RESULTS OF 1997 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
e-mail: rws9@cornell.edu

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

*Part of the N. Y. State (Geneva) Agricultural Experiment Station

Cornell's Hudson Valley Lab Publication #F/V-97
November 1997

APPLE: *Malus domestica* 'Cortland'

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

HARVEST EVALUATION OF INSECTICIDES AGAINST FRUIT-FEEDING INSECTS, 1997: 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 190 (prebloom) to 300 (postbloom) gal/acre depending upon foliage density. Trees on the EMII rootstock were 34 years-old, 10 ft high, and 12 ft wide. Treatments were applied on various schedules as shown in **Table 1**. Damage to fruit was assessed by randomly selecting 100 fruit at harvest maturity (18 SEPTEMBER) and scoring for external damage by each pest; subsequently, fruits were dissected to detect internal damage. Damage by early PC designates ovipositional scars, while late PC indicates feeding punctures. Damage by early Lepidoptera includes GFW and OBLR, while late Lepidoptera includes OFM, OBLR. Data were converted to % damaged fruit.

Weather for the '97 growing season was unusually dry with moderate temperatures, poor conditions for vegetative growth and fruit development (see APPENDIX I)

As shown by untreated, pressure from early and late PC was high. Furthermore, we experienced an extended apple bloom period, allowing for a long ovipositional period. Except for Diazinon, all treatments provided good management of early and late PC infestations (**Table 1**). Pressure from late season Lepidoptera was severe and most schedules showed some weakness. Danitol/Guthion was notably superior, while Diazinon was the weakest. Primarily because the final cover spray was 12 AUG and evaluations made on 9 SEPT, apple maggot damage was excesive in many treatments. No treatment provided greater that 85% clean fruit. Poor overall performance by a particular treatment could generally be attributed to weakness against curculio and/or late Lepidoptera, which consisted primarlily of OBLR.

TABLE OF CONTENTS

Table 1. Evaluation of insecticides for controlling fruit feeding insects on apple[1]
N.Y.S.A.E.S., Hudson Valley Lab., Highland, N.Y.-1997

Treatment	Formulation amt./100 gal.	Application[3] Dates	TPB	Early PC	Late PC	EAS	Early Lep	Late Lep	CM	SJS	AM Puncture	AM Tunnel	Clean
			% fruit damaged by insect species[2]										
Sunspray 6E	2.0 gal.	9 April	3.3a	0.0a	0.3a	0.0a	0.0a	11.0ab	0.0a	0.7ab	1.3a	7.3 b	76.7 d
Asana 0.66EC	5.8 oz.	27 April											
Guthion 50W	8.0 oz.	May 27, 6 June, 19 June, 11 July, 28 July, 12 Aug.											
Vendex 50WP	10.7 oz.	5 June, 19 June											
Vydate 2L	8.0 oz.	5 June											
Lannate 2.4L	3.3 oz.	19 June, 11 July											
Guthion 50W	8.0 oz.	May 27, 6 June, 19 June, 11 July, 28 July, 8 Aug.	5.1a	4.4 b	0.0a	1.7 c	0.0a	12.2ab	0.0a	1.0ab	0.7a	5.7ab	72.0 d
Provado 1.6F	2.0 oz.	May 27											
Danitol 2.4E	3.6 oz.	9 April, 9 July	1.8a	1.4ab	0.0a	0.0a	0.0a	7.8a	0.0a	2.1ab	1.4a	2.5a	83.6 e
Guthion 50W	8.0 oz.	May 27, 6 June 19 June, 11 July, 28 July, 8 Aug.											
Orthene 75S	7.1 oz.	22 April, 27 May, 6 June 19 June, 11 July, 28 July, 12 Aug.	3.3a	3.3ab	0.7a	0.0a	0.3a	22.7 c	0.0a	10.7 d	1.7a	4.3ab	61.3 c
Lorsban 50W	12.0 oz.	30 April, 19 June	4.0a	4.0ab	2.0ab	0.0a	0.0a	16.0 b	0.0a	0.0a	1.7a	2.7a	71.7 d
Imidan 70W	16.0 oz.	May 27, 7 June											
Imidan 70W	12.0 oz.	11 July, 28 July, 12 Aug.											
Provado 1.6F	2.0 oz.	May 27											
Diazinon AG600	17.3 oz.	22 April, May 27, 7 June 19 June, 11 July, 28 July, 12 Aug.	4.0a	14.0 c	3.7 b	0.3ab	1.3a	37.3 d	0.3ab	0.0a	2.0a	2.0a	42.0 b
Carbaryl 50W	16.0 oz.	6 June	3.7a	5.7 b	0.3a	1.3 bc	0.0a	15.7 b	2.0 b	3.0 b	0.7a	19.7 c	56.0 c
Guthion 50W	8.0 oz.	May 27, 19 June, 28 July, 12 Aug.											
Spintor 2SC	1.7 oz.	9 July											
Untreated	-		3.7a	56.7 d	24.3 c	1.3 bc	8.7 b	70.3 e	8.0 c	6.3 c	1.3a	43.7 d	5.3a

1 Data from ' Cortland' harvested on September 18.

2 Mean separation by Fishers Protected LSD (P=<0.05). Treatment means followed by the same letter are not significantly different.

3 Apple Phenology; Pink (22 April) , Petal Fall (May 27) , 1C (6 June) , 2C (19 June) , 3C (11 July) , 4C (28 July) , 5C (8 Aug.).

APPLE: Malus domestica 'Rhode Island Greening'

European apple sawfly (EAS): Hoplocampa testudinea (Klug)
Green fruitworm (GFW): Lithophane antennata (Walker)
Plum curculio (PC): Conotrachelus nenuphar (Herbst)
Tarnished plant bug (TPB): Lygus lineolaris (P. de B.)

EVALUATION OF INSECTICIDES AGAINST EARLY-SEASON INSECT PESTS OF APPLE, 1997: Treatments were applied to four-tree (of which 'Greening' 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 160 (prebloom) to 300 (postbloom) gal/acre depending upon foliage density. Trees on the EMII rootstock were 34 years-old, 10 ft high, and 12 ft wide. Treatments were applied on various schedules as shown in **Table 2**. Damage to fruit was assessed by randomly selecting 100 fruits prior to 'June drop' (7 June) and scoring for internal damage (EAS) and external damage and by each pest. Data were converted to percent damage.

Weather during the early portion of the '97 season was unusually dry with moderate temperatures, poor conditions for vegetative growth and fruit development (see APPENDIX I) These conditions probably had little impact on early season insect pests, other than an extended bloom period that tends to make management of PC more difficult.

As evidenced by untreated, damage by PC was severe **(Table 2)**. All treatments except for Diazinon, provided adequate control of PC. Schedule #1 was weak considering that Asana was applied at 'pink' - this probably because no organophosphate was applied during first cover. All treatments except for Diazinon provided control of TPB and EAS.

Table 2. Evaluation of seasonal insecticides for controlling early fruit feeding insects on apple[1], N.Y.S.A.E.S., Hudson Valley Lab., Highland, N.Y.-1997

Treatment	Formulation amt./100 gal.		% fruit damaged by insect species[2] PC	TPB	EAS	E.Lep
Sunspray 6E	2.0 gal.	9 April	1.7 b	0.0a	<0.1a	0.0a
Asana 0.66EC	5.8 oz.	27 April				
Guthion 50W	8.0 oz.	May 27, 6 June, 19 June. 11 July, 28 July, 12 Aug.				
Vendex 50WP	10.7 oz.	5 June, 19 June				
Vydate 2L	8.0 oz.	5 June				
Lannate 90SP	3.3 oz.	19 June, 11 July				
Guthion 50W	8.0 oz.	May 27, 6 June, 19 June. 11 July, 28 July, 8 Aug.	<0.1a	<0.1ab	0.6 b	0.0a
Provado 1.6F	2.0 oz.	May 27				
Danitol 2.4EC	3.6 oz.	9 April, 9 July	0.1a	<0.1ab	<0.1a	0.0a
Guthion 50W	8.0 oz.	May 27, 6 June, 19 June. 11 July, 28 July, 8 Aug.				
Orthene 75S	7.1 oz.	22 April, 27 May, 6 June 19 June, 11 July, 28 July. 12 Aug.	0.1a	<0.1ab	<0.1a	0.0a
Lorsban 50W	12.0 oz.	30 April, 19 June	0.1a	0.1abc	<0.1a	0.0a
Imidan 70W	16.0 oz.	May 27, 7 June				
Imidan 70W	12.0 oz.	11 July, 28 July, 12 Aug.				
Provado 1.6F	2.0 oz.	May 27				
Diazinon AG600	17.3 oz.	22 April, May 27, 7 June 19 June, 11 July, 28 July. 12 Aug.	13.3 c	0.6 d	1.7 c	<0.1a
Untreated	-		50.2 d	0.5 cd	1.3 bc	0.1 b

1 Data from ' Rhode Island Greening' 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. Statistical analysis includes treatments omitted from text.
PC = Plum curculio; TPB = Tarnished plant bug; EAS = European apple sawfly; E.Lep = Green fruit worm

APPLE: Malus domestica 'Delicious'

Apple leafminer (ALM): *Lyonetia speculella* Clemens
Cecidomyid predator: *Aphidoletes aphidimyza*
Green apple aphid (GAA): *Aphis pomi* De Geer
Japanese beetle (JB): *Popillia japoncia* Newman
Potato leafhopper (PLH): *Empoasca fabae* (Harris)
Rose leafhopper (RLH): *Edwardsaina rosae* (L.)
Rosy apple aphid (RAA): *Dysaphis plantaginea* (Comstock)
Spotted tentiform leafminer (STLM): *Phyllonorycter blancardella* (Fabr.)
White apple leafhopper (WALH): *Typhlocyba pomaria* McAtee

EVALUATION OF INSECTICIDES AGAINST FOLIAR-FEEDING INSECT PESTS OF APPLE, 1997: Treatments were applied to four-tree (of which 'Delicious' 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 160 (prebloom) to 300 (postbloom) gal/acre depending upon foliage density. Trees on the EMII rootstock were 34 years-old, 10 ft high, and 12 ft wide. Treatments were applied on various schedules as shown in **Table 3**. Damage to foliage was assessed at the appropriate time by:

- •walking tree perimeter and counting the number of infested terminals or fruit clusters per 3 min (RAA);
- •walking tree perimeter and counting the number of infested terminals per 50 randomly selected terminals (GAA);
- •walking tree perimeter and counting the number of terminals displaying 'hopperburn' symptoms per 50 randomly selected terminals (PLH);
- • counting the number of nymphs per 100 randomly selected leaves (WALH & RLH);
- •estimating WALH & RLH foliar damage during late-season by selecting 25 proximal terminal leaves and rating: 0=no stippling; 1=slight stippling(<10%);2=low stippling(>10-25%); 3=moderate stippling(26-50%); and 4=high stippling(51-75%);
- •counting the number of mines per 100 randomly selected leaves (STLM);
- •walking the tree perimeter and counting the number of infested terminals per 2 min (JB and ALM);
- •assessing GAA populations by walking tree perimeter, selecting the 10 most heavily infested terminals and rating by: 0=0 aphids/leaf; 1=1-10 aphids/leaf; 2=11-100 aphids/leaf; and 3=>100 aphids/leaf. Within those same terminals, predators were rated by: 0=0 predators/leaf; 1=1-5 predators/leaf; and 2=>5 predators/leaf. Assessments were made both preapplicaion and postapplication.

Weather during the early portion of the '97 season was unusually dry with moderate temperatures, poor conditions for vegetative growth and fruit development (see APPENDIX I) These conditions probably had little negative impact on foliar-feeding pests: however, poor vegetative sucker growth tended to decrease severity of GAA.

Although RAA infestation in untreated was significant (**Table 3**), all treatments provided good control of this pest. Against minimum-level 2nd generation STLM, 3rd cover applications of Provado and Danitol were effective.

PLH immigrations throughout the Northeast were unusually high during 1997. Evaluations on 10 JULY just prior to third cover produced highly variable data from which conclusions could not be drawn (e.g., in some cases Guthion worked, and in other cases the same Guthion schedule didn't work). Orthene however, was very effective against PLH.

Populations of 1st generation WALH were too low to provide meaningful comparisons. Against 2nd generation RLH however (impacted by 3rd cover sprays), showed Lannate, Orthene, Diazinon and Provado to be efficacious - while Guthion and Imidan were generally weaker.

No treatment had significant effects against ALM. Because this pest lays eggs only in newly-expanded terminal leaves where there is usually no fresh residue, treatments not specifically timed for ALM are not effective.

During AUG, adult JB were present in unusually high numbers. Although their feeding is not generally damaging to mature trees, growers frequently inquire about control measures. Notable reductions of damage by JB were provided by schedules that included Guthion, Lorsban and Diazinon.

Ratings of leafhopper damage (WALH & RLH) were performed during mid-SEPT. With ratings below 1.0 representing very good control, exemplary results were obtained in schedules that included Provado, Orthene, carbaryl and Diazinon.

Preapplication counts on 18 JUNE, revealed very low GAA populations. Post counts on 29 JUNE revealed that some reinfestation had occurred in all treatments except Pirimor and Pyramite (4.4 oz). Preapplication counts on 7 JULY showed population increases in all treatments except for Pirimor and Pyramite, suggesting some degree of persistence for these two materials. Postapplication counts on 14 JULY showed a general decline of populations in all treatments (a usual JULY phenomenon). Predators were generally low in all treatments, verifying the density-dependence of this predator (e.g., if prey is absent, so are they). It is difficult to distinguish between treatment effects and the effects of low prey densities.

Table 3. Evaluation of seasonal insecticides for controlling foliar-feeding insects on apple[1,2]
N.Y.S.A.E.S., Hudson Valley Lab., Highland, N.Y.-1997

Treatment	Formulation amt./100 gal.	Application[3] Dates	6/11 # inf. term / 3 min. Rosy apple aphid	6/11 # mines / 100 lvs Spotted tentiform leafminer	8/6 # mines / 100 lvs Spotted tentiform leafminer	9/18 # dam. term. / 2 min. Apple blotch leafminer	6/11 LH nym. / 100 lvs White apple leafhopper	7/17 LH nym. / 100 lvs 2nd Gen. Rose leafhopper	9/16 LH[4] leaf rating 0-5	7/10 # inf. term / 50 Potato leaf-hopper	9/18 # dam. term. / 2 min. Japaneese Beetle
Sunspray 6E	2.0 gal.	9 April	0.0a	0.0a	17.9 bc	30.2a	0.0a	3.0abc	1.3 e	0.8a	42.9 cd
Asana 0.66EC	5.8 oz.	27 April									
Guthion 50W	8.0 oz.	May 27, 6 June, 19 June, 11 July, 28 July, 12 Aug.									
Vendex 50WP	10.7 oz.	5 June, 19 June									
Vydate 2L	8.0 oz.	5 June									
Lannate 90SP	3.3 oz.	19 June, 11 July									
Guthion 50W	8.0 oz.	May 27, 6 June, 19 June, 11 July, 28 July, 8 Aug.	*3.0 bc	0.0a	11.4ab	45.5a	0.0a	2.3ab	0.0a	16.7 c	1.3a
Provado 1.6F	2.0 oz.	May 27									
Danitol 2.4EC	3.6 oz.	9 April, 9 July	0.3a	0.3a	8.6a	43.8a	0.0a	6.9 bcd	1.8 f	4.5 b	5.2ab
Guthion 50W	8.0 oz.	May 27, 6 June 19 June, 11 July, 28 July, 8 Aug.									
Orthene 75S	7.1 oz.	22 April, 27 May, 6 June 19 June, 11 July, 28 July, 12 Aug.	0.0a	0.0a	45.7 d	24.3a	0.0a	<0.1a	0.0a	0.4a	26.9 bcd
Lorsban 50W	12.0 oz.	30 April, 19 June	*1.9ab	0.0a	26.0 cd	26.4a	0.0a	3.7abc	0.1 b	22.1 cd	13.1 bc
Imidan 70W	16.0 oz.	May 27, 7 June									
Imidan 70W	12.0 oz.	11 July, 28 July, 12 Aug.									
Provado 1.6F	2.0 oz.	May 27									
Diazinon AG600	17.3 oz.	22 April, May 27, 7 June 19 June, 11 July, 28 July, 12 Aug.	0.6ab	0.0a	31.7 cd	21.8a	0.4a	1.1a	0.4 c	19.2 cd	9.9abc
Untreated	-		12.3 d	0.0a	28.6 cd	47.6 a	0.0a	78.6 i	2.2 g	50.0 d	91.3 d

1 Data from 'Red Delicious'

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. Statistical analysis includes treatments omitted from text.

3 Apple Phenology; Pink (22 April), Petal Fall (May 27), 1C (6 June), 2C (19 June), 3C (11 July), 4C (28 July), 5C (8 Aug.).

* No living RAA obser. in infected terminals

4 25 proximal terminal leaves / trmt. representing seasonal LH feeding damage of both WALH and RLH nymphs. Damage determined by visual evaluation.
0 = no stipling, 1 = slight stipling (<10%), 2 = low stipling (>10-25%), 3 = moderate stipling (25-50%), 4 = high stipling (50-75%),5 = near white stipling (>75%)

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, 1997: 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 160 (prebloom) to 300 (postbloom) gal/acre depending upon foliage density. Trees on the EMII rootstock were 34 years-old, 10 ft high, and 12 ft wide. Treatments were applied on various schedules shown in **Table 4**. 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. ERM cumulative mite days/leaf (CMD) were calculated as: CMD = $[0.5(mpl_1 + mpl_2]*d_{1-2}$, where mpl_1 is the number of mites per leaf at time 1, mpl_2 is the number of mites per leaf at time 2, and d_{1-2} is the number of days elapsed between the two counts. CMD's conveniently measure accumulation of infestation throughout the season, e.g., 600 CMD is equivalent to 10 mite/leaf for 60 days, 20 mites/leaf for 30 days, etc.

Weather for the'97 season was unusually dry with moderate temperatures, poor conditions for vegetative growth and fruit development, but excellent conditions for severe mite infestations (APPENDIX I).

Mite populations attained high numbers by 7 JULY, particularly in treatments that included Danitol and Provado. At this date, mite numbers were notably low in the Orthene and Diazinon treatments. By 4 AUG, mite numbers had built to over-threshold numbers in all treatments. Those treatments that allowed high CMD's/leaf (900-1000), showed very poor foliage conditions. In contrast, those that allowed low CMD's/leaf (<700) maintained healthy foilage into mid-SEPT.

Table 4. Evaluation of seasonal insecticides for controlling mite populations on apple[1,2]
N.Y.S.A.E.S., Hudson Valley Lab., Highland, N.Y.-1997

Treatment	Formulation amt./100 gal.	Application[3] Dates	6/4 Mean # of mites or eggs / leaf* ERM	ERME	TSM	AMB	ARM	7/7 Mean # of mites or eggs / leaf* ERM	ERME	TSM	AMB	ARM
Sunspray 6E	2.0 gal.	9 April	<0.1a	0.2a	0.0a	0.0a	0.0a	1.8ab	2.0ab	0.2a	0.2a	0.0a
Asana 0.66EC	5.8 oz.	27 April										
Guthion 50W	8.0 oz.	May 27, 6 June, 19 June, 11 July, 28 July, 12 Aug.										
Vendex 50WP	10.7 oz.	5 June, 19 June										
Vydate 2L	8.0 oz.	5 June										
Lannate90SP	3.3 oz.	19 June, 11 July										
Guthion 50W	8.0 oz.	May 27, 6 June, 19 June, 11 July, 28 July, 8 Aug.	0.5a	2.6a	0.0a	0.0a	0.0a	19.9 de	10.8 cd	4.7 cde	0.2a	<0.1a
Provado 1.6F	2.0 oz.	May 27										
Danitol 2.4EC	3.6 oz.	9 April, 9 July	0.5a	1.7a	0.0a	0.0a	0.0a	19.3 de	16.8 d	5.6 de	0.7a	0.0a
Guthion 50W	8.0 oz.	May 27, 6 June 19 June, 11 July, 28 July, 8 Aug.										
Orthene 75S	7.1 oz.	22 April, 27 May, 6 June 19 June, 11 July, 28 July, 12 Aug.	<0.1a	0.5a	0.0a	0.0a	<0.1a	7.1 cd	3.4abc	0.5ab	0.1a	<0.1a
Lorsban 50W	12.0 oz.	30 April, 19 June	0.3a	0.9a	0.0a	0.0a	<0.1a	18.9 d	11.1 cd	2.8 cd	0.2a	<0.1a
Imidan 70W	16.0 oz.	May 27, 7 June										
Imidan 70W	12.0 oz.	11 July, 28 July, 12 Aug.										
Provado 1.6F	2.0 oz.	May 27										
Diazinon AG600	17.3 oz.	22 April, May 27, 7 June 19 June, 11 July, 28 July, 12 Aug.	<0.1a	0.5a	0.0a	0.0a	0.0a	4.7 bc	3.2abc	0.4ab	0.2a	1.0a
Untreated	-		0.3a	3.1a	0.0a	0.0a	<0.1a	5.3 bc	1.7ab	0.6ab	0.4a	<0.1a

1 Data from ' Red Delicious'.
2 Mean separation by Fishers Protected LSD (P=<0.05). Data transformed by Log_{10} (X + 1) prior to analysis. Treatment means followed by the same letter are not significantly different. Statistical analysis includes treatments omitted from text.
* ERM = European Red Mite, ERME = ERM Egg, TSM = Two Spotted Mite, AMB = Amblyseius fallacis, ARM = Apple Rust Mite.
**ETC = early tight cluster, P = pink, 3C = third cover spray application timing

Table 4 (cont.) Evaluation of seasonal insecticides for controlling mite populations on apple[1,2]
N.Y.S.A.E.S., Hudson Valley Lab., Highland, N.Y.-1997

Treatment	Formulation amt./100 gal.	Application[3] Dates	8/4 Mean # of mites or eggs / leaf* ERM	ERME	TSM	AMB	ARM	CMD
Sunspray 6E	2.0 gal.	9 April	13.4 c	8.4 cde	0.9abc	0.0a	<0.1a	261.3
Asana 0.66EC	5.8 oz.	27 April						
Guthion 50W	8.0 oz.	May 27, 6 June, 19 June, 11 July, 28 July, 12 Aug.						
Vendex 50WP	10.7 oz.	5 June, 19 June						
Vydate 2L	8.0 oz.	5 June						
Lannate 90SP	3.3 oz.	19 June, 11 July						
Guthion 50W	8.0 oz.	May 27, 6 June, 19 June, 11 July, 28 July, 8 Aug.	9.2 bc	7.6 cde	1.6 cd	0.3a	0.3a	909.8
Provado 1.6F	2.0 oz.	May 27						
Danitol 2.4EC	3.6 oz.	9 April, 9 July	16.1 c	15.4 ef	4.4 ef	<0.1a	0.7a	1054.7
Guthion 50W	8.0 oz.	May 27, 6 June 19 June, 11 July, 28 July, 8 Aug.						
Orthene 75S	7.1 oz.	22 April, 27 May, 6 June 19 June, 11 July, 28 July, 12 Aug.	24.0 c	11.3 def	7.5 f	0.2a	3.3 c	672.8
Lorsban 50W	12.0 oz.	30 April, 19 June	18.4 c	19.2 f	2.8 de	0.2a	1.7 bc	963.6
Imidan 70W	16.0 oz.	May 27, 7 June						
Imidan 70W	12.0 oz.	11 July, 28 July, 12 Aug.						
Provado 1.6F	2.0 oz.	May 27						
Diazinon AG600	17.3 oz.	22 April, May 27, 7 June 19 June, 11 July, 28 July, 12 Aug.	10.3 c	12.6 ef	0.9abc	<0.1a	3.3 bc	330.3
Untreated	-		2.0a	1.9ab	0.3ab	<0.1a	0.3a	288.7

1 Data from ' Red Delicious'.

2 Mean separation by Fishers Protected LSD (P=<0.05). Data transformed by Log_{10} (X + 1) prior to analysis. Treatment means followed by the same letter are not significantly different. Statistical analysis includes treatments omitted from text.

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

3 ETC = early tight cluster, P = pink, 3C = third cover spray application timing

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 MITICIDES, 1997: 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 190 (prebloom) to 300 (postbloom) gal/acre depending upon foliage density. Trees on the EMII rootstock were 34 years-old, 10 ft high, and 12 ft wide. Treatments were applied on various schedules as per **Table 5**. 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. ERM cumulative mite days/leaf (CMD) were calculated as: CMD = $[0.5(mpl_1 + mpl_2]*d_{1-2}$, where mpl_1 is the number of mites per leaf at time 1, mpl_2 is the number of mites per leaf at time 2, and d_{1-2} is the number of days elapsed between the 2 counts.

Weather for the'97 season was unusually dry with moderate temperatures (APPENDIX I). Mite populations built very slowly. Prebloom applications of Apollo, and TD2383 applied at 3rd cover, kept populations at very low levels throughout the season and yielded very low CMD's. Populations in Pyramite blocks were over threshold on 2 JULY, but a threshold application brought mites to very low levels. Under abnormally low population levels (Untreated = only 97 CMD's), all treatments performend well.

Table 5. Evaluation of miticides for controlling mite populations on apple[1,2]
N.Y.S.A.E.S., Hudson Valley Lab., Highland, N.Y.-1997

Treatment	Formulation amt./100 gal.	Application Dates**	6/9 Mean # of mites or eggs / leaf*					7/2 Mean # of mites or eggs / leaf*				
			ERM	ERME	TSM	AMB	ARM	ERM	ERME	TSM	AMB	ARM
Pyramite 60DF	1.5 oz.	9 July (3C)	0.0a	0.3a	0.0a	0.0a	2.1 c-f	1.3a	0.5a	0.1a	<0.1a	<0.1a
Pyramite 60DF	2.2 oz.	9 July (3C)	0.2 b	0.3a	0.0a	0.0a	2.0 c-f	1.7a	2.3a	0.4a	0.4a	<0.1a
Apollo 4SC Sunspray 6E	2.0 oz. 2.0 gal.	16 April (ETC) 16 April (ETC)	0.0a	<0.1	0.0a	0.0a	1.1a-c	0.7a	1.0a	1.0a	0.6a	<0.1a
Apollo 4SC	2.0 oz.	29 April (P)	0.0a	<0.1a	0.0a	0.0a	1.9 c-e	1.1a	0.9a	0.1a	<0.1a	<0.1a
TD2383-01 5F	8.5 oz.	9 July (3C)	0.0a	0.2a	0.0a	0.0a	2.5 d-f	0.7a	0.6a	0.1a	0.3a	0.0a
Untreated	-		<0.1a	0.2a	0.0a	0.0a	3.6 f	2.1a	1.1a	0.3a	0.4a	0.0a

1 Data from ' Red Delicious'.
2 Mean separation by Fishers Protected LSD (P=<0.05). Data transformed by Log_{10} (X + 1) prior to analysis. Treatment means followed by the same letter are not significantly different. Statistical analysis includes treatments omitted from text.
* ERM = European Red Mite, ERME = ERM Egg, TSM = Two Spotted Mite, AMB = Amblyseius fallacis, ARM = Apple Rust Mite.
**ETC = early tight cluster, P = pink, 3C = third cover spray application timing

Table 5 (cont.) Evaluation of miticides for controlling mite populations on apple[1,2]
N.Y.S.A.E.S., Hudson Valley Lab., Highland, N.Y.-1997

	7/16					7/28					8/11					
	Mean # of mites or eggs / leaf*					Mean # of mites or eggs / leaf*					Mean # of mites or eggs / leaf*					
Treatment	ERM	ERME	TSM	AMB	ARM	ERM	ERME	TSM	AMB	ARM	ERM	ERME	TSM	AMB	ARM	CMD
Pyramite 60DF	0.3a-c	1.6ab	0.2a	0.7a	<0.1a	0.5a	0.3ab	0.1a	0.0a	0.0a	0.8a	0.1a	<0.1a	0.0a	0.8a	40.1
Pyramite 60DF	0.3a-c	1.0a	<0.1a	0.0a	0.3a	0.2a	<0.1ab	0.1a	0.0a	0.0a	0.2a	0.1a	0.1a	0.0a	0.0a	41.7
Apollo 4SC Sunspray 6E	0.2a-b	1.1a	<0.1a	<0.1a	<0.1a	0.3a	0.3ab	0.1a	0.0a	0.2a	0.4a	0.2a	<0.1a	0.0a	0.0a	23.0
Apollo 4SC	0.1a	1.1a	<0.1a	0.0a	0.0a	0.1a	<0.1a	0.0a	0.0a	0.0a	0.3a	0.1a	0.1a	0.0a	0.0a	25.3
TD2383-01 5F	<0.1a	1.0a	0.0a	0.0a	0.0a	0.4a	0.4 b	0.1a	0.0a	0.0a	0.5a	0.5a	<0.1a	0.0a	0.2a	21.7
Untreated	0.6a-d	2.2ab	0.2a	0.2a	0.3a	3.4 b	4.4 c	0.9 b	0.0a	<0.1a	0.9a	0.3a	0.1a	0.0a	1.6a	97.2

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. Statistical analysis includes treatments omitted from text.

* ERM = European Red Mite, ERME = ERM Egg, TSM = Two Spotted Mite, AMB = Amblyseius fallacis, ARM = Apple Rust Mite, CMD = Cumulative ERM days (9 June - 11 Aug.)

PEAR: *Pyrus communis* 'Bartlett'

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

PEAR INSECT AND MITE CONTROL, 1997: 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 22 years old. Treatments were applied by high-pressure handgun sprayer, dilute to runoff, at 300 psi using 200 gal/acre. All plots, except Kaolin received Guthion at PF for plum curculio. Treatments were applied on various schedules as shown in **Table 6.** Weather conditions are shown in APPENDIX I.

Insecticide efficacy against pear psylla and pear rust mite was evaluated by sampling 25 spur leaves from five separate spurs until 2 JUN, 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 29 August, 25 'Bartlett' leaves were picked at random and the degree of damage (dead lesions and/or sooty mold deposits) estimated. Cumulative psylla nymph days per leaf (CPD) were calculated as: $CPD = [0.5(ppl_1 + ppl_2]*d_{1-2}$, where ppl_1 is the number of psylla nymphs per leaf at time 1, ppl_2 is the number of psylla nymphs per leaf at time 2, and d_{1-2} is the number of days elapsed between the two counts. CPD's conveniently measure accumulation of infestation throughout the season, e.g., 60 CPD is equivalent to 1 nymph/leaf for 60 days, 2 nymphs/leaf for 30 days, etc.

The pear bloom period was prolonged, allowing for considerable hatch prior to petal fall. Because many treatments were not scheduled to commence until 29 MAY (9d post petal fall), psylla populations in some treatments were over threshold (1 nymph/leaf) at the first application (**Table 6**). Under high psylla pressure during the '97 season, few treatments controlled psylla past 30 JUNE, and where existing supply of material permitted, some treatments were rescued on 10 JULY. Rescue treatments appear to have been beneficial, although the population was declining, as is typical during mid-late JULY. High degrees of foliar damage from some treatments is expressed in the leaf damage estimates. Treatments that allowed <75 CPD/leaf generally had low leaf damage estimates and could be considered as good commercial control of psylla. Anomalies are Provado and Pyramite, which had relatively high CPD's but low damage estimates. Apparently these treatments produced sub-lethal effects that allowed nymphs to survive, but with reduced feeding and honeydew secretions. Because fruit dropped prematurely in some treatments, fruit damage estimates were not possible. It was apparent however, that even the best treatments were not free of fruit contaminated by sooty mold.

NOTE: In Provado treatment, Spinosid was included for evaluation of Lepidoptera control and TD2383-1 was included for evaluation of rust mite control - '97 infestations of these two pests were inadequate for any conclusions regarding efficacy.

Table 6. Evaluations of insecticides for controling Pear Psylla and Pear Rust Mite on Bartlett pear.[1]
N.Y.S.A.E.S., Hudson Valley Lab., Highland, N.Y.-1997

Treatment	Formulation amt./100 gal.	Application[2] Dates	5/27 # / Leaf* Nymphs	5/27 # / Leaf* Eggs	5/27 # / Leaf* PRM	6/2 # / Leaf* Nymphs	6/2 # / Leaf* Eggs	6/2 # / Leaf* PRM
Alert 2SC Sunspray UF	4.8 oz. 64 oz	21, 29 May 21, 29 May	0.5ab	0.2a-c	13.4 b-e	0.2a-c	0.5ab	7.9a
Alert 2SC	4.8 oz.	21, 29 May	0.7 bc	0.5a-f	22.9 c-f	0.6a-f	0.4ab	3.4a
Alert 2SC Sunspray UF	6.4 oz 64 oz	21, 29 May, 9 July 21, 29 May, 9 July	1.4 c-e	0.9 ef	13.0 b-d	0.5a-f	0.8ab	15.9a
Alert 2SC Sunspray UF	8.0 oz. 64 oz	21, 29 May 21, 29 May	0.7 bc	0.6a-f	5.1ab	0.6a-f	0.8ab	5.5a
M-96-018 Kaolin	25.0 lbs.	21,29 April, 15 May 9 July, 20 Aug.	0.1a	<0.1a	1.1a	<0.1a	0.4ab	1.8a
Provado 1.6F Spintor 2SC TD 2383-1 5F	5.0 oz. 5.0 oz 8.53 oz.	29 May, 9 July 9 July, 20 Aug. 9 July	0.8 b-d	0.4a-f	93.2 g	0.3a-d	0.6ab	21.0a
Pyramite 60DF	8.8 oz.	29 May, 9 July	1.1 b-e	1.0 f	39.3 c-g	0.4a-e	0.4ab	15.7a
CM007	8.0 oz.	29 May	1.0 b-e	0.9 d-f	39.8 c-g	0.8 d-f	1.2 b	3.6a
CM007 Sunspray UF	8.0 oz. 64 oz	29 May 29 May	1.5 e	1.1 f	69.1 fg	0.7 c-f	0.6ab	5.3a
CM007	16.0 oz.	29 May	0.7 b-d	0.1ab	28.7 c-g	0.2 ab	0.3a	4.6a
CM007 Sunspray UF	16.0 oz. 64 oz	29 May, 9 July 29 May, 9 July	1.0 b-e	0.2a-d	19.3 b-f	0.9 ef	0.6ab	6.8a
CM007	32.0 oz.	29 May	0.9 b-e	0.8 c-f	24.3 c-g	0.7 b-f	0.4ab	5.0a
CM007 Sunspray UF	32.0 oz. 64 oz	29 May 29 May	0.6 b	0.6 b-f	30.8 c-g	0.6 b-f	0.3a	3.6a
AgriMek 0.15EC Mitac 1.5EC	10.0 oz. 8.0 oz.	29 May 9 July	0.8 b-d	0.3a-e	52.8 e-g	0.2a-d	0.4ab	6.8a
Mitac 1.5EC	8.0 oz.	9 June, 9 July	1.3 c-e	0.6a-f	45.6 d-g	0.6a-f	0.8ab	14.5a
Untreated	-		1.4 de	0.9 ef	10.0 bc	1.2 f	0.7ab	73.1a

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 Pear phenology: swollen bud (9 April), bud burst (21 April), early petal fall (15 May), petal fall (21 May)
* Counts taken from 25 spur lvs / trmt until 6/2; thereafter 5 terminals / trmt each containing 1 proxmal, 1 distal, and 3 mid-terminal leaves were sampled.

Table 6 (cont.) Evaluations of insecticides for controling Pear Psylla and Pear Rust Mite on Bartlett pear.[1]
N.Y.S.A.E.S., Hudson Valley Lab., Highland, N.Y.-1997

Treatment	Formulation amt./100 gal.	6/15 # / Leaf* Nymphs	6/15 # / Leaf* Eggs	6/15 # / Leaf* PRM	6/30 # / Leaf* Nymphs	6/30 # / Leaf* Eggs	6/30 # / Leaf* PRM
Alert 2SC Sunspray UF	4.8 oz. 64 oz.	<0.1a	2.1 b	1.2a	3.2a	5.5 c-e	1.0a
Alert 2SC	4.8 oz.	0.3a-d	3.3 b-d	8.5a-f	2.5a	6.0 de	0.4a
Alert 2SC Sunspray UF	6.4 oz. 64 oz.	<0.1a	1.9 b	4.1ab	2.0a	2.0a-c	2.2a
Alert 2SC Sunspray UF	8.0 oz. 64 oz.	0.2a-c	2.2 b	3.9ab	2.9a	6.0 de	0.9a
M-96-018 Kaolin	25.0 lbs.	0.4a-e	3.5 b-d	7.6a-e	3.3a	5.8 c-e	1.0a
Provado 1.6F Spintor 2SC TD 2383-1 5F	5.0 oz. 5.0 oz. 8.53 oz.	0.9 ef	2.9 b-d	36.4 ef	6.0a	4.1 b-e	1.0a
Pyramite 60DF	8.8 oz.	0.7 c-f	5.0 c-e	27.8 c-f	4.5a	3.9 b-e	0.4a
CM007	8.0 oz.	2.8 h	7.1 e	11.4 b-f	5.7a	5.5 c-e	1.5a
CM007 Sunspray UF	8.0 oz. 64 oz.	2.0 gh	5.8 de	26.0 c-f	4.1a	3.3a-d	0.0a
CM007	16.0 oz.	1.4 fg	6.0 de	4.8a-c	3.2a	5.4 c-e	0.5a
CM007 Sunspray UF	16.0 oz. 64 oz.	1.2 f	3.9 b-e	9.2a-f	2.9a	1.1a	0.5a
CM007	32.0 oz.	0.8 def	5.0c-e	45.1 f	7.7a	8.9 e	2.9a
CM007 Sunspray UF	32.0 oz. 64 oz.	0.8 def	2.7 bc	4.7a-c	3.5a	2.8a-d	0.4a
AgriMek 0.15EC Mitac 1.5EC	10.0 oz. 8.0 oz.	0.2a-c	0.4a	5.8a-d	1.4a	1.3ab	0.4a
Mitac 1.5EC	8.0 oz.	0.5 b-e	3.4 b-d	13.9 b-f	1.6a	2.1a-d	3.5a
Untreated	- -	2.6 h	3.8 b-e	30.9 d-f	4.8a	3.0a-d	1.6a

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.

* Counts taken from 25 spur lvs / trmt until 6/2; thereafter 5 terminals / trmt each containing 1 proxmal, 1 distal, and 3 mid-terminal leaves were sampled.

Table 6 (cont.) Evaluations of insecticides for controling Pear Psylla and Pear Rust Mite on Bartlett pear.[1]
N.Y.S.A.E.S., Hudson Valley Lab., Highland, N.Y.-1997

Treatment	Formulation amt./100 gal.	rescue trmt	7/15 # / Leaf* Nymphs	Eggs	PRM	7/21 # / Leaf* Nymphs	Eggs	PRM	CPD**	Total # appl.	% Leaf Damage
Alert 2SC Sunspray UF	4.8 oz. 64 oz.		-	-	-	0.6a	0.7a	0.0a	68.7	2	6.1a
Alert 2SC	4.8 oz.		-	-	-	0.8a	0.6a	0.0a	66.6	2	11.2a
Alert 2SC Sunspray UF	6.4 oz. 64 oz.	7/10	1.3a	1.7 bc	0.0a	0.2a	0.7a	0.0a	51.9	3	2.2a
Alert 2SC Sunspray UF	8.0 oz. 64 oz.		-	-	-	0.5a	1.0a	0.0a	69.0	2	2.9a
M-96-018 Kaolin	25.0 lbs.	7/10	1.5a	0.8a	0.0a	0.5a	0.3a	0.0a	70.2	5	5.4a
Provado 1.6F Spintor 2SC TD 2383-1 5F	5.0 oz. 5.0 oz. 8.53 oz	7/10	0.7a	2.0 c	1.1a	0.5a	0.6a	0.0a	130.7	2 2 1	5.8a
Pyramite 60DF	8.8 oz.	7/10	1.1a	0.7a	0.5a	1.0a	0.7a	0.7a	109.7	2	6.5a
CM007	8.0 oz.		-	-	-	0.6a	0.2a	0.0a	159.6	1	45.1 cde
CM007 Sunspray UF	8.0 oz. 64 oz.		-	-	-	0.8a	0.3a	0.2a	110.7	1	54.8 e
CM007	16.0 oz.	7/10	-	-	-	0.6a	0.5a	0.0a	88.1	1	33.0 b
CM007 Sunspray UF	16.0 oz. 64 oz.		1.6a	1.2a-c	0.5a	0.5a	0.5a	0.9a	88.1	2	34.0 bc
CM007	32.0 oz.		-	-	-	0.8a	0.6a	0.0a	166.8	1	43.0 bcd
CM007 Sunspray UF	32.0 oz. 64 oz.		-	-	-	1.7a	0.5a	0.0a	99.9	1	44.0 bcde
AgriMek 0.15EC Mitac 1.5EC	10.0 oz. 8.0 oz.	7/10	1.0a	0.5a	0.0a	0.2a	0.5a	0.2a	36.2	1 1	1.8a
Mitac 1.5EC	8.0 oz.	7/10	0.4a	1.0a-c	0.0a	0.2a	1.1a	0.3a	50.9	2	5.1a
Untreated	-	-	1.0a	0.8ab	2.3a	0.4a	0.5a	0.0a	145.0	0	49.0 de

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.

* Counts taken from 25 spur lvs / trmt until 6/2; thereafter 5 terminals / trmt each containing 1 proxmal, 1 distal, and 3 mid-terminal leaves were sampled.

** CPD = Cumulative psylla nymph days / leaf (27 May - 21 July.) For formula, see text

ONION: *Allium cepa* L. 'Spartan Banner 80'
Onion thrips: *Thrips tabaci* Lindeman

CONTROL OF ONION THRIPS WITH INSECTICIDES, PINE ISLAND, NY 1997: 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. Treatments were applied 7 July, 16 July, 23 July and 30 July. Efficacy evaluations were made 3 - 10 days postapplication by harvesting 10 randomly selected plants per treatment-replicate, and examining the 4 youngest leaves for number of thrips adults and nymphs by means of a 10-power 'OptiVisor' scope. Seasonal adult and nymph data were converted to cumulative thrips days per plant (1 nymph/plant for one day) by the formula: CTD = $[0.5(tpl_1 + tpl_2]*d_{1-2}$, where tpl_1 is the number of thrips per leaf at time 1, tpl_2 is the number of thrips per leaf at time 2, and d_{1-2} is the number of days elapsed between the 2 counts. Because adult feeding effects are less than for nymphs, the product of formula computation is multiplied by [0.5] to get adult CTD's.

Unusually mild temperatures were evidenced in Orange County, with adequate, well spaced rainfall (APPENDIX I not representative of Orange County). Thrips infestations were low throughout most of the season, only building to significant numbers during late August, when plants were nearing maturity and the tops going down.

Results are presented in **Table 7**. Previous research has shown that <u>1000 - 1200 CTD's</u> are necessary to effect yield reductions. In general, under low population conditions, most treatments performed well, but treatments that maintained CTD's below 500 were superior. The addition of Silwet sticker to Orthene and Ambush improved performance, but the addition of Silwet to Warrior had no effect.

Table 7. Insecticide management of cumulative thrips days on onion, Pine Island, NY - 1997.

		Cumulative thrips days/plant[2]		
TREATMENT[1]	lb AI/acre	Adults	Nymphs	Total
Orthene 75S + Silwet	0.5	36.4 ab	290.0 a	327.0 a
Orthene 75S	0.5	33.3 a	335.2 ab	377.5 ab
Warrior 1E	0.025	40.3 abc	434.6 abc	475.3 abc
Lannate 1.8L	0.45	49.0 abcd	459.5 abcd	509.0 abcd
TD 2344 0.83EC	0.03	45.8 abc	465.7 abcd	511.8 abcd
Ambush + Silwet	0.3	53.9 abcd	493.1 abcd	547.0 abcd
TD 2344 0.83EC	0.04	48.2 abcd	510.4 abcd	558.8 abcd
Mustang 1.5EW	0.05	45.5 abc	576.6 bcd	622.3 bcd
Baythroid + Silwet	0.024	48.4 abcd	579.6 bcd	627.8 bcd
Ambush 2E	0.3	56.8 bcd	614.6 cd	671.8 cd
Mustang 1.5EW	0.0375	39.0 abc	657.1 cd	711.8 cd
Warrior + Silwet	0.025	47.1 abcd	664.4 cd	749.8 cd
Silwet	0.25%	54.1 abcd	695.5 d	749.8 d
Penncap 2L	0.5	58.0 bcd	702.8 d	761.0 d
UNTREATED	-	68.9 d	1097.6 e	1166.5 e
	SEM =	6.38	7.63	7.85

[1]Treatments were applied 7 July, 16 July, 23 July and 30 July.

[2] Cumulative Thrips Day = one nymph per plant for one day. Calculated as: $CTD = [0.5(tpl_1 + tpl_2]*d_{1-2}$, where tpl_1 is the number of thrips per leaf at time 1, tpl_2 is the number of thrips per leaf at time 2, and d_{1-2} is the number of days elapsed between the 2 counts. Because adult feeding effects are less than for nymphs, the product of formula computation is multiplied by [0.5] to get adult CTD's.

NOTE: Previous research has shown tha 1000 - 1200 CTD's are necessary to effect yield reductions.

SWEET CORN: *Zea mays* 'Sensor'

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, 1997: 'Sensor' sweet corn was planted 26 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 were applied on a 5-day schedule starting at first silk on 25 Aug., followed by sprays on 29 Aug., 3 Sept. and 8 Sept. Warrior and Asana on a 7-day schedule was treated 25 Aug., followed by sprays on 1 & 8 Sept. Efficacy was evaluated by examining 30 randomly selected ears per treatment/replicate.

Weather for the '97 season was dry with moderate temperatures and corn emergence was poor or uneven throughout much of the season (APPENDIX I). For whatever reason, European corn borer infestations were much lower than normal. Fall armyworm populations were moderate until very late season and corn earworn populations were not present in plots at the time of evaluation (15 Sept).

As shown by UNTREATED (**Table 8**), insect infestations were lower than expected for this production region. In general, all treatments provided acceptable commercial control (<5% infested ears). As is expected, if degree of control is suspect, it is due to weakness against FAW.

Table 8. Insecticide efficacy against late season sweet corn insects, New Paltz, NY - 1997

Treatment[1,2]	lb AI/acre	% infested ears ECB	FAW	Total
Spintor 2SC	0.093	0.00	0.00	0.00 a
Larvin 3.2F	0.50	0.00	0.25	0.25 a
Spintor 2SC	0.047	0.50	0.25	0.75 ab
Ambush 4E	0.20	0.00	1.00	1.00 abc
Warrior 1E	0.025	0.25	1.25	1.50 abcd
Capture 2E	0.033	0.00	2.00	2.00 abcde
Ambush 4E	0.15	0.75	1.50	2.25 abcde
ICI 0321 1CS	0.025	0.50	1.75	2.25 abcde
Warrior 1E	0.015	0.25	2.50	2.75 abcde
Warrior 1E	0.025(7d)	0.00	2.75	2.75 abcde
TD2344-01 0.83EC	0.04	0.00	3.25	3.25 bcde
Capture 2E	0.04	0.25	3.50	3.75 cdef
Asana 0.66E	0.05(7d)	0.25	3.75	4.00 def
Baythroid 2E[3]	0.0438	0.25	4.25	4.50 ef
FCR 4545 1SC[3]	0.022	0.75	5.25	6.00 ef
Asana 0.66E	0.05	1.0	5.25	6.25 f
UNTREATED	-	3.25	10.25	13.50 g
				SEM = 0.85

1 Planting date, 26 June. ECB, European corn borer; FAW, fall armyworm.

2 Application dates (unless otherwise specified, applications on a 5 day schedule - 8/25; 8/29; 9/3; 9/8. Seven day schedule [7d] - 8/25; 9/1; 9/8.

3 Silwet added.

1997 MAXIMUM AND MINIMUM TEMPERATURES AND PRECIPITATION
Hudson Valley Laboratory, Highland, NY

All readings were taken at 0800 EST on the dates indicated

	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	47	33	*1.51*	77	48		81	62		89	60		86	56		80	66	0.11
2	48	31		71	43	0.09	71	59	0.02	84	63		87	67		81	63	
3	56	26		65	46	0.13	60	51	0.41	78	67	0.14	89	65		85	57	0.14
4	62	43		62	46	0.90	66	47		82	63	0.01	89	64		69	45	
5	63	38		60	37		72	46		81	56		76	61	0.01	69	4	
6	62	44		67	49	0.14	76	48		79	52		78	52	0.04	75	49	
7	62	47		65	36	0.14	71	51		83	58		77	52		76	54	
8	71	35		55	34		66	49		85	58		82	51		77	61	0.21
9	54	25		67	48	0.05	75	47		87	64		79	57		73	56	
10	39	21		59	47	0.11	82	51		88	59	1.79	89	62		71	53	
11	48	28		59	42		90	56		79	53		90	63		69	61	0.10
12	55	37		67	45		87	63		83	58		91	66	0.15	70	62	1.71
13	54	43	0.48	78	54		89	65	0.01	86	60		84	69		78	56	
14	65	38		61	40	0.10	82	58	0.04	91	63		79	64	0.55	75	58	
15	54	25		70	51	0.01	79	44		91	69		80	58		77	53	
16	58	30		73	46		75	47		94	69	3.80	80	68		78	58	
17	67	43		57	44		79	51		88	66		93	71	0.18	80	53	
18	53	38	0.06	58	38	0.06	70	60		92	68		88	60	0.4375	62		
19	40	35	1.22	69	52	0.22	74	65	0.27	90	63		77	51		78	52	
20	50	30	0.02	77	54	0.63	83	56		77	51		76	55		79	60	
21	57	33		68	38		84	68	0.01	79	59		74	56	1.24	82	45	0.06
22	57	33		59	45		92	72		77	61	0.49	62	58	0.13	62	37	
23	64	45		59	44		93	60		79	55		75	53	0.11	66	51	
24	64	44		68	46		87	57		79	59	0.04	73	53		64	39	
25	58	42		72	56		80	63		67	58		77	56		62	38	
26	61	42		61	52	0.14	95	72	0.05	81	52		79	58		66	48	
27	66	35		68	39		89	60	0.87	85	69		80	60	0.17	71	38	
28	68	47	0.72	66	40		81	54		88	67	0.51	79	63	0.88	66	39	
29	56	39	0.06	75	45		86	58		87	61		72	62	0.60	66	53	
30	67	40		74	51	0.01	90	60		80	50		77	57	0.01	67	53	
31				66	55	0.03				81	53		79	57				
Avg/Tot	57.5	36.3	4.07	66.2	45.5	2.76	80.2	56.7	1.68	83.5	60.1	6.78	80.5	59.5	4.50	72.5	48.7	2.33