximately 30 years old, spaced 30 by 36 ft., and from 16 to 18 ft. tall. Treatments were applied with a Bean 757 Speedsprayer delivering 100 gal/acre (4X), at a ground speed of 2.5 mph. Additional pesticides applied to the entire block included: Pydrin 2.4EC, 8 oz/acre, 5/2 - 5/4; Manzate 200 80WP, 3 lb/acre, 4/18, 4/25, 5/2 - 5/4, 5/19, 5/31, 6/11; Benlate 50WP, 6½ oz/acre, 4/18, 4/25, 5/2 - 5/4, 5/19, 5/31, 6/11, 6/25, 7/9, 7/23; Lorsban 50WP, 2½ lb/acre, 5/31, 6/11, 6/25; and Guthion 50WP, 1½ lb/acre, 7/9, 7/23, 8/7, 8/23. Mite samples were collected at biweekly intervals throughout the season from 4 'Red Delicious' trees in each plot. These samples consited of 25 leaves/tree, which were brought back to the laboratory where they were brushed and the mites counted using a binocular scope.

Initial control was excellent with all materials. Mite populations of both species were noted first in the single NC 21314 application (plot #1), while only twospotted spider mites were found in the plot receiving the pink and petal fall applications of Carzol (plot #4). It was difficult to assess the effectiveness of the Aug 11 NC 21314 application, thus Plictran was applied a week later and the populations were much reduced on the final Aug 30 count in plot #1. Omite provided good control of the twospotted spider mite population in plot #4. The best overall treatment was the combination of NC 21314 and Carzol (plot #3) applied at petal fall.

Treatment	Rate form /acre	Application date(s)	Mean No. mites* or eggs/leaf											
			Jun 14				Jun 28				Jul 21			
			ERM	ERME	TSM	TSME	ERM	ERME	TSM	TSME	ERM	ERME	TSM	TSME
1. NC 21314 FP Plictran 50WP	8 oz 24 oz	5/2, 8/11 8/18	0.0	0.2	0.0	0.2	0.3	2.7	0.0	1.0	0.6	2.2	0.0	0.1
2. NC 21314 FP Carzol 92SP	8 oz 8 oz	5/4 5/31	0.0	0.1	0.0	0.1	0.0	0.3	0.0	0.1	0.0	0.1	0.0	0.0
3. NC 21314 FP Carzol 92SP	8 oz 8 oz	5/31 5/31	0.0	0.1	0.1	0.3	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.0
4. Carzol 92SP Omite 6E	16 oz 32 oz	5/4, 6/1 8/23	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.2	0.5

	Jul 23				Aug 1				Aug 16				Aug 30			
	ERM	ERME	TSM	TSME	ERM	ERME	TSM	TSME	ERM	ERME	TSM	TSME	ERM	ERME	TSM	TSME
1.	1.2	6.6	0.4	0.2	7.7	20.0	10.7	19.5	15.5	36.6	0.4	38.0	0.2	1.7	0.0	0.0
2.	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.3	1.4	0.2	0.4	0.2	0.4
3.	0.0	0.1	0.1	0.3	0.0	0.3	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1
4.	0.0	0.0	0.7	0.8	0.0	0.1	1.2	1.9	0.0	0.1	17.8	14.1	0.0	0.1	3.1	4.8

*ERM = European red mit, TSM = Twospotted spider mite

APPLE: Malus domestica
European red mite: Panonychus ulmi (Koch)
Twospotted spider mite: Tetranychus urticai Koch

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APPLE, MITE CONTROL, MARLBORO, NEW YORK, 1984. Four blocks of 'Red Delicious' apples ranging in size from 3.9-4.9 acres were each treated at the tight cluster stage of bud development with NC 21314 or oil. Trees were from 17-26 years old, spaced from 36 X 40 to 30 X 32 ft, and were 15-17 ft. in height. Treatments were applied at 4X (100 gal/acre) with a Bean 757 speed sprayer at 2.5 mph. Mites were sampled by collecting 25 leaves/tree from 4 trees in each block. Leaves were then brushed and all mites and eggs counted on glass plates using a binocular scope. Additional pesticides appllied over all treatments included: Guthion 50WP, 2 lb/acre, 5/31, 6/10, and 8/13; Manzate 200 WP, 6 lb/acre, 5/31; Thiram 65WP, 5 lb/acre , 6/10, 6/20; Topsin M, 16 oz/acre, 5/31, 4 oz/acre, 7/7; Lorsban 50WP, 3 lb/acre, 6/20, 7/7; Captan 50WP, 4 lb/acre, 7/7, 7/31, 8/13; and Benlate 50WP, 12 oz/acre, 8/13.

The initial tight cluster mite control sprays provided excellent control into the month of July. Mite increases were first found in the oil treatment and a Carzol application was applied Jul 7 in this plot. Carzol controlled the European red mite population but not the twospotted spider mite population. The NC 21314 plots were retreated on Jul 31 and Carzol was reapplied in the oil plot. Twospotted spider mite populations were still high in the oil plot and NC 21314 8 Oz rate plot on August 10. These plots were treated with Plictan or a Carzol + Plictran combination, on August 12. The final August 23 count found low numbers of both mite species in all plots.

Treatment and rate form./acre	Application date(s)	Mean No. mites or eggs/leaf*											
		Jun 12				Jun 27				Jul 4			
		ERM	ERME	TSM	TSME	ERM	ERME	TSM	TSME	ERM	ERME	TSM	TSME
1. NC 21314 4.0 oz	4/27, 7/31	0.0	0.1	0.0	0.0	0.1	0.7	0.2	0.3	0.1	0.1	0.0	0.1
2. NC 21314 6.0 oz	4/28, 7/31	0.0	0.0	0.1	0.0	0.1	0.2	0.0	0.2	0.8	0.7	0.4	0.7
3. NC 21314 8.0 oz Plictran 50WP 24.0 oz	4/28, 7/31 8/12	0.0	0.1	0.0	0.0	0.3	1.2	0.6	0.9	0.2	0.5	0.6	0.8
4. Oil 60 sec. 4gal Carzol 92SP 16.0 oz 8.0 oz Plictran 50WP 6.0 oz	4/28 7/7, 7/31 8/12 8/12	0.0	0.2	0.2	0.1	0.5	1.2	0.3	0.7	2.1	3.0	3.1	1.0

	Jul 16				Jul 23				Aug 10				Aug 23			
	ERM	ERME	TSM	TSME	ERM	ERME	TSM	TSME	ERM	ERME	TSM	TSME	ERM	ERME	TSM	TSME
1.	0.1	0.1	0.0	0.0	0.3	1.1	0.2	0.1	0.6	0.9	0.5	1.7	0.6	3.3	0.8	0.8
2.	0.5	0.9	0.2	0.2	0.6	2.6	1.2	1.4	0.3	1.4	0.4	1.9	0.1	0.7	0.1	0.9
3.	0.0	0.3	0.4	0.3	0.2	0.3	1.0	0.8	0.9	6.7	4.3	13.0	0.0	0.1	0.1	1.5
4.	0.4	1.3	2.1	2.5	0.8	1.2	2.1	2.4	1.8	0.9	18.0	8.9	0.3	0.1	1.1	2.2

*ERM = European red mite, ERME= ERM eggs, TSM = Twospotted spider mite, TSME = TSM eggs.

APPLE: Malus domestica
European red mite: Panonychus ulmi (Koch)
Twospotted spider mite: Tetranychus urticae Koch

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APPLE, MITE CONTROL, MODENA, NY 1984: Miticide treatments were first applied on April 30 at the tight cluster stage of development, to unreplicated plots ranging in size from 1.6 to 3.0 acres. The trees had been planted in 1978, were spaced 15 X 22 ft., and were approximately 12 ft. in height. Treatments were applied with a Swanson airblast sprayer, delivering 100 gal/acre (4X), at a speed of 2.5 mph. Additional treatments applied over the entire block included: Pydrin 2.4E, 10.6 oz/acre, 4/30; Guthion 50WP, 1½-2 lb/acre, 6/4, 7/9, 7,26, 8/13; Benlate 50WP, 8 oz/acre, 4/30, 6/4, 6/21, 7/9; Manzate 200 80WP, 4 lb/acre, 4/30, 6/4, 6/21, 7/9; Captan 50WP, 4 lb/acre, 7/26, 8/13; Phosphamidon 8E, ½ pt/acre, 8/13; Lorsban 50WP, 3 lb/acre, 6/21; Solubor, 40lb/acre, 6/21, 7/9; and Calcium Nitrate, 4 lb/acre, 8/13 Mites were sampled throughout the season on a weekly to biweekly basis. Mites were counted from 25 leaves/tree from 4 'Red Delicious' trees in each plot. Mites were brushed from the leaves onto glass plates where they were counted with the aid of a binocular scope.

European red mite increases were first noted in the check and consequently in the low rate plot of NC 21314. Carzol applied Jul 9 in the check plot reduced European red mites, but had less effect on the twospotted spider mite population. Several treatments were applied on Jul 26, the most effective being Plictran, while Carzol was poor against the twospotted spider mites, and the NC 21314 treatments did not appear to prevent egg-laying. An application of NC 21314 over the entire block appeared to reduce mite numbers in most plots by the final count on Aug 30.

Mean No. mites* or eggs/leaf

Treatment	Rate form /acre	Application date(s)	Jun 6				Jun 21				Jul 4			
			ERM	ERME	TSM	TSME	ERM	ERME	TSM	TSME	ERM	ERME	TSM	TSME
1. NC 21314 FP	4 oz 8 oz	4/30, 7/26 8/13	0.1	0.7	0.1	0.1	0.1	1.6	0.2	0.1	0.9	0.8	0.4	0.9
2. NC 21314 FP	6 oz 8 oz	4/30, 7/26 8/13	0.0	0.9	0.1	0.3	0.2	0.9	0.4	0.7	0.3	0.5	1.6	0.5
3. Oil 60 sec Carzol 92SP NC 21314 FP	4 gal 16 oz 8 oz	4/30 7/26 8/13	0.0	0.1	0.0	0.1	0.1	0.5	0.1	0.2	0.3	0.2	0.7	0.5
4. NC 21314 FP Plictran 50WP	8 oz 24 oz	4/30, 8/13 7/26	0.0	0.2	0.0	0.1	0.1	0.4	0.0	0.0	0.3	0.3	0.2	0.2
5. Carzol 92SP NC 21314 FP	16 oz 8 oz	7/9, 7/26 8/13	0.1	2.0	0.2	0.2	0.9	6.1	1.1	0.1	2.6	1.9	1.1	0.6

	Jul 19				Aug 1				Aug 9				Aug 30			
	ERM	ERME	TSM	TSME	ERM	ERME	TSM	TSME	ERM	ERME	TSM	TSME	ERM	ERME	TSM	TSME
1.	1.9	3.8	1.3	0.3	0.5	9.1	3.1	18.2	1.0	0.5	2.4	31.0	0.0	1.0	0.0	0.3
2.	1.7	2.4	2.3	3.3	0.7	6.9	2.6	11.1	0.1	0.5	2.0	40.6	0.0	0.4	0.0	0.3
3.	1.5	1.7	1.5	0.7	0.5	2.6	2.9	4.1	1.1	1.0	4.2	4.2	0.0	1.5	0.7	11.2
4.	0.8	1.3	0.5	0.3	0.3	3.1	0.2	3.2	0.2	1.9	0.0	1.2	0.0	0.1	0.0	0.1
5.	0.1	0.9	1.2	0.2	0.0	0.2	2.0	3.2	0.2	0.5	9.7	5.5	0.0	0.0	2.2	16.1

*ERM = European red mite, TSM = Twospotted spider mite.

APPLE: Malus domestica
European red mite: Panonychus ulmi (Koch)
Twospotted spider mite: Tetranychus urticae Koch

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APPLE, MITE CONTROL, MILTON, NEW YORK, 1984. Two unreplicated 5 acre blocks were treated with different formulations of Kelthane. Four trees were left untreated as a check while the remainder of the farm received Omite. Trees in each block ranged from 20-25 years old, were spaced 30 X 30 ft., and were approximately 16 ft. in height. Mites were evaluated by sampling 25 leaves/tree from 4 "McIntosh" trees in each block. Leaves were brushed with a mite brushing machine and all mite stages were counted using a binocular scope. Treatments were all applied using 100 gal/acre (4X) with a Bean 707 speedsprayer at 3mph.

Neither Kelthane formulation provided control of the twospotted spider mite. Twospotted spider mites continued to build up in all plots except the Omite treatment. Kelthane 4F was reapplied and compared with Plictran. Both treatments resulted in lower mite numbers on the final count, but numbers had also declined in the check on that date.

Treatment and rate form./acre	Application date(s)	Mean No. mites or eggs/leaf* July 18 TSM	TSME	ERM	ERME	July 26 TSM	TSME	ERM	ERME
1. Kelthane MF 3pt Plictran 50WP 1 2/3 lb	Jul 19 Aug 14	12.1	15.9	0.1	0.1	13.6	18.8	0.2	0.8
2. Kelthane 4F 3pt	Jul 19 Aug 14	14.8	24.6	0.0	0.0	20.7	23.4	0.2	0.6
3. Omite 6E 2 pt	Jul 19	10.4	16.5	0.1	0.2	4.3	9.1	0.1	0.5
4. Check		9.1	13.7	0.1	0.2	12.5	12.0	0.1	0.2

	August 1 TSM	TSME	ERM	ERME	August 21 TSM	TSME	ERM	ERME
1.	23.6	31.8	0.0	0.0	1.3	5.3	0.0	0.0
2.	27.1	22.9	0.1	0.1	2.3	9.0	0.0	0.0
3.	6.2	8.0	0.0	0.0	1.9	15.3	0.0	0.0
4.	21.7	24.1	0.0	0.0	3.4	13.4	0.0	0.0

ERM = European red mite, TSM = Twospotted spider mite.

PEAR: Pyrus communis
Pear midge: Contarinia pyrivora (Riley)

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PEAR, PEAR MIDGE CONTROL, MODENA, NEW YORK, 1984: Nine treatments and a check were compared using single tree plots replicated 6 times in a randomized block design. The block was approximately 20 yrs-old and contained primarily 'Bartlett' and 'Bosc' cultivars at a spacing of 16 X 18 ft with a tree height of 14-16 ft. Treatments were applied at green cluster (Apr 27), early white bud (May 1), white bud (May 3), or at both green cluster and white bud stages of development. Treatments were applied by high-pressure handgun sprayer dilute to runoff at 400 psi using 4.2 gal spray/tree (630 gal/acre). Pear midge was evaluated May 25th by sampling 50 fruit clusters/tree and recording the number of clusters having at least one infested fruit. Analysis of the data indicated that almost all of the damage occurred in one replicate located on the Northwest corner of the block. Thus on Jun 11 each tree in this replicate was evaluated by sampling all of the fruit on the tree using a ladder where necessary to examine fruit at the top of the tree. The infested fruits (which had a round, black and swollen appearance) were much easier to distinguish on the final Jun 11 evaluation.

The results of the Jun 11th evaluation (which were basically similar to the earlier evaluation) indicated that for effective control of pear midge the green cluster application is essential and that Guthion or Systox are the materials of choice. The pyrethroid applications tested did not provide commerically acceptable control.

Treatment	Rate form. /100 gal	Application date(s)	Pear midge % infested fruit clusters May 25	Pear midge % infested fruit Jun 11
Guthion 50WP	6 oz	Apr 27, May 3	0.3	0.4
Guthion 50WP	8 oz	Apr 27	0.0	-*
Guthion 50WP	8 oz	May 3	1.7	20.0
Guthion 50WP	8 oz	May 3	1.9	14.5
Pydrin 2.4EC	2.6 oz	Apr 27, May 3	0.4	8.2
Pydrin 2.4EC	2.6 oz	May 3	0.0	22.7
Pydrin 2.4EC	2.6 oz	May 1	4.1	11.8
Systox 6E	4 oz	Apr 27	2.7	0.0
Systox 6E	4 oz	May 3	0.0	7.4
Check			3.0	35.1

*No fruit was present at either evaluation.

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APPLE: Malus domestica
European red mite: Panonychus ulmi (Koch)
Twospotted spider mite: Tetranychus urticae Koch
Plum curculio: Conotrachelus nenuphar (Herbst)
Tarnished plant bug: Lygus lineolaris (P. de B.)
San Jose scale: Quadraspidiotus perniciosus (Comstock)
Spotted tentiform leafminer: Phyllonoryctor blancardella (Fabr.)
a green fruitworm: Orthosia hibisci (Guenee)
Oystershell scale: Lepidosaphes ulmi (L)

APPLE, INSECT AND MITE CONTROL, CHAMPLAIN VALLEY, NY, 1984. A 55 yr.-old block of 'McIntosh' trees, spaced 40 X 40 ft. and approximately 17 ft. in height, was divided into 12 plots ranging in size from 2.3-2.8 acres. Six treatments, each replicated twice, were arranged in the twelve plots. Early season insecticide applications were applied at either the ½ inch green (May 3) or tight cluster (May 13) stage of development. All treatments were applied using a Bean Model 502 Speedsprayer delivering 100 gal/acre (4X) at a ground speed of 2½ mph. Additional sprays applied over the entire block included: Phygon 50WP, .75 lb/acre (aerial application), May 5, 14; Cyrex 65WP, 1 lb/acre, May 9, Jun 13; Captan 80WP, 3 lb/acre (aerial application) May 28, 31, Jun 5, 3 lb/acre (ground application) Jul 2; Imidan 50WP, 3 lb/acre (aerial application), Jun 5; Sevin 50WP, 2 lb/acre, Jun 13; Phosphamidon 8E, ½ pt/acre, Jul 2, 20; Guthion 50WP, 1 lb/acre, Jul 20; Plictran 50WP, 1¼ lb/acre, Jul 2; and Kelthane 4F, 4 pt/acre, Aug 2. Mites were evaluated on Jun 18 by sampling 25 leaves/tree from 4 'McIntosh' trees/plot. Leaves were brought into the laboratory where they were brushed with a mite brushing machine. The mites obtained from this process were counted with the aid of a binocular scope. Leafminers were evaluated Jul 19 by counting the number of clusters infested with tissue-feeding stage mines on 25 clusters/tree from 8 trees in each plot. The fruit was examined for insect injury on Sept 13 just prior to harvest. 100 fruits/tree from 5 trees in each plot were examined.

Excellent early season mite control was found with all treatments. All treatments show phytotoxicity symptoms at this time, and this may have contributed to the control found. The symptoms (greenish-yellow mottling and crinkled, stunted, cluster leaves) were apparently exacerbated by cold injury the buds suffered in March as well as cool, wet temperatures found during most of the spring. Oil was a major factor in the injury, although the Lorsban applied alone also showed less severe but similar injury. The data suggests that the Lorsban alone showed some toxicity to the European red mite and this may have resulted in the buildup of twospotted spider mites in these plots. Leafminer counts were lowest in the Pydrin plots, but there was also a reduction in the Lorsban plots compared with the check counts. However, this may have been related to the phytotoxicity problem also. Both Lorsban and Pydrin plots showed a similar reduction in tarnished plant bug numbers, while low numbers of San Jose scale were found in several plots but were much worse in the check. Oystershell scale (0.2%) and green fruitworm (0.1%) injury were also found in the check plots.

Treatment	Rate form. /acre	Application date(s)	Mean no. mites* or eggs/leaf Jun 18 ERM	ERME	TSM	TSME
1. Lorsban 4E	4 pt	May 3				
+ oil 60 sec	8 gal	May 3	0.1	0.6	0.9	0.4
2. Lorsban 4E	4 pt	May 13				
+ oil 60 sec	4 gal	May 13	0.2	0.8	1.3	0.2
3. Pydrin 2.4E	10 2/3 oz	May 13				
+ oil 60sec	4 gal	May 13	0.6	1.0	1.2	0.5
4. Pydrin 2.4E	10 2/3 oz	May 13				
+ oil 60sec	4 gal	May 13	1.1	0.7	0.0	0.0
5. Lorsban 50WP	3 lb	May 13	1.1	4.6	6.0	7.0
6. Check			27.2	19.7	0.4	0.2

Mean no. infested clusters/25	% injured fruit			
Spotted tentiform leafminer	Tarnished Plant bug	Plum Curculio	San Jose scale	% Clean fruit
1. 3.3	0.3	0.3	0.0	99.4
2. 2.4	0.2	0.0	0.6	99.2
3. 1.8	0.3	0.0	0.2	99.5
4. 1.3	0.1	0.0	0.4	99.5
5. 7.3	0.3	0.0	0.0	99.6
6. 11.4	0.7	0.2	1.6	97.1**

*ERM = European red mite, TSM = Twospotted spider mite

**Additional injury to fruit in the check was due to green fruitworm and Oystershell scale.

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

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APPLE, LEAFMINER CONTROL, CHAMPLAIN VALLEY, SITE A, 1984. Treatments were applied at pink (May 18) to unreplicated one acre plots starting from the East side of a 60 acre block of 7 year old 'McIntosh', 'Cortland' and 'Paula Red' cultivars. Trees were 12 ft high and spaced 14 X 22 ft. Treatments were applied by airblast sprayer delivering 60 gal/acre (6 2/3X) at a ground speed of 2 mph. Additional pesticides applied over the entire block included: Captan 50WP, 1.7 lb/acre, Apr 28, May 4, 9, 14, 18, 24, 3.3 lb/acre, Jun 2, 6, 12, 26, Jul 17; Cyprex 65WP, 2 lb/acre, May 30; Imidan 50WP, 4.4 lb/acre, Jun 6, 26; Guthion 50WP, 1 lb/acre, Jul 17, Aug 13; Carzol 92SP, 3/4 lb/acre, Jun 6; Sevin 50WP, 3 3/4 lb/acre, Jun 12; and Plictran 50WP, 3/4 lb/acre, June 26. First generation spotted tentiform leafminer was evaluated June 12 by examing the leaves on 10 fruiting clusters/tree from 16 'McIntosh' trees in each plot and counting the cluster as infested if any of the leaves has tissue-feeding stage mines present. Terminal leaves were examined on Aug 7 for presence of 2nd generation leafminer mines. Twenty-five leaves/tree from 8 McIntosh trees in each plot were examined.

Almost 50% of the clusters had at least one infested leaf in the check plot while none were infested in the Dimilin or Vydate plots and very few were infested in the Thiodan/Carzol plot. Infestation levels of 2nd brood leafminers were very low, but treatments effectiveness was similar to that found for 1st brood, indicating that carry-over effects apparently continue for at least an additional generation.

Treatment & rate form./acre		Spotted tentiform leafminer % clusters infested[a]	Spotted tentiform leafminer Mean no. infested leaves[b]
Dimilin 25WP	1 lb	0.0	0.6
Vydate 2L	3.4 pt	0.0	0.5
Thiodan 50WP + Carzol 92SP	3 lb + 1 lb	5.6	1.0
Check		49.2	4.9

[a]Based on examining 117-60 clusters/treatments (10/tree) on Jun 12.

[b]Based on examining 25 leaves/tree from 8 trees/treatment.

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

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APPLE,LEAFMINER CONTROL, CHAMPLAIN VALLEY, SITE B, 1984.

A 5 acre block of 'McIntosh' and 'Cortland' apples spaced 22 X 32 ft with trees approximately 16 ft in height was divided into 3 unreplicated plots ranging in size fr 1/2 - 2.5 acres. Treatments were applied July 10, approximately 2 weeks after 1st generation leafminer adults had started flying. Several sap-feeding stage mines could be found on some of the leaves at this point. Treatments were applied with an airblast sprayer using 100 gal/acre (4X) at a speed of 2 mph. Additional pesticides applied over the entire block included: Polyram 80WP, 6 lb/acre, May 3, 7, 16; Cyprex 65WP, 1 lb/acre, May 11, 30; Captan 80WP, 4 lb/acre May 24, Jun 5, 14, 25, Jul 10, 19,30, Aug 2; Malathion 25WP, 8 lb/acre, May 11; Lorsban 50WP, 3 lb/acre, May 18; Guthion 50WP 2 lb/acre, June 5; Imidan 50WP, 4 lb/acre, June 25, Jul 19, 30, Aug 18; Sevin 50WP, 5 lb/acre, Jun 12; and Kelthane 4F, 3 pt/acre, Aug 2. Treatments were evaluated Aug 7 by counting all sap-feeding and tissue-feeding stage mines found on 25 leaves/tree from 10 'McIntosh' trees in each plot.

The Dimilin treatments reduced the number of leafminer mines compared with the check. The treatments were apparently applied slightly late and thus permitted most of the sap-feeders present at the time of application to complete their development.

Treatment and rate formulation/acre		Mean no. spotted tentiform leafminer infested leaves/25
Dimilin 25WP	1/2 lb	3.5
Dimilin 25WP	1 lb	2.9
Check		10.3