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1973 Field research report on Cabbage maggot, seedcorn maggot, and aster leafhopper

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ROOT MAGGOT STUDIES

A. Cabbage Maggot—*Hylemya brassicae* (Bouche')

INTRODUCTION

The threat of insecticide resistance, label cancellation of still-effective pesticides, and changing planting patterns dictate the need for continued evaluation of candidate materials for control of the cabbage maggot, Diazinon was the only material recommended for maggot control on direct-seeded cabbage and root crops in New York in 1973.

Purple-Top White Globe turnip and Roundup cabbage were direct-seeded (15 seeds/ft of row) with a dual cone seeder. Candidate materials were applied in bands to control the cabbage maggot. In addition, Roundup cabbage transplants were treated with various directed sprays or transplant solutions.

RESULTS

Granular seed-furrow (SF) placements of CGA 12223, Counter, carbofuran, Bay 92114, and Lorsban provided the best maggot protection in the direct-seeded cabbage test (Table 1). Identical treatments of CGA 12223, Counter, and carbofuran gave the greatest damage reduction on turnip (Table 2). Lorsban, either as a soil-surface spray band (Sp) or granules dropped on the drag-chain for light incorporation (INC), also effectively reduced maggot damage on the direct-seeded cabbage.

Under the conditions of these tests, serious cabbage stand reduction due to phytotoxicity was noted with 1-pound rates of CGA 12223 and Bay 92114 in SF treatments. Turnip stands were noticeably reduced by the two treatments mentioned above, in addition to 1-pound rates of Lorsban and diazinon. Two-pound applications of CGA 12223 were even more phytotoxic to turnips than the 1 -pound rate and completely destroyed the cabbage seedlings as did SN 316 at 1 pound in the SF of both crucifer crops.

Guthion wettable powder at 1 pound Al/A (based on a 24-inch row width) gave the greatest maggot damage reduction when applied to cabbage transplants either in the transplant water or as a directed spray to the plant bases immediately after transplanting (Table 3).

B. Seed-corn Maggot—*Hylemya platura* (Meigen)

INTRODUCTION

The seed-corn maggot (SCM) is a continuing problem to bean production in New York. Although infestations are sporadic, it is necessary to regularly treat seeds because the outbreaks have not been predictable. Beans are vulnerable to attack only for the short time while they are underground; so, cool, wet conditions which prolong germination render crops more susceptible. At most, 2 weeks of protection are needed. Thus, many of the less persistant treatments tested gave effective control of this pest since extended residual activity is unnecessary. For 1973, recommended treatments for SCM control in New York on beans and corn were planter box applications of diazinon or lindane.

Fordhook 242 limas, Tendercrop snaps, and Silver Queen Hybrid sweet corn seeds were either pretreated with 2 per cent methocel slurries (1/2 pt./bu. of seed) or planter box applications, or treated with granular bands in the seed furrow (SF). All seeds were protected with captan fungicide to eliminate seed rots which may interfere with maggot damage assessment on emerging seedlings. Cor-enco meat and bone meal (1/2 lb./15 ft. row) was sprinkled in a 2-4-inch band on top of each row immediately after planting to encourage oviposition.

RESULTS

Slurry applications of diazinon, Lorsban, and Orthene gave good damage reduction on beans and limas (Tables 4 and 5). Orthene slurries did not appear to be as effective for treatment of sweet corn (Table 6). Planter box applications providing good control on limas and snaps were diazinon, Lorsban, and Imidan. Imidan PB did not perform as well on the sweet corn. Lindane PB (Isotox) was not effective on any of the three crops tested.

The only granular SF applications which did not perform effectively on snaps were .5 pound AI/A rates of Dasanit, Temik, carbofuran, and Zolone, and the 1-pound rate of Zolone. Granular bands of Di-Syston lightly incorporated (INC) above snap beans were not effective. On limas, .5-pound SF rates of Counter and Zolone and 1 -pound rates of carbofuran and Zolone were inadequate. The Di-Syston INC applications were again ineffective. The only granular application giving ineffective control on the sweet corn was Zolone. The only evidence of stand reduction in these tests occurred when limas were treated with 2 oz./cwt Orthene slurries (51% reduction).

Control of Aster Leafhopper, *Macrosteles fascifrons* (Stal.), on Carrots

INTRODUCTION

The aster leafhopper is a vector of the causal agent of aster yellows disease. In New York, this insect overwinters in grain in the egg stage. The adults must feed on an infected source (usually weeds) in order to become infective. To control aster yellows, insecticides should be applied to carrots at the time when leaf hoppers are moving into carrot fields. In New York, the localized pockets of high yellows infection develop where large numbers of leafhoppers and overwintering primary inoculum in weeds occur together.

Various foliar treatments and one systemic sidedressed to the young carrots were tested in 1973. Regular leafhopper sweeps were made after each application using a hand sweep net. These counts were compared to those found in the recommended treatment for New York (car-baryl on a 7- to 10-day schedule).

RESULTS

Because of fluctuating leafhopper populations and an uneven carrot stand, there were no statistical differences at 7 or 10 days in this test. However, the Orthene-treated carrots had the lowest numbers of leafhoppers after 10 days (Table 7).

Table 1.—Cabbage maggot control 89 days after treatment and phytotoxicity to cabbage. Geneva, New York. 1973.

Treatment[a]		Lb. AI/A[b]	Average	
			Seedlings/27 ft.	Tunnels/20 roots[c]
CGA 12223	SF	1.0	40	0.0 a
Counter	SF	1.0	168	0.0 a
CGA 12223	SF	0.5	113	0.3 a
Counter	SF	2.0	126.8	0.3 a
Counter	SF	0.75	107.5	0.5 a
Carbofuran	SF	1.0	131.0	0.5 a
BAY 92114	SF	1.0	64.5	1.8 ab
Lorsban	SF	0.5	104.5	1.8 ab
Lorsban	INC	1.0	167.8	2.0 ab
Lorsban	SP	1.0	155.5	4.0 ab
Diazinon	SF	1.0	85.5	4.3 a-c
Lorsban	SP	0.5	156.8	5.5 bc
Lorsban	INC	0.5	189.8	8.5 cd
Zolone	SF	1.0	96.3	11.5 de
Dyfonate	SP	1.0	106.0	12.0 de
Check	—	—	126.0	12.3 de
Zolone	SF	1.5	92.5	13.8 ef
Bay Meb 6046	SP	2.0	159.8	14.0 ef
Diazinon	SP	1.0	158.8	14.8 ef
TH 6040	SPI	1.0	161.8	15.3 ef
Carbofuran	SP	1.0	160.0	15.8 ef
Temik	SF	1.0	76.0	17.0 f
Check	—	—	85.3	18.0 f

[a] SF=seed furrow; SP=spray on soil surface above SF with 80 g. H_2O/acre; SPI=spray in the furrow; INC=gran. dropped on drag chain for light inc.

[b] Appl. based on 24-inch row width.

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

Date planted and treated—7/2/73
Seedlings counted—7/20
Root damge read—9/28

Randomized complete block design:
Single row plots—four replications
Row length—27 feet

Table 2.—Cabbage maggot control 82 days after treatment and phytotoxicity to turnip. Geneva, New York. 1973.

Treatment[a]		Lb. AI/A[b]	Average	
			Seedlings/27 ft.	Tunnels/20 roots[c]
CGA 12223	SF	2.0	111.5	3.0 a
CGA 12223	SF	1.0	169.3	4.8 ab
Counter	SF	2.0	216.0	6.3 ab
CGA 12223	SF	0.5	212.5	9.5 ab
Carbofuran	SF	1.0	235.0	10.3 ab
Counter	SF	0.75	266.3	19.8 ab
Counter	SF	1.0	194.5	20.3 ab
Lorsban	INC	1.0	274.8	30.0 bc
Lorsban	SP	1.0	273.0	31.0 bc
BAY 92114	SF	1.0	206.0	31.8 bc
Lorsban	SP	0.5	236.0	47.0 cd
Lorsban	SF	1.0	161.0	48.5 c-e
Lorsban	INC	0.5	249.0	52.5 c-f
Lorsban	SF	0.5	229.8	60.8 d-f
Carbofuran	SP	1.0	268.3	62.3 d-f
Diazinon	SF	1.0	152.3	62.8 d-f
Dyfonate	SP	1.0	244.3	65.3 d-g
TH 6040	SP	2.0	273.3	66.0 d-g
Zolone	SF	1.5	218.5	72.3 d-g
Diazinon	SP	1.0	271.3	73.5 e-h
Temik	SF	1.0	229.3	77.3 f-i
Zolone	SF	1.0	226.8	89.0 g-i
Bay Meb 6046	SP	2.0	231.3	94.5 hi
Check	—	—	265.5	101.0 ij
Check	—	—	255.8	118.0 j

[a]SF = seed furrow; SP = spray on soil surface above SF with 80 g. H_2O/acre; INC = gran. dropped on drag chain for light inc.

[b]Appl. based on 24-inch row width.

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

Date planted and treated—6/29
Seedlings counted—7/9
Root damage read—9/19

Randomized complete block design:
Single row plots—four replications
Row length—27 feet

Table 3.—Cabbage maggot control in transplanted cabbage. Geneva, New York. 1973.

Treatment, 1.0 lb. AI/A	Av. no. tunnels /60 roots[a]
Guthion, Trans.[b]	20.8 a
Guthion, Spray[c]	37.8 ab
Diazinon, Trans.	70.0 bc
Dyfonate, Spray	77.8 bc
Diazinon, Spray	114.0 c
Check —	168.0 d

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

[b]530 gal. H_2O/A—about 7 oz./plant with a 2-row transplanter.

[c]100 gal. H_2O directed spray to bases of plants. One nozzle on each side of row using a modified boom on a John Deere sprayer.

Planted and treated—7/25
Damage read—9/20
Randomized complete block design:
Two-row plots bordered on either side by two untreated rows
Each row—45 feet

Table 4.—Seed-corn maggot injury to snap bean seed. Geneva, New York. 1973.

Treatment[a]		Rate AI per cwt or acre[b]	Average % damage[c]
Diazinon	S1	1.2 oz./cwt	0 a
Diazinon	PB	1.2 oz./cwt	0.4 ab
Lorsban	S1	1.0 oz./cwt	0.4 ab
SD 34110	SF	0.5 lb./A	1.3 a-c
SD 8332	SF	0.5 lb./A	0.9 a-c
Diazinon	SF	0.5 lb./A	1.1 a-d
Orthene	S1	2.0 oz./cwt	1.1 a-c
SN 316	SF	0.5 lb./A	1.6 a-d
CGA 12223	SF	0.25 lb./A	1.4 a-e
Lorsban	PB	1.25 oz./cwt	1.8 a-e
Lorsban	S1	0.5 oz./cwt	1.9 a-f
Imidan	PB	1.2 oz./cwt	2.2 a-f
CGA 12223	SF	0.5 lb./A	1.6 a-f
Dasanit	SF	1.0 lb./A	2.4 a-f
Counter	SF	0.5 lb./A	2.5 a-f
Lorsban	PB	1.67 oz./cwt	2.7 a-f
Carbofuran	SF	1.0 lb./A	2.1 a-g
Dasanit	SF	0.5 lb./A	3.3 b-g
Temik	SF	0.5 lb./A	5.9 c-h
Orthene	S1	1.0 oz./cwt	5.0 d-h
Carbofuran	SF	0.5 lb./A	5.8 e-h
Zolone	SF	0.5 lb./A	8.2 f-h
Lindane	PB	1.2 oz./cwt	9.0 gh
Zolone	SF	1.0 lb./A	9.6 h
Di-Syston	INC	2.0 lb./A	19.9 i
Di-Syston	INC	1.0 lb./A	22.9 ij
Check	—	—	28.4 ij
Check	—	—	32.3 j

[a]S1 = slurry seed treatment with methocel; PB = planter box; SF = seed furrow; INC = gran. dropped on drag chain for light inc.
[b]Appl. based on 36-inch row width.
[c]Duncan's multiple range test at 5 per cent level using arcsin transformations.

Date planted—6/8/73
Stand counts and damage readings—6/18 and 6/19
Randomized complete block design:
Single row plots—four replications
Row length—15 feet
Planted with dual cone hand seeder
Each seedling in each row examined for maggot damage

Table 5.—Seed-corn maggot injury to lima bean seed. Geneva, New York. 1973.

Treatment[a]		Rate AI per cwt or acre[b]	Average % damage[c]
Orthene	S1[d]	2.0 oz./cwt	0.8 a
Lorsban	S1	1.0 oz./cwt	0.7 ab
CGA 12223	SF	0.5 lb./A	1.3 ab
Diazinon	PB	1.2 oz./cwt	1.3 ab
Diazinon	S1	1.2 oz./cwt	1.4 a-c
SD 34110	SF	0.5 lb./A	1.4 a-c
Orthene	S1	1.0 oz./cwt	2.2 a-c
Lorsban	PB	1.25 oz./cwt	2.7 a-c
Lorsban	S1	0.5 oz./cwt	3.0 a-c
CGA 12223	SF	0.25 lb./A	3.4 a-c
Diazinon	SF	0.5 lb./A	2.8 a-c
SN 316	SF	0.5 lb./A	5.8 a-c
Dasanit	SF	0.5 lb./A	3.5 a-c
Carbofuran	SF	0.5 lb./A	3.5 a-c
SD 8332	SF	0.5 lb./A	3.5 a-c
Lorsban	PB	1.67 oz./cwt	3.7 a-c
Imidan	PB	1.2 oz./cwt	5.7 a-c
Dasanit	SF	1.0 lb./A	5.6 a-c
Temik	SF	0.5 lb./A	5.3 a-c
Carbofuran	SF	1.0 lb./A	6.0 b-d
Counter	SF	0.5 lb./A	7.0 c-e
Zolone	SF	1.0 lb./A	16.3 d-f
Zolone	SF	0.5 lb./A	16.7 ef
Lindane	PB	1.0 oz./cwt	21.6 fg
Check	—	—	28.8 fg
Check	—	—	35.4 g
Di-Syston	INC	2.0 lb./A	36.7 g
Di-Syston	INC	1.0 lb./A	36.5 g

[a]S1 = slurry seed treatment using methocel; PB = planter box; SF = seed furrow; INC = gran. dropped on drag chain for light inc.
[b]Appl. based on 36-inch row width.
[c]Duncan's multiple range test at 5% level using arcsin transformations.
[d]Suspected stand reduction (51% of check).

Date planted—6/8/73
Stand counts and damage readings—6/18 and 6/19
Randomized complete block design:
Single row plots—four replications
Row length—15 feet
Planted with dual cone hand seeder
Each seedling in each row examined for maggot damage

Table. 6.—Seed-corn maggot injury to sweet corn seed. Geneva, New York. 1973.

Treatment[a]		Rate AI per cwt or acre[b]	Average % damage[c]
Diazinon	S1	1.2 oz./cwt	.5 a
Lorsban	PB	1.67 oz./cwt	1.8 ab
Lorsban	PB	1.25 oz./cwt	1.8 ab
CGA 12223	SF	0.25 lb./A	1.8 ab
Lorsban	S1	1.0 oz./cwt	2.0 ab
Carbofuran	SF	0.5 lb./A	2.0 ab
Diazinon	PB	1.2 oz./cwt	2.3 ab
SN 316	SF	0.5 lb./A	2.3 ab
CGA 12223	SF	0.5 lb./A	2.5 ab
Di-Syston	INC	1.0 lb./A	2.5 ab
SD 8332	SF	0.5 lb./A	2.5 ab
Dasanit	SF	1.0 lb./A	2.8 ab
Diazinon	SF	0.5 lb./A	2.8 ab
Carbofuran	SF	1.0 lb./A	2.8 ab
SD 34110	SF	0.5 lb./A	2.8 ab
Temik	SF	0.5 lb./A	2.0 ab
Lorsban	S1	0.5 oz./cwt	3.3 ab
Di-Syston	INC	2.0 lb./A	3.5 a-c
Zolone	SF	0.5 lb./A	3.5 a-c
Counter	SF	0.5 lb./A	3.8 a-c
Dasanit	SF	0.5 lb./A	4.3 a-c
Lindane	PB	1.2 oz./cwt	4.8 bc
Zolone	SF	1.0 lb./A	4.8 bc
Orthene	S1	2.0 oz./cwt	5.5 bc
Imidan	PB	1.2 oz./cwt	7.3 cd
Orthene	S1	1.0 oz./cwt	7.3 cd
Check	—	—	10.3 de
Check	—	—	12.8 e

[a]S1 = slurry seed treatment using methocel; PB = planter box; SF = seed furrow; INC = gran. dropped on drag chain for light inc.
[b]Appl. based on 36-inch row width.
[c]Duncan's multiple range test at 5 per cent level using arcsin transformations.

Date planted—6/8/73
Stand counts—6/18 and 6/19
25 seed pieces/row dug and examined for injury—6/20 and 6/22

Randomized complete block design:
Single row plots—four replications
Row length—15 feet
Planted with dual cone hand seeder

Table 7.—Aster leafhopper control on carrots at various time intervals (days) after application of sprays at 1 pound AI/A. Geneva, New York. 1973.

Material	Av. no./100 sweeps[a]			
	1 day (8/17)	4 day (8/20)	7 day (8/23)	10 day (9/7)
Orthene	33.7 ab	28.0 a	36.7 a	28.5 a
Parathion encapsulated[b]	34.7 ab	60.3 abc	41.7 a	71.0 a
Sevinmol	17.7 a	34.0 a	42.3 a	91.3 a
Carbofuran 10G[c]	78.3 bc	47.0 ab	53.3 a	74.0 a
Carzol	34.7 ab	81.0 bc	92.0 b	111.3 a
Phosvel	107.0 c	94.7 c	92.3 b	98.3 a
Check	96.0 c	61.7 abc	56.0 a	104.3 a

[a]Duncan's multiple range test at 5 per cent level.
[b].5 lbs. AI/A.
[c]Sidedressed to both sides of row with dual cone hand seeder—7/30.

Planted on 6/27/73 using Stan-hay precision planter
Sprayed with power-driver sprayer at rate of 30 gal. H_2O/A on 7/29, 8/6, 8/16, 8/28

Randomized complete block design:
Two-row plots—45 feet long—four replications
Bordered on each side by four untreated rows

Variety—Red-cored Chantenay

Materials Used

Insecticide	Company
Bay 92114	Chemagro, Div. of Baychem
Bay Meb 6046	Chemagro, Div. of Baychem
Carbofuran	FMC, Niagara Chem. Div.
Carzol	NOR-AM Agric. Products, Inc.
CGA 12223	Ciba-Geigy
Counter	American Cyanamid, Agric. Div.
Dasanit	Chemagro, Div. of Baychem
Diazinon	Ciba-Geigy
Di-Syston	Chemagro, Div. of Baychem
Dyfonate	Stauffer Chemical Co.
Guthion	Chemagro, Div. of Baychem
Imidan	Stauffer Chemical Co.
Isotox (lindane)	Chevron Chemical Co., Ortho Div.
Lorsban	Dow Chemical Co.
Orthene	Chevron Chemical Co., Ortho Div.
Parathion (encapsulated)	Stauffer Chemical Co.
Phosvel	Velsicol Chemical Corp.
Sevinmol	Union Carbide Corp.
SD 34110	Shell Chemical
SD 8332	Shell Chemical
SN 316	NOR-AM Agric. Products, Inc.
Temik	Union Carbide Corp.
TH 6040	Thompson-Hayward Chemical Co.
Zolone	Rhodia, Inc., Chipman Division

1973 Weather Data
Geneva, New York

	Rainfall (inches)	Av. air temp. (°F)
June	3.55	67.8
July	1.65	70.8
August	2.68	71.6
September	2.50	61.5

Soil Types

Cabbage maggot tests and leafhopper tests—Berrian fine sandy loam, 0-6 per cent slope
Seed-corn maggot tests—Lima silt loam, 0-3 per cent slope