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Control of seedcorn maggot, cabbage maggot, and black cutworm (1975 insecticide research report)

C. S. Eckenrode, P. S. Robbins, and D. R. Webb

A. Seedcorn Maggot (SCM)— *Hylemya platura* (Meigen)

INTRODUCTION AND METHODS

This pest threatens the germinating seeds of a number of crops, particularly in the spring when soils are cool and wet. A high content of organic matter in the soil increases the probability for an infestation. Once the growing seedlings are above the soil surface, they are less likely to be seriously injured.

Planterbox formulations of diazinon and/or lindane, and a fungicide have been the recommended seed treatments for some time in New York. In addition, planterbox and slurry treatments of Lorsban were recently labeled for SCM control. Both Lorsban and diazinon provide adequate protection when they are applied properly.

A recently developed laboratory technique has provided an effective primary screen for SCM control with some of the newer compounds. Lima beans, the most frequently used crop in this test, are treated, placed in greenhouse sand, and then artificially infested with 1 st instar maggots reared from our laboratory colonies. Emerged seedlings are rated for injury, and then the sand is screened for surviving maggots.

In the field, we use snap beans as the major test crop, since large acreages of snaps are grown in upstate New York, and these beans are preferred sites for oviposition. Upon request, we sometimes test insecticide treatments on cucurbits, sweet corn, peas, and kidney beans. All of the field plots are baited with surface bands of Corenco meat and bone meal immediately after planting.

RESULTS

Laboratory.—A synthetic pyrethroid, FMC 33297, reduced feeding of laboratory-reared maggots when the seeds were slurry-treated at 1 ounce AI/cwt (Table 1). Another pyrethroid, SD 43775, provided some protection when applied as a 1 ounce slurry. None of the pyrethroid treatments, however, were as effective as the standard treatment, diazinon PB at 1 ounce.

In a second laboratory test, three different slurries of Lorsban applied at 1 ounce AI/cwt along with thiram at recommended rates were still protecting sweet corn, snap beans, and butternut squash seeds from SCM attack after 6 months of storage (Table 2). No evidence of stand reduction due to phytotoxicity was detected at 3 or 6 months.

Table 1.-Seedcorn maggot control in the laboratory on Tendercrop snap beans. Geneva, N. Y., 1975.

Treatment[a]		Oz. AI/cwt	Av. % damage	Live form recovery
Diazinon (Agrox 2-way)	PB	1	0	1
FMC 33297	SL	1	13	0
FMC 33297	SL	4	16	1
SD 43775	SL	4	21	26
SD 41706	SL	1	62	45
SD 43775	SL	1	63	10
SD 41706	SL	4	67	47
Avg. for 2 checks:		-	78	29

a/ PB = planterbox; SL = slurry treatment with Thiram using Bioflim (1 pt. of 1%/seed cwt).

5 seeds/rep.; 10 1st instar maggots/seed; combination of 2 separate tests [4 reps./test].

Table 2.-Seedcorn maggot laboratory bioassay with Lorsban slurries using various stickers. Geneva, N. Y., 1975[a].

Treatment	Silver Queen sweet corn % Stand	% Damage	Av. no. live form rec.	Tendercrop snap beans % Stand	% Damage	Av. no. live form rec.	Butternut squash % Stand	% Damage	Av. no. live form rec.
3 Months After Treatment									
Lorsban (25 w.p.) + Biofilm	100 a	5 a	0 a	90 a	5 a	0 a	55 a	0 a	0 a
Lorsban (25 w.p.) + Exhalt	95 a	10 a	0 a	85 a	0 a	0 a	60 a	0 a	1 b
Lorsban (25 w.p.) + Methocel	95 a	0 a	.3 a	75 a	0 a	0 a	80 a	14.6 a	0 a
Diazinon (25%) PB	90 a	5 a	0 a	70 a	6.3 a	0 a	70 a	0 a	0 a
Thiram (check)	90 a	50 b	6.5 b	75 a	100 b	10.5 b	40 a	12.5 a	2 b
6 Months After Treatment									
Lorsban (25 w.p.) + Biofilm	80 a	0 a	0 a	30 a	10 b	.3 b	40 a	0 a	0 a
Lorsban (25 w.p.) + Exhalt	90 a	0 a	0 a	45 a	0 a	0 a	70 a	0 a	0 a
Lorsban (25 w.p.) + Methocel	90 a	5 a	0 a	50 a	5 ab	0 a	80 a	0 a	0 a
Diazinon (25%) PB	95 a	5 a	0 a	45 a	0 a	0 a	90 a	5 a	0 a
Thiram (check)	60 a	60 b	5 b	0 a[b]	100 c	34 b	65 a	30 b	2 b

[a] All % columns analyzed using Duncan's multiple range test at 5% level on Arcsin transformations. Arcsin transformations were not used in live form-recovery columns.

[b] Reduced stand due to SCM damage.

Table 3.-Seedcorn maggot injury to Tendercrop snap beans. Geneva, New York, 1975.

Treatment[a]		Rate (AI)[b]	Av. % damage[c]
UC 21865 75 w.p.	SF[d]	2 lb./A	0 a
M 3726 4 lbs./gal.	SL	1 oz./cwt	1 ab
Lorsban (25 w.p.) + Methocel	SL	1 oz./cwt	1 a-c
Diazinon (Agrox 2-way)	PB	1 oz./cwt	1 a-c
Lorsban (25 w.p.) + Biofilm	SL	1 oz./cwt	2 a-d
Lorsban (25 w.p.) + Exhalt	SL	1 oz./cwt	2 b-d
FMC 33297 25 w.p.	SL	1 oz./cwt	3 c-e
Furadan 10G	SF[e]	1 lb./A	3 c-f
Counter 15G	SF	1.1 lb./A	4 d-g
UC 21865 75 w.p.	SF[d]	1 lb./A	7 e-h
Dasanit 15G	INC	.5 lb./A	7 f-h
UC 51717 50 w.p.	SF	1 lb./A	8 gh
UC 21865 75 w.p.	SF[d]	.5 lb./A	8 gh
UC 51109 50 w.p.	SF	2 lb./A	10 gh
Dasanit 15G	INC	1 lb./A	11 h
UC 51109 50 w.p.	SF	1 lb./A	13 hi
UC 51717 50 w.p.	SF	2 lb./A	14 hi
Thiram (check)	-	-	20 ij
Thiram (check)	-	-	25 ij
Untreated	-	-	29 j

[a] SF = seed furrow; SL = slurry seed treatment with Thiram using Biofilm (1 pt. of 1%/seed cwt); PB = planterbox; INC = 2 inch band treatment lightly incorporated.

[b] Rate/A applications based on 36 inch row widths.

[c] Duncan's multiple range test at 5% level using Arcsin transformations.

[d] Early leaf burning.

[e] Whitened leaf edges on seedlings.

Date planted 6/11; damage readings 6/23; randomized complete block design single row plots, 4 reps.; row length 15 ft.; planted with dual cone hand seeder.

Field.—A wp formulation of UC 21865 applied dry in the seed-furrow at 2 pounds AI /A gave 100 per cent protection of snap beans (Table 3), but was phytotoxic to the emerging seedlings. Considerable leaf burning was noted, even with .5 pound of the material applied as a dry furrow treatment. Effective, non-phytotoxic seed treatments were slurries of M 3726, Lorsban, and FMC 33297; and diazinon applied as a planterbox treatment (PB).

Granular materials applied in the seed-furrow usually were less effective than the seed coatings (Table 3).

On sweet corn, diazinon PB was the most effective treatment (Table 4). All of the other insecticides reduced SCM injury significantly. In the squash plots, significant injury reductions were given by the diazinon PB treatments only (Table 5).

On kidney beans, seed-furrow (SF) treatments of Temik provided effective SCM control (Table 6), but the 1 and 2 pound rates were phytotoxic and reduced the stand. On the other hand, SF treatments of UC 21865 were not phytotoxic, even at the 2 pound rate, but were not as effective as the Temik treatments. Peas and pumpkin seeds treated with Lorsban did not germinate as well as the seeds treated with diazinon, and the protection was slightly reduced (Table 7).

Table 4.-Seedcorn maggot injury to Silver Queen sweet corn. Geneva, N. Y., 1975.

Treatment[a]		Rate (AI)[b]	Av. % damage[c]
Diazinon (Agrox 2-way) 25%	PB	1 oz./cwt	2 a
FMC 33297 25 w.p.	SL	1 oz./cwt	8 b
Furadan 10G	SF	1 lb./A	10 b
Counter 15G	SF	1.1 lb./A	13 b
Dasanit 15G	INC	.5 lb./A	11 b
Lorsban (25 w.p.) + Exhalt	SL	1 oz./cwt	12 b
Bay 92114 15G	SF	.8 lb./A	13 b
Lorsban (25 w.p.) + Methocel	SL	1 oz./cwt	14 b
Bay 92114 15G	SF	1.1 lb./A	14 b
Dasanit 15G	INC	1 lb./A	15 b
Bay 92114 6E	SPI	1.1 lb./A	16 b
Bay 92114 6E	SPI	.8 lb./A	16 b
Lorsban (25 w.p.) + Biofilm	SL	1 oz./cwt	15 b
Thiram (check)	-	-	32 c
Untreated	-	-	32 c

[a] SF = seed furrow; SL = slurry seed treatment with Thiram using Biofilm (1 pt. of 1%/seed cwt); PB = planterbox; INC = 2 inch band treatment lightly incorporated; SPI = spray in furrow.

[b] Rate/A applications based on 36 inch row widths.

[c] Duncan's multiple range test at 5% level using arcsin transformations.

Date planted 6/23; damage readings 7/2; randomized complete block design; single row plots, 4 reps.; row length 15 ft.; planted with dual cone hand seeder.

Table 5.-Seedcorn maggot injury to Waltham Butternut squash. Geneva, N. Y., 1975.

Treatment[a]		Rate (AI)[b]	Av. % damage[c]
Diazinon (Agrox 2-way) 25%	PB	1 oz./cwt	2 a
Lorsban (25 w.p.) + Methocel	SL	1 oz./cwt	6 ab
FMC 33297 25%	SL	1 oz./cwt	9 a-c
Lorsban (25 w.p.) + Exhalt	SL	1 oz./cwt	14 bc
Dasanit 15G	INC	.5 lb./A	15 bc
Thiram (check)	-	-	15 bc
Untreated (check)	-	-	17 bc
Furadan 10G	SF	1 lb./A	18 bc
Lorsban (25 w.p.) + Biofilm	SL	1 oz./cwt	22 c
Counter 15G	SF	1.1 lb./A	21 e
Dasanit 15G	INC	1 lb./A	23 e

a/ PB = planterbox; SL = slurry treatment with Thiram using Biofilm (1 pt. of 1%/seed cwt); INC = 2 inch band treatment lightly incorporated.

b/ Rate/A based on 36 inch row width.

c/ Duncan's multiple range test at 5% level using Arcsin transformations.

Date planted 6/18; damage readings 7/2; randomized complete block design; single row plots, 4 reps.; row length 15 ft.; planted with dual cone hand seeder.

Table 6.-Seedcorn maggot injury to Red kidney beans. Geneva, N. Y., 1975.

SF treatments		Lbs. AI/A[a]	Av. Stand	% damage[b]
Temik	15G	2	38 d	2 a
Temik	15G	.5	88 b	2 a
Temik	15G	1	54 c	3 a
UC 21865	75 w.p.	2	73 ab	4 ab
UC 21865	75 w.p.	1	69 b	8 b
UC 21865	75 w.p.	.5	75 a	15 c
Untreated	(check)	-	68 b	28 d
Thiram	(check)	-	65 b	34 d

a/ Rate/acre based on 36 inch row width.

b/ Duncan's multiple range test at 5% level using Arcsin transformations.

Date planted 6/18; damage readings 6/27; randomized complete block design 2 row plots, 4 reps.; row length 15 ft.; planted with dual cone hand seeder.

Table 7.-Seedcorn maggot injury to various crops treated with Lorsban and diazinon at 1 oz. AI/seed cwt. Geneva, N. Y., 1975.

Treatment[a]			Av. % [b] Wando pea[c] Stand	Wando pea[c] Damage	Conn. Field pumpkin Stand	Conn. Field pumpkin Damage
Diazinon (Agrox 2-way)	25%	PB	79 a	4 a	91 a	1 a
Lorsban	25% wp	SL	41 c	9 ab	76 b	2 a
Thiram (check)		-	66 b	13 b	91 a	2 a
Untreated (check)		-	24 d	51 c	65 b	5 b

a/ PB = planterbox; SL = slurry treatment with Thiram using Biofilm (1 pt. of 1%/seed cwt.).

b/ Duncan's multiple range test at 5% level using Arcsin transformations.

c/ 25 seed pieces/row dug, washed, and examined for injury.

Date planted 6/18; damage readings 6/27; randomized complete block design; 2 row plots, 4 reps.; row length 15 ft.; planted with dual cone hand seeder.

B. Cabbage Maggot (CM)— *Hylemya hrasslcae (Bouche)*

INTRODUCTION AND METHODS

Direct-seeded Roundup cabbage, King Cole transplanted cabbage, and Purple-top White Globe turnip were used as test crops in 1975. The cabbage and turnip were direct-seeded (15 seeds/ft) with a dual-cone hand seeder. Cabbage transplants were planted with a 2-row transplanter and treated either at time of transplanting or by *directed sprays* shortly after transplanting.

An additional test, originally intended for residue samples, provided information on control of flea beetles and cabbage maggots by seed-furrow treatments of Counter and Furadan applied with cabbage and broccoli seed. These plots were planted, and the granular insecticides were applied with the dual cone hand seeder.

RESULTS

The most effective chemicals applied to direct-seeded crucifers were CGA 12223, CGA 30017, Furadan, Counter, and Bay 92114 (Tables 8,9,10). Both CGA 12223 and CGA 30017 were phytotoxic at 1 pound seed-furrow rates and reduced the turnip stand significantly (Table 8). Other phytotoxic treatments were Dyfonate and N-2596 SPI (Tables 8 and 9). GuthionSP treatments with supplemental foliage sprays timed for peaks of CM fly activity and Dyfonate SP with one supplemental foliar application gave effective control.

Both Counter and Furadan granules applied in cabbage and broccoli seed-furrows effectively controlled flea beetles on the young plants and reduced CM feeding on the roots (Table 10). Either of these treatments would be welcomed by New York crucifer growers.

Table 8.-Cabbage maggot control ca. 1 month after treatment and phytotoxicity to seedling turnip. Geneva, N. Y., 1975.

Treatment[a]			Lbs. AI/A[b]	Av.[c] Seedlings/27 ft.	Tunnels/10 roots
CGA 12223 5G		SF	1	91 k	1 a
CGA 30017 5G		SF	1	89 k	1 a
CGA 12223 5G		SF	.5	114 h-k	1 a
CGA 12223 5G		SF	.25	156 a-h	3 a
CGA 12223 4E		SP	1	180 a-c	3 a
CGA 30017 5G		SF	.25	142 c-j	4 a
Furadan 10G		SF	1	-	4 a
CGA 30017 5G		SF	.5	157 a-g	5 a
Guthion[d] 50 w.p.		SP	.75	134 e-j	7 a
Guthion[d] 2S		SP	.75	148 b-i	9 ab
CGA 12223 4E		SP	.5	196 a	11 ab
Dyfonate[e] 4E		SP	1	128 f-k	14 a-c
Diazinon 4E		SPI	1	163 a-g	17 a-c
Dyfonate 4E		SPI	1	36 l	18 a-d
N-2596 4E		SPI	1	103 jk	26 b-e
Furadan 4F		SP	1	181 a-c	28 c-f
M-3726 4E		SP	1	176 a-d	29 c-f
CGA 12223 4E		SP	.25	189 a-b	29 c-f
Dyfonate 4E		SP	1	124 g-k	35 d-f
Diazinon 4E		SP	1	195 a	43 fg
UC 51717 50 w.p.		SP	2	136 d-j	44 fg
UC 51109 50 w.p.		SP	2	136 d-j	45 fg
UC 21865 75 w.p.		SP	2	171 a-e	58 g
Avg. for 2 checks:				133	54

a/ SF = seed furrow; SP = spray on soil surface above SF with 74 g. H_2O/A; SPI = spray in the furrow.

b/ Appl. based on 24 in. row width.

c/ Duncan's multiple range test at 5% level.

d/ 2 additional sprays at 3/4 lb. AI/A on 7/31 and 8/14.

e/ 1 additional spray a 1 lb. AI/A timed for CM fly peak - 8/14.

Date planted and treated 7/18; seedlings counted 8/4; maggot fly peak 8/19; damage counts 8/20; randomized complete block design; single row plots, 4 reps.; row length 27 ft.

Table 9.-Cabbage maggot control ca. 1.5 months after treatment and phytotoxicity to seedling cabbage. Geneva, N. Y., 1975.

Treatment[a]		Lb. AI/A[b]	No. seedlings/27 ft.[c]	% damaged plants[d]
CGA 12223 4E	SP	1	187 ab	0 a
CGA 12223 5G	SF	1	146 b-f	0 a
CGA 12223 5G	SF	.25	163 a-d	3 ab
Furadan 4F	SP	1	204 a	8 a-c
Bay 92114 15G	SF	1.9	150 b-c	13 a-d
CGA 12223 5G	SF	.5	129 d-f	15 a-e
CGA 12223 4E	SP	.5	184 ab	18 b-e
Guthion 2S	SP	.75	172 a-c	20 a-e
Guthion 50 w.p.	SP	.75	166 a-d	23 b-e
Bay 92114 15G	SF	.8	186 ab	33 d-f
CGA 12223 4E	SP	.25	174 a-c	33 c-f
Dyfonate 4E	SPI	1	47 g	38 d-g
N-2596 4E	SPI	1	51 g	38 d-g
Diazinon 4E	SPI	1	160 a-d	40 d-g
Dyfonate 4E	SP	2	106 f	43 e-h
Diazinon 4E	SP	1	200 a	55 f-h
N-3726 4E	SP	1	169 a-c	70 hi
Check 1	-	-	138 c-f	75 gh
Check 2	-	-	133 c-f	95 i
Check 3	-	-	152 b-e	95 i

[a] SP = spray on soil surface above SF with 74 g H_2O/A; SF = seed furrow; SPI = spray in the furrow.

[b] Appl. based on 24 in. row width.

[c] Duncan's multiple range test at 5% level.

[d] Duncan's multiple range test at 5% level using Arcsin transformations.

Date planted and treated 7/10; seedlings counted 7/28; maggot fly peak 8/19; damage counts 9/8; randomized complete block design; single row plots, 4 reps.; row length 27 ft.

Table 10.-Insect control with seed-furrow applications using 1 lb. AI/A. Geneva, N. Y., 1975.

Treatment	Seedlings/ft.	No. Flea-beetle holes/30 ft.[a]	Tunnels/10 roots
		Roundup Cabbage	
Counter 15G	3	11 a	1
Furadan 10G	4	4 a	2
Check -	3	201 b	33
		Green Comet Broccoli	
Counter 15G	4	31 a	1
Furadan 10G	4	24 a	1
Check -	4	387 b	42

[a] Duncan's multiple range test at 5% level.

Date planted 6/30; germination counts 7/14; flea beetle damage counts 7/22; maggot damage counts 9/17; randomized complete block design; double or triple row plots, 4 reps.; row length 27 ft.

Guthion 50 wp and 2S in the transplant water provided the most effective CM control for the transplanted cabbage (Table 11). Other effective treatments were N-2596 directed sprays, Lorsban and diazinon transplant treatments, and Dyfonate directed sprays. No phytotoxicity was observed in this test.

Table 11.Cabbage maggot control ca. 3 weeks after treatment on transplanted cabbage. Geneva, N. Y., 1975.

Treatment[a]		Lbs. AI/A	Av. no. tunnels/ 10 roots[b]
Guthion 50 w.p.	Trans.	1	1 a
Guthion 2S	Trans.	1	2 a
N-2596 4E	Dir. Sp.	2	3 ab
Lorsban 4E	Trans.	1	3 ab
Diazinon 4E	Trans.	1	5 a-c
Dyfonate 4E	Dir. Sp.	2	6 a-c
N-2596 4E	Dir. Sp.	1	6 a-d
Guthion 50 w.p.	Dir. Sp.	1	10 b-e
Guthion 2S	Dir. Sp.	1	12 c-e
Dyfonate 4E	Dir. Sp.	1	13 d-e
Diazinon 4E	Dir. Sp.	1	15 e
Check -	-	-	22 f

[a] Trans. = Ca. 300 gal. transplant H_2O/A, with about 4-6 oz./plant; Dir. Sp. = 100 gal H_2O directed spray to bases of plants. One nozzle on each side of row using a tractor-mounted boom sprayer with drop pipes.

[b] Duncan's multiple range test at 5% level.

Dates planted and treated 7/24 and 7/25; maggot fly peak 8/19; damage counts 9/10; randomized complete block design; double row plots, 4 reps.; 50 ft. rows.

C. Black Cutworm (BC)— *Agrotis ipsilon* (Hufnagel)

INTRODUCTION AND METHODS

Complaints by New York onion growers prompted a study on control of the black cutworm (BC) in the laboratory and field in 1975. This pest is exceedingly difficult to manage with the compounds now labeled for use on onions. Also, it is difficult to conduct control tests on naturally-occurring field populations because they are so

sporadic, and the larvae remain underground much of the time. Because of these, we used laboratory-reared cutworms originally obtained from a culture at the Ohio Agricultural Research Development Center at Wooster, Ohio. The larvae were released either into pots in the greenhouse where onion seedlings were growing in muck soil or they were placed in 3 x 4 "microplots" in a grower's field near Batavia, New York. The 12 inch high microplot barriers were constructed to prevent the larvae from escaping into the commercial field. In both the laboratory and field tests, sufficient time (ca. 24 hrs.) was allowed after introduction of the larvae to permit them to burrow into the muck soil, after which sprays or baits were applied. Cut onion plants were counted and removed daily or at 2-day intervals.

RESULTS

The synthetic pyrethroids FMC 33297 and SD 43775 were effective in the greenhouse test even after 5 days (Table 12). In the field, the FMC compound was effective (Table 13). The more effective SD material in the greenhouse test was not applied in the field trial. The conventional insecticides were inadequate or only moderately effective. Certain of the synthetic pyrethroids clearly show promise in control of the BC.

Table 12.-Black cutworm control on greenhouse onions with 1 application. Geneva, N. Y., 1975[a].

Treatment[b]	Av. % damage (days)[c] 1	2	3	5	# Larvae recovered
FMC 33297	0	0 a	0 a	0 a	0
SD 43775	0	0 a	0 a	0 a	0
SD 41706	3	5 ab	5 a	8 ab	2
Lannate	6	6 ab	6 a	11 ab	6
Diazinon	3	15 ab	18 ab	24 ab	9
Parathion	3	38 b	43 bc	48 bc	12
Methoxychlor	16	33 ab	43 bc	63 c	13
Guthion	18	54 b	62 c	70 c	13
Check	12	34 b	59 bc	76 c	9

[a] 5 seedlings/pot; 8 pots/treat.; each infested with 5 3rd or 4th instar larvae.

[b] Applied at .5#/AI/A 24 hrs. after infestation.

[c] Duncan's multiple range test at 5% level using Arcsin transformations.

Table 13.-Black cutworm control on field onions with 1 application on 6/25/75. Elba, N. Y.[a]

Treatment[b]	Lbs. AI/A	Av. no. seedlings cut (days) 2[c]	5	7
FMC 33297 25 w.p.	.5	1 a	1	0
Lannate 90 w.p.	1	3 ab	1	1
N-2596 4E	2	6 ab	1	1
Parathion 8E	1	6 ab	3	1
N-2596 4E	1	7 b	2	1
Dylox 80 w.p.	1	7 b	3	1
Diazinon 4E	1	8 b	5	2
Thur. Bait .035%	2.1	14 c	9	2
Check -	-	15 c	9	2

[a] Ca. 125 seedlings/12 sq. ft. plot; 4 reps.; infested with 50 larva/plot (4th or 5th instar).

[b] Sprays applied with 50 gal. H_2O/A 1 day after infestation on 6/24.

[c] Duncan's multiple range test at 5% level using Arcsin transformations.

1975 Weather Data
Geneva, New York

	Rainfall (inches) 1975	10 yr. av. '66-'75	Av. air temp. (°F) 1975	10 yr. av. '66-'75
May	3.40	3.28	61.3	54.3
June	3.02	4.31	65.7	65.4
July	2.32	2.98	71.5	70.1
August	4.11	3.76	69.7	68.9
September	6.43	3.06	57.8	61.3

Soil Types

Seedcorn maggot tests - Lima silt loam, 0-3% slope, 6.9 ph, 3.2% O.M.

Cabbage maggot tests - Berrian fine sandy loam, 0-6% slope, 5.7-6.1 ph, O.M. - no test made on this particular field but soil discription defines this type as low in O.M.

Cutworm test - Muck soil at Elba, N. Y.

MATERIALS USED

Insecticide	Company	Table
Bay 92114	Chemagro, Div. of Baychem	4,9
CGA 12223	Ciba-Geigy	8,9
CGA 30017	Ciba-Geigy	8
Counter	American Cyanamid, Agric. Div.	3-5,10
Dasanit	Chemagro, Div. of Baychem	3-5
Diazinon	Ciba-Geigy	1-5,7-9,11-13
Dyfonate	Stauffer Chem. Co.	8,9,11
Dylox	Chemagro, Div. of Baychem	13
FMC 33297	FMC, Niagara Chem. Div.	1,3-5,12,13
Furadan	FMC, Niagara Chem. Div.	3-5,8-10
Guthion	FMC, Niagara Chem. Div.	8,9,11,12
Lannate	DuPont	12,13
Lorsban	Dow Chemical Co.	2-5,7,11
M 3726	Dow Chemical Co.	3,8,9
Methoxychlor	DuPont	12
N-2596	Stauffer Chem. Co.	8,9,11,13
Parathion	Stauffer Chem. Co.	12,13
SD 43775	Shell Chemical	1,12
SD 41706	Shell Chemical	1,12
Temik	Union Carbide Corp.	6
Thuricide	Sandoz, Inc.	13
UC 51717	Union Carbide Corp.	3,8
UC 51109	Union Carbide Corp.	3,8
UC 21865	Union Carbide Corp.	3,6,8