RESULTS OF 1995 INSECTICIDE AND ACARICIDE TRIALS IN EASTERN NEW YORK

R.W. STRAUB, Professor of Entomology

Cornell University's Hudson Valley Laboratory*
P.O. Box 727, Highland, NY 12528

Tel: 914-691-7151
FAX: 914-691-2719

Research Support Specialist.....P. J. Jentsch
Technical Assistant.....H. Grimsland

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EVALUATION OF INSECTICIDES AGAINST EARLY-SEASON INSECT PESTS OF APPLE, 1995: Treatments were applied to four-tree (of which 'McIntosh' was included) plots replicated three times in a randomized complete block design. All treatments were applied dilute to runoff using a high-pressure handgun sprayer at 300 psi delivering from 1.7 to 2.7 gal spray/tree or 160 to 260 gal/acre depending upon foliage density. Trees on the EMII rootstock were 32 years-old, 10 ft high, and 12 ft wide. Treatments were applied on various schedules as per APPENDIX II. Damage to fruit was assessed by randomly selecting 100 fruits prior to 'June drop' (7 June) and scoring for external damage by each pest. Damage to fruit by early-Lepidoptera includes OFM, OBLR and GFW. Data were converted to % damaged fruit. On the same day, damage to foliage was determined by examining 25-100 terminals or 100 leaves, and RAA infestation was determined by counting the number of infested fruit clusters/3 minute period. Leaves were rated 0-4 for WALH damage, where 0 = no damage and 4 = >50% stipling. Foliar damage by leafrollers include OFM, RBLR, OBLR, CM and LAW.

Weather for the '95 season was favorable for insect pressure, and unfavorable for vegatative growth and fruit development. Spring was preceeded by one of the mildest winters on record, allowing for high overwintering rates for arthropods [notable exception was STLM, due to high overwintering success of predators/parasitoids]. Very low rainfall was evidenced for most of the summer (see APPENDIX I)

Because of high overwintering success, PC pressure was high and due to an extended apple bloom period, damage to some treatments (**Table 1a**) was severe (so too, for many commercial blocks). The excellent control of PC in Treat. #10, which received Asana @ pink, perhaps demonstrates the rationale of a pre-bloom application of pyrethroid. Likewise for TPB. Treatments that reveived an OP or pyrethroid provided good control of high early-Lep populations.

For foliar evaluations (**Table 1b**), treatments that included Imidan during PF and 1C appeared to provide the best control of leafrollers. No treatments were efficacious against aphids (GAA/SA). Because the optimum timing for RAA is pre-bloom, those treatments that included a pre-bloom application provided the best control. The best leafhopper treatments were Provado, V-71639 + adjuvant and Tmt # 10, which included carbaryl as a fruit thinner.

Table 1a Evaluation of insecticides for controling early season pest complex on apple[1], N.Y.S.A.E.S., Hudson Valley Lab., Highland, N.Y.-1995

Treatment	Formulation amt./100 gal.	Timing[3]	% fruit damaged by insect species[2] Tarnish Plant Bug	Plum Curculio	European Apple Sawfly	Early Lep. Sp.
2. Imidan 70W	12.0 oz.	P, PF, 1-2C	4.5a	4.1ab	0.2a	1.5a-c
Savey 50W	21.3 gr.	P				
Endosulfan 50W	12.0 oz.	P				
3. V-71639	3.4 oz.	P, PF, 1C	5.6a	28.4 c-f	4.1a	16.0 de
4. V-71639	3.4 oz.	PF, 1-2C	2.8a	52.7 g	3.9a	18.1 e
5. V-71639 +	3.4 oz.	PF, 1-2C	2.8a	42.7 fg	3.8a	12.8 de
AG98	1.0 pt.					
6. Provado 1.6F	2.0 oz.	PF	5.4a	2.1a	2.4a	0.4a
Guthion 3F	10.7 oz.	PF-6C				
7. Comply 40W	1.25 oz.	PF, 2C	2.4a	31.5 c-f	1.9a	7.5 b-e
8. Confirm 70W	2.3 oz.	2-5C	4.8a	20.4 c-e	3.3a	12.7 de
B1956	0.12%					
10. Imidan 70W	12.0 oz.	PF-2C	0.7a	0.7a	0.1a	1.3ab
Carbaryl 50W	16.0 oz.	10mm				
Asana 0.66 EC	5.8 oz.	P				
11. Untreated	-		4.0a	39.1 fg	7.9a	16.3 de

1 Data from ' McIntosh' on 7 June prior to "June Drop".

2 Mean separation by Fishers Protected LSD (P=<0.05). Arcsin transformation used for statistical analysis of data expressed as percentages. Treatment means followed by the same letter are not significantly different.

3 McIntosh phenology: 1/2" G on 4/19; TC on 4/24; Pink on 5/1, Bloom on 5/8; PF on 5/23; 10mm on 5/31, 1C on 6/1

Table 1b Evaluation of insecticides for controling early season pest complex on apple[1,2], N.Y.S.A.E.S., Hudson Valley Lab., Highland, N.Y.-1995

Treatment	Formulation amt./100 gal.	Timing[3]	Leafroller inf./ 100 Terminals	SAA / GAA inf./ 25 Terminals	RAA inf./ 3 min. obser.	1st Gen. WALH / 100 lvs.	LH[4] lf. rating 0-4
2. Imidan 70W	12.0 oz.	P, PF, 1-6C	5.7a	14.9a	0.6a	2.6a	0.9c
Savey 50W	21.3 gr.	P					
Endosulfan 50W	12.0 oz.	P					
3. V-71639	3.4 oz.	P, PF, 1C	9.9a	11.5a	1.6a	24.2 d	2.1 e
4. V-71639	3.4 oz.	PF, 1-2C	14.0a	9.9a	2.6a	8.6abc	1.3 d
5. V-71639 +	3.4 oz.	PF, 1-2C	18.0a	10.2a	4.6a	0.0a	0.5 b
AG98	1.0 pt.						
6. Provado 1.6F	2.0 oz.	PF, 3, 5C	11.2a	12.2	4.3a	0.0a	<0.1a
Guthion 3F	10.7 oz.	PF-6C					
7. Comply 40W	1.25 oz.	PF, 2C	13.8a	12.9a	2.5a	15.1 bcd	0.5 b
8. Confirm 70W	2.3 oz.	PF-4C	10.4a	13.5a	2.7a	7.9abc	1.0 c
B1956	0.12%						
9. Omite 30W	16.0 oz.	PF-2C	21.6a	14.9a	1.5a	5.4ab	1.2 d
10. Imidan 70W	12.0 oz.	PF-6C	3.3a	11.6a	0.6a	0.0a	0.2a
Carbaryl 50W	16.0 oz.	10mm					
Asana 0.66 EC	5.8 oz.	P					
11. Untreated	-		47.9a	11.6a	4.2a	19.4 cd	1.4 d

1 Data from ' McIntosh' on 7 June.

2 Mean separation by Fishers Protected LSD (P=<0.05). Treatment means followed by the same letter are not significantly different. Log 10 (X + 1) used for statistical analysis of data expressed as # / leaf; # / terminal.

3 McIntosh phenology 1/2" G on 4/19; TC on 4/24; Pink on 5/1, Bloom on 5/8; PF on 5/23; 10mm on 5/31, 1C on 6/1.

4 25 spur leaves / tree representing 1st gen WALH damaged leaves. 0 = no stipling, 1 = slight stipling (<10% of leaf), 2 = low stipling (>10-25%), 3 = moderate 25-50%, 4 = heavy stipling (>50%)

WALH = white apple leafhopper, Leafroller = oriental fruit moth, red banded leafroller; oblique banded leafroller, codling moth, lesser apple worm, green fruit worm SAA / GAA = spiria apple aphid & green apple aphid. RAA = rosy apple aphid.

APPLE: Malus domestica 'McIntosh'

Apple maggot (AM): Rhagoletis pomonella (Walsh)
Codling moth (CM): Cydia pomonella (Linnaeus)
European apple sawfly (EAS): Hoplocampa testudinea (Klug)
Green fruitworm (GFW): Lithophane antennata (Walker)
Lesser appleworm (LAW): Grapholita prunivora (Walsh)
Obliquebanded leafroller (OBLR); Choristoneura rosaceana (Harris)
Oriental fruit moth (OFM): Grapholita molesta (Busck)
Plum curculio (PC): Conotrachelus nenuphar (Herbst)
Redbanded leafroller (RBLR): Argyrotaenia velutinana (Walker)
San Jose scale (SJS): Quadraspidiotus perniciosus (Comstock)
Sparganothis fruitworm (SFW): Sparganothis sulfureana (Clemens)
Variegated leafroller (VLR): Platynota flavedana Clemens
Tarnished plant bug (TPB): Lygus lineolaris (P. de B.)

HARVEST EVALUATION OF INSECTICIDES AGAINST FRUIT-FEEDING INSECTS, 1995: Treatments were applied to four-tree (of which 'McIntosh' was included) plots replicated three times in a randomized complete block design. All treatments were applied dilute to runoff using a high-pressure handgun sprayer at 300 psi delivering from 1.7 to 2.7 gal spray/tree or 160 to 260 gal/acre depending upon foliage density. Trees on the EMII rootstock were 32 years-old, 10 ft high, and 12 ft wide. Treatments were applied on various schedules as per APPENDIX II. Damage to fruit was assessed on 17 AUGUST by randomly harvesting 100 'Cortland' fruits/treatment and scoring for external damage by each pest. Harvest was earlier than normal because extremely dry conditions caused premature drop of this cultivar.

Weather for the '95 season was favorable for insect pressure, and unfavorable for vegatative growth and fruit development. Spring was preceeded by one of the mildest winters on record, allowing for high overwintering rates for arthropods [notable exception was STLM, due to high overwintering success of predators/parasitoids]. Very low rainfall was evidenced for most of the summer (see APPENDIX I)

Because of high overwintering success, PC pressure was high and due to an extended apple bloom period, damage to some treatments (**Table 2**) was severe (so too, for many commercial blocks). Only treatments that included an OP insecticide @ PF - 2C provided acceptable control. Treatment #2 which included Imidan from pink through 1C provided excellent control of TPB; while V-71639 + adjuvant (PF - 2C) provided acceptable control of this pest. All treatments except V-71639 (stopped @ 1C) provided good control of early Lepidoptera (includes OFM, OBLR and GFW). Poor SJS control was provided by the IGR's, Comply and Confirm. Infestation pressure by late-Lepidoptera (OFM, RBLR, OBLR, VLR, SFW and LAW) was unusually high, and notable control was provided by season-long coverage with Imidan or Guthion; all other treatments performed poorly because none were applied late-season. All treatments, appeared to have some effect on AM infestations.

Table 2 Evaluation of insecticides for controling fruit feeding insects on apple[1]
N.Y.S.A.E.S., Hudson Valley Lab., Highland, N.Y.-1995

Treatment	Formulation amt./100 gal.	% fruit damaged by insect species[2,3] TPB	PC	EAS	E.Lep	CM	SJS	L.Lep	AM	Clean
2. Imidan 70W Savey 50W Endosulfan 50W	12.0 oz. 21.3 gr. 12.0 oz.	0.5a	2.3a	0.4a	0.7a	0.0a	1.5a	3.9a	0.2a	88.8 c
3. V-71639	3.4 oz.	9.0 d	51.0 c	0.7a	3.6a	0.0a	0.0a	37.5 b	2.4a	25.7a
4. V-71639	3.4 oz.	4.5 bcd	62.1 c	2.9a	10.9a	0.0a	0.2a	40.5 b	1.9a	16.4a
5. V-71639 + AG98	3.4 oz. 1.0 pt.	2.8 b	66.6 c	1.9a	1.6a	0.1a	0.0a	39.2 b	2.5a	15.2a
6. Provado 1.6F Guthion 3F	2.0 oz. 10.7 oz.	3.8 bc	6.6ab	2.8a	0.1a	0.0a	1.3a	2.2a	0.4a	80.8bc
7. Comply 40W	1.25 oz.	4.1 bc	50.3 c	0.4a	3.0a	0.0a	4.8a	32.8 b	0.1a	26.0a
8. Confirm 70W B1956	2.3 oz. 0.12%	3.5 bc	59.8 c	1.9a	0.2a	0.0a	5.8a	11.4a	1.5a	32.3a
11. Untreated	-	5.2 bcd	55.7 c	0.7a	2.2a	0.6a	9.7a	45.0 b	7.1a	17.1a

1 Data from ' McIntosh' harvested on August 17.

2 Mean separation by Fishers Protected LSD (P=<0.05). Arcsin transformation used for statistical analysis of data expressed as percentages. Treatment means followed by the same letter are not significantly different.

3 Application schedule, see appendix II.

APPLE: Malus domestica 'Cortland'

European apple sawfly (EAS): Hoplocampa testudinea (Klug)
Green fruitworm (GFW): Lithophane antennata (Walker)
Lesser appleworm (LAW): Grapholita prunivora (Walsh)
Obliquebanded leafroller (OBLR); Choristoneura rosaceana (Harris)
Oriental fruit moth (OFM): Grapholita molesta (Busck)
Plum curculio (PC): Conotrachelus nenuphar (Herbst)
San Jose scale (SJS): Quadraspidiotus perniciosus (Comstock)
Sparganothis fruitworm (SFW): Sparganothis sulfureana (Clemens)
Variegated leafroller (VLR): Platynota flavedana Clemens
Tarnished plant bug (TPB): Lygus lineolaris (P. de B.)

HARVEST EVALUATION OF INSECTICIDES AGAINST FRUIT FEEDING INSECTS APPLE, 1995: Treatments were applied to four-tree (of which 'Cortland' was included) plots replicated three times in a randomized complete block design. All treatments were applied dilute to runoff using a high-pressure handgun sprayer at 300 psi delivering from 1.7 to 2.7 gal spray/tree or 160 to 260 gal/acre depending upon foliage density. Trees on the EMII rootstock were 32 years-old, 10 ft high, and 12 ft wide. Treatments were applied on various schedules as per APPENDIX II. Damage to fruit was assessed by randomly selecting 100 'Cortland' fruit at harvest maturity (27 Sept) and scoring for external damage by each pest; subsequently, fruits were dissected to detect internal damage. Damage by early-Lepidoptera includes OFM, OBLR and GFW. Damage from late-Lepidoptera includes OBLR, VLR and perhaps SFW and LAW. Data were converted to % damaged fruit (**Table 3**).

Weather for the '95 season was favorable for insect pressure, and unfavorable for vegatative growth and fruit development. Spring was preceeded by one of the mildest winters on record, allowing for high overwintering rates for arthropods [notable exception was STLM, due to high overwintering success of predators/parasitoids]. Very low rainfall was evidenced for most of the summer (see APPENDIX I)

Because of high overwintering success, PC pressure was high and due to an extended apple bloom period, damage to some treatments was severe (so too, for many commercial blocks). Only treatments that included an OP insecticide @ PF - 2C provided acceptable control. No treatment provided satisfactory control of TPB. Comply provided poor conctol of early Lepidoptera (includes OFM, OBLR and GFW) and SJS. Infestation pressure by late-Lepidoptera (OFM, RBLR, OBLR, VLR, SFW and LAW) was unusually high, and notable control was provided by season-long coverage with Imidan or Guthion; all other treatments performed poorly because none were applied late-season. All treatments, appeared to have some effect on low AM infestations.

Table 3 Evaluation of insecticides for controling pest complex on apple[1]
N.Y.S.A.E.S., Hudson Valley Lab., Highland, N.Y.-1995

Treatment	Formulation amt./100 gal.	% fruit damaged by insect species[2,3]								
		TPB	PC	EAS	E.Lep	CM	SJS	L.Lep	AM	Clean
1 Material X Guthion 3F	1188.0 gr. 10.7 oz.	6.2 b-e	14.3a	1.3 b	1.3a-d	0.0a	0.0a	8.5ab	2.6a-d	67.4 c
2 Imidan 70W Savey 50W Endosulfan 50W	12.0 oz. 21.3 gr. 12.0 oz.	3.8ab	3.3a	0.0a	1.3a-d	0.0a	0.0a	7.8ab	0.7ab	83.1 c
3 V-71639	3.4 oz.	8.8 e	47.4 b	0.1a	5.5 cd	5.1 cd	0.0a	36.6 cd	9.2 de	28.0ab
4 V-71639	3.4 oz.	8.6 de	65.3 bc	0.0a	1.0a-d	2.8 b-d	0.0a	43.3 d	2.1a-c	18.9ab
5 V-71639 + AG98	3.4 oz. 1.0 pt.	4.6a-e	77.4 c	1.9 b	3.5a-d	1.3a-c	0.0a	44.4 d	9.1 de	9.0a
6 Provado 1.6F Guthion 3F	2.0 oz. 10.7 oz.	5.2a-e	4.1a	0.1a	0.2ab	0.0a	0.0a	8.7ab	0.1a	80.9 c
8 Comply 40W	1.25 oz.	7.7 c-e	63.6 bc	0.1a	6.7 d	0.1ab	2.9 b	23.5 b-d	6.3 c-e	17.4ab
9 Confirm 70W B1956	2.3 oz. 0.12%	6.7 b-e	54.1 bc	0.1a	2.5a-d	0.4ab	0.8ab	20.8 bc	2.8a-d	29.4 b
11 Imidan 70W Carbaryl 50W Asana XLR	12.0 oz. 16.0 oz.	2.3a	2.9a	0.0a	0.1a	0.1ab	0.1a	3.5a	2.0a-c	87.5 c
12 Untreated	-	8.6 de	62.0 bc	0.4ab	4.7 b-d	7.7 d	10.0c	45.3 d	12.5 e	12.3ab

1 Data from ' Cortland' harvested on 27 September.

2 Mean separation by Fishers Protected LSD (P=<0.05). Arcsin transformation used for statistical analysis of data expressed as percentages. Treatment means followed by the same letter are not significantly different.

3 Application schedule, see Appendix II.

APPLE: Malus domestica 'Delicious'

Apple rust mite(ARM): Aculus schlechtendali (Nalepa)
A predatory phytoseid(AMB): Amblyseius fallacis (Garman)
European red mite(ERM): Panonychus ulmi (Koch)
Twospotted spider mite (TSM): Tetranychus urticae Koch

MITE CONTROL WITH INSECTICIDES, 1995: Treatments were applied to four-tree (one of which was 'Delicious') plots replicated three times in a randomized complete block design. No dormant oil or miticide was applied. All treatments were applied dilute to runoff using a high-pressure handgun sprayer at 300 psi delivering from 1.7 to 2.7 gal spray/tree or 160 to 260 gal/acre depending upon foliage density. Trees on the EMII rootstock were 32 years-old, 10 ft high, and 12 ft wide. Treatments were applied on various schedules as per APPENDIX II. Phytophagous and predacious mite populations were evaluated by sampling 25 leaves from one 'Delicious' tree per plot. Leaves were removed to the laboratory where they were brushed with a mite brushing machine, and the mites and eggs examined using a binocular scope.

Weather for the '95 season was favorable for insect pressure, and unfavorable for vegatative growth and fruit development. Spring was preceeded by one of the mildest winters on record, allowing for high overwintering rates for mites. Very low rainfall was evidenced for most of the summer (see APPENDIX I)

ERM developed early (**Table 4**) and at the second evaluation (5 JULY) high populations were present in Provado and Tmt # 10 which included early-season Asana/carbaryl. In these two treatments ERM remained at extreme levels through JULY. When the included miticides were compared, Omite (three applications) performed much better than did Savey applied at pink. As during 1994 trials, Confirm (applied PF - 4C) provided some suppression of ERM.

Table 4 Evaluation of insecticides for controling mite populations on apple[1,2,3]
N.Y.S.A.E.S., Hudson Valley Lab., Highland, N.Y.-1995

Treatment	Formulation amt./100 gal.	6/21 Mean # of mites or eggs / leaf* ERM	ERME	TSM	AMB	ARM	7/5 Mean # of mites or eggs / leaf* ERM	ERME	TSM	AMB	ARM
2. Imidan 70W Savey 50W Endosulfan 50W	12.0 oz. 21.3 gr. 12.0 oz.	<0.1a	<0.1a	0.0a	0.0a	430.5 b-d	2.7 b-d	6.4 b	0.2	<0.1a	561.3 b
3. V-71639	3.4 oz.	0.9a-c	4.4 bc	<0.1a	0.0a	235.6a-d	11.1 ef	21.0 cd	<0.1a	<0.1a	408.3 b
4. V-71639	3.4 oz.	0.4ab	1.7ab	<0.1a	<0.1a	402.6 b-d	5.5 de	17.1 b-d	0.1a	<0.1a	508.3 b
5. V-71639 + AG98	3.4 oz. 1.0 pt.	0.6a-c	0.7a	<0.1a	<0.1a	546.0 cd	2.7 cd	8.5 bc	0.1a	<0.1a	560.3 b
6. Provado 1.6F Guthion 3F	2.0 oz. 10.7 oz.	4.2 e	22.2 de	0.1a	0.0a	459.3 b-d	84.9 g	141.9 f	1.1a	0.2 b	460.3 b
7. Comply 40W	1.25 oz.	3.1 de	4.3 bc	<0.1a	0.0a	988.6 d	4.3 d	6.9 bc	0.0a	<0.1a	577.1 b
8. Confirm 70W B1956	2.3 oz. 0.12%	1.2 b-d	1.0ab	<0.1a	<0.1a	664.3 cd	0.4a	0.7a	0.0a	0.0a	278.3 b
9. Omite 30W	16.0 oz.	<0.1a	<0.1	0.0a	0.0a	69.6a	0.9ab	1.5a	<0.1a	0.0a	29.4a
10. Imidan 70W Carbaryl 50W Asana 0.66 EC	12.0 oz. 16.0 oz. 5.8 oz.	10.3 f	45.1 e	<0.1a	0.0a	80.3ab	46.5 g	108.1 ef	0.2a	0.0a	65.7a
11. Untreated	-	0.3ab	0.9ab	0.0a	0.0a	156.4a-c	1.5a-c	1.5a	0.0a	<0.1a	314.5

1 Data from ' Red Delicious'

2 Mean separation by Fishers Protected LSD (P=<0.05). Log_{10} (X + 1) used prior to transformation for statistical analysis of data. Treatment means followed by the same letter are not significantly different.

3 Application schedule, see appendix II.

* ERM = European Red Mite, ERME = ERM Egg, TSM = Two Spotted Mite, AMB = Amblyseius fallacis, ARM = Apple Rust Mite.

Table 4 (cont.) Evaluation of insecticides for controling mite populations on apple[1,2,3], N.Y.S.A.E.S., Hudson Valley Lab., Highland, N.Y.-1995

Treatment	Formulation amt./100 gal.	7/17 Mean # of mites or eggs / leaf* ERM	ERME	TSM	AMB	ARM	8/9 Mean # of mites or eggs / leaf* ERM	ERME	TSM	AMB	ARM
2. Imidan 70W Savey 50W Endosulfan 50W	12.0 oz. 21.3 gr. 12.0 oz.	19.5 bc	9.3ab	0.3a	<0.1a	337.8 cd	6.8 e	6.0 cd	0.1a	0.5a	27.2abc
3. V-71639	3.4 oz.	77.0 de	38.6 b-d	1.1a	0.0a	615.6 d	1.9 cd	1.2ab	<0.1a	<0.1a	21.3abc
4. V-71639	3.4 oz.	28.4 cd	11.0a-c	<0.1a	<0.1a	566.5 cd	2.4 d	1.7abc	<0.1a	0.2a	25.4abc
5. V-71639 + AG98	3.4 oz. 1.0 pt.	11.4a-c	15.8a-c	0.3a	<0.1a	579.8 cd	3.7 de	1.7abc	<0.1a	0.2a	47.6 cd
6. Provado 1.6F Guthion 3F	2.0 oz. 10.7 oz.	214.3 ef	44.4 b-d	1.7a	2.1 b	262.4 bc	0.2a	2.5 bcd	<0.1a	0.3a	16.8ab
7. Comply 40W	1.25 oz.	30.6 cd	24.9a-d	0.4a	<0.1a	484.3 cd	1.8 bcd	2.2 bcd	<0.1a	0.3a	54.5 cd
8. Confirm 70W B1956	2.3 oz. 0.12%	7.4ab	8.2ab	0.2a	0.2a	324.8 b-d	0.4abc	0.9ab	<0.1a	0.4a	54.2 cd
9. Omite 30W	16.0 oz.	5.3a	3.7a	0.2a	<0.1a	102.3a	3.5 de	6.4 d	<0.1a	0.3a	73.8 d
10. Imidan 70W Carbaryl 50W Asana 0.66 EC	12.0 oz. 16.0 oz. 5.8 oz.	470.0 f	111.7 d	1.7a	0.1a	152.8ab	4.0 de	23.3 e	0.1a	0.3a	40.5b-d
11. Untreated	-	7.9ab	10.4a-c	0.5a	<0.1a	418.8 cd	0.5abc	0.3a	<0.1a	0.1a	11.4a

1 Data from ' Red Delicious'

2 Mean separation by Fishers Protected LSD (P=<0.05). Log_{10} (X + 1) used prior to transformation for statistical analysis of data. Treatment means followed by the same letter are not significantly different.

3 Application schedule, see appendix II.

* ERM = European Red Mite, ERME = ERM Egg, TSM = Two Spotted Mite, AMB = Amblyseius fallacis, ARM = Apple Rust Mite.

APPLE: Malus domestica 'Empire'

Apple rust mite(ARM): Aculus schlechtendali (Nalepa)
A predatory phytoseid(AMB): Amblyseius fallacis (Garman)
European red mite(ERM): Panonychus ulmi (Koch)
Twospotted spider mite (TSM): Tetranychus urticae Koch
Spotted tentiform leafminer: Phyllonorycter blancardella (Fabr.)

MITE AND LEAFMINER CONTROL WITH APPLICATIONS OF AGRIMEK AND OMITE/VYDATE, 1995: Treatments were applied to six-tree plots replicated four times in a randomized design. No dormant oil or miticide was applied. Vydate 2L (16 oz/100 gal.) and Omite 30W 20 oz/100 gal) and AgriMek + oil (2.7 oz + 32 oz/100 gal.) were applied dilute tree-row-volume (100 gal/acre TRV) using an air-blast sprayer. Trees on the M.26 rootstock were 11 years-old, 8 ft high, and 3 ft wide. Treatments consisted of AgriMek applied at PF (23 May) for ERM and Omite timed for ERM (PF-23 May; 1C-1 June; 4C-17 July), and Vydate timed for and the sap feeding stage of STLM (4C-17 July). Phytophagous and predacious mite populations were evaluated by sampling 25 leaves (5 leaves/tree) from each plot. Leaves were removed to the laboratory where they were brushed with a mite brushing machine, and the mites and eggs examined using a binocular scope. Because STLM infestations were extremely low, no efficacy evaluations were possible.

Weather for the '95 season was favorable for insect pressure, and unfavorable for vegatative growth and fruit development. Spring was preceeded by one of the mildest winters on record, allowing for high overwintering rates for arthropods [notable exception was STLM, due to high overwintering success of predators/parasitoids]. Very low rainfall was evidenced for most of the summer (see APPENDIX I)

Against ERM (see **Table 5**), evaluations on 30 May showed that AgriMek had significantly lower egg and motile populations than did Omite. This trend persisted throughout the season Both schedules controlled ARM and TSM. Neither schedule significantly affected the mite predator, Amblyseius fallacis. These data suggest that a single application of AgriMek at PF is as effective against ERM as are three applications of Omite 30W.

Table 5 Evaluation of insecticides for controling mite populations on apple[1,2], N.Y.S.A.E.S., Hudson Valley Lab., Highland, N.Y.-1995

Treatment[3]	Appl. date	Formulation amt./100 gal.	5/30 Mean # of mites or eggs / leaf* ERM	ERME	TSM	AMB	ARM
1. AgriMek +	PF	2.7 oz.	0.5a	23.2a	<0.1a	<0.1a	0.3a
UF oil	PF	32.0 oz.					
Guthion 3F	PF, 1C	10.7 oz.					
2. Vydate	4C	16.0 oz.	5.9 b	124.9 b	<0.1a	<0.1a	0.3a
Guthion 3F	PF, 1C	10.7 oz.					
Omite 30W	PF, 1, 4C	20.0 oz.					
3. Untreated	-	-	6.0 b	159.6 b	0.1a	<0.1a	0.1a

Treatment	6/19 Mean # of mites or eggs / leaf* ERM	ERME	TSM	AMB	ARM	6/30 Mean # of mites or eggs / leaf* ERM	ERME	TSM	AMB	ARM
1.	1.5a	1.3a	<0.1a	0.0a	0.0a	5.5a	4.5a	0.1a	<0.1a	4.0 b
2.	1.4a	8.0 b	<0.1a	0.0a	0.0a	11.2ab	10.5a	1.0a	0.0a	0.5 b
3.	12.2 b	47.1 c	1.3 b	<0.1a	4.1 b	37.3 b	16.0a	7.3 b	0.1a	38.0 c

Treatment	7/12 Mean # of mites or eggs / leaf* ERM	ERME	TSM	AMB	ARM	7/26 Mean # of mites or eggs / leaf* ERM	ERME	TSM	AMB	ARM
1.	4.5a	2.9a	0.8a	0.2a	17.2a	1.8a	1.9a	0.6a	0.2a	24.0a
2.	24.4	26.2 c	0.8a	0.2a	31.2a	4.3a	4.0a	0.5a	0.1a	24.6a
3.	18.3 b	8.9 b	6.5 b	0.1a	132.7 b	1.7	1.4a	1.6a	0.5a	39.7a

1 Data from ' Empire'.

2 Mean separation by Fishers Protected LSD (P=<0.05). Log_{10} (X + 1) used prior to transformation for statistical analysis of data. Treatment means followed by the same letter are not significantly different.

3 Phenology / application date : PF on 24 May; 1C on 1 June; 4C (Sap-feeding of STLM) on 17 July.

* ERM = European Red Mite, ERME = ERM Egg, TSM = Two Spotted Mite, AMB = Amblyseius fallacis, ARM = Apple Rust Mite.

PEAR: Pyrus communis 'Bartlett'

Pear psylla (PP): Psylla pyricola Forester
Pear rust mite (PRM): Epitrimerus pyri (Nalepa)

PEAR INSECT AND MITE CONTROL, 1995: Treatments were applied to 4 tree plots, replicated 3 times in a randomized complete block design. Each plot contained 2 'Bartlett' and 2 'Bosc' cultivars, spaced 12 x 18 ft, 12 ft in height and 20 years old. Treatments were applied by high-pressure handgun sprayer, dilute to runoff, at 300 psi using from 1.7 to 2.6 gal/tree or 160 to 260 gal/acre, depending on foliage density. All plots received Guthion at PF for plum curculio. Provado was applied at PF (18 May), first cover (31 May) and 3rd cover (30 June). AgriMek + 1% oil was applied at 14 days post-PF (31 May). Comply (phenoxycarb) was applied at PF and first cover. CM-006 (200, 300 and 400 ml/100, with and w/o oil) was applied at first cover. V-71639 was applied on various schedules as per APPENDIX III.

Efficacy against pear psylla was evaluated by sampling 25 spur leaves from five seperate spurs until 15 May, and thereafter sampling five terminals/treatment each containing one proximal, one distal, and three mid-terminal leaves. Samples were removed to the laboratory, and PP nymphs and eggs, and PRM, were counted using a binocular scope. On 11 Sept., 'Bartlett' trees in all treatments were rated (Barratt-Horsfall,1 to 11 scale) for foliar damage and fruit russeting attributed to secretions of honeydew. Throughout the season, beginning 31 March, adult populations were sampled weekly by sweeping foliage of the untreated plots for nine minutes with a vacuum device.

Weather for the '95 season (see APPENDIX I) was favorable for insect pressure, and unfavorable for vegatative growth and fruit development. Spring was preceeded by one of the mildest winters on record. Very low rainfall was evidenced for most of the summer

The mild winter allowed for high overwintering rates for psylla - egg laying began earlier than normal and the bloom period was prolonged, allowing for considerable hatch prior to the first cover period. Psylla populations had reached high numbers by 13 June, and all treatments except AgriMek and Comply were over threshold (**Table 6a**). The early and rapid development of hardshells this season may have contributed to the mediocre performanace of AgriMek. Because of high populations, Provado was reapplied 30 June, which significantly reduced populations. Because of extremely high foliar damage, Mitac was applied 11 July to all treatments except Comply, AgriMek and Provado.

Leaf damage ratings and fruit russet ratings are presented in **Table 6b**. Because of superior control of psylla, Comply had significantly lower leaf ratings than other treatments. In general, all treatments, save Comply, AgriMek and Provado had excessive leaf damage from sooty-mold and resulting leaf necrosis. Fruit russet rating primarily reflects damage by PRM. Provado provided poor control of PRM (**see Table 6a**) and the russet ratiing reflects this ('Bartlettt' in Comply treatment fruited poorly and no rating was possible).

During most seasons, psylla populations crash during mid-July. Perhaps because of excellent growing conditions during July and Aug of '94 however, second generation adults remained active until the end of Aug (**Table 6b**). The increase in oviposition during this period subjected treatments to unusually high nymph populations. A re-application of many treatments during the first week of August would have been warranted.

Table 6a Early season evaluations of insecticides for controling Pear Psylla on Bartlett Pear[1] , N.Y.S.A.E.S., Hudson Valley Lab., Highland, N.Y.-1995

	Treatment	Formulation amt./100 gal.	Timing[2]	5/15 # / Leaf* Nymphs	5/15 # / Leaf* Eggs	5/22 # / Leaf* Nymphs	5/22 # / Leaf* Eggs	5/22 # / Leaf* PRM
1.	AgriMek / oil	5.0 oz	1C	-	-	1.2a	0.3a	4.4a
	Sunspray 6E	2.0 gal.	D					
2.	Comply 40W	1.6 oz.	PF, 2C	0.2ab	0.7ab	1.0a	0.3a	<0.1a
	Sunspray 6E	2.0 gal.	D					
3.	CM-006 + oil	200.0 ml	1C	-	-	-	-	-
	Sunspray 6E	2.0 gal.	D					
4	CM-006	200.0 ml	1C	-	-	-	-	-
	Sunspray 6E	2.0 gal.	D					
5.	CM-006 + oil	300.0 ml	1C	-	-	-	-	-
	Sunspray 6E	2.0 gal.	D					
6.	CM-006	300.0 ml	1C	-	-	-	-	-
	Sunspray 6E	2.0 gal.	D					
7.	CM-006 + oil	400.0 ml	1C	-	-	-	-	-
	Sunspray 6E	2.0 gal.	D					
8.	CM-006	400.0 ml	1C	-	-	-	-	-
	Sunspray 6E	2.0 gal.	D					
9.	V-71639 + oil	3.4 oz	DD	1.5abc	1.1ab	3.4a	0.2a	1.7a
	Sunspray 6E	2.0 gal.	D					
10.	V-71639 + oil	4.5 oz	DD	0.2a	1.0ab	1.0a	0.3a	0.5a
	Sunspray 6E	2.0 gal.	D					
11.	V-71639 + oil	5.7 oz	DD	1.0ab	2.6 bc	0.9a	0.8a	8.4a
	Sunspray 6E	2.0 gal.	D					
12	V-71639 + oil	3.4 oz	DD & PF	0.5ab	0.5a	2.8a	0.5a	2.7a
	Sunspray 6E	2.0 gal.	D					
13.	V-71639	3.4 oz	WB & 1C	0.4ab	0.3a	0.9a	0.3a	0.3a
	Sunspray 6E	2.0 gal.	D					
14.	Provado 1.6F	5.0 oz.	PF-1C, 3C	-	-	1.1a	0.2a	1.0a
	Sunspray 6E	2.0 gal.	D					
15.	Untreated	-	-	2.1 bc	2.7 bc	2.4a	0.2a	3.0a
	Sunspray 6E	2.0 gal.	D					
16.	Untreated	-	-	5.1 c	3.8 c	4.2a	1.5a	4.1a

1 Treatment means followed by the same letter are not significantly different (P<0.5; Fishers protected LSD). Data treated by $\log_{10}(x+1)$ transformation prior to analysis.

2 Application Dates: See appendix III. All treatments recieved Guthion 3F @ PF, 5 & 6C

* Counts taken from 25 spur lvs / trmt until 5/15; thereafter 5 terminals / trmt each containing 1 proxmal, 1 distal, and 3 mid-terminal leaves were sampled. PRM = pear rust mite

Table 6a (cont.) Early season evaluations of insecticides for controling Pear Psylla on Bartlett Pear[1], N.Y.S.A.E.S., Hudson Valley Lab., Highland, N.Y.-1995

Treatment	Formulation amt./100 gal.	Timing[2]	5/30 # / Leaf* Nymphs	5/30 # / Leaf* Eggs	5/30 # / Leaf* PRM	6/13 # / Leaf* Nymphs	6/13 # / Leaf* Eggs	6/13 # / Leaf* PRM
1. AgriMek / oil	5.0 oz	1C	0.6a-c	14.0 g	0.7ab	1.7ab	9.4a	<0.1a-c
Sunspray 6E	2.0 gal.	D						
2. Comply 40W	1.6 oz.	PF, 2C	0.4ab	2.7ab	<0.1a	<0.1a	10.5ab	0.4a-c
Sunspray 6E	2.0 gal.	D						
3. CM-006 + oil	200.0 ml	1C	0.3ab	9.4 efg	<0.1a	6.5 c-f	83.3 de	0.0a
Sunspray 6E	2.0 gal.	D						
4 CM-006	200.0 ml	1C	0.3ab	8.4 c-g	<0.1ab	4.8 b-e	55.6 c-e	0.1a-c
Sunspray 6E	2.0 gal.	D						
5. CM-006 + oil	300.0 ml	1C	0.5ab	8.3c-g	0.5ab	10.1 d-g	66.5 de	<0.1a-c
Sunspray 6E	2.0 gal.	D						
6. CM-006	300.0 ml	1C	0.5ab	3.7 cd	0.2ab	3.6 b-d	29.6a-e	0.0a
Sunspray 6E	2.0 gal.	D						
7. CM-006 + oil	400.0 ml	1C	0.3ab	6.1 b-f	7.0 c	6.1 c-f	33.4 b-e	0.1a-c
Sunspray 6E	2.0 gal.	D						
8. CM-006	400.0 ml	1C	0.5ab	8.7d-g	1.7 b	8.8 c-g	61.4 c-e	0.2a-c
Sunspray 6E	2.0 gal.	D						
9. V-71639 + oil	3.4 oz	DD	1.7 d	10.0 e-g	0.6ab	10.7 d-g	29.1a-d	0.7a-c
Sunspray 6E	2.0 gal.	D						
10. V-71639 + oil	4.5 oz	DD	0.3ab	11.8 fg	0.2ab	19.7 g	45.8 c-e	2.0b-d
Sunspray 6E	2.0 gal.	D						
11. V-71639 + oil	5.7 oz	DD	0.1a	5.0 b-e	0.6ab	16.6 fg	65.8 de	3.8 de
Sunspray 6E	2.0 gal.	D						
12 V-71639 + oil	3.4 oz	DD & PF	0.2a	6.0 b-f	<0.1a	10.1 d-g	49.1 c-e	7.1 e
Sunspray 6E	2.0 gal.	D						
13. V-71639	3.4 oz	WB & 1C	0.1a	4.0 b-d	0.3ab	3.8 b-d	90.6 e	0.1a-c
Sunspray 6E	2.0 gal.	D						
14. Provado 1.6F	5.0 oz.	PF-1C, 3C	0.3ab	1.3a	0.2ab	3.0 bc	13.4ab	9.5 ef
Sunspray 6E	2.0 gal.	D						
15. Untreated	-	-	0.8 bcd	5.7 b-f	0.8ab	4.0 b-e	29.4a-e	1.7 de
Sunspray 6E	2.0 gal.	D						
16. Untreated	-	-	1.3 cd	11.0 e-g	1.5ab	11.7 e-g	20.5a-c	25.9 f

1 Treatment means followed by the same letter are not significantly different (P<0.5; Fishers protected LSD). Data treated by $\log_{10}(x+1)$ transformation prior to analysis.

2 Application Dates: See appendix III. All treatments recieved Guthion 3F @ PF, 5 & 6C

* Counts taken from 25 spur lvs / trmt until 5/15; thereafter 5 terminals / trmt each containing 1 proxmal, 1 distal, and 3 mid-terminal leaves were sampled. PRM = pear rust mite

Table 6a (cont.) Mid - season evaluations of insecticides for controling Pear Psylla on Bartlett Pear[1], N.Y.S.A.E.S., Hudson Valley Lab., Highland, N.Y.-1995

Treatment	Formulation amt./100 gal.	Timing[2]	6/26 # / Leaf* Nymphs	6/26 # / Leaf* Eggs	6/26 # / Leaf* PRM	7/10 # / Leaf* Nymphs	7/10 # / Leaf* Eggs	7/10 # / Leaf* PRM
1. AgriMek / oil	5.0 oz	1C	7.9 b-e	20.6a-f	0.2a	4.2 c-g	5.1a	0.2a
Sunspray 6E	2.0 gal.	D						
2. Comply 40W	1.6 oz.	PF, 2C	0.5a	10.4a-c	3.0 bc	<0.1a	6.6a	95.8 f
Sunspray 6E	2.0 gal.	D						
3. CM-006 + oil	200.0 ml	1C	18.4 c-f	19.2a-f	0.3a	6.6 g	9.0a	0.2a
Sunspray 6E	2.0 gal.	D						
4 CM-006	200.0 ml	1C	19.2 c-f	45.7 f	0.9ab	1.9 cd	8.5a	4.3 bc
Sunspray 6E	2.0 gal.	D						
5. CM-006 + oil	300.0 ml	1C	13.8 b-f	19.7a-f	0.3a	5.5 e-g	10.1a	0.2a
Sunspray 6E	2.0 gal.	D						
6. CM-006	300.0 ml	1C	6.9 bc	9.9ab	0.4a	3.2 c-g	4.2a	0.3a
Sunspray 6E	2.0 gal.	D						
7. CM-006 + oil	400.0 ml	1C	27.1 ef	28.2 c-f	0.2a	4.1 c-g	7.2a	<0.1a
Sunspray 6E	2.0 gal.	D						
8. CM-006	400.0 ml	1C	29.5 f	33.8 d-f	0.1a	6.4 g	16.1a	0.1a
Sunspray 6E	2.0 gal.	D						
9. V-71639 + oil	3.4 oz	DD	22.2 d-f	14.9a-d	2.6 bc	4.7 d-g	4.2ab	2.3 b
Sunspray 6E	2.0 gal.	D						
10. V-71639 + oil	4.5 oz	DD	16.2 c-f	18.6a-f	4.6 c	2.2 c-e	5.4a-c	4.1 bc
Sunspray 6E	2.0 gal.	D						
11. V-71639 + oil	5.7 oz	DD	24.2 d-f	23.4 b-f	3.1 bc	5.7 e-g	10.0 bc	5.4 c
Sunspray 6E	2.0 gal.	D						
12 V-71639 + oil	3.4 oz	DD & PF	13.3 b-f	19.9a-f	14.8 d	2.3 c-f	7.6 bc	29.5 e
Sunspray 6E	2.0 gal.	D						
13. V-71639	3.4 oz	WB & 1C	21.2 c-f	41.8 f	1.9abc	1.4 bc	10.0 bc	33.0 e
Sunspray 6E	2.0 gal.	D						
14. Provado 1.6F	5.0 oz.	PF-1C, 3C	3.8ab	8.1a	51.0 e	0.3ab	1.9a	32.7 e
Sunspray 6E	2.0 gal.	D						
15. Untreated	-	-	7.8 b-e	16.4a-e	22.4 de	3.2 c-g	5.6a-c	4.6 bc
Sunspray 6E	2.0 gal.	D						
16. Untreated	-	-	7.2 b-d	8.4a	3.0 bc	6.0 fg	6.0a-c	13.3 d

1 Treatment means followed by the same letter are not significantly different (P<0.5; Fishers protected LSD). Data treated by $\log_{10}(x+1)$ transformation prior to analysis.

2 Application Dates: See appendix III. All treatments recieved Guthion 3F @ PF, 5 & 6C

* Counts taken from 25 spur lvs / trmt until 5/15; thereafter 5 terminals / trmt each containing 1 proxmal, 1 distal, and 3 mid-terminal leaves were sampled. PRM = pear rust mite

Table 6b Evaluations of insecticides for controlling pear psylla on bartlett pear[1,2], N.Y.S.A.E.S., Hudson Valley Lab., Highland, N.Y.-1995

	Treatment	Formulation amt./100 gal.	Timing[3]	Barratt-Horsfall 1-11 Rating[4] Leaf Rating	Fruit Russet Rating
1.	AgriMek / oil	5.0 oz	1C	0.7 b	2.4ab
	Sunspray 6E	2.0 gal.	D		
2.	Comply 40W	1.6 oz.	PF, 2C	0.5a	-
	Sunspray 6E	2.0 gal.	D		
3.	CM-006 + oil	200.0 ml	1C	3.4 hi	2.5 b
	Sunspray 6E	2.0 gal.	D		
4	CM-006	200.0 ml	1C	2.2 d	2.7 c
	Sunspray 6E	2.0 gal.	D		
5.	CM-006 + oil	300.0 ml	1C	3.3 ghi	2.3ab
	Sunspray 6E	2.0 gal.	D		
6.	CM-006	300.0 ml	1C	2.7 ef	3.1 def
	Sunspray 6E	2.0 gal.	D		
7.	CM-006 + oil	400.0 ml	1C	2.4 de	2.2a
	Sunspray 6E	2.0 gal.	D		
8.	CM-006	400.0 ml	1C	2.1 d	2.9 cd
	Sunspray 6E	2.0 gal.	D		
9.	V-71639 + oil	3.4 oz	DD	3.4 hi	3.1 def
	Sunspray 6E	2.0 gal.	D		
10.	V-71639 + oil	4.5 oz	DD	3.4 hi	2.4ab
	Sunspray 6E	2.0 gal.	D		
11.	V-71639 + oil	5.7 oz	DD	3.7 i	3.2 ef
	Sunspray 6E	2.0 gal.	D		
12	V-71639 + oil	3.4 oz	DD & PF	2.2 d	3.7 g
	Sunspray 6E	2.0 gal.	D		
13.	V-71639	3.4 oz	WB & 1C	1.2 c	2.9 cde
	Sunspray 6E	2.0 gal.	D		
14.	Provado 1.6F	5.0 oz.	PF-1C, 3C	0.8 b	9.2 h
	Sunspray 6E	2.0 gal.	D		
15.	Untreated	-	-	2.8 efg	3.3 f
	Sunspray 6E	2.0 gal.	D		
16.	Untreated	-	-	3.0 fgh	3.4 fg

1 Harvest "Bartlett" on 9/11.

2 Treatment means followed by the same letter are not significantly different ($P<0.5$; Fishers protected LSD). Data treated by $\log_{10}(x+1)$ transformation prior to analysis.

3 Application Dates: Application Dates: See appendix III. All treatments recieved Guthion 3F @ PF, 5 & 6C.

4 Ratings for leaf necrosis & fruit russet using Horsfall-Barratt rating system (0-11), the higher the number the greater the damage. * Based on 20 spur leaves from 5 spurs per tree & 60 fruit from tree perimeter.

SWEET CORN: Zea mays 'Sensor'

Corn earworm (CEW): Helicoverpa zea Boddie
European corn borer (ECB): Ostrinia nubilalis (Hubner)
Fall armyworm (FAW): Spodoptera frugiperda J.E. Smith

INSECT CONTROL ON LATE-SEASON SWEET CORN WITH FOLIAR SPRAYS OF INSECTICIDES, 1995: 'Sensor' sweet corn was planted on 30 June, in Tioga silt-loam soil at New Paltz, NY. Treatments were arranged in 2-row plots 488 ft. long, replicated 4 times in a randomized block design. Insecticide emulsions were applied by high-clearance sprayer, through three D3-25 cone nozzles/row, dispensing 51 GPA @ 100 PSI @ 3 MPH. Treatments to Test #1 were applied starting at first silk on 7 Aug., followed by another on 10 August. Because of a sprayer malfunction, a planned third application was not made. Because this test was abbreviated, a second trial was performed. Treatments to Test #2 were applied starting at first silk on 21 August, followed by applications on 24 August, 28 August and 1 September. Efficacy was evaluated (Trial #1 - 24 August; Trial #2 - 11 September) by examining 30 randomly selected ears per treatment/replicate.

Weather for the'95 season was favorable for insect pressure, and unfavorable for vegatative growth and fruit development. Spring was preceeded by one of the mildest winters on record, allowing for high overwintering rates for ECB. Very low rainfall and moderately high temperatures were evidenced for most of the summer (see APPENDIX I) Insect infestations were moderate, with ECB above normal, FAW moderate and very low numbers of CEW. Because of dry conditions, corn in both plots was irregular in height and silking - conditions that made difficult the objective of insuring that all silks were covered. The acceptance threshold for fresh market sweet corn is 5% infested ears.

Results are presented in **Table 7**. Please note that the "total % infested ears" column presents arcsin transformed data; when data are converted back to real terms, the mathematic conversions carry inherent adjustments for variability, and therefore the sums of "% infested by species" rows may not match the converted data figures. In Trial #1, excellent control was provided by Larvin (0.75 ai), TD2351-02 and Warrior (0.02 ai). Under the abbreviated application schedule, many materials provided control within the 5% acceptance threshold. In Trial #2, control within the acceptance threshold was provided by TD 2344-01, Capture (0.03 ai), and all rates of Warrior.

Table 7 Seasonal Control of Insects on Sweet Corn[1, 3], (NYSAES, Hudson Valley Lab, New Paltz, NY - 1995)

TREATMENT / FORM	RATE (ai.)	% Ear infest. - Trial #1[2] ECB	CEW / FAW	Total	% Ear infest. - Trial #2[2] ECB	CEW	FAW	Total
1. BAYTHROID 2E	2.8 oz/acre	3.0 b-d	0.2ab	4.7 cd	3.8a	0.2a	0.9a-c	6.3a
2. LARVIN 80WG	0.5 lb/acre	4.1 b-d	0.2ab	4.8 cd	5.7a	0.0a	2.0a-d	15.0a
3. LARVIN 80WG	0.75 lb/acre	0.9a-c	0.0a	0.9a-c	7.4a	0.2a	1.0a-c	9.0a
4. TD 2351-02 4FM	1.0 lb/acre	0.0a	0.0a	0.0a	2.1a	0.0a	9.1 d	12.2a
5. TD 2351-03 4FM	1.0 lb/acre	2.6a-d	0.5ab	4.0 b-d	1.4a	0.0a	7.9 cd	10.2a
6. TD 2344-01 0.42EC	0.035 lb/acre	2.7a-d	0.0a	2.7a-d	1.2a	0.0a	0.4ab	1.9a
7. PENNCAP 2L	1.0 lb/acre	2.5a-d	0.2ab	3.2 b-d	1.2a	0.0a	2.7a-d	5.9a
8. MUSTANG 1.5E	0.0375 lb/acre	3.2 b-d	0.0a	3.2 b-d	2.6a	0.0a	4.1 b-d	6.8a
9. MUSTANG 1.5E	0.041 lb/acre	2.1a-d	0.0a	2.1a-c	6.2a	0.0a	1.3a-c	8.5a
10. MUSTANG 1.5E	0.045 lb/acre	1.8a-d	0.0a	1.8a-c	5.8a	0.0a	3.7 b-d	10.4a
11. CAPTURE 2E	0.02 lb/acre	4.9 c-e	0.0a	4.9 cd	5.0a	0.0a	2.6a-d	7.9a
12. CAPTURE 2E	0.025 lb/acre	1.3a-d	0.0a	1.3a-c	5.0a	0.0a	0.2ab	5.7a
13. CAPTURE 2E	0.03 lb/acre	5.6 c-e	0.0a	5.6 cd	1.4a	0.0a	0.4ab	3.3a
14. POUNCE 3.2E	0.15 lb/acre	7.6 de	1.3 b	9.8 d	5.4a	0.0a	0.0a	5.4a
15. POUNCE 3.2E	0.20 lb/acre	1.8a-d	0.0a	1.8a-c	4.6a	0.0a	0.2ab	5.2a
16. WARRIOR 1E	0.015 lb/acre	1.0a-c	0.2ab	2.1a-c	3.2a	0.0a	0.0a	3.2a
17. WARRIOR 1E	0.02 lb/acre	0.2ab	0.0a	0.2ab	1.8a	0.0a	1.3abc	4.4a
18. WARRIOR 1E	0.025 lb/acre	2.5a-d	0.0a	2.5a-d	4.8a	0.0a	0.0a	4.8a
19. Untreated	-	14.3 e	5.3 c	21.9 e	16.8a	0.2a	10.2 d	28.4a

1 Sweet Corn Variety : Sensor

2 Applications: Early 8/7; 8/10. Evaluations on 8/24 (30 ears / replicate examined for presence of worms or damaged kernels).
Late 8/21, 8/24, 8/28, 9/1. Evaluations on 9/11 (30 ears / replicate examined for presence of worms or damaged kernels).

3 Mean separation by Fishers Protected LSD (P=<0.05). Arcsin transformation used for statistical analysis of data expressed as percentages. Treatment means followed by the same letter are not significantly different.

ONION: *Allium cepa* L. 'Spartan Banner 80'

Onion thrips: *Thrips tabaci* Lindeman

CONTROL OF ONION THRIPS WITH INSECTICIDES, 1995: 'Spartan Banner 80' was seeded into muck soil 17 April, at Pine Island NY. Treatments were arranged in 1-row plots, 40 ft long, and replicated 4 times in a randomized block design. Insecticide emulsion treatments were applied over the plants with a CO_2 pressurized (100 PSI) back-pack sprayer dispensing 38 GPA @ 2 MPH. Efficacy evaluations were made ca. 5 days postapplication by harvesting 10 randomly selected plants per treatment-replicate, and examining for number of thrips larvae and adults by means of a 10-power 'OptiVisor' scope. Reduction in numbers of thrips were determined by: [# thrips pretreatment - # thrips posttreatment] ÷ [# thrips pretreatment] x 100.

Weather for the '95 season was favorable for insect development, and unfavorable for vegatative growth. Spring was preceeded by one of the mildest winters on record, allowing for early planting, high overwintering rates and rapid build-up of onion thrips. Very low rainfall, along with high temperatures, was evidenced until 11 July (see APPENDIX I) Soon after the onset of rains (19 July), very high populations of immigrating adults occurred. As a normal procedure, adults are not counted in evaluations. This season however, the adults were at such high numbers, and were actively feeding and causing damage, that they are incuded in the counts.

Because of weather conditions very favorable for the development of thrips populations, control of thrips with weekly applications was inadequate in these small plots. Results are presented in **Table 8**. After the 10 July evaluation date, no treatments were effective in keeping thirps below the threshold of 3 nymphs/leaf. In general, control with pyrethroids was poorer than expected. Perhaps the negative termperature coefficient sometimes attributed to these materials was in evidence. Orthene (without surfactant), provided the highest percent reduction (relative to untreated) at the final evaluation date. In previous seasons, Orthene has been noted for it's rescue properties.

Table 8. Efficacy of Insecticides Against Onion Thrips - Orange County NY, 1995.

Treatment [1]	lb. AI/A	Number of nymphs and adults/leaf @ eval. date 7/3	7/10	7/18	7/24	8/1	% redn [2] @ 8/1
Pounce 3.2 E	0.3	2.4	1.3	3.6	9.9	17.3	50.0 c
Ambush 2E	0.3	0.7	1.5	3.8	10.9	10.4	69.9 ab
TD2344-02 .83E	0.035	0.9	1.0	3.4	11.2	12.0	65.3 ab
TD2351-02 4FM	0.5	1.5	1.9	3.4	13.0	17.9	48.3 cd
TD2351-03 4FM	0.5	1.1	1.5	2.8	8.4	10.6	69.4 ab
TD2372-01 3.2FM	0.5	0.9	1.8	3.4	10.8	23.9	30.9 e
Orthene 75S	0.75	0.6	1.2	3.6	9.3	6.6	80.9 a
Orthene 75S + surf [3].	0.75	1.7	2.1	3.6	11.2	9.4	72.8 ab
Orthene 75S + surf [4]	0.75	1.1	1.4	5.0	9.0	11.5	66.8 ab
Penncap M 2L	0.5	0.5	1.9	4.0	10.6	19.1	44.8 cd
Warrior 1EC	0.025	0.14	1.1	4.8	11.3	13.4	61.3 ab
Baythroid 2E	0.0375	0.22	1.3	4.9	11.1	13.6	60.7 ab
Ammo 2.5E	0.1	0.33	1.8	3.4	9.5	10.3	70.2 ab
UNTREATED	-	2.3	4.9	5.7	17.0	34.6	-

1 All treatments applied on 7 day schedule: 28 June; 5 July; 12 July; 19 July; 25 July.

2 Percent reduction relative to untreated by: [# thrips untreated - # thrips treated] ÷ [# thrips untreated] x 100. Means followed by the same letter are not significantly different as determined by DMRT (P=< 0.05). Data treated by arcsin transformation for porportions prior to analysis.

3 Non-ionic surfactant.

4 Silicone surfactant.

ONION: *Allium cepa* L. 'Spartan Banner 80'

Bulb mite: *Rhizoglyphus robini*

CONTROL OF ONION BULB MITE WITH INSECTICIDES AND ACARACIDES, 1995: 'Spartan Banner 80' was seeded into muck soil on 20 April, at Pine Island NY. Treatments were arranged in 1-row plots, 40 ft long, and replicated 4 times in a randomized block design. Insecticide and acaracide emulsion treatments were applied either in-furrow (IF; 20 April) or over the plants (F; 26 May) with a CO_2 pressurized (100 PSI) back-pack sprayer dispensing 38 GPA @ 2 MPH. Efficacy evaluations were made by pulling plants exhibiting characteristic mite-damage symptoms and examined to diffenentiate between mite damage and maggot damage by means of a 10-power 'OptiVisor' scope. After four evaluations ca. 7 days apart, data were converted to mean number of damaged plants/treatment. As a suppliment to efficacy data, traps (2 each) were emplaced 2" deep within the rows of selected treatments. Treatments were selected on the basis of showing promise in efficacy trial, the hypothesis being that efficacious treatments would trap fewer mites. Traps consisted of garlic-baited 5" long sections of PVC (.75", ID), the ends covered by fine-mesh screening. Traps were emplaced 2 June and checked at ca. 14 day intervals. In the laboratory, commercial formulations of 12 pesticides were prepared as 1000 ppm solutions, 2 ml of which were used to treat absorbent filter paper placed inside petri dishes. After 48 hrs, five female R. robini were introduced, bioassayed for 48 hrs, and mortality determined.

Results of the two field trials and the laboratory bioassays are presented in **Table 9**. In the efficacy trial, because of extreme varation in mite-damaged plants among replicates, no significant differences were found among the insecticide/acaracide treatments. Numerically however, four treatments were superior to untreated: Carzol (IF); Diazinon (IF); Alert (IF & F) and Kelthane (IF). In the trapping study, Carzol was greatly superior to Cygon, Diazinon or Alert. Bioassays revealed that both Carzol and Vydate are extremely toxic to R. robini. All other treatments caused <35% mortality at 48 hours. These results suggest that Carzol, Vydate and Cygon warrant further investigation as possible treatments against this pest.

Table 9. Evaluation of insecticide and acaracide treatments against onion bulb mite, Pine Island, NY - 1995

Treatment	Form./acre	Efficacy trial (μ damaged plants)[1]	Trapping trial (μ no. mites/trap)[2]	Bioassay (% mortality)[2]
Carzol 92 SP (IF)	2 lb	1.94 ± 0.51	32.8 ± 12.0 a	100 a
Diazinon 4E (IF)	1 gal	2.44 ± 0.92	121.0 ± 34.2 b	0 c
Alert 2SC (IF&F)	13 oz	3.56 ± 1.20	226.7 ± 61.0 b	0 c
Kelthane 50W (IF)	4 lb	4.50 ± 0.68	-	na
UNTREATED	-	4.81 ± 1.56	104.5 ± 24.6 a	0 c
Omite 30W (F)	12 lb	5.94 ± 1.96	-	0 c
Vendex 50W (IF)	4 lb	6.44 ± 0.92	-	na
Omite 30W (IF)	12 lb	6.50 ± 2.00	-	na
Cygon 4E (F)	2 pt	6.50 ± 1.46	96.42 ± 28.3 a	20 b
Carzol 92 SP (F)	2 pt	6.56 ± 1.29	-	na
Alert 2SC (IF)	13 oz	6.75 ± 1.73	-	na
Vendex 50W (F)	4 lb	6.75 ± 1.51	-	na
Alert 2SC (F)	13 oz	7.06 ± 1.96	-	na
Alert 2SC (F)	6.5 oz	7.50 ± 1.98	-	na
Vydate 2L (F)	2 gal	7.69 ± 1.83	-	100 a
Cygon 4E (F)	1 pt	7.75 ± 3.20	-	na
Vydate 2L (IF)	2 gal	7.88 ± 2.57	-	na
Kelthane 50W (F)	4 lb	8.88 ± 2.46	-	32 b
Alert 2SC (IF&F)	6.5 oz	9.38 ± 2.90	-	na
Alert 2SC (IF)	6.5 oz	10.94 ± 3.17	-	na
Lorsban 4E	-	-	-	8 c
Ambush 2EC	-	-	-	0 c
Capture 2EC	-	-	-	0 c
Trigard 75WP	-	-	-	

1 No significant differences among treatments

2 Means followed by the same letter are not significantly different (P=< 0.05). Bioassays utilized filter paper treated with 2 ml of 1000 ppm concentrations.

Appendix I

1995 MAXIMUM AND MINIMUM TEMPERATURES AND PRECIPITATION, Hudson Valley Laboratory, Highland, NY

All readings were taken at 0800 EST on the dates indicated for preceding 24 hours

	APRIL			MAY			JUNE			JULY			AUGUST			SEPTEMBER		
Date	Max	Min	Precip	Max	Min	Precip	Max	Min	Precip	Max	Min	Precip	Max	Min	Precip	Max	Min	Precip
1	50	29		53	43	0.30	85	52		84	65		89	60		90	65	0.50
2	44	24		61	40		86	61		83	66	0.33	91	72		82	59	
3	43	22		56	36		79	65	0.01	79	48		92	71	0.10	76	49	
4	52	36		70	38		85	64		80	54		85	72		78	50	
5	58	18	0.25	72	51		78	50		83	65		92	71	0.08	84	59	
6	32	21		60	38	0.10	83	55		81	65		81	68	1.30	86	58	
7	42	27		64	33		83	65		82	64		72	64		85	61	
8	46	28		64	38		84	64		75	66	0.04	78	51		89	55	
9	37	30		64	37		75	52	0.05	85	55		81	54		60	56	
10	52	28	0.75	72	50		77	58		77	58		84	57		70	47	
11	44	30		52	49	0.16	73	60		84	61	0.60	84	68		69	38	
12	57	34		55	51	0.07	77	61	0.22	81	59	0.50	84	69		73	44	
13	49	42	0.55	64	48		64	54	0.20	85	64		86	61		79	60	0.17
14	52	38	0.02	69	42		73	51		91	73		85	61		75	65	0.15
15	48	35		70	52		74	47		97	74		89	70	0.28	86	48	
16	48	32		72	40	0.05	77	48		101	69		83	69		70	42	
17	56	28		79	49		81	55		86	68		89	71		70	54	
18	58	38		65	56	0.10	89	59		81	69	2.10	89	71		66	58	0.88
19	66	42		62	51	0.07	91	65		88	63		90	60		68	47	
20	57	45	0.50	59	42	0.07	95	70		85	61		83	49		71	51	
21	60	47		73	44	0.09	93	62		87	68		85	54		68	58	
22	56	50		80	45		80	63		81	64		92	64		73	63	0.01
23	65	40	0.15	73	40		81	54		86	70		81	53		73	48	0.70
24	57	38		78	56		81	60		84	66	1.35	80	58		61	41	
25	58	36		86	58	0.95	84	67	0.01	87	70	0.82	86	51		64	50	
26	61	43		70	57	0.10	86	69		88	72		76	49		64	53	0.28
27	62	40		64	50		86	66	1.15	85	71	2.45	80	60		62	53	0.20
28	70	46	0.10	72	46	0.06	78	46		87	70	0.12	80	56		74	49	
29	62	44		67	54	0.07	78	51		86	72	0.38	82	52		68	39	
30	61	44		78	58	0.47	84	56		91	68		84	59		69	43	
31				71	50					89	60		81	48				
Avg/Tot	53.4	35.2	2.32	67.6	46.5	2.66	81.3	58.3	1.64	85.1	65.1	8.69	84.3	61.1	1.76	73.4	52.1	2.89

APPENDIX II

Insecticide treatment spray timing on apple

Treatment*	Formulation amt./100 gal.	Timing	1/2"	5/2 P	5/23 PF	6/1 1C	6/13 2C	6/28 3C	7/17 4C	8/2 5C	8/21 6C
1. Material X	1188.0 gr.	4C							x		
Guthion 3F	10.7 oz.	PF, 4-6C			x				x	x	x
2. Imidan 70W	12.0 oz.	P, PF, 1-6		x	x	x	x	x	x	x	x
Savey 50W	21.3 gr.	P		x							
Endosulfan 50W	12.0 oz.	P		x							
3. V17639	3.4 oz.	P, PF, 1C		x	x	x					
4. V17639	3.4 oz.	PF, 1-2C			x	x	x				
5. V17639	3.4 oz.	PF, 1-2C			x	x	x				
AG98	1.0 pt.	PF, 1-2C			x	x	x				
6. Provado 1.6F	2.0 oz.	PF, 3C, 5C			x			x		x	
Guthion 3F	10.7 oz.	PF, 1-6C			x	x	x	x	x	x	x
7. Compy 40W	1.25 oz.	PF, 2C			x		x				
8. Confirm 70W +	2.3 oz.	PF-4C			x	x	x	x	x		
B1956	0.12%	PF-4C			x	x	x	x	x		
9. Omite 30W	27.2 oz.	PF, 1-2C			x	x	x				
10 Imidan 70W	12.0 oz.	PF, 1-6C			x	x	x	x	x	x	x
Carbaryl 50W*	16.0 oz.	10 mm				x					
Asana 0.66 EC	5.8 oz.	P		x							
11 Untreated	-	-									

* Treatment # 6 received Provado 1.6F for STLM 1st sap feeding (3C) on 6/23 and peak flight (5C) on 7/14. Treatment # 10 received Carbaryl 50W timed for thinning McIntosh at 10mm on 5/31.

APPENDIX III

Insecticide treatment spray timing on pear

Treatment*	Formulation amt./100 gal.	Timing	4/18 DD	4/28 WB	5/16 PF	5/31 1C	6/13 2C	6/30 3C	7/11 4C	7/26 5C	6C
1. AgriMek +	5.0 oz.	1C				x					
UF oil	32.0 oz.	1C				x					
2. Comply 40W	1.6 oz.	PF, 2C			x		x				
3. CM-006 +	200 ml.	1C				x					
UF oil	32.0 oz.	1C				x					
Mitac	32.0 oz.	4C							x		
4. CM-006	200 ml.	1C				x					
Mitac	32.0 oz.	4C							x		
5. CM-006 +	300 ml.	1C				x					
UF oil	32.0 oz.	1C				x					
Mitac	32.0 oz.	4C							x		
6. CM-006	300 ml.	1C				x					
Mitac	32.0 oz.	4C							x		
7. CM-006 +	400 ml.	1C				x					
UF oil	32.0 oz.	1C				x					
Mitac	32.0 oz.	4C							x		
8. CM-006	400 ml.	1C				x					
Mitac	32.0 oz.	4C							x		
9. V71639 +	3.4 oz.	DD, 4C	x						x		
UF oil	32.0 oz.	DD	x								
10 V71639 +	4.5 oz.	DD	x								
UF oil	32.0 oz.	DD	x								
Mitac	32.0 oz.	4C							x		
11 V71639 +	5.7 / 3.4 oz.	DD / 4C	x						x		
UF oil	32.0 oz.	DD	x								
12 V71639 +	3.4 oz.	DD, PF, 4C	x		x				x		
UF oil	32.0 oz.	DD, PF	x		x						
13 V71639 +	4.5 / 3.4 oz.	WB,1C / 4C		x		x			x		
UF oil	32.0 oz.			x		x					
14 Provado 1.6F	5.0 oz.	PF, 1C, 3C			x	x		x			
15 Sunspray oil	2.0 gal.	D	x								
Neemix 4.2	7.0 oz.	4C							x		
16 Untreated	-	-									

* All treatments except for #16 received Sunspray 6E at 2 gal./100 on 3/29,
All treatments except for #15 & 16 received Guthion 3F at 8.0 oz./100 at PF on 5/16 and 5C on 7/26.