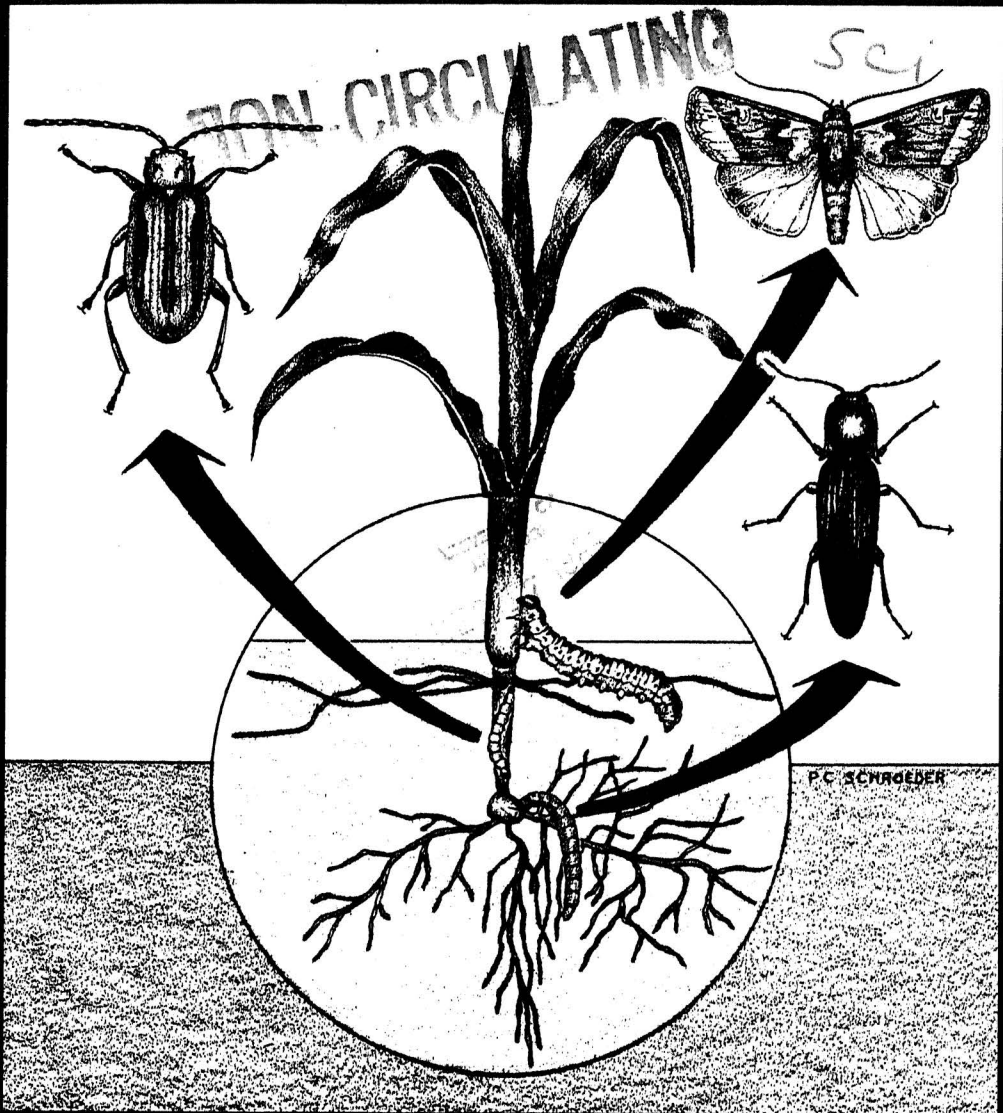


Corn Soil Insects Research

1985 Insecticide Evaluations



Judy A. Grundler

Armon J. Keaster

University of Missouri-Columbia
Agricultural Experiment Station

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CORN SOIL INSECTS RESEARCH
1985 INSECTICIDE EVALUATIONS

Judy A. Grundler, Entomology Senior Research Specialist
Armon J. Keaster, Professor of Entomology
Department of Entomology, University of Missouri

Soil insecticide evaluations are conducted to compare the relative efficacy of labeled and experimental compounds for control of corn soil insect pests. This report contains data on the efficacy of these compounds for control of western and northern corn rootworms (Diabrotica virgifera LeConte and D. longicornis (Say)), black cutworm (Agrotis ipsilon (Hufnagel)), and wireworms (Melanotus spp.).

This report and the data contained within are presented for purposes of information only to agribusiness industries and to University of Missouri extension and research personnel. The data do not reflect nor constitute a recommendation of specific compounds. The five- and ten-year comparisons of performance for recommended cutworm and rootworm compounds do, however, provide a basis for comparison of efficacy for control over a period of time. For specific recommendations for control of corn soil insects, see UMC Agricultural Guides 4150 (Corn Cutworm Control), 4151 (Corn Rootworm Control), 4154 (Control of Wireworm and Other Corn Soil Insects), and 4906 (Soil Insect Control in Reduced Tillage Cropping Systems).

ROOTWORM INSECTICIDE EVALUATIONS

Rootworm insecticide evaluations were conducted at two locations, near Fairfax in Atchison County, and at the University of Missouri Greenley Research Center in Novelty, Knox County. The plots near Fairfax were located in a corner of a 100 acre field planted to corn in 1984. Oats and alfalfa were seeded in the fall of 1984 and disked under approximately one week prior to planting the plots. This field had an "organophosphate history" of Counter use on corn from 1981-84 and exhibited a decrease in insecticide efficacy in 1984. Plots at the Greenley Center were part of a 7 acre block which has been in continuous corn for 6 years. This location was known to have a carbamate aggressive soil shown in previous years but had no actual history of insecticide application.

A two-row John Deere model 7100 max-emerge planter with a mounted V-belt seeder was used for the 7-inch band (7" B), in-furrow (IF), and behind the press wheel (BPW) treatments. Pre-weighed insecticide granules were placed uniformly along the V-belt seeder and directed through banders or tubes to obtain the desired placement. Banded sprays were applied at 30 pounds per square inch (psi) and 11 gallons per acre (gpa) with a tractor-mounted compressed-air sprayer. Insecticides were applied to two rows 35 feet long, and replicated four times. A randomized complete block design was used. A 15 foot alleyway separated each replication. Cultivation treatments (cult) were applied with an International cub tractor equipped with a one row cultivator and a compressed air sprayer. The sprays were applied at 30 psi in 14 gpa.

The efficacy of the treatments within each test was determined by digging 16 plants from each treatment (2 plants per row x 2 rows per plot x 4 replications). The root systems of the plants were washed free of dirt, and evaluated as follows:

- A. General Root Rating - The entire root system was taken into consideration when assigned a rating according to the amount of visible rootworm damage. The ratings were assigned as follows: 1) no feeding damage, 2) light feeding damage with no pruning, 3) occasional pruning, 4) moderate to severe pruning (one node of roots destroyed), 5) severe pruning (two nodes of roots destroyed), and 6) three nodes of roots destroyed.
- B. Damaged Root Rating - The percentage of the roots showing rootworm damage in the second and third nodes below ground level were estimated and assigned to five categories as follows: 1) no injury, 2) 1-25%, 3) 26-50%, 4) 51-75%, and 5) 76-100%.

- C. Pruned Root Rating - The same root systems evaluated under A and B were rated where only the percent of the roots pruned in the second and third nodes below ground level were estimated. Ratings were as follows: 1) no pruning, 2) 1-25%, 3) 26-50%, 4) 51-75%, and 5) 76-100%.
- D. Combined Analysis Rating - The combined analysis rating is the average of the pruned root rating, damaged root rating, and general root rating. Only the general root rating and the combined analysis ratings are reported herein as indicators of insecticide performance.

TABLE 1. Comparison of Soil Insecticide Efficacy for Control of Western and Northern Corn Rootworm Larvae (Commercial Test), Fairfax, Missouri, 1985.

Insecticide	Rate (lb ai/A)	Placement	General Root, Rating Means ¹
Lance 15G	1.00	7"B	2.19 a
Furadan 15G	1.00	7"B	2.31 a
Lance 15G	0.75	7"B	2.31 a
Broot 15G	1.00	7"B	2.88 b
Dyfonate 20G	1.00	7"B	2.94 b
Lorsban 15G	1.00	7"B	2.94 b
Counter 15G	1.00	7"B	3.00 b
Mocap 15G	1.00	BPW	3.13 b
Aastar 15G	1.00	7"B	3.44 b
Thimet 20G	1.00	7"B	4.25 c
Control	-	-	5.13 d

¹Mean separation by DMRT; means followed by the same letter are not significantly different at P=0.05.

TABLE 2. Comparison of Soil Insecticide Efficacy for Control of Western and Northern Corn Rootworm Larvae (Commercial Test), Fairfax, Missouri, 1985.

Insecticide	Rate (lb ai/A)	Placement	Combined Analysis Rating Means ¹
Lance 15G	1.00	7"B	2.44 a
Furadan 15G	1.00	7"B	2.54 a
Lance 15G	0.75	7"B	2.69 ab
Broot 15G	1.00	7"B	3.08 bc
Dyfonate 20G	1.00	7"B	3.12 bc
Lorsban 15G	1.00	7"B	3.29 c
Counter 15G	1.00	7"B	3.48 cd
Mocap 15G	1.00	BPW	3.52 cd
Aastar 15G	1.00	7"B	3.83 d
Thimet 15G	1.00	7"B	4.50 e
Control	-	-	5.04 f

¹Mean separation by DMRT; means followed by the same letter are not significantly different at P=0.05.

TABLE 3. Comparison of Soil Insecticide Efficacy for Control of Western and Northern Corn Rootworm Larvae (Test 2), Fairfax, Missouri, 1985.

Insecticide	Rate (lb ai/A)	Placement	General Root, Rating Means ¹
UBI-A920 15G	1.00	7"B	2.31 a
F-5093 1-10G	0.10-1.00	7"B	2.38 ab
Furadan 15G	1.00	7"B	2.44 abc
F-5093 1-10G	0.075-0.75	7"B	2.56 abcd
67825 20G	1.00	7"B	2.63 abcd
Broot 15G	1.00	7"B	2.69 abcd
UC 70667 10G	1.00	7"B	2.75 abcde
PP993 1.5G	0.075	7"B	2.88 abcdef
UC 70480 10G	1.00	7"B	2.94 abcdef
UC 70667 10G	0.50	7"B	3.00 abcdef
PP993 1.5G	0.125	7"B	3.00 abcdef
UC 70667 10G	0.75	7"B	3.06 abcdef
UC 70480 10G	0.75	7"B	3.06 abcdef
LY 76499 10G	0.50	7"B	3.13 bcdef
Counter 15G	1.00	7"B	3.19 cdef
LY 178429 10G	0.50	7"B	3.31 defg
LY 178429 10G	0.25	7"B	3.31 defg
LY 76499 10G	0.25	7"B	3.50 efg
PP993 1.5G	0.100	7"B	3.50 efg
CGA 12223 10G	0.38	7"B	3.50 efg
CGA 12223 10G	0.50	7"B	3.56 fg
CGA 12223 10G	0.50	1F	3.94 gh
SC-0135 10G	1.00	1F	4.38 hi
SC-0135 10G	1.00	7"B	4.63 i
Control	-	-	4.81 i

¹Mean separation by DMRT; means followed by the same letter are not significantly different at P=0.05.

TABLE 4. Comparison of Soil Insecticide Efficacy for Control of Western and Northern Corn Rootworm Larvae (Test 2), Fairfax, Missouri, 1985.

Insecticide	Rate (lb ai/A)	Placement	Combined Analysis Rating Means ¹
F-5093 1-10G	0.10-1.00	7" B	2.63 a
UBI-A920 15G	1.00	7" B	2.75 ab
Furadan 15G	1.00	7" B	2.83 abc
F-5093 1-10G	0.075-0.75	7" B	2.85 abc
UC 70667 10G	1.00	7" B	2.96 abc
67825 20G	1.00	7" B	3.02 abcd
Broot 15G	1.00	7" B	3.10 abcde
UC 70480 10G	1.00	7" B	3.27 abcdef
UC 70667 10G	0.50	7" B	3.33 bcdefg
Counter 15G	1.00	7" B	3.33 bcdefg
UC 70480 10G	0.75	7" B	3.35 bcdefg
UC 70667 10G	0.75	7" B	3.38 bcdefg
PP993 1.5G	0.075	7" B	3.46 cdefg
PP993 1.5G	0.125	7" B	3.48 cdefg
LY 76499 10G	0.50	7" B	3.69 defgh
LY 178429 10G	0.25	7" B	3.75 efgh
CGA 12223 10G	0.38	7" B	3.81 fgh
LY 178429 10G	0.50	7" B	3.83 fgh
CGA 12223 10G	0.50	7" B	3.90 fgh
LY 76499 10G	0.25	7" B	3.92 fgh
PP993 1.5G	0.100	7" B	3.96 gh
CGA 12223 10G	0.50	IF	4.25 hi
SC-0135 10G	1.00	IF	4.69 ij
SC-0135 10G	1.00	7" B	4.75 ij
Control	-	-	4.94 j

¹Mean separation by DMRT; means followed by the same letter are not significantly different at P=0.05.

TABLE 5. Comparison of Soil Insecticide Efficacy for Control of Western and Northern Corn Rootworm Larvae (Test 3), Fairfax, Missouri, 1985.

Insecticide	Rate (lb ai/A)	Placement	General Root Rating Means ¹
Counter 15G	1.00	7"B	2.38 a
Dyfonate 15G	1.00	7"B	3.38 b
Dyfonate 20G	1.00	7"B	3.50 b
Dyfonate 4E	1.00	Cult	3.50 b
Dyfonate 4.6MS	1.00	7"B	4.25 bc
Control	-	-	4.63 c
Dyfonate 4.6MS	1.00	Cult	4.81 c
Combined Analysis Rating Means ¹			
Counter 15G	1.00	7"B	2.72 a
Dyfonate 15G	1.00	7"B	3.60 b
Dyfonate 20G	1.00	7"B	3.77 bc
Dyfonate 4E	1.00	Cult	3.83 bc
Dyfonate 4.6MS	1.00	7"B	4.47 cd
Control	-	-	4.75 d
Dyfonate 4.6MS	1.00	Cult	4.83 d

¹Mean separation by DMRT; means followed by the same letter are not significantly different at P=0.05.

TABLE 6. Comparison of Soil Insecticide Efficacy for Control of Western and Northern Corn Rootworm Larvae (Commercial Test), Novelty, Missouri, 1985.

Insecticide	Rate (lb ai/A)	Placement	General Root, Rating Means ¹
Dyfonate 20G	1.00	7"B	2.56 a
Counter 15G	1.00	7"B	2.63 ab
Aastar 15G	1.00	7"B	3.00 abc
Lance 15G	0.75	7"B	3.00 abc
Thimet 20G	1.00	7"B	3.13 abc
Lorsban 15G	1.00	7"B	3.13 abc
Furadan 15G	1.00	7"B	3.19 bc
Lance 15G	1.00	7"B	3.25 c
Broot 15G	1.00	7"B	3.31 c
Mocap 15G	1.00	BPW	3.50 cd
Control	-	-	4.00 d

¹Mean separation by DMRT; means followed by the same letter are not significantly different at P=0.05.

TABLE 7. Comparison of Soil Insecticide Efficacy for Control of Western and Northern Corn Rootworm Larvae (Commercial Test), Novelty, Missouri, 1985.

Insecticide	Rate (lb ai/A)	Placement	Combined Analysis Rating Means ¹
Counter 15G	1.00	7" B	2.83 a
Dyfonate 20G	1.00	7" B	2.96 ab
Thimet 20G	1.00	7" B	3.25 abc
Aastar 15G	1.00	7" B	3.35 abc
Lance 15G	0.75	7" B	3.45 bcd
Furadan 15G	1.00	7" B	3.58 cd
Lorsban 15G	1.00	7" B	3.60 cd
Lance 15G	1.00	7" B	3.63 cd
Broot 15G	1.00	7" B	3.81 cd
Mocap 15G	1.00	BPW	4.00 de
Control	-	-	4.52 e

¹Mean separation by DMRT; means followed by the same letter are not significantly different at P=0.05.

TABLE 8. Comparison of Soil Insecticide Efficacy for Control of Western and Northern Corn Rootworm Larvae (Test 2), Novelty, Missouri, 1985.

Insecticide	Rate (lb ai/A)	Placement	General Root, Rating Means ¹
Counter 15G	1.00	7" B	2.19 a
PP993 1.5G	0.125	7" B	2.94 b
PP993 1.5G	0.100	7" B	2.94 b
67825 20G	1.00	7" B	2.94 b
PP993 1.5G	0.075	7" B	2.94 b
UC 70667 10G	0.75	7" B	3.13 b
CGA 12223 10G	0.50	IF	3.13 b
UC 70480 10G	0.75	7" B	3.19 b
Furadan 15G	1.00	7" B	3.25 b
F-5093 1-10G	0.10-1.00	7" B	3.25 b
LY 76499 10G	0.50	7" B	3.31 bc
UC 70480 10G	1.00	7" B	3.31 bc
F-5093 1-10G	0.075-0.75	7" B	3.31 bc
UC 70667 10G	0.50	7" B	3.38 bcd
UC 70667 10G	1.00	7" B	3.38 bcd
SC-0135 10G	1.00	IF	3.44 bcd
CGA 12223 10G	0.50	7" B	3.44 bcd
LY 178429 10G	0.50	7" B	3.44 bcd
Broot 15G	1.00	7" B	3.50 bcde
SC-0135 10G	1.00	7" B	3.88 bcde
UBI-A920 15G	1.00	7" B	3.94 cdef
CGA 12223 10G	0.38	7" B	4.00 ef
Control	-	-	4.25 f

¹Mean separation by DMRT; means followed by the same letter are not significantly different at P=0.05.

TABLE 9. Comparison of Soil Insecticide Efficacy for Control of Western and Northern Corn Rootworm Larvae (Test 2), Novelty, Missouri, 1985.

Insecticide	Rate (lb ai/A)	Placement	Combined Analysis Rating Means ¹
Counter 15G	1.00	7" B	2.71 a
67825 20G	1.00	7" B	3.13 ab
PP993 1.5G	0.075	7" B	3.33 bc
PP993 1.5G	0.125	7" B	3.35 bc
PP993 1.5G	0.100	7" B	3.46 bc
UC 70667 10G	0.75	7" B	3.50 bc
UC 70480 10G	0.75	7" B	3.58 bcd
F-5093 1-10G	0.10-1.00	7" B	3.63 bcd
CGA 12223 10G	0.50	1F	3.63 bcd
UC 70480 10G	1.00	7" B	3.63 bcd
LY 76499 10G	0.50	7" B	3.67 bcd
Furadan 15G	1.00	7" B	3.73 bcd
UC 70667 10G	1.00	7" B	3.73 bcd
LY 178429 10G	0.50	7" B	3.75 bcde
CGA 12223 10G	0.50	7" B	3.83 cde
UC 70667 10G	0.50	7" B	3.85 cde
F-5093 1-10G	0.075-0.75	7" B	3.88 cde
Broot 15G	1.00	7" B	3.96 cdef
UBI-A920 15G	1.00	7" B	4.19 def
SC-0135 10G	1.00	1F	4.19 def
CGA 12223 10G	0.38	7" B	4.25 def
SC-0135 10G	1.00	7" B	4.40 ef
Control	-	-	4.54 f

¹Mean separation by DMRT; means followed by the same letter are not significantly different at P=0.05.

TABLE 10. Comparison of Soil Insecticide Efficacy for Control of Western and Northern Corn Rootworm Larvae (Test 3), Novelty, Missouri, 1985.

Insecticide	Rate (lb ai/A)	Placement	General Root, Rating Means ¹
Counter 15G	1.00	7"B	2.69 a
Dyfonate 15G	1.00	7"B	2.69 a
Dyfonate 20G	1.00	7"B	2.75 ab
Dyfonate 4.6MS	1.00	7"B	3.19 abc
Dyfonate 4.6MS	1.00	Cult	3.31 bcd
Control	-	-	3.56 cd
Dyfonate 4E	1.00	Cult	3.81 d
			Combined Analysis Rating Means
Counter 15G	1.00	7"B	2.88 a
Dyfonate 15G	1.00	7"B	3.04 a
Dyfonate 20G	1.00	7"B	3.25 ab
Dyfonate 4.6MS	1.00	7"B	3.72 bc
Dyfonate 4.6MS	1.00	Cult	3.85 bc
Control	-	-	4.00 c
Dyfonate 4E	1.00	Cult	4.25 c

¹ Mean separation by DMRT; means followed by the same letter are not significantly different at P=0.05.

TABLE 11. Ten Year Comparison of Performance¹ for Recommended Insecticides Applied at 1 lb ai/A in a Seven-Inch Band at Planting

Insecticide	1976	1977	1978	1979	1980		1981	1982	1983		1984		1985	
	A	A	A	A	A	B	A	A	A	B	A	B	A	C
carbofuran 10G (Furadan) 15G	3.19	3.94	3.56	2.75	3.19	2.13	3.56							
					3.75	1.88	3.75	3.44	4.00	2.06	3.25	2.19	3.19	2.31
chloropyrifos (Lorsban) 15G	2.81		2.88	2.75	3.50	3.06	3.00	2.44	3.13	3.06	3.13	2.52	3.13	2.94
ethoprop 10G (Mocap) 15G	2.88		2.94	2.69	2.89	2.75	3.56	3.00						
					2.67	2.44			3.88	2.81	3.63	2.18	3.50	3.13
fonofos 10G (Dyfon- ate) 15G 20G			2.63		3.13	2.38								
	2.56	3.25 ²	2.50	2.56	3.25	2.69		2.44	2.94	2.56	2.75	2.42	2.56	2.94
phorate 15G (Thimet) 20G		3.19		2.44		2.31	2.53							
	2.50		2.38					3.50	3.00	2.94	4.50	-	3.13	4.25
phorate + flucythrinate Aastar 15G														
													3.00	3.44
terbufos 15G (Counter)	2.00	3.19	2.44	2.03	2.13	2.56	2.10	2.56	2.19	3.19	4.00	2.28	2.63	3.00
trimethacarb 15G (Broot)								3.06	3.50	2.88	3.19	-	3.31	2.88
CONTROL	4.94	5.50	5.06	5.06	3.97	4.03	5.55	4.00	4.63	3.06	4.56	3.75	4.00	5.13

¹Based on general root rating (Iowa method 1-6)

²Mean 3 plots

A Data from field with carbamate history

B Data from field with no carbamate history

C Data from field with organophosphate history

CUTWORM INSECTICIDE EVALUATIONS

Planting time evaluations were conducted in barrier plots on the University of Missouri South Farms near Columbia, Boone County. Row band treatments were applied with a V-belt seeder mounted on a two-row John Deere model 7100 max-emerge planter. Pre-weighed insecticide granules were placed uniformly along the V-belt seeder and directed through seven-inch banders to obtain the desired placement. Corn was planted in a conventional manner at the same time. Band and broadcast sprays were applied at the rate of 11 gallons of finished spray per acre at 30 psi through a tractor-mounted compressed-air sprayer. Pre-plant incorporated treatments were applied as a broadcast and incorporated with a motorized garden tiller prior to planting.

Individual plots were two rows, 35 feet in length. Treatments were replicated three times according to a randomized complete block design. Following planting, metal barriers (8" in height) were driven approximately 3 inches into the soil to enclose portions of the 35-foot plots (15' x 2 rows). Twenty 3rd- to 5th-instar laboratory-reared black cutworm larvae were released in the barriers at seedling emergence. Efficacy of the treatments was evaluated by counting the number of plants cut on three different dates throughout the test period.

Rescue evaluations were also conducted on the University of Missouri South Farms, Boone County. Rescue treatments were evaluated using metal barriers 8 inches in height and 6 feet in diameter placed over two rows of seedling corn. When the corn reached the two-leaf stage, each barrier was infested with ten 4th- to 5th-instar laboratory-reared black cutworms. Treatments were applied within two hours following infestation. Bait and granular treatments were hand broadcast in each individual barrier. Spray treatments were applied with a tractor-mounted compressed-air sprayer at 30 psi and 40 gallons per acre. All treatments were replicated three times in a randomized complete block design. Efficacy of treatments was measured by cut plant counts on three dates following treatments.

TABLE 12. Comparison of Registered and Experimental Insecticide Efficacy for Black Cutworm Planting Time Treatments (Test 1) in Corn, Columbia, Missouri, 1985.

Insecticide	Rate (lb ai/A)	Placement	Mean % Cut Plants			
			Days Post-Infestation			Total ¹
			1	4	10	
Pounce 1.5G	0.10	7" B	6.20	6.19	0.68	13.08 a
F-5187 3G	0.30	7" B w/c ²	7.75	8.79	2.37	18.92 ab
Pounce 3.2EC	0.10	7" B	6.65	9.24	3.94	19.84 ab
F-5658 3G	0.30	7" B w/c	6.56	10.88	4.14	21.59 abc
F-4878 3G	0.30	7" B w/c	11.05	8.98	2.77	22.83 abc
Lorsban 15G	1.00	7" B	13.10	10.23	0.90	24.24 abcd
Pounce 1.5G	0.10	7" B w/c	10.46	14.86	4.72	30.05 abcde
F-3881 3G	0.30	7" B w/c	9.11	17.42	4.59	31.13 abcde
Pounce 3.2EC	0.10	7" B w/c	11.99	17.72	2.44	32.16 abcde
Ammo 0.75G	0.05	7" B w/c	10.92	16.76	5.50	33.18 abcde
Pounce 3.2EC	0.10	Bd	10.97	17.96	4.53	33.47 abcde
F-5187 3G	0.10	7" B w/c	12.16	16.85	6.79	35.81 abcde
F-5187 3G	0.05	7" B w/c	7.55	23.51	6.20	37.27 abcdef
F-4878 3G	0.10	7" B w/c	12.09	16.15	10.47	38.72 abcdef
67825 20G	1.00	7" B w/c	14.69	15.68	8.49	38.87 abcdef
F-5658 3G	0.10	7" B w/c	7.53	26.13	8.93	42.60 bcdef
F-4878 3G	0.05	7" B w/c	9.86	26.76	6.09	42.73 bcdef
F-4792 5G	0.30	7" B w/c	10.22	24.45	9.34	44.03 bcdefg
F-5205 1-10G	.01-1.0	7" B w/c	9.92	26.19	9.12	45.23 bcdefg
Pounce 3.2EC	0.10	PPI	12.20	26.08	8.77	47.06 cdefg
F-4922 5G	0.50	7" B w/c	17.08	20.40	12.69	50.18 defg
F-5685 1-10G	.01-1.0	7" B w/c	14.15	25.18	13.91	53.25 efg
F-5658 3G	0.05	7" B w/c	19.85	23.97	9.62	53.44 efg
F-4922 5G	0.30	7" B w/c	9.44	29.01	16.45	54.91 efg
F-4792 5G	0.50	7" B w/c	14.25	36.95	11.33	62.53 fg
Control	-	-	15.20	29.52	24.20	63.93 g
F-5093 1-10G	.01-1.0	7" B w/c	21.50	34.66	12.83	69.00 g

¹Mean separation by DMRT; means followed by the same letter are not significantly different at P=0.05.

²Applications were made with chain placed behind press wheel.

TABLE 13. Comparison of Registered Insecticide Efficacy for Black Cutworm Planting Time Treatments (Test 2) in Corn, Columbia, Missouri, 1985.

Insecticide	Rate (lb ai/A)	Placement	Mean % Cut Plants			
			Days Post-Infestation			Total ¹
			1	4	10	
Lorsban 15G	1.00	7" B	25.42	11.29	3.68	40.40 a
Pydrin 2.4EC	0.10	Bd	21.46	14.66	4.36	40.48 a
Pounce 3.2EC	0.10	Bd* ²	25.23	6.79	14.04	46.08 a
Lorsban 15G	0.50	7" B	26.88	9.63	10.25	46.76 a
Lorsban 15G	0.75	7" B	25.05	15.23	10.59	50.87 ab
Lorsban 4E	0.50	PP1*	22.38	14.38	21.51	58.28 ab
Lorsban 4E	1.00	PP1*	21.93	15.46	21.45	58.84 ab
Pounce 3.2EC	0.10	PP1*	30.22	18.60	10.07	58.89 ab
Lorsban 15G	0.25	7" B	31.65	10.99	17.24	59.89 ab
Pydrin 2.4EC	0.10	PP1*	33.42	12.51	15.18	61.11 ab
Lorsban 4E	0.25	Bd	28.42	10.03	24.18	62.65 ab
Lorsban 4E	0.75	PP1*	23.70	22.42	19.62	65.75 ab
Control	-	-	34.76	12.69	26.37	73.83 b

¹ Mean separation by DMRT; means followed by the same letter are not significantly different at P=0.05.

² Applications followed by a * were applied 5 days prior to planting.

TABLE 14. Comparison of Registered and Experimental Insecticide Efficacy for Black Cutworm Planting Time Treatments (Test 3) in Corn, Columbia, Missouri, 1985.

Insecticide	Rate (lb ai/A)	Placement	Mean % Cut Plants				
			Days Post-Infestation			Total ¹	
			1	6	10		
PP993 1.5G	0.125	7" B	1.60	0.77	0.00	2.38	a
PP993 1.5G	0.100	7" B	5.05	0.68	0.00	5.73	ab
Pydrin 1G	0.10	7" B	4.23	4.66	0.85	9.74	abc
PP993 1.5G	0.075	7" B	3.03	8.33	0.00	11.36	abcd
Baythroid 5G(S)	0.0023 g/m	7" B	4.83	5.65	1.60	12.09	abcd
Aastar 15G	1.00	7" B	8.98	3.02	1.95	13.96	abcd
Baythroid 5G(C)	0.0023 g/m	7" B	4.74	7.40	3.10	15.25	abcde
SD 70616 1.9EC	0.025	Bd	7.18	7.87	2.56	17.62	abcdef
Baythroid 2EC	12.5 g/ha	7" B	10.60	7.28	0.59	18.48	abcdef
Ambush 2E	0.10	7" B	9.20	4.94	5.12	19.27	abcdefg
Pydrin 2.4EC	0.10	Bd	12.03	7.80	3.73	23.57	abcdefgh
SD 208304 15G	0.75	7" B	7.02	13.03	5.77	25.83	abcdefghi
Lorsban 15G	1.00	7" B	11.80	14.36	2.31	28.47	bcdefghijk
Baythroid 2EC	25 g/ha	7" B	10.28	11.92	9.32	31.54	cdefghijk
S-41298(O) 15G	1.00	7" B	10.20	14.77	7.00	31.98	cdefghijk
CGA-12223 4E	0.50	PPI	8.70	17.98	6.96	33.65	cdefghijkl
CGA-12223 10G	0.50	7" B	16.97	12.53	4.30	33.82	cdefghijkl
UC 70480 10G	0.75	7" B	4.33	22.93	7.84	35.10	defghijkl
Mocap 15G	1.00	BPW	7.13	23.09	8.71	38.94	efghijkl
UC 70667 10G	0.75	7" B	14.82	17.78	7.59	40.20	fghijkl
S-41298(L) 15G	0.75	7" B	8.52	25.56	7.08	41.18	fghijkl
S-41298(O) 11.25G	1.00	7" B	7.28	23.41	10.75	41.45	fghijkl
S-41298(O) 15G	0.75	7" B	21.01	14.83	6.08	41.93	fghijkl
S-41298(L) 15G	1.00	7" B	11.91	28.41	3.52	43.85	ghijkl
UC 70667 10G	1.00	7" B	17.78	20.73	5.84	44.35	hijkl
UC 70667 10G	0.50	7" B	21.92	13.79	11.02	46.74	hijkl
S-41298(L) 11.25G	1.00	7" B	17.55	23.26	6.69	47.51	hijkl
Mocap 6E	3.00	PPI	17.00	23.10	9.78	49.87	ijkl
S-41298(L) 11.25G	0.75	7" B	19.24	22.47	8.68	50.40	ijkl
Mocap 6E	2.00	PPI	16.99	28.83	4.77	50.60	ijkl
Control	-	-	16.26	23.88	12.04	52.19	ijkl
CGA-12223 10G	0.75	7" B	10.68	34.57	7.12	52.38	ijkl
UC 70480 10G	1.00	7" B	14.62	29.00	9.93	53.55	ijkl
CGA-12223 4E	0.75	PPI	10.38	29.81	14.46	54.66	kl
S-41298(O) 11.25G	0.75	7" B	16.36	28.75	12.69	57.81	l
Lorsban 4E	2.00	PPI	13.15	32.69	12.38	58.23	l

¹Mean separation by DMRT; means followed by the same letter are not significantly different at P=0.05.

TABLE 15. Comparison of Registered and Experimental Insecticide Efficacy for Black Cutworm Rescue Treatments (Test 4) in Corn, Columbia, Missouri, 1985.

Insecticide	Rate (lb ai/A)	Mean % Cut Plants			
		Days Post-Treatment			Total ¹
		1	3	8	
Pounce 3.2EC	0.10	1.96	0.00	0.00	1.96 a
F-4922 9.4EC	0.40	13.12	12.54	2.22	27.89 ab
F-4922 9.4EC	0.20	17.93	13.49	6.66	38.09 ab
F-4449 9.4EC	0.10	22.77	10.68	7.56	41.02 b
F-4792 9.4EC	0.40	7.87	18.84	20.04	46.75 b
F-4449 9.4EC	0.40	10.65	21.31	17.50	49.48 b
F-4922 9.4EC	0.10	19.57	28.12	5.12	52.82 b
F-4792 9.4EC	0.20	16.88	22.94	15.15	54.97 b
F-4449 9.4EC	0.20	29.22	24.37	2.22	55.81 b
F-4792 9.4EC	0.10	30.53	21.61	10.66	62.81 b
Control	-	16.47	24.62	21.78	62.87 b

¹Mean separation by DMRT; means followed by the same letter are not significantly different at P=0.05.

TABLE 16. Comparison of Registered and Experimental Insecticide Efficacy for Black Cutworm Rescue Treatments (Test 5) in Corn, Columbia, Missouri, 1985.

Insecticide	Rate (lb ai/A)	Mean % Cut Plants			
		Days Post-Treatment			Total ¹
		1	4	10	
Baythroid 2EC	0.06	2.38	0.00	1.75	4.13 a
Karate 1E	0.010	5.00	3.33	0.00	8.33 ab
Ambush 2E	0.10	6.69	1.96	0.00	8.66 ab
Baythroid 2EC	0.04	3.83	3.50	2.08	9.43 ab
Karate 1E	0.015	5.55	5.55	0.00	11.11 ab
Sevin 5B	2.00	9.30	2.08	0.00	11.38 abc
Pounce 3.2EC	0.10	7.93	4.76	0.00	12.69 abc
Karate 1E	0.005	8.63	2.08	2.08	12.79 abc
TD2192 10B	1.50	10.31	1.58	1.58	13.49 abc
Pydrin 1G	0.10	2.22	13.27	0.00	15.49 abcd
SD 70616 1.9EC	0.025	8.61	6.94	4.86	20.41 abcde
Lorsban 4E	1.00	16.37	2.22	3.97	22.57 abcde
Pydrin 2.4EC	0.10	9.95	14.58	4.16	28.70 abcdef
TD 2192 10B	0.75	21.18	9.30	1.58	32.07 abcdef
Capture 2.0EC	0.02	16.40	11.76	3.92	32.08 abcdef
Larvin 3.2LE	0.60	5.00	19.48	8.46	32.94 abcdef
S-41298(L) 11.25G	0.75	13.65	20.60	9.95	44.21 bcdefg
S-41298(L) 11.25G	1.00	20.19	18.13	6.54	44.88 bcdefg
Larvin 3.2F	0.60	9.92	24.58	14.65	49.16 cdefg
S-41298(O) 15G	0.75	20.78	22.39	8.33	51.51 defgh
Capture 2.0EC	0.01	12.69	34.23	5.00	51.92 defgh
Capture 2.0EC	0.005	16.14	30.06	5.88	52.09 defgh
S-41298(O) 15G	1.00	15.73	24.63	13.98	54.36 defghi
Payoff 2.5EC	0.10	22.13	29.91	9.57	61.62 fghi
CME-13406 15SC	0.015	28.37	27.44	9.95	65.77 fghi
Control	-	34.74	31.81	6.34	72.90 ghi
CGA-12223 10G	0.05	19.11	27.26	26.62	73.00 ghi
CME-13406 15SC	0.06	28.05	33.70	14.53	76.29 ghi
CME-13406 15SC	0.03	22.32	48.43	17.54	88.30 hi
Control	-	23.41	51.98	14.28	89.68 i

¹Mean separation by DMRT; means followed by the same letter are not significantly different at P=0.05.

Table 17. Five Year Performance of Cutworm Control Insecticides Used in a 7" Band at Planting Time.

			Total % Cutting at Final Observation						
			Barrier Plot Evaluations						
			1981	1982	1983	1984		1985	
Planting Time Application (7" Band)	lb ai/A	(1-2 Weeks Post Application)		(5 Days Post Application)		(10 Days Post Application)			
		(1)	(2)	(1)	(2)	Test		(1)	(2)
chlorpyrifos (Lorsban)	15G 1.0	29.9	16.9	25.63	7.77	26.64	24.24	28.47	
ethoprop (Mocap)	10G 1.0	-	-	23.23	-	-	-	-	
	2.0	46.9	-	-	-	-	-	-	
	15G 1.0	-	-	23.02	-	-	-	38.94	
fenvalerate (Pydrin)	1G 0.10	-	-	-	-	-	-	9.74	
permethrin (Pounce)	1.5G 0.10	-	-	-	-	-	13.08	-	
	3.2E 0.10	-	-	-	-	-	19.84	-	
fonofos (Dyfonate)	10G 1.0	-	15.3	-	-	-	-	-	
	20G 1.0	-	-	25.91	-	-	-	-	
	2.0	-	-	17.99	-	-	-	-	
	4.0	-	-	19.41	-	-	-	-	
phorate + flucythrinate (Aastar)	15G 1.0	-	-	-	-	14.96	-	13.96	
Control	-	60.0	51.4	42.20	82.70	86.83	63.93	52.19	

Table 18. Five Year Performance of Cutworm Control Insecticides Used For Rescue Treatments.

			Total % Cutting at Final Observation							
			Barrier Plots			Field Plots				Barrier Plots
			1981	1982		1983		1984	1985	
			(1-2 Weeks Post Application)	Test		(5 Days Post Application)		(10 Days Post Application)	(10 Days Post Application)	
Rescue Applications	lb ai/A	(1)	(2)	(1)	(2)					
chlorpyrifos (Lorsban) 4E	1.0	0	12.3	22.5	15.83	17.51	23.02	22.57		
fenvalerate (Pydrin) 2.4E	0.10	1.1	9.1	-	18.43	-	14.44	28.70		
	0.15	-	-	-	9.46	-	33.70	-		
permethrin (Ambush) 2E	0.10	0.35	0	-	-	-	8.13	8.66		
(Pounce) 3.2E	0.10	0.63	4.2	-	14.53	-	30.16	12.69		
	0.15	-	-	-	-	-	20.73	-		
cypermethrin (Ammo) 2.5E	0.06	0.35 ¹	3.7 ²	-	7.61 ²	-	20.19	-		
carbaryl (Sevin) 5% Bait	1.0	-	-	17.4	-	13.54	-	-		
	2.0	-	-	-	-	-	-	-		
baythroid (Baythroid) 2EC	0.04	-	-	-	-	-	-	9.43		
	0.06	-	-	-	-	-	-	4.13		
	0.75	-	-	-	-	-	15.24	-		
Control	-	1.6	86.5	73.8	13.17	35.99	100.00	81.29 ³		

¹ Rate = 0.10 lb ai/A

² Rate = 0.04 lb ai/A

³ Mean of two plots

WIREWORM INSECTICIDE EVALUATIONS

Wireworm insecticide evaluations were conducted in a 2 acre section of a 90 acre field. According to the land owner, the field was noted to have a history of chronic wireworm problems. Severe damage to corn in 1983 occurred in an area approximately 20 acres in size with more than 50% stand loss. The remainder of the 90 acres suffered a loss of 5-10%. In 1984 the plot location was used for insecticide evaluations, with the remainder of the field planted to soybeans. Individual plots were two rows by 35 feet long and replicated four times according to a randomized complete block design. Performance of treatments was evaluated by counting the number of live and dead and/or injured plants in each row four weeks following planting.

The 7-inch band (7" B), in-furrow (IF), and behind the press wheel treatments (BPW) were made with a V-belt seeder mounted on a two-row John Deere model 1700 max-emerge planter. Pre-weighed insecticide granules were placed uniformly along the V-belt seeder and directed through banders or tubes to obtain the desired placement. Corn was planted in a conventional manner at the same time.

The seed treatments (ST) were planted by placing the treated seed in the V-belt seeder and using the in-furrow placement on the planter. A specific number of seeds was counted out for each row prior to planting.

TABLE 19. Comparison of Registered and Experimental Insecticide Efficacy for Control of Wireworms in Corn (Test 1), Shelbyville, Missouri, 1985.

Insecticide	Rate (lb ai/A)	Placement	Plant Emergence (Standcount) Mean No. Emerged Plants/35 row ft.
Control	-	-	41.50 a
SD 208304 15G	0.75	7"B	40.83 a
Counter 15G	1.00	7"B	39.12 a
Aastar 15G	1.00	7"B	39.00 a
PP993 15G	0.10	7"B	38.38 a
TF 3643	3.6 oz/cwt	ST	38.25 a
SD 208304 15G	0.50	7"B	38.25 a
Mocap 15G	1.00	BPW	38.25 a
UC 70667 10G	2.00	7"B	38.25 a
Agrox DL	4 oz/cwt	ST	38.12 a
PP993 1.5G	0.075	7"B	38.00 a
CGA-12223 10G	0.38	IF	37.88 a
CGA-12223 10G	0.50	IF	37.63 a
UC 70480 10G	1.00	7"B	37.63 a
PP993 1.5G	0.125	7"B	37.25 a
TF 3682	3.6 oz/cwt	ST	37.13 a
UC 70667 10G	1.00	7"B	36.63 a
Furadan 15G	1.00	7"B	36.25 a
Lorsban 15G	1.00	7"B	36.25 a
UC 70480 10G	2.00	7"B	36.12 a
Counter 15G	0.50	iF	35.63 a
SD 208304 15G	1.00	7"B	35.63 a

¹Mean separation by DMRT; means followed by the same letter are not significantly different at P=0.05.

TABLE 20. Comparison of Registered and Experimental Insecticide Efficacy for Control of Wireworms in Corn (Test 1), Shelbyville, Missouri, 1985.

Insecticide	Rate (lb ai/A)	Placement	% Damaged Plants	
			Mean \bar{x} ¹ Damaged Plants (Arcsin Transformation)	% Damaged Plants
TF 3643	3.6 oz/cwt	ST	0.22 a	5.24
Agrox DL	4 oz/cwt	ST	0.25 ab	6.13
UC 70480 10G	1.00	7" B	0.26 ab	6.87
Counter 15G	0.50	IF	0.26 ab	7.07
Counter 15G	1.00	7" B	0.27 ab	7.08
TF 3682	3.6 oz/cwt	ST	0.28 abc	8.07
Aastar 15G	1.00	7" B	0.30 abcd	8.94
UC 70667 10G	1.00	7" B	0.30 abcde	9.05
PP993 1.5G	0.125	7" B	0.31 abcde	9.20
SD 208304 15G	0.50	7" B	0.31 abcde	9.54
Furadan 15G	1.00	7" B	0.32 abcde	10.91
PP993 1.5G	0.10	7" B	0.33 bcde	10.81
PP993 1.5G	0.075	7" B	0.33 bcde	10.57
CGA 12223 10G	0.38	IF	0.34 bcde	11.06
Lorsban 15G	1.00	7" B	0.34 bcde	11.28
UC 70667 10G	2.00	7" B	0.35 bcde	11.71
UC 70480 10G	2.00	7" B	0.35 bcde	12.09
CGA 12223 10G	0.50	IF	0.35 bcde	11.96
SD 208304 15G	1.00	7" B	0.38 cde	13.59
Control	-	-	0.38 cde	13.85
SD 208304 15G	0.75	7" B	0.39 de	14.41
Mocap 15G	1.00	BPW	0.39 de	14.74

¹Mean separation by DMRT; means followed by the same letter are not significantly different at P=0.05.

TABLE 21. Comparison of Registered and Experimental Insecticide Efficacy for Control of Wireworms in Corn (Test 1), Shelbyville, Missouri, 1985.

Insecticide	Rate (lb ai/A)	Placement	Live Plant Count Mean No. Live Plants/35 row ft.
Counter 15G	1.00	7"B	36.38 a
TF 3643	3.6 oz/cwt	ST	36.12 a
Control	-	-	35.75 a
Agrox DL	4.0 oz/cwt	ST	35.75 a
Aastar 15G	1.00	7"B	35.50 a
SD 208304 15G	0.75	7"B	35.00 a
UC 70480 10G	1.00	7"B	35.00 a
SD 208304 15G	0.50	7"B	34.63 a
PP993 1.5 G	0.10	7"B	34.38 a
TF 3682	3.6 oz/cwt	ST	34.25 a
PP993 1.5G	0.075	7"B	34.88 a
UC 70667 10G	2.00	7"B	33.88 a
PP993 1.5G	0.125	7"B	33.88 a
CGA-12223 10G	0.38	IF	33.75 a
UC 70667 10G	1.00	7"B	33.25 a
CGA-12223 10G	0.50	IF	33.13 a
Counter 15G	0.50	IF	33.13 a
Mocap 15G	1.00	BPW	32.63 a
Lorsban 15G	1.00	7"B	32.13 a
Furadan 15G	1.00	7"B	32.13 a
UC 70480 10G	2.00	7"B	31.63 a
SD 208304 15G	1.00	7"B	30.75 a

¹Mean separation by DMRT; means followed by the same letter are not significantly different at P=0.05.

TABLE 22. Comparison of Registered and Experimental Insecticide Efficacy for Control of Wireworms in Corn (Test 2), Shelbyville, Missouri, 1985.

Insecticide	Rate (lb ai/A)	Placement	Plant Emergence (Standcount) Mean No. ¹ Emerged Plants/35 row ft.
F-5658 3G	0.05	7" B	43.88 a
Control	-	-	43.38 a
F-5187 3G	0.05	7" B	43.13 a
F-4878 3G	0.10	7" B	42.00 ab
F-5658 3G	0.10	7" B	41.75 ab
F-5658 3G	0.30	7" B	41.50 ab
F-4878 3G	0.05	7" B	41.25 ab
F-3881 3G	0.30	7" B	40.50 ab
67825 20G	0.75	7" B	40.25 ab
Dyfonate 20G	1.00	7" B	40.25 ab
67825 20G	0.50	7" B	40.00 ab
F-5187 3G	0.30	7" B	40.00 ab
Counter 15G	1.00	7" B	39.38 ab
F-4878 3G	0.30	7" B	38.50 b
F-5187 3G	0.10	7" B	38.38 b
67825 20G	1.00	7" B	37.50 b

¹Mean separation by DMRT; means followed by the same letter are not significantly different at P=0.05.

TABLE 23. Comparison of Registered and Experimental Insecticide Efficacy for Control of Wireworms in Corn (Test 2), Shelbyville, Missouri, 1985.

Insecticide	Rate (lb ai/A)	Placement	% Damaged Plants	
			Mean % ¹ Damaged Plants (Arcsin Transformation)	% Damaged Plants
F-5187 3G	0.30	7"B	0.27 a	7.55
F-5187 3G	0.10	7"B	0.28 ab	8.09
67825 20G	0.50	7"B	0.29 ab	8.59
F-4878 3G	0.30	7"B	0.29 ab	8.69
F-3881 3G	0.30	7"B	0.30 abc	8.86
F-5658 3G	0.30	7"B	0.30 abc	8.71
F-4878 3G	0.10	7"B	0.30 abc	9.26
F-4878 3G	0.05	7"B	0.31 abcd	9.64
F-5187 3G	0.05	7"B	0.31 abcd	9.77
F-5658 3G	0.05	7"B	0.32 abcd	9.67
F-5658 3G	0.10	7"B	0.32 abcd	9.79
Counter 15G	1.00	7"B	0.32 abcd	9.83
67825 20G	0.75	7"B	0.35 abcd	12.50
Dyfonate 20G	1.00	7"B	0.37 bcd	13.60
Control	-	-	0.38 cd	14.15
67825 20G	1.00	7"B	0.39 c	15.12

¹Mean separation by DMRT; means followed by the same letter are not significantly different at P=0.05.

TABLE 24. Comparison of Registered and Experimental Insecticide Efficacy for Control of Wireworms in Corn (Test 2), Shelbyville, Missouri, 1985.

Insecticide	Rate (lb ai/A)	Placement	Live Plant Count Mean No. ¹ Live Plants/35 row ft.
F-5658 3G	0.05	7"B	39.63 a
F-5187 3G	0.05	7"B	39.00 ab
F-4878 3G	0.10	7"B	38.13 ab
F-5658 3G	0.30	7"B	37.88 ab
F-5658 3G	0.10	7"B	37.63 ab
F-4878 3G	0.05	7"B	37.25 ab
Control	-	-	37.25 ab
F-5187 3G	0.30	7"B	37.00 ab
F-3881 3G	0.30	7"B	36.88 ab
67825 20G	0.50	7"B	36.50 ab
Counter 15G	1.00	7"B	35.50 abc
F-5187 3G	0.10	7"B	35.25 abc
67825 20G	0.75	7"B	35.25 abc
F-4878 3G	0.30	7"B	35.13 abc
Dyfonate 20G	1.00	7"B	34.75 bc
67825 20G	1.00	7"B	31.75 c

¹Mean separation by DMRT; means followed by the same letter are not significantly different at P=0.05.

APPENDIX

Agronomic and Entomological Information for Insecticide Efficacy Plots, Missouri, 1985.

	ROOTWORM		CUTWORM					WIREWORM
Location	Fairfax Atchison County	Novelty Knox County	Planting Time Test 1 Test 2 Test 3 Boone County			Rescue Test 4 Test 5 Boone County		Shelbyville Shelby County
Planting Date	May 6	May 9	Sept. 9,	13,	24	May 24	Sept.16	April 25
Corn Hybrid	Garst 8344	Garst 3323	Garst 8315	Garst 8315	DeKalb TXS115A	Garst 8315	Garst 8315	Garst 3323
Evaluation Date	July 8-9	July 17	Sept.17 20 25	Sept.21 24 27	Oct.15 21 25	May 25 28 31	Sept.17 20 25	May 21
Insect Population	Eggs 2/pint of soil Adult Population 95% western 4% southern 1% northern		3/pint of soil 84% western 10% northern 6% southern		All cutworm tests infested with laboratory-reared black cutworm larvae.			Ave. 1.5 wireworm/ bait

1985 Soil Test Results for Insecticide Evaluation Sites

Location	P-I ¹	pHs	% OM	$\frac{\text{NA me}}{100 \text{ g}}$	P-II ²	CA lbs/A	Mg lbs/A	K lbs/A	% Sand	% Silt	% Clay	Soil Type
Fairfax	61	6.1	2.6	1.5	344	5020	619	643	20.6	48.6	30.8	Clay Loam
Novelty	65	6.9	2.1	0.0	349	4190	275	423	12.4	60.2	27.2	Silt Loam
South Farms Cutworm Tests 1, 2, 4, 5	46	4.8	2.0	5.5	211	2800	454	373	12.8	60.0	27.2	Silt Loam
South Farms Cutworm Test 3	69	4.5	1.2	1.2	244	1430	178	323	27.5	48.9	23.6	Loam
Shelbyville	76	6.5	2.9	0.0	250	4110	343	328	23.6	50.0	26.4	Silt Loam

¹P-I, lbs P₂O₅/A extracted with 0.025 normal HCL

²P-II, lbs P₂O₅/A extracted with 0.1 normal HCL

Daily Rainfall and Temperature Data for Fairfax, Missouri, 1985¹

Day	May 1985			June 1985			July 1985		
	Temp (F)		Rainfall (Inches)	Temp (F)		Rainfall (Inches)	Temp (F)		Rainfall (Inches)
	Max	Min		Max	Min		Max	Min	
1	67	58	0.50	79	50	0.05	85	54	
2	72	44		89	52	0.05	89	58	
3	75	39		80	49		89	52	
4	76	44		74	51		94	59	
5	80	54		70	56		93	52	
6	70	53		79	54		85	54	
7	80	51		77	60		95	60	
8	85	51		89	68		97	60	
9	84	54		98	61	0.10	97	72	
10	82	61	0.10	80	52		100	64	
11	78	62		76	56	0.30	94	67	
12	85	53		73	49		99	70	
13	78	56	1.60	61	38		88	67	
14	63	56		77	45	0.30	95	72	0.60
15	63	46		78	57		100	62	
16	68	51		82	59		88	52	
17	71	48		94	63	0.50	89	58	
18	76	40		85	57		93	66	
19	82	45		86	56		93	69	2.00
20	84	56	0.60	77	50				0.60
21	75	43		90	64				
22	75	43		86	48				
23	80	46		89	63				
24	86	53		93	63	1.50			
25	84	51		89	68				1.00
26	90	64		90	73				
27	79	61	0.50	85	56				
28	76	54		74	48		84	69	
29	79	59	0.10	76	49		90	67	
30	87	67	0.20	80	50		84	67	0.80
31	82	51					81	68	0.60

¹Rainfall data recorded at the Fairfax weather station, approximately 5 miles nw of rootworm test plots. Temperature data was recorded at the Rockport weather station, approximately 15 miles nw of plots.

Daily Rainfall and Temperature Data for Novelty, Missouri, 1985

Day	May 1985			June 1985			July 1985		
	Temp (F)		Rainfall (inches)	Temp (F)		Rainfall (inches)	Temp (F)		Rainfall (inches)
	Max	Min		Max	Min		Max	Min	
1	73	59	0.82	78	53		80	57	0.67
2	61	47	0.65	79	59	1.80	83	59	0.22
3	67	44		74	55	Trace	86	59	0.23
4	71	49		70	60		84	58	
5	72	54		65	57	0.07	86	66	0.53
6	71	58	0.17	71	61		82	57	
7	74	53		67	59		88	64	
8	76	54		79	61		87	69	0.92
9	77	54		89	70		90	72	
10	77	57		82	55		91	70	0.34
11	77	60		76	61	Trace	86	67	0.15
12	75	61		68	51	0.40	88	68	Trace
13	75	53	0.30	65	48		78	76	
14	66	53	1.30	73	58	0.30	90	73	
15	76	53	0.03	68	55	0.45	89	58	0.70
16	65	54	Trace	82	60		83	57	
17	59	54		85	58	0.10	83	60	
18	66	46		79	58		83	62	
19	75	52		71	53	0.04	86	69	
20	75	56		75	55		82	69	
21	75	50		79	63		89	68	0.80
22	73	53		80	62	0.40	79	66	0.30
23	70	48		80	56	Trace	84	60	
24	76	57	Trace	82	61	1.20	80	65	
25	79	54		86	68		89	71	0.46
26	82	63		89	70		82	64	0.60
27	90	64	0.40	89	68		81	58	
28	70	57	Trace	73	57		81	57	
29	72	54		75	53		84	60	
30	79	64		76	53		84	69	
31	83	61	Trace				76	70	2.53

**Daily Rainfall and Temperature Data for University of
Missouri South Farms, Columbia, Missouri, 1985.**

Day	<u>September 1985</u>			<u>October 1985</u>		
	<u>Temp (F)</u>		Rainfall (inches)	<u>Temp (F)</u>		Rainfall (inches)
	Max	Min		Max	Min	
1	88	69		70	39	0.57
2	90	70		51	31	
3	95	71		58	30	
4	88	68		64	35	
5	82	68	0.12	73	47	0.26
6	84	69		60	44	0.02
7	93	69		57	35	
8	92	71		73	48	
9	93	70		72	58	0.16
10	93	71		74	61	0.14
11	79	57		79	48	
12	75	58		54	46	0.10
13	75	53		69	50	0.16
14	75	54	0.09	74	56	0.07
15	75	51		73	59	0.17
16	69	54		66	44	0.01
17	74	52	0.04	69	42	
18	80	55	0.01	76	42	
19	88	66		77	53	
20	89	65		70	61	0.92
21	88	64		66	58	0.01
22	85	57	0.11	60	53	
23	76	63	0.73	68	53	
24	76	54	0.07	73	59	
25	54	36	0.02	76	61	0.44
26	67	37	0.27	75	48	
27	59	43				
28	60	36				
29	70	36				
30	77	56				

Daily Rainfall and Temperature Data for Shelbyville, Missouri, 1985

Day	April 1985			May 1985			June 1985		
	Temp (F)		Rainfall (inches)	Temp (F)		Rainfall (inches)	Temp (F)		Rainfall (inches)
	Max	Min		Max	Min		Max	Min	
1	54	24		75	53	0.83	79	53	
2	62	20		68	42	0.45	80	58	0.56
3	66	36		72	38		69	53	0.50
4	70	41		75	46		69	52	
5	70	33	0.36	75	44		67	56	0.53
6	47	35	0.33	75	53	0.68	67	58	
7	48	34	0.33	73	50		79	59	
8	50	30		76	49		89	59	
9	54	29		79	47		89	56	
10	54	42		77	52		79	56	
11	64	42	0.19	77	53		74	54	
12	75	46		79	57	0.37	64	48	Trace
13	74	44		75	53		68	42	0.24
14	50	42	Trace	75	55	1.71	70	53	
15	70	38		75	48	Trace	80	53	2.03
16	80	42		63	47		84	54	
17	82	44		65	48		84	63	0.51
18	84	58		75	48		75	53	
19	84	50		73	46		72	49	
20	80	62		70	55		74	51	
21	83	61		73	49		80	61	
22	83	61		73	51		80	55	0.38
23	68	56		73	44		84	57	
24	72	48		75	52		84	59	0.24
25	76	48		80	51		87	65	
26	76	44		88	60		90	68	
27	76	57		80	61	0.29	88	63	
28	72	46	Trace	66	55		75	59	
29	74	46		75	51		76	52	
30	75	60	0.08	79	69		79	56	
31				79	54	0.29			

COOPERATING COMPANIES

<u>Company</u>			<u>Insecticide</u>
American Cyanamid Company			Aastar Counter Payoff Thimet
BASF-Wyandotte Corporation			Lance
Ciba-Geigy Corporation			CGA 12223
Chipman Chemical Inc.			Agrox DL TF 3682 TF 3643
Dow Chemical U.S.A.			Lorsban
Elanco Products Company			LY 76499 LY 178429
EM Industries Inc.			CME-13406
FMC Corporation	Ammo	F-3881	F-5093
	Capture	F-4449	F-5658
	Furadan	F-4792	F-5205
	Pounce	F-4878	F-5187
	68725	F-4922	
ICI Americas Inc.			Ambush Karate PP993
Mobay Chemical Corporation			Baythroid
Penwalt Corporation			TD2192
Rhone-Poulenc Chemical Company			Mocap
Shell Development Company			Pydrin SD 208304 SD 70616
Stauffer Chemical Company			Dyfonate SC-0135
Union Carbide Corporation			Broot Larvin UC 70480 UC 7066
Uniroyal Chemical Company			UBI-A920
Watson Consulting Services and Enterprises, Inc.			S-41298