

NOT FOR PUBLICATION

FRUIT INSECT AND MITE CONTROL STUDIES

EASTERN NEW YORK

1983

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45 2 121050.7 2600N

70 201047

40 150140.5 2600N

334.3 800 75

Materials Tested

Advantage 4EC	FMC Corp.
Bay FCR 1272 2EC	Mobay Chemical Corp.
Bay Sir 8514 4F	Mobay Chemical Corp.
Carzol 92SP	NOR-AM America, Inc.
Dikar 72WP	Rohm and Haas Co.
FMC 54800 2EC	FMC Corp.
Guthion 50WP	Mobay Chemical Corp.
Imidan 50WP	Stauffer Chemical Corp.
Kelthane 4F, 32WP	Rohm and Haas Co.
Larvin 3.2F, 80DF	Union Carbide Corp.
Lorsban 50WP	Dow Chemical, U.S.A.
Orthene 75SP	Chevron Chemical Co.
Payoff 2.4EC, 50WP	American Cyanamid Co.
Penncap 2M	Penwalt Corporation
Plictran 50WP	Dow Chemical, U.S.A.
	Chevron Chemical Co.
Pydrin 2.4EC	Shell Chemical Co.
SLJ 0312 50WP	Mobay Chemical Corp.
SN 72129 50WP	NOR-AM America, Inc.
Systox 6E	Mobay Chemical Corp.
ZE 938 2.4EC	Chevron Chemical Co.

1983 Weather Conditions - Hudson Valley Laboratory, Highland, NY

Date	Temp		Rain in.
	Max	Min	
Mar 1	54	32	
2	48	32	.46
3	51	36	
4	56	30	
5	43	31	
6	46	26	
7	46	34	.94
8	44	34	.02
9	37	34	.87
10	43	37	
11	39	35	.45
12	45	33	
13	42	33	.47
14	54	29	
15	59	38	
16	64	30	
17	53	30	
18	45	33	
19	51	41	
20	56	44	1.26
21	54	34	
22	44	33	1.10
23	37	21	.07
24	37	21	
25	41	19	
26	40	18	
27	47	24	
28	43	33	.90
29	52	35	
30	44	24	
31	48	26	
TOTAL			6.54
Apr 1	49	30	
2	55	29	
3	55	38	.95
4	42	37	
5	59	42	
6	56	32	
7	59	39	
8	58	47	.19
9	64	43	
10	64	43	
11	41	41	1.91
12	56	39	
13	57	35	
14	61	32	
15	51	43	
16	57	47	
17	48	32	2.25

Date	Temp		Rain in.
	Max	Min	
Apr 18	52	29	
19	49	32	
20	38	32	.70
21	45	35	.07
22	54	29	
23	61	33	
24	68	46	.05
25	46	43	1.69
26	43	40	.40
27	61	38	
28	76	48	
29	84	57	
30	76	54	
TOTAL			8.21
May 1	79	55	
2	78	56	.18
3	73	62	
4	78	60	
5	67	36	.12
6	68	40	
7	65	42	
8	71	44	
9	72	40	.52
10	54	35	
11	55	32	
12	55	36	
13	59	39	
14	71	46	
15	76	54	
16	66	49	.48
17	50	36	
18	61	30	
19	63	40	
20	64	50	
21	69	56	
22	70	55	
23	72	60	.88
24	76	55	.06
25	76	41	
26	76	53	
27	60	48	1.45
28	52	38	
29	67	48	
30	67	54	.38
31	70	60	1.30
TOTAL			5.37

Date	Temp		Rain in.
	Max	Min	
Jun 1	66	47	.07
2	70	51	
3	74	50	
4	77	59	
5	78	51	
6	79	63	
7	81	59	.84
8	76	57	
9	73	41	
10	72	43	
11	74	54	
12	85	55	
13	89	63	
14	90	64	
15	93	64	
16	91	68	
17	89	63	
18	86	64	
19	86	69	
20	85	66	
21	78	62	
22	84	55	
23	89	58	
24	88	67	
25	88	61	
26	76	51	
27	78	62	
28	95	65	.90
29	75	64	1.00
30	78	52	
TOTAL			2.81
Jul 1	82	63	
2	80	66	
3	93	69	
4	90	72	
5	93	70	.01
6	84	64	.09
7	80	52	
8	78	52	
9	84	66	
10	84	52	
11	78	50	
12	82	61	
13	92	70	
14	90	58	
15	90	62	
16	97	71	.14
17	96	61	
18	88	66	

1983 Weather Conditions Continued (Highland, NY)

Date	Temp		Rain in.
	Max	Min	
Jul 19	95	66	
20	86	67	.08
21	88	63	
22	96	60	.22
23	85	54	
24	88	60	.74
25	73	62	
26	81	58	
27	84	54	
28	87	59	
29	89	70	
30	87	71	
31	93	70	
TOTAL			1.28

Aug 1	90	69	
2	92	64	.19
3	86	58	
4	90	70	.13
5	88	68	.03
6	83	68	
7	89	64	
8	90	64	.10
9	93	67	
10	87	56	
11	79	62	.07
12	70	60	.68
13	60	57	.02
14	74	47	
15	79	52	
16	82	55	
17	87	60	
18	89	68	.21
19	80	65	.04
20	91	70	
21	97	58	
22	83	53	
23	87	61	
24	82	56	
25	85	54	
26	86	58	
27	92	64	
28	95	70	
29	90	69	.33
30	85	62	.03
31	85	63	.17
TOTAL			2.00

Date	Temp		Rain in.
	Max	Min	
Sep 1	72	62	.08
2	83	51	
3	85	56	
4	89	57	
5	89	62	
6	92	68	
7	95	67	
8	90	55	
9	83	51	
10	87	58	
11	96	64	
12	99	62	
13	79	55	.15
14	65	52	
15	71	40	
16	70	40	
17	69	48	.02
18	75	52	
19	77	54	
20	93	62	
21	93	66	
22	81	51	2.30
23	68	44	
24	65	37	
25	64	34	
26	67	40	
27	69	44	
28	76	53	
29	70	45	
30	71	46	
TOTAL			2.55

APPLE: Malus domestica

Woolly apple aphid: Eriosoma lanigerum (Hausmann)

Apple aphid: Aphis pomi DeGeer

Rosy apple aphid: Dysaphis plantaginea (Passerini)

Codling moth: Laspeyresia pomonella (L.)

Plum curculio: Conotrachelus nenuphar (Herbst)

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

San Jose Scale: Quadraspidiotus perniciosus (Comstock)

Variegated leafroller: Platynota flavedana (Clemens)

Spotted tentiform leafminer: Phyllonorycter blancardella (Fabr.)

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APPLE, INSECT CONTROL, HUDSON VALLEY, HIGHLAND, NEW YORK, 1983: Treatments were applied to plots of eight trees, each a different cultivar. Plots were replicated 3 times in a randomized complete block design. Most treatments were applied at pink, May 2, petal fall, May 22, 23, and in 6 cover sprays, Jun 6, 21, Jul 6, 21, Aug 3, and Aug 17. Advantage was applied with 2% oil on Apr 12 and by itself in cover sprays directed at San Jose Scale crawlers on Jun 21, Jul 6, Aug 3, and Aug 17. Larvin 3.2F was applied at 10.0 and 20.0 oz form./100 gal as the 4th and 5th treatments at pink, May 2, while all Larvin treatments were omitted from the Jul 21 cover spray. Bar Sir 8514 was applied at pink, May 2, and again on Jun 21 and Jul 6, with Guthion used on the remaining dates. FMC 54800 was applied at the rate of 1.28 oz form./100 gal and FCR 1272 at rate of 1.2 oz form./100 gal on the May 2 pink spray. Orthene was only applied in the May 2, May 23, and Jun 6 applications. Imidan, FMC 54800, and Larvin were all applied May 22, and again on May 23, following a rainstorm the night of the 22nd. Treatments were all applied dilute to runoff by high-pressure handgun sprayer at 400 psi delivering 4.2 gal spray/tree (403 gal/acre) except for the final 2 applications using 5.2 gal spray/tree (500 gal/acre). Trees were 19-yrs-old, 12 ft high, on the EM2 rootstock, and spaced 15 x 30 ft. Plictran 50WP at rates of 4-6 oz/100 gal was the primary miticide used, although Carzol 92SP 6 oz/100 gal was applied to the FCR 1272 and Penncap + Pydrin plots on Aug 3 while Kelthane 4F 1 pt/100 gal was applied to the Larvin plots on the same date. Fungicide applications over all plots include: Bravo 500 3 qt/100 gal, Apr 12; Vanquard 10WP 2 oz/100 gal, Jun 10, 17, and Jul 13; Captan 50WP 0.5 lb/100 gal, Jun 10 and 17; and Polyram 80WP 1.13 lb/100 gal, Jul 13. All trees were thinned with 10 ppm naphthaleneacetic acid on Jun 2. April and May were unusually cold and wet, while July and August were much hotter and dryer than normal. Insect populations were at normal levels throughout the season. Insect damage was assessed at harvest by examining 100 fruits/cultivar/plot from 'McIntosh' Sep 7, 'Cortland' Sep 23, 'Golden Delicious' Oct 3, and 'Red Delicious' Oct 10.

All treatments except Larvin, Bay Sir 8514 and Guthion, controlled the Rosy apple aphid and woolly apple aphid. Best control of the apple aphid was observed with Advantage, FMC 54800, Penncap + Pydrin, and XE 938. Spotted tentiform leafminer control was evident in the FMC 54800, Bay Sir 8514, FCR 1272, Penncap + Pydrin, and XE 938 treatments. Larvin and the FCR 1272 treatments were least effective in controlling San Jose Scale. This season was excellent for finish on the 'Golden Delicious' cultivar, and no differences were observed between treatments.

Treatment and oz form./100 gal	Mean no. infested terminals/25			Spotted tentiform leafminer	
	Rosy apple aphid Jun 20	Apple aphid Jul 8	Woolly apple aphid Sep 9	Mean no. mined clusters/25 Jun 20	Mean no. mines/25 leaves Aug 5
Advantage 4EC	8.0				
Imidan 50WP	16.0	0.0 a	0.0 a	3.3 bc	14.3 c
FMC 54800 2EC	1.0	0.3 a	1.3 a	0.0 a	0.3 a
Larvin 80DF	5.0	11.0 d	14.7 bc	1.7 ab	7.3 abc
Larvin 80DF	5.0	4.3 b	12.3 b	1.0 ab	6.0 ab
Larvin 80DF	10.0	6.0 bc	19.0 c	0.0 a	5.7 ab
Bay Sir 8514 4F	4.0				
Guthion 50WP	8.0	6.7 bc	16.3 cd	0.0 a	0.0 a
FCR 1272 2EC	0.8	0.0 a	11.0 abcd	0.0 a	0.0 a
Pennicap 2M	6.0				
+ Pydrin 2.4EC	1.5	0.0 a	4.3 abc	0.0 a	1.3 a
Orthene 75SP	5.3				
Guthion 50WP	8.0	0.0 a	12.0 abcd	1.0 ab	10.0 bc
XE 938 2.4 EC	5.3	0.0 a	3.3 ab	0.0 a	0.0 a
Guthion 50WP	8.0	4.0 b	19.0 d	3.0 bc	9.3 bc
Check	9.0	cd	15.0 bcd	5.0 c	5.7 ab

Means followed by the same letter are not significantly different by Waller and Duncan's BSD test, K = 100 (P = ca..05).

Treatment and oz form./100 gal	% injured fruit						% Clean fruit	Mean russet rating/apple*
	Plum curculio	Tarnished plant bug	San Jose Scale	Codling moth	Variegated leafroller			
Advantage 4EC	8.0							
Imidan 50WP	16.0	0.9 a	5.1 a	0.1 a	0.0 a	0.0 a	93.7 b	0.6 a
FMC 54800 2EC	1.0	2.3 a	5.0 a	0.0 a	0.0 a	0.0 a	92.5 a	0.3 a
Larvin 80DF	5.0	0.8 a	6.8 a	8.2 a	0.0 a	0.0 a	85.7 b	0.3 a
Larvin 80DF	5.0	2.9 a	5.6 a	17.0 ab	0.2 a	0.2 a	75.5 b	0.5 a
Larvin 80DF	10.0	0.4 a	4.5 a	0.6 a	0.1 a	0.0 a	93.9 b	0.6 a
Bay Sir 8514 4F	4.0							
Guthion 50WP	8.0	0.3 a	13.0 b	1.1 a	0.1 a	0.0 a	84.9 b	0.5 a
FCR 1272 2EC	0.8	0.6 a	3.4 a	9.3 a	0.0 a	0.3 a	86.8 b	0.5 a
Pennacap 2M	6.0							
+ Pydrin 2.4EC	1.5	0.3 a	5.1 a	0.8 a	0.0 a	0.0 a	93.5 b	0.3 a
Orthene 75SP	5.3							
Guthion 50WP	8.0	0.5 a	4.3 a	0.1 a	0.1 a	0.0 a	94.9 b	0.5 a
XE 938 2.4EC	5.3	0.3 a	2.8 a	1.8 a	0.0 a	0.0 a	94.8 b	0.6 a
Guthion 50WP	8.0	0.5 a	5.8 a	0.3 a	0.0 a	0.0 a	91.8 b	0.6 a
Check	21.7 b	7.6 ab	27.6 b	18.0 b	1.7 b	1.7 b	39.7 a	0.4 a

Means followed by the same letter are not significantly different by Duncan's Multiple Range Test, $P = 0.05$.

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

APPLE: Malus domestica

Apple rust mite: Aculus schlechtendali (Nalepa)

European red mite: Panonychus ulmi (Koch)

Twospotted spider mite: Tetranychus urticae Koch

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NYS Agric. Exp. Station

APPLE, MITE CONTROL, HUDSON VALLEY, HIGHLAND, NEW YORK, 1983. Insecticide treatments were applied at pink, May 2; petal fall, May 22, 23; and in 6 cover sprays, Jun 6, 21, Jul 6, 21, Aug 3, and Aug 17. Advantage was applied with 2% oil on Apr 12 and in cover sprays directed against San Jose Scale. Bay Sir 8514 was applied at pink and again Jun 21 and Jul 6; Orthene was applied at pink, petal fall and Jun 6 applications; while Larvin was omitted at pink (1st rate only) and on Jul 21 (all rates). Treatments were applied to 8 tree plots replicated 3 times in a randomize complete block design. Treatments were all applied dilute to run-off by high-pressure handgun sprayer at 400 psi delivering 4.2 gal spray/tree (403 gal/acre) except in final 2 applications where 5.2 gal spray/tree (500 gal/acre) was applied. Trees were 19-yrs-old, 12 ft high, on EM2 rootstock, and spaced 15 x 30 ft. Miticides used in the plots are presented in the tables and were applied along with the treatments. After an unusually cold wet bloom period temperatures warmed-up and June-July-August were hotter and dryer than normal. Mite populations were assessed by sampling 25 'Red Delicious' leaves/tree/plot, brushing the leaves onto a plate and counting live mites on the plates.

The oil + Advantage application provided good mite control into July, at which time 2 Plictran applications were used, the 1st not providing complete control. FMC 54800 and XE 938 provided seasonal spider mite control. XE 938 also controlled the apple rust mite whereas FMC 54800 did not. FCR 1272 and the PennCap + Pydrin combination provided spider mite, but not apple rust mite, suppression through July. Where Larvin, Bay Sir 8514, Orthene, or Guthion were used mite control was supplemented with Plictran, however control with this material was not always consistent. A final miticide application on Aug 3 resulted in less than complete control with most materials, Kelthane being the most effective.

Mean no. mites*/leaf

Treatment and oz form./100 gal	Jun 20		Jun 21**		Jun 30		Jul 6**		Jul 28		Aug 3***		Aug 16	
	ERM	ARM	ERM	ARM	ERM	ARM	ERM	ARM	ERM	TSM	ERM	ARM	ERM	TSM
Advantage 4EC	8.0													
Imidan 50WP	16.0...	0.1	2.2		0.9	1.3	Plic.	2.9	1.4	0.0	Plic. ^a	0.3	0.1	0.0
FMC 54800 2EC	1.0...	0.0	39.0		0.1	45.7		0.5	0.0	458.8		1.0	0.0	141.1
Larvin 80DF	5.0...	1.2	28.3		6.1	65.7	Plic.	22.7	2.8	4.9	Kelt. ^b	0.6	0.2	0.0
Larvin 80DF	5.0...	0.4	2.4		4.5	7.8	Plic.	3.3	1.5	5.8	Kelt. ^b	0.1	0.3	0.0
Larvin 80DF	10.0...	12.5	117.8	Plic.	0.9	17.4	Plic.	3.3	0.3	1.9	Plic. ^a	0.5	0.4	0.7
Bay Sir 8514 4F	4.0													
Guthion 50WP	8.0...	6.4	111.1	Plic.	4.3	16.2	Plic.	0.6	0.0	0.2		2.7	0.3	1.1
FCR 1272 2EC	0.8...	0.2	159.0		0.5	183.7		16.4	11.9	295.7	Carz. ^c	1.6	3.1	38.1
Pennacap 2M	6.0													
+ Pydrin 2.4EC	1.5...	0.0	5.8		0.0	20.3		6.4	10.4	216.9	Carz. ^c	5.7	8.3	26.1
Orthene 75SP	5.3													
Guthion 50WP	8.0...	5.9	181.4	Plic.	4.6	59.7	Plic.	5.6	0.1	0.4	Plic. ^d	2.5	0.0	0.0
XE 938 2.4EC	5.3...	0.0	0.0		0.0	1.9		0.1	0.0	0.0		0.0	0.0	5.2
Guthion 50WP	8.0...	13.6	114.6	Plic.	3.2	8.8	Plic.	2.4	0.1	0.4	Plic. ^d	0.4	0.0	0.0
Check	4.4	14.1			13.5	77.3		4.4	0.7	110.5		0.2	0.5	0.1

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

**Plic. + Plictran 50WP 4 oz form./100 gal.

***The following miticides were applied: ^aDow Plictran 50WP 6 oz/100 gal; ^bKelthane 4F 1 pt/100 gal; ^cCarzol 92SP 6 oz/100 gal; ^dOrtho Plictran 50WP 6 oz/100 gal.

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

APPLE: Malus domestica

Apple rust mite: Aculus schlechtendali (Nalepa)

European red mite: Panonychus ulmi (Koch)

Twospotted spider mite: Tetranychus urticae Koch

a predator mite: Zetzellia mali (Ewing)

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APPLE, MITICIDE TRIAL, HUDSON VALLEY, HIGHLAND, NY 1983: Miticide treatments were applied to 8 tree plots replicated 3 times in a randomized block design. 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 the plots included the fungicides Bravo 500 2 or 4 qt/100 gal or Difolatan 4F 5 qt/100 gal applied Apr 12, and Rubigan IEC 3 oz/100 gal plus Manzate 200 80WP 1.5 lb/100 gal applied May 28 and Jun 10. Mites were evaluated by collecting 25 'Red Delicious' leaves from 1 tree in each plot and brushing these leaves with a mite brushing machine. All mites were then counted using a binocular scope.

The SLJ 0312 and Carzol treatments applied in Jun and Jul were not as effective as the Kelthane treatments in reducing mite populations. The Aug 3 Plictran and Carzol applications were more effective but may have been assisted by the predator mite, Zetzellia mali, which was found in the last count in Aug. Fruit finish was rated in the block and both Kelthane treatments were found to have caused slight (>25%, <50% russeted fruit) to moderate (>50%, <75% russeted fruit) russet damage on the 'Golden Delicious' cultivar.

Treatment and oz form./100 gal			Application date(s)	Mean no. mites*/leaf						
				Jun 1			Jun 16		Jun 27	
				ERM	TSM	ARM	ERM	ARM	ERM	ARM
SLJ 0312 50WP	8.0,7.1	Jun 2,Jul 6								
Plictran 50WP	6.0	Aug 3	1.8	0.3	11.4	3.0	0.2	3.0	3.9	
Kelthane 4F	32.0	Jun 2	3.7	1.2	10.8	0.0	0.2	0.0	1.1	
Kelthane 4F	64.0	Jun 2	2.8	0.5	15.9	0.0	3.2	0.0	2.2	
Carzol 92SP	4.0	Jun 2,Jul 6 Aug 3	0.8	0.0	5.2	6.3	3.2	12.2	7.5	
Check			2.8	0.0	19.6	10.4	144.1	17.5	277.0	

Treatment and oz form./100 gal	Application date(s)	Mean no. mites*/leaf							
		Jul 21			Aug 22				
		ERM	TSM	ARM	ERM	TSM	ARM	ZM	
SLJ 0312 50WP 8.0,7.1	Jun 2, Jul 6								
Plictran 50WP 6.0	Aug 3	22.6	2.5	10.1	0.0	0.1	3.9	0.1	
Kelthane 4F 32.0	Jun 2	0.1	0.0	4.3	0.0	0.0	3.9	0.1	
Kelthane 4F 64.0	Jun 2	0.0	0.0	3.9	0.0	0.0	8.8	0.0	
Carzol 92SP 4.0	Jun 2, Jul 6 Aug 3	1.7	0.1	21.3	0.0	0.1	1.9	0.4	
Check		1.4	0.2	167.2	0.0	0.0	10.5	0.3	

*ERM = European red mite, TSM = Twospotted spider mite, ARM = Apple rust mite;
ZM = Zetzellia mali.

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

PEAR: Pyrus communis

Pear psylla: Psylla pyricola Foerster

Plum curculio: Conotrachelus nenuphar (Herbst)

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

Pear rust mite: Epitrimerus pyri (Nalepa)

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PEAR, INSECT CONTROL, HUDSON VALLEY, HIGHLAND, NEW YORK, 1983: 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 9-yrs-old. Treatments were applied dilute to run-off by high-pressure handgun sprayer at 350 psi using 2.5 gal/tree during the 1st 2 sprays and 3.75 gal/tree for the final 2 sprays (480-720 gal/acre). All treatments were applied at white bud, May 1, petal fall, May 13, and 1st cover Jun 8. Pydrin (in the Orthene plot), Dikar, and the SN 72129 treatments were all applied Jul 1. In the SN 72129 treatment at 6 oz/100 gal, 1.0 oz/100 gal was applied May 1 instead of the 6 oz rate. Pear psylla counts were made throughout the season by collecting 4 spurs (20 leaves) from each plot (1 spur/Bartlett tree) and counting all of the live psylla nymphs on each leaf using a binocular scope in the laboratory. The fruit was rated by examining 50 Bartlett and 50 Bosc fruits/plot on Jun 7. Each plot was rated on Oct. 7 for pear rust mite damage to Bartlett fruits. Damage was rated as slight if over 20% but less than 50% of fruit was russeted, moderate if over 50% but less than 75%, and severe if over 75% of the fruit was russeted.

Orthene was ineffective against the pear psylla; but provided moderate plum curculio control. Pay-Off was very effective against plum curculio, pear psylla, and to a lesser extent, tarnished plant bug. An early-season build-up of European red mite was observed in the Pay-Off plots. The SN 72129 material was ineffective against plum curculio, except at the highest rate. This material was not as fast-acting as Pay-off in reducing psylla populations, but by mid-season, the control looked excellent. Dikar provided a moderate level of psylla suppression throughout the season, but slight to moderate leaf yellowing and chlorosis was observed on the younger foliage following the first 2 applications. The Orthene-Pydrin plots averaged a slight level of russeted Bartlett fruit from pear rust mite, but the 2 Pay-Off treatments averaged a moderate level of russeted fruit.

Treatment and oz form./100 gal		Mean no. pear psylla nymphs/20 leaves					
		May 12	Jun 1	Jun 29	Jul 8	Jul 20	Aug 1
Orthene 75SP	5.3						
Pydrin 2.4EC	1.25	31.7 c	25.7 b	610.7 b	22.3 a	12.7 ab	2.0 a
Pay-Off 2.4EC	1.25	1.3 a	0.0 a	0.0 a	10.3 a	2.3 a	2.7 a
Pay-Off 50WP	0.75	0.0 a	0.0 a	0.3 a	11.0 a	13.0 ab	2.0 a
Dikar 72WP	32.0	8.0 ab	0.3 a	87.3 a	30.7 a	14.3 b	30.7 a
SN 72129 50WP	4.0	14.0 ab	1.3 a	107.3 a	2.3 a	2.7 a	0.3 a
SN 72129 50WP	2.0	10.0 ab	1.0 a	18.0 a	9.3 a	5.0 ab	2.7 a
SN 72129 50WP	1.0 6.0	19.0 bc	1.7 a	13.7 a	0.7 a	2.7 a	0.0 a
Check		21.3 bc	49.0 c	331.0 ab	343.3 b	91.7 c	1.7 a

Treatment and oz form./100 gal		% injured fruit		% Clean fruit*
		Plum curculio	Tarnished plant bug	
Orthene 75SP	5.3			
Pydrin 2.4EC	1.25	11.0 a	7.3 a	83.7 c
Pay-Off 2.4EC	1.25	14.7 a	3.0 a	82.3 c
Pay-Off 50WP	0.75	6.0 a	4.3 a	89.7 c
Dikar 72WP	32.0	36.3 bc	6.3 a	58.7 ab
SN 72129 50WP	4.0	36.7 bc	6.7 a	58.0 ab
SN 72129 50WP	2.0	45.7 c	4.0 a	51.7 a
SN 72129 50WP	1.0 6.0	21.3 ab	5.7 a	73.3 bc
Check		52.3 c	6.0 a	42.7 a

*Fruit damaged by pear psylla was subtracted from this column in addition to injury shown.

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

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

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 Highland, NY 12528

PEAR, PEAR MIDGE CONTROL, MODENA, NEW YORK, 1983: Single tree plots of the 'Bartlett' and 'Bosc' cultivars were replicated 8 times in a randomized block design. Treatments were applied by high-pressure handgun sprayer dilute to runoff at 400 psi using 4.4 gal spray/tree (664 gal/acre) on Apr 28 (green cluster) and/or May 2 (white bud). Evaluations were made by examining 25 fruit clusters/tree from each tree in the plot on May 31st (fruit set stage on Bartlett). Presence of the midge was discerned by the fact that infested fruits had a round, swollen appearance, whereas normal fruits were pyriform. Only the 4 replicates in the western half of the block were used in the analysis of the data, since none of the treatments or replicates in the eastern half of the block were infested.

Guthion and Systox applied at both green cluster and white bud effectively controlled the midge, whereas Pydrin did not. Results of the white bud spray alone are more confusing, but may be related to the distance of these treatments to the foci of infestation. The results suggest that a white bud spray alone would be insufficient to provide complete control of the midge.

* * * * *

Treatment and oz form./100 gal	Application date(s)	Mean no. pear midge infested fruit cluster/25
Guthion 50WP 8.0	Apr 28, May 2	0.25 a
Systox 6E 4.0	Apr 28, May 2	0.0 a
Pydrin 2.4E 2.6	Apr 28, May 2	3.25 bc
Guthion 50WP 8.0	May 2	1.0 ab
Pydrin 2.4E 2.6	May 2	0.75 ab
Check		4.5 c

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

PEACH: Prunus persicae

Oriental fruit moth: Grapholitha molesta (Busck)

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

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PEACH, INSECT CONTROL, HUDSON VALLEY, HIGHLAND, NEW YORK, 1983: A .5 acre planting of 8 and 4-yr-old 'Red Haven', 'Reliance', and 'Canadian Harmony' peaches was divided into 6 sections. The two end sections were unsprayed and served as checks while the 2 middle sections were treated at the rate of 3 lb Lorsban 50WP/acre using an airblast sprayer applying 40 gal spray/acre. Two sections on either side of the middle sections were treated dilute to run-off with a high-pressure handgun sprayer at 300 psi using from 300-357 gal spray/acre at the rate of 1 lb Lorsban 50WP/100 gal. Treatments were applied at pink, Apr 27, petal fall, May 13, and in 5 cover sprays May 28, Jun 10, Jun 24, Jul 8, and Jul 23. Insect damage was evaluated Aug 5 by examining 100 Red Haven fruits/tree from 3 trees in each section.

Catfacing injury caused by the tarnished plant bug and oriental fruit moth feeding were the only insect injury found. The Lorsban treatments completely controlled the oriental fruit moth, as well as greatly reducing the catfacing injury.

* * * * *

Treatment and rate formulation	Location	% injured fruit	
		'catfacing'	Oriental fruit moth
Check	south	6.3	1.0
Lorsban 50WP 1 lb/100 gal	south	1.7	0.0
Lorsban 50WP 3 lb/acre	south	1.7	0.0
Lorsban 50WP 3 lb/acre	north	1.7	0.0
Lorsban 50WP 1 lb/100 gal	north	1.0	0.0
Check	north	10.3	2.0

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

APPLE: Malus domestica

European red mite: Panonychus ulmi (Koch)

Twospotted spider mite: Tetranychus urticae Koch

a predator mite: Zetzellia mali (Ewing)

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APPLE, MITE CONTROL, HUDSON, NEW YORK, 1983: An 8 acre block of 26 yr-old 'Red Delicious' and 'Golden Delicious' cultivars, 16 ft high, spaced 35' x 18 ft, was divided into 4 unreplicated plots 1.7 - 2.4 acres in size. Eight trees on the end of the 1st plot served as an untreated check. Treatments were applied by airblast sprayer on Aug 24 using 100 gal spray/acre. Mites were evaluated by sampling 25 'Red Delicious' leaves/tree from 4 trees in each plot. All samples were brushed and counted in the laboratory. A pre-spray count was made followed by 2 post-spray counts.

Initial knockdown and control was greater in the Plictran and Carzol treated blocks than in those treated with Kelthane. The second post-spray count indicated, however, that Kelthane's residual activity was still working whereas European red mites were starting to build-up again in the Plictran plot. The predatory mite Zetzellia mali was found in almost all treatments on the final date.

* * * * *

Treatment and rate form./acre	Mean no. mites*/leaf						
	Aug 22		Aug 26		Sep 5		
	ERM	TSM	ERM	TSM	ERM	TSM	ZM
Kelthane 4F 3 pt	10.5	0.4	1.4	0.3	0.2	0.2	0.1
Plictran 50WP 1 lb	8.2	0.0	0.5	0.0	3.4	0.1	0.0
Kelthane 35WP 4 lb	11.9	0.1	1.4	0.1	0.2	0.2	0.1
Carzol 92SP 1 lb	12.2	0.3	0.1	0.0	0.6	0.0	0.2
Check	4.1	0.1	1.0	0.1	7.9	0.4	0.3

*ERM = European red mite, TSM = Twospotted spider mite, ZM = Zetzellia mali.

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

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APPLE, MITE CONTROL, MODENA, NEW YORK, 1983. Three unreplicated 5 acre blocks were each treated with a different rate of Kelthane 4F. Trees ranged in age from 15-25 yrs-old and spacings varied from 15 x 30 to 22 x 20 ft. Treatments were applied July 8 by airblast sprayer at 3 mph using 100 gal spray/acre. An untreated check plot of 45 trees was sprayed with Plictran 50WP 1 lb/acre on Aug 2 as the leaves were beginning to 'bronze' in this plot. Mites were evaluated by sampling 25 leaves/tree from 4 'Red Delicious' trees in each plot. Leaves were brushed with a mite brushing machine and all mite stages were counted using a binocular scope.

The Kelthane applications all resulted in a slow but steady and long-lasting reduction of both European red mite and twospotted spider mite populations. The Plictran application in the check plot also reduced both mite populations effectively.

* * * * *

Treatment & rate form./acre	Mean no. mites*/leaf									
	Jul 5		Jul 11		Jul 26		Aug 5		Aug 22	
	ERM	TSM	ERM	TSM	ERM	TSM	ERM	TSM	ERM	TSM
Kelthane 4F 2 pt	6.3	1.9	4.7	3.2	0.1	0.2	0.0	0.1	0.1	0.5
Kelthane 4F 3 pt	2.6	1.2	1.6	0.6	0.1	0.2	0.1	0.0	0.0	0.3
Kelthane 4F 4 pt	8.7	7.4	2.9	1.4	1.3	0.4	0.0	0.1	0.0	0.1
Check	2.3	5.6	6.7	11.9	37.7	36.9	1.7	2.7	0.2	0.4

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

APPLE: Malus domestica

Apple aphid: Aphis pomi DeGeer

San Jose scale: Quadraspidiotus perniciosus
(Comstock)

Spotted tentiform leafminer: Phyllonorycter
blancardella (Fabr.)

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

Woolly apple aphid: Eriosoma lanigerum (Hausmann)

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APPLE, SAN JOSE SCALE CONTROL, BURNSIDE, NY, 1983: A 30-yr-old block of 'McIntosh' and 'Cortland' apple cultivars was divided into 3 unreplicated plots 3.5 - 3.6 acre in size. Treatments were applied to each plot primarily for San Jose Scale control. Trees in the Lorsban plot were spaced 40 x 40 ft while the other 2 plots were spaced 32 x 32 ft. Trees were ca. 18 ft tall and well pruned. Treatments were applied with a Swanson airblast sprayer using from 66 to 300 gal/acre at a speed of from 1.5 - 3.0 mph. In general the slower speed and greater gallonage was used while applying the prebloom oil sprays, whereas fungicide and alternate row sprays were applied at the higher speed and lower gallonage. The summer scale crawler sprays were applied using 100 gal/acre. Additional treatments applied over the entire block and included with the insecticide treatments whenever possible, included: Manzate 200 80WP 4.2 lb/acre Apr 8A (A= alternate row), Apr 14A, Apr 23A, 2.2 lb Apr 29A, May 2, 5.6 lb May 27A; Benlate 50WP 6-9 oz Apr 13, May 2, 4.8 oz Apr 29A; Dikar 72WP 2.8 lb May 13A, May 16A, 4-6 lb May 18A, May 23A, May 31A, Jun 2A, Jun 8A, 6.7 lb Jun 16, Jun 30, 4.3 lb Jul 14, 2.5 lb Jul 25A, Aug 4, Aug 17; Solubor 1.4 lb May 13A, May 16A, 2.0 lb May 18A, May 23A, May 31A; Urea 1.3 lb May 18A, May 23A; Epsom salts 5.6 lb Jun 2A, Jun 8A, 9.0 lb Jun 16, 6.0 lb Jun 30; Zineb 75WP 1.7 lb Aug 4, Aug 17; Captan 50WP 3.0 lb Aug 17 or Aug 22. Apple aphids and woolly apple aphids were evaluated on Jun 29 and Aug 23, respectively, by examining 25 terminal shoots/tree from 6 and 8 McIntosh trees in each treatment. Spotted tentiform leafminer mines were counted on 25 McIntosh leaves/tree from 8 trees/treatment on Aug 23. San Jose scale was evaluated Jul 29 by examining 100 fruits from the top and 100 from the bottom halves of the tree canopy on 6 McIntosh trees/treatment. On Aug 23 100 fruits/tree from 8 McIntosh trees/treatment were evaluated for insect injury while on Sep 26 4 McIntosh trees/treatment were sampled by evaluating 50 fruits in the top and 100 fruits in the bottom of each tree.

Apple aphid control was very good with the Pydrin and Lorsban treatments. The Pydrin block had a late-season outbreak of woolly apple aphids, which were controlled by a PennCap application. The Pydrin applications provided some suppression of spotted tentiform leafminer, but control of tarnished plant bug was inconsistent between the two evaluation dates. The Lorsban provided the least insect injured fruit, primarily because it provided complete control of the San Jose scale.

Treatment, rate form./acre, and applications dates

1. Lorsban 4E 3 pt, oil 60 sec 8 gal Apr 13; Lorsban 50WP 2.3 lb May 2; Guthion 50WP 1.1 lb May 18A, 23A, 31A, Jun 2A, 8A; Lorsban 50WP 2.7 lb Jun 16, 3.3 lb Jun 30, Jul 14, Aug 4, Aug 22; Guthion 1.2 lb Jul 25A; Plictran 50WP 1.3 lb Aug 4, Aug 22.
2. Oil 60 sec 8 gal Apr 14; Guthion 50WP 1.8 lb May 2, Guthion 50WP 1.1 lb May 18A, 23A, 31A, Jun 2A, 8A; Guthion 50WP 2.0 lb Jun 17, Sep 13, 2.4 lb Jun 30, Jul 14, Aug 4; Guthion 50WP 1.2 lb Jul 25A, 1.9 lb Aug 17; Imidan 50WP 2.0 lb; Phosphamidon 8E 12.1 oz Jun 30; Plictran 50WP 1.6 lb Aug 4, Aug 17.
3. Oil 60 sec 9.0 gal Apr 22; Pydrin 2.4EC 7.6 oz May 2, Guthion, 50WP 1.1 lb May 18A, 23A, 31A, Jun 2A, Jun 8A, Pydrin 2.4EC 9.0 oz Jun 16, 10.5 oz Jun 30, Jul 14, Aug 8; Guthion 50WP 1.2 lb Jul 25A, 2.0 lb Sep 13; PennCap 2M 6.7 pt Aug 22; Plictran 50WP 1.3 lb Aug 8, Aug 22, 1.5 lb Aug 16.

* * * * *

Treatment	Mean no. aphid infested terminals/25		Mean no. STLM* mines/25 leaves Aug 23	% San Jose Scale infested fruit					
	apple aphid Jun 29	Woolly apple aphid		Jul 29		Aug 23	Sep 26		
		Aug 23			Top	Bot.	Bot.	Top	Bot.
1	2.0	0.0	2.8	0.0	0.0	0.0	0.0	0.0	
2	12.3	0.3	2.3	3.0	0.8	0.6	9.5	1.0	
3	1.2	11.5	1.1	0.5	0.0	0.3	4.0	1.5	
% Tarnished plant bug injury									
	Aug 23		Sep 26		% Clean fruit				
	Bot.	Top	Bot.	Aug 23	Sep 26				
1	0.3	0.0	0.8	99.7	99.5				
2	2.5	0.0	2.5	96.9	95.5				
3	0.9	0.0	5.5	98.8	94.5				

*STLM = Spotted tentiform leafminer.

APPLE: Malus domestica

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San Jose scale: Quadraspidiotus perniciosus
(Comstock)

Apple blotch leafminer: Phyllonorycter crataegella
(Clemens)

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

APPLE, SAN JOSE SCALE CONTROL, GLENCOE MILLS, NY, 1983: A 36-yr-old planting of 'Cortland' and 'Lobo' apple cultivars was divided into six plots from 3.4 - 8.7 acres in size. Three programs designed to evaluate San Jose scale control with different materials were arranged in a randomized block design with two replicates. The trees were ca. 18 ft tall and were spaced 40 x 40 ft. Additional treatments applied over the entire block (and combined with the insecticides whenever possible) included: Captan 80WP 2.4 lb/acre Apr 13A (A=alternate row) Jun 29, Jul 17, Aug 3, Aug 24; Dikar 72WP 6.0 lb Apr 23A, Apr 29A, Jun 14; Solubor 2.0 lb May 25, Jun 1; Omite 6E 1 1/2 pt Jul 19, and Jul 27. Treatments were applied at 20 or 30 gal/acre with an Agtec model 5002 PTO-powered sprayer at 2-3 mph. First generation San Jose scale activity was evaluated by examining 100 fruits in the top and 100 in the bottom halves of the tree canopy. This evaluation was conducted Aug 1 and included 3 Cortland and 3 Lobo trees from each plot. The Lobos were evaluated for insect damage on Aug 26, one week prior to their harvest. Six trees were evaluated for each treatment by examining 50 fruits in the top and 100 in the bottom canopy areas. A sample of 25 leaves/tree was evaluated for the presence of apple blotch leafminer mines. The Cortland fruit was evaluated in the same manner on Sep. 29.

The Pydrin program provided seasonal suppression of the apple blotch leafminer. Both Pydrin and Lorsban provided better control of the tarnished plant bug than the Guthion standard. Lorsban provided the best control of San Jose scale, while Guthion appeared to provide better control than Pydrin. The Lobo cultivar had greater scale populations than the Cortland cultivar, possibly due to the rougher bark on this cultivar. Coverage was undoubtedly an additional factor resulting in the high San Jose scale populations. Coverage was decreased by the low gallonage per acre used and also the fact that the block was not pruned during the previous season.

Treatment, rate form./acre and application dates

1. Lorsban 50WP 3.0 lb May 4, May 25, Jun 1, Jun 14, Jun 29, Aug 3, Aug 24;
Captan 80WP 2.4 lb May 4, May 14, May 25 Jun 1; Bayleton 50WP 1 1/2 oz
May 4, May 14, May 25, Jun 1; Carzol 92SP 1.0 lb May 25, Jun 1.
2. Guthion 50WP 2.0 lb May 4, May 25, Jun 1, Jun 14, Jun 29, Aug 3, Aug 24;
Dikar 72WP 6.0 lb May 4, May 14, May 25, Jun 1; Lorsban 50WP 3.0 lb Sep 10.
3. Pydrin 2.4E 10 2/3 oz May 4, Jun 14, Jun 29, Aug 3, Aug 24; Dikar 72WP 6.0 lb
May 4, May 14, May 25, Jun 1; Guthion 50WP 2.0 lb May 25, Jun 1; Lorsban
50WP 3.0 lb Sep 10.

* * * * *

Treat- ment	% San Jose scale infested fruit						% Tarnished plant bug injury			
	Aug 1		Aug 26		Sep 29		Aug 26		Sep 29	
	Top	Bot.	Top	Bot.	Top	Bot.	Top	Bot.	Top	Bot.
1	2.6	0.7	8.0	0.3	3.5	0.0	0.0	1.7	0.0	1.3
2	3.3	0.4	40.0	6.5	17.0	2.3	0.0	2.5	0.5	3.5
3	11.7	4.0	43.7	13.0	33.5	0.5	1.0	0.5	0.0	1.0

	Mean no. ABLM*	% Clean fruit	
	mines/25 leaves Aug 26	Aug 26	Sep 29
1	5.5	96.1	98.0
2	8.8	80.3	90.3
3	0.7	76.3	87.8

*ABLM = apple blotch leafminer.

APPLE: Malus domestica

European red mite: Panonychus ulmi (Koch)

San Jose Scale: Quadraspidiotus perniciosus (Comstock)

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

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APPLE, SAN JOSE SCALE CONTROL, POUGHKEEPSIE, NY, 1983: A fifty-yr-old block of 'McIntosh' and 'Cortland' cultivars was divided into two 5 acre plots, one which received Lorsban the other on a Guthion program. Trees were spaced 26 x 40 ft and were 18 1/2 ft in height. Treatments were applied by airblast sprayer delivering 133 gal/acre at a ground speed of 3 mph. Materials applied over the entire block along with the forementioned insecticide treatments included: Manzate 200 80WP 6 lb/acre Apr 13, Apr 23, Apr 28, 3.1 lb May 3, May 9, May 17, May 23, May 27, Jun 2, Jun 10, Jun 16, Jul 1, Jul 19, Aug 4, Aug 17; Benlate 50WP 12 oz Apr 13, Apr 23, Apr 28, May 3, May 9, May 17, May 23, May 27, Jun 2, Jun 10, Jun 16, Jul 1, Jul 19, Aug 4, Aug 17; Solubor 2 lb May 27, Jun 2 : Naphtheleneacetic acid 5 ppm Jun 1; Phosphamidon 8E 6 oz Jul 1; Alar 65WP 4 lb Jul 12; Carzol 92SP 1 1/3 lb Aug 4, and Aug 17. Mite counts were made on Jun 21 and Jul 14 by collecting 25 'McIntosh' leaves/tree from 4 trees in each plot and brushing the leaves in the laboratory with a mite brushing machine. San Jose scale was evaluated following 1st brood crawler activity on Jul 25 by examining 100 Cortland fruits from the top and bottom of each tree using 6 trees in each plot. Insect injury was evaluated prior to harvest by examining 50 fruits in the top and 100 from the bottom of each tree and sampling 4 trees/cultivar/plot.

European red mite populations were not a problem in the Lorsban plot but were over 3 mites/leaf in the Guthion plot by the middle of July. Both San Jose scale and tarnished plant bug injury was greater in the Guthion standard than in the Lorsban plot. Coverage appeared to be a factor as control was noticeably poorer in the tops of the trees.

Treatment, rate formulation/acre and application dates:

1. Oil 60 sec 8 gal Apr 23; Lorsban 4E 4 pt Apr 23; Lorsban 50WP 3 lb May 3, May 17, May 23, Jun 2, Jun 16, Jul 1, Jul 19, Aug 4, Aug 17.
2. Oil 60 sec 8 gal Apr 23; Guthion 50WP 2.0 lb May 3, May 17, May 23, Jun 2, Jun 16, Jul 1, Jul 19, Aug 4, Aug 17.

* * * * *

Treatment	Mean no. European red mites/leaf				% Injured fruit					
	Jun 21		Jul 14		San Jose scale					
					Jul 25		Sep 21		Oct 5	
	mites	eggs	mites	eggs	Top	Bot.	Top	Bot.	Top	Bot.
1	0.0	0.0	0.0	0.1	0.5	0.0	0.0	0.0	0.0	0.0
2	0.2	1.3	3.3	27.4	3.0	0.0	7.5	0.0	0.0	0.3

Treatment	% Injured fruit				% Clean fruit	
	Tarnished plant bug					
	Sep 21		Oct 5			
	Top	Bot.	Top	Bot.	Sep 21	Oct 5
1	0.0	0.2	0.0	0.0	99.8	100.0
2	0.5	0.8	0.0	0.8	96.7	99.3

APPLE: Malus domestica

San Jose Scale: Quadraspidiotus perniciosus
(Comstock)

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

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APPLE, SAN JOSE SCALE CONTROL, NEW PALTZ, NY, 1983: A 35-yr-old block of 'Red Delicious' and 'Golden Delicious' cultivars was interplanted with 20-yr-old 'Spartan' trees so that the spacing in the block was 20 x 35 ft. The block was divided into 3 plots ranging in size from 0.6 - 1.5 acres. One plot was treated with Lorsban, another with PennCap, and the third with Guthion starting at the 1st sign of San Jose scale crawler activity. Two sprays were applied against 1st brood crawlers and 2 against 2nd brood crawlers. The 4 crawler treatments were applied with a Friend model 393 airblast sprayer using from 120-175 gal/acre and at speeds of 2.2-2.7 mph depending upon the particular application. Treatments over the entire block were applied by the grower with a Bean Speedsprayer using 200 gal/acre prebloom and 100 gal/acre postbloom at a speed of 2.5 mph. Treatments applied over the entire block, rates of formulation/acre, and application dates included: Oil 60 sec 6 gal Apr 13, Glyodin 30% 1 pt Apr 22A, Apr 29A; Cyprex 65WP 2 oz Apr 22A, Apr 29A; Pydrin 2.4E 10.0 oz May 2; Benlate 50WP 8.0 oz May 2, May 12A, May 18A, May 23, May 31, Jun 7A, 6 oz Jun 14, Jun 30, Jul 28; Manzate 80WP 3.4 lb May 2, May 12A, May 18A, May 23, 2.5 lb May 31, Jun 7A; Guthion 50WP 1.5 lb May 23, May 31, Jun 7A, Jul 14; Urea 2 lb May 18A, May 23; Solubor 1.5 lb May 31, Jun 7A, Captan 50WP 6 lb Jun 14, 80WP 3.0 lb Jun 30, Jul 28, 2.0 lb Jul 14, Aug 19; Plictran 50WP 1.0 lb Jun 30, and Aug 19. First brood San Jose scale infestations were evaluated Jul 27 by examining 100 Red Delicious apples from the top and 100 from the bottom of 6 trees/plot. Insect injury was also evaluated at harvest by evaluating 100 Spartan apples/tree from 4 trees/plot on Sep 16 and 50 Red Delicious in the top and 100 around the bottom of 4 trees/plot on Oct 6.

Lorsban-treated trees had less scale-infested fruit than PennCap-treated trees, which had less than Guthion-treated trees at both the 1st brood and harvest evaluations. Tarnished plant bug injury was uniform throughout the treatments, which was expected since they were applied too late to influence this pest's damage. It was noted that the color development of the Spartan fruit in the Lorsban and PennCap treatments was slightly behind that in the Guthion plot.

Treatment, rate form./acre and application dates:

1. Lorsban 50WP 3.0 lb Jun 14, Jun 30, Jul 28, 2.5 lb Aug 19.
2. Guthion 50WP 2.5 lb Jun 14, Jun 30, Jul 28, 2.4 lb Aug 19.
3. Penncap 2M 6 pt Jun 14, Jun 30, Jul 28, 5.5 pt Aug 19.

Treat- ment	% fruit injured										
	San Jose scale						Tarnished plant bug			% Clean fruit	
	Jul 27		Sep 16	Oct 6		Sep 16	Oct 6				
	Top	Bot.	Bot.	Top	Bot.	Bot.	Top	Bot.	Sep 16		
1	0.0	0.0	0.0	2.0	0.0	1.8	0.5	1.3	98.3	98.3	
2	2.2	0.2	0.5	28.5	0.5	2.5	1.0	1.5	97.3	89.0	
3	0.8	0.0	0.0	7.0	0.0	3.3	0.5	1.3	96.8	96.7	

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APPLE: Malus domestica

San Jose scale: Quadraspidiotus perniciosus
(Comstock)

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

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APPLE, SAN JOSE SCALE CONTROL, CLINTONDALE, NY, 1983: A 75-yr-old planting of 'McIntosh' apple trees was divided into 2 one-half acre blocks. One block received Lorsban sprays on a seasonal schedule while the other received Guthion sprays. Trees were spaced 27 x 40 ft, and were approximately 18 ft in height. Treatments were applied with a Friend model 375D airblast sprayer, delivering 200 gal/acre prebloom and 100 gal/acre post-bloom, and traveling at 2.0-2.5 mph. Additional treatments applied over the entire block and mixed with the insecticides whenever possible, included: Polyram 80WP 3.0 lb/acre May 4, May 19, May 25, Jun 1, Jun 15; Topsin M 70WP 0.5 lb May 4, May 19, May 25, Jun 1, Jun 15; Niacide M 2.5 lb Jun 30, Jul 13, Aug 3, 2.0 lb Aug 16, 1.5 lb Sep 8; Carzol 92SP 0.5 lb Jun 15, Plictran 50WP 0.5 lb Aug 3, Aug 16, and Sep 8. Treatments were evaluated for San Jose scale infested fruit on Jul 29 by examining 100 fruits from the top and bottom canopy area of 4 trees in each block. All insect injury was evaluated on Sep 14 by examining 50 fruits from the top and 100 from the bottom of each tree, from 4 trees/block.

San Jose scale infestations were more prevalent in the tops of the trees and in the Guthion treatments. The Lorsban block was virtually pest-free except for a trace of tarnished plant bug damage.

* * * * *

Treatment, rate form./acre and application dates

1. Oil 60 sec 8 gal Apr 7; Lorsban 4E 4 pt Apr 7; Lorsban 50WP 3 lb May 4, May 19, May 25, Jun 1, Jun 15, Jun 30, Aug 3, Aug 16; Guthion 50WP 1.5 lb Jul 13, 1.0 lb Sep 8.
2. Oil 60 sec 8 gal Apr 7; Pydrin 2.4E 9.6 oz May 4; Guthion 50WP 2.0 lb May 19, May 25, Jun 1, Jun 15, Jun 30, Aug 3, Aug 16, 1.5 lb Jul 13, 1.0 lb Sep 8.

Treatment	% San Jose scale infested fruit				% Tarnished plant bug injury		% Clean fruit
	Jul 29		Sep 14		Sep 14		Sep 14
	Top	Bot.	Top	Bot.	Top	Bot.	
1	0.3	0.0	0.0	0.0	0.0	0.5	99.7
2	1.8	0.3	28.5	3.5	0.0	0.0	88.2

APPLE: Malus domestica

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European apple sawfly: Hoplocampa testudinea (Klug)
San Jose scale: Quadraspidiotus perniciosus (Comstock)
Tarnished plant bug: Lygus lineolaris (P. de B.)
a green fruitworm: Orthosia hibisci Guenee

APPLE, SAN JOSE SCALE CONTROL, CLIFTON PARK, NY, 1983: A 56-yr-old block of 'McIntosh' and 'Cortland' cultivars was divided so that one half received Lorsban sprays and the other half Penncap sprays. The plots were 2.5 acres in size, with the trees spaced 30 x 30 ft and approximately 19 ft in height. Treatments were applied with an airblast sprayer delivering 200 gal spray/acre at a ground speed of 2.5 mph. Additional treatments applied along with the insecticides over the entire block included: Benlate 50WP 8.0 oz Apr 23, Apr 30, May 23, Jun 1, Jun 14, 12.8 oz May 7, May 28, Manzate 80WP 3.0 lb Apr 23, Apr 30, May 7, May 23, May 38, Jun 1, Jun 14; Guthion 50WP 2.0 lb May 7, Jun 1; Vydate 2L 4 pt May 7; Solubor 4 lb Jun 14, Jun 29; Captan 50WP 4 lb Jun 29, Captan 80WP 4 lb Jul 14, Aug 3, Aug 16; Plictran 50WP 1.2 lb Jul 14, Aug 3; Phosphamidon 8E 1 pt Jul 14; and Alar 65WP 4 lb Jul 15. Fifty 'McIntosh' fruits in the top and 50 in the bottom of each tree were examined for insect injury from 6 trees in each plot on Aug 4 and 4 trees in each plot on Sep 30.

San Jose scale control was better in the Lorsban block than the Penncap block. Control of tarnished plant bug, European apple sawfly and green fruitworm may have been better because of the early green-tip Lorsban + oil application. Lack of control of the forementioned pests cannot be attributed to Penncap, however, since both blocks were treated with Guthion at pink and petal fall.

* * * * *

Treatment, rate form./acre and application dates

1. Oil 60 sec 8 gal Apr 23; Lorsban 4E 4 pt Apr 23; Lorsban 50WP 3.0 lb Jun 14, Jun 29, Jul 14, Aug 16; Guthion 50WP 3.0 lb Aug 3.

2. Oil 60 sec 8 gal Apr 23; Penncap 2M 1 gal Jun 14, Jun 29, Jul 14, Aug 3, Aug 16.

Treatment	% damaged fruit											% Clean fruit Sep 30
	San Jose scale				Tarnished plant bug		European apple sawfly		Green fruitworm			
	Aug 4		Sep 30		Sep 30		Sep 30		Sep 30			
	Top	Bot.	Top	Bot.	Top	Bot.	Top	Bot.	Top	Bot.		
	Top	Bot.	Top	Bot.	Top	Bot.	Top	Bot.	Top	Bot.		
1	0.3	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	99.8	
2	2.0	0.0	3.0	0.0	1.0	0.3	0.0	0.3	0.0	0.3	98.3	

APPLE: Malus domestica

San Jose scale: Quadraspidiotus perniciosus (Comstock)

European red mite: Panonychus ulmi (Koch)

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APPLE, SAN JOSE SCALE CONTROL, OHIOVILLE, NY, 1983: A 'McIntosh' apple orchard was divided into 3 plots ranging in size from 0.5 - 0.8 acres. Trees were approximately 60-yrs-old spaced 36 x 40ft and 21 ft in height. The fruit had been badly infested with San Jose scale during the previous season. Treatments were timed for 1st and 2nd brood scale crawler activity. Treatments were applied with a Friend Model 393 airblast sprayer using 150 gal/acre at a ground speed of 2.25 mph. Captan 50WP 6 lb/acre and Benlate 50WP 6 oz/acre were applied with the insecticide treatments. The grower applied additional sprays in the block for disease and insect control prior to the crawler sprays. Preliminary observations indicated that 1st brood infestations were severe in the non-Lorsban treated plots, so Lorsban was applied to these plots for control of the 2nd brood crawlers. Fruit was evaluated at harvest by examining 50 fruits in the top and 100 in the bottom of each tree from 4 trees in each plot. Mites were sampled Jul 13 by collecting 25 leaves/tree from 4 trees in each plot, brushing the leaves onto a plate, and counting the mites on each plate.

In spite of the fact that a switch in materials was made, considerable scale injury was found in the Pydrin and Guthion plots. Most of the injury was on apples located in the tops of the trees, indicating that the height of the trees probably restricted optimal coverage. Mite suppression was noted in the Lorsban plot on the Jul 13 count.

*	*	*	*	*	*	*	*	*	*	*	*	*	*
Treatment, rate form./acre and application dates						Mean no.		% San		% Clean fruit Sep 21			
						European red		Jose scale					
						mites/leaf		damaged fruit					
						Jul 13		Sep 21					
						mites	eggs	Top	Bot.				
1. Lorsban 50WP 3 lb, Jun 14, Jun 30, Jul 28, Aug 19						0.1	0.2	25.0	2.0	90.0			
2. Pydrin 2.4E 10 2/3 oz, Jun 14, Jun 30 Lorsban 50WP 3 lb Jul 28, Aug 19						0.8	1.4	77.0	5.8	70.3			
3. Guthion 50WP 2.5 lb Jun 14, Jun 30, Lorsban 50WP 3 lb Jul 28, Aug 19						1.0	3.2	69.5	13.3	67.2			

APPLE: Malus domestica

San Jose scale: Quadraspidiotus perniciosus
(Comstock)

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

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APPLE, SAN JOSE SCALE CONTROL, MILTON, NY, 1983: A 3 1/2 acre block of 'McIntosh' apple trees was treated with Lorsban on a season-long schedule. The trees were 35-40-yrs-old, spaced 36 x 36 ft, and 18-20 ft in height. Sprays were applied with a John Bean 4000^R Speed sprayer delivering 142 gal/acre at a speed of 2.5 mph. Materials applied in addition to and/or with the Lorsban sprays included: Benlate 50WP 8 oz/acre May 2, May 10, May 18, May 24, Jun 1, Jun 9, Jun 23; Manzate 200 80WP 3 lb May 2, May 10, May 18, May 24, Jun 1, Jun 9; Captan 50WP 6 lb Jun 23, Jul 7, Jul 21, Aug 4, Aug 18; Kelthane 4F 1.7 pt Jul 21, Aug 18; and Plictran 50WP 1 lb Aug 4. Insect damage was evaluated on Sep 22 by sampling 50 fruits in the top and 100 fruits in the bottom of each tree from 4 trees in the Lorsban block and 4 trees in an adjacent block owned by the grower's neighbor.

Virtually all of the insect injury was found in the tops of the trees. The Lorsban applications were more effective in controlling San Jose scale, tarnished plant bug, and green fruitworm than the schedule utilized on the neighboring block.

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Treatment, rate form./acre & appli- cation date(s)	% injured fruit						% Clean fruit
	San Jose scale		Tarnished plant bug		Green fruitworm		
	Top	Bot.	Top	Bot.	Top	Bot.	
	Top	Bot.	Top	Bot.	Top	Bot.	
1. Oil 60 sec 8 gal Apr 13; Lorsban 4E 4 pt Apr 13; Lorsban 50WP 3 lb May 2, May 24, Jun 9, Jun 23, Jul 7, Jul 21, Aug 4, Aug 18	0.5	0.0	0.0	0.0	0.0	0.0	99.8
2. Standard (neighbors block)	7.5	0.0	1.5	0.3	0.5	0.0	97.0

APPLE: Malus domestica

Dogwood borer: Synanthedon scitula (Harris)

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APPLE, DOGWOOD BORER CONTROL, VALATIE, NEW YORK, 1982-83: A nine-year-old apple planting of 5 cultivars, spaced 10 x 19 ft (230 trees/acre), 6 ft in height, on the M26 rootstock, was divided into 3 blocks. Block A contained 3 treatments and an untreated check arranged in a randomized complete block design with 10 tree plots replicated once on the 'Mutsu' and 'Macoun' cultivars and twice on the 'Empire' cultivar. Block B consisted of 4 tree plots of the 'Red Delicious' cultivar with 4 treatments and a check replicated 4 times in a randomized complete block design. Block C was arranged in a similar design using 10 tree plots replicated 5 times with one-half the cultivars 'Red Delicious' and the other half 'McIntosh'. Treatments were applied Jul 21 (Block A) and Aug 5 (Blocks C and D) in 1982 using a Spartan^R handgun sprayer at 150 psi. Approximately 1/3 gallon of spray was applied dilute to run-off around the trunk of each tree from the base to the first scaffold level. Treatments were reapplied to the same plots on Aug 15, 1983 using a Bean^R handgun sprayer at 200 psi delivering 1/2 gallon of spray/tree. Rates and formulations were readjusted and the Tree-hold treatments omitted in 1983. All treatments were evaluated Nov 2, 1983 by examining each tree for the presence of live borer larvae, pupal skins, cocoons and fresh borer frass. The number of burr knots, i.e. above-ground adventitious root growths, were also recorded since borers usually became established at these sites.

The presence of live larvae is probably the best indication of a treatment's effectiveness, since pupal skins may persist over a season, and most cocoons were from previous seasons infestations. The "new infestations" category is simply the sum of the live larvae, fresh frass, and pupal skins categories. The number of burr knots/tree was similar between treatments and block, with the exception of the Tree-hold plus paint treatment in block C which had significantly fewer knots. No attempt was made to distinguish between live or dead burr knots in the counts, but we observed the Tree-hold treatments all killed the burr knots. In spite of the fact that Tree-hold treated burr knots were killed, borers still infested these knots and in fact were observed to kill many untreated knots through their extensive feeding activity. All insecticide treatments reduced the number of live borers compared to the checks, but differences were only statistically significant in blocks B and C. The Pydrin treatments were less effective than either Lorsban or Thiodan in block A. Addition of white paint or Tree-hold to the insecticide treatments did not appear to inhibit their effectiveness; rather it allowed the applicator to see the coverage better, and may have helped the pesticides to weather better. The amount of white paint used, however, did not appear to be thick enough for the purpose of providing protection against southwest injury during cold winter days. In addition, applying paint in August required considerable care to prevent drift on fruit on low-hanging limbs.

Treatment and oz form./100 gal	Application dates				Mean burr knots /tree	Mean no. live larvae /tree	Mean no. fresh frass /tree	Mean no. pupal skins /tree	Mean no. cocoons /tree	Mean no. new infest- ations/tree
	1983									
	Jul 21	Aug 5	Aug 15	Aug 15						
Block A										
Pydrin 2.4E 20.0	X					0.15	0.15 bc	0.30	0.15	0.60
Lorsban 4E 106.6	X									
50WP 48.0						0.03	0.0 a	0.18	0.18	0.18
Thiodan 50WP 24.0						0.03	0.03 ab	0.13	0.18	0.18
Check						0.58	0.23 c	0.40	0.18	1.20
Block B										
Thiodan 50WP 16.0		X								
24.0										
White paint* 3072.0		X								
Tree-hold A112** 384.0			X			0.0 a	0.06	0.19	0.06	0.25 ab
Lorsban 4E 128.0		X								
50WP 48.0										
White paint 4096.0		X								
Tree-hold A112 512.0			X			0.0 a	0.0	0.0	0.06	0.0 a
Pydrin 2.4E 26.0		X								
4.0										
White paint 4096.0		X								
Tree-hold A112 512.0			X			0.0 a	0.0	0.06	0.0	0.06 a
White paint 4096.0		X								
Tree-hold A112 448.0			X			0.63 b	0.0	0.13	0.06	0.75 b
Check						0.06 a	0.0	0.31	0.0	0.38 ab
Block C										
Thiodan 50WP 24.0						0.06 a	0.0 a	0.08	0.04	0.14 a
Lorsban 4E 106.6		X								
50WP 48.0						0.0 a	0.02 a	0.02	0.06	0.04 a
Pydrin 2.4E 20.0		X								
White paint 4096.0						0.04 a	0.04 ab	0.02	0.08	0.12 a
Tree-hold A112 448.0						0.50 b	0.14 b	0.06	0.06	0.71 b
Check						0.58 b	0.14 b	0.22	0.12	0.94 b

Means followed by the same letter are not significantly different by Duncan's Multiple Range Test, P = 0.05.

*White paint = Exterior/interior latex paint, white GL800, Sentry Hardware Corp., Cleveland, OH.

**Tree-hold sprout inhibitor A112, contains 12% Naphtheleneacetic acid equivalent.

Means followed by the same letter are not significantly different by Duncan's Multiple Range Test, P = 0.05.
 *White paint = Exterior/interior latex paint, white GL800, Sentry Hardware Corp., Cleveland, OH.
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