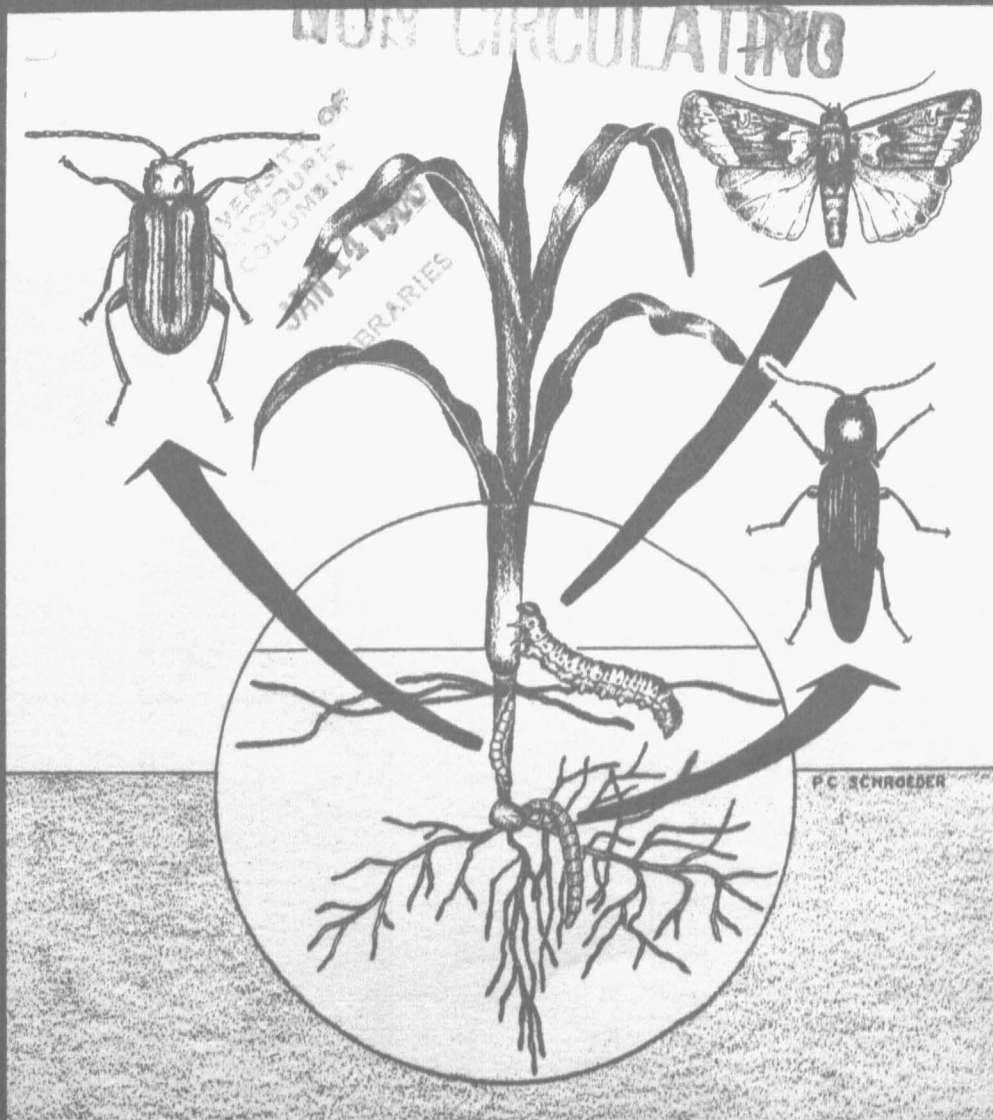


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Corn Soil Insects Research

1987 Insecticide Evaluations

#371
1987



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Special Report 371

11/87/400

CONTENTS

	<u>Page</u>
Corn Rootworm-----	2
Cutworm-----	19
Wireworm-----	22
Appendix-----	35
Agronomic and Entomological Information for Insecticide Efficacy Plots	
Soil Test Results for Insecticide Evaluation Sites	
Rainfall and Temperature Data	
Cooperating Companies	

ACKNOWLEDGEMENT

The authors wish to acknowledge the assistance of Mary Jackson and George Laur in the typing and preparation of this report. The authors are indebted to Kristin Simpson, Aaron Wallman, Mary Jackson, Carol Ferguson, Randall Smoot and Roger Wilkins for their assistance in plot evaluations. They also express appreciation to Peter Schroeder for the cover drawing.

CORN SOIL INSECTS RESEARCH
1987 INSECTICIDE EVALUATIONS

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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 10-year comparisons of performance for rootworm compounds do, however, provide a basis for comparison of efficacy for control over a period of time. For additional information and specific recommendations for control of corn soil insects, see the current issue of the Missouri Insect Control Recommendations Handbook, 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).

CORN SOIL INSECTS RESEARCH
1987

ROOTWORM INSECTICIDE EVALUATIONS

Rootworm insecticide evaluations were conducted at two locations: near Cosby in Andrew County and at the University of Missouri Greenley Research Center near Novelty, Knox County. The plots near Cosby were located in a corner of a 40 acre field planted to corn in 1986. This field had "furadan failure" during the late 1970's. Counter has since been used in this field for control of corn rootworm when planted to corn. Plots at the Greenley Center were part of a 7 acre field research block that has been in continuous corn for seven years. This location is known to have a carbamate aggressive soil but has no actual history of repeated applications of carbamate class insecticides.

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 35-foot rows 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 gandy applicator. Feeding tubes were used to direct granules around the base of the plants while cultivating.

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 was 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 (Test 1), Cosby, Missouri, 1987.

Insecticide	Rate (lb ai/A)	Placement	General Root, Rating Means ¹
Counter 15	1.00	1F	2.43 a
Lance 15G	1.00	7"B	2.50 ab
Counter 15G	1.00	7"B	2.62 ab
Aastar 15G	1.00	7"B	2.62 abc
Lance 15G	0.75	7"B	2.62 abc
Brace 10G	0.50	7"B	2.62 abc
Dyfonate 20GM	1.00	7"B	2.75 abc
Dyfonate 20G	1.00	7"B	2.81 abc
Force 1.5G	0.125	7"B	2.87 abc
Force 1.5G	0.10	7"B	2.93 abc
Lorsban 15G	1.00	7"B	3.00 abcd
Furadan 15G	1.00	7"B	3.12 abcd
Broot 15GX	1.00	7"B	3.18 bcd
Thimet 20G	1.00	7"B	3.31 cd
Mocap 15G	1.00	BPW	3.68 de
Control	-	-	4.00 e

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 (Test 1), Cosby, Missouri, 1987.

Insecticide	Rate (lb ai/A)	Placement	Combined Analysis Rating Means ¹
Lance 15G	1.00	7" B	2.79 a
Counter 15G	1.00	IF	2.83 a
Counter 15G	1.00	7" B	2.89 a
Lance 15G	0.75	7" B	2.91 a
Aastar 15G	1.00	7" B	2.95 a
Dyfonate 20GM	1.00	7" B	3.02 a
Dyfonate 20G	1.00	7" B	3.06 a
Brace 10G	0.50	7" B	3.06 a
Force 1.5G	0.125	7" B	3.12 a
Lorsban 15G	1.00	7" B	3.37 ab
Broot 15GX	1.00	7" B	3.39 ab
Thimet 20G	1.00	7" B	3.41 ab
Furadan 15G	1.00	7" B	3.45 ab
Force 1.5G	0.10	7" B	3.52 abc
Mocap 15G	1.00	BPW	3.93 bc
Control	-	-	4.16 c

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 1), Novelty, Missouri, 1987.

Insecticide	Rate (lb ai/A)	Placement	General Root Rating Means ¹
Force 1.5G	0.125	7" B	2.12 a
Counter 15G	1.00	1F	2.43 ab
Counter 15G	1.00	7" B	2.50 ab
Dyfonate 20GM	1.00	7" B	2.56 ab
Brace 10G	0.50	7" B	2.75 ab
Lorsban 15G	1.00	7" B	2.75 ab
Force 1.5G	0.10	7" B	2.87 ab
Aastar 15G	1.00	7" B	3.12 abc
Thimet 20G	1.00	7" B	3.18 abc
Furadan 15G	1.00	7" B	3.43 bcd
Lance 15G	0.75	7" B	3.43 bcd
Lance 15G	1.00	7" B	3.43 bcd
Dyfonate 20G	1.00	7" B	3.56 bcd
Mocap 15G	1.00	BPW	4.06 cde
Broot 15GX	1.00	7" B	4.37 de
Control	-	-	5.00 e

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 1), Novelty, Missouri, 1987.

Insecticide	Rate (lb ai/A)	Placement	Combined Analysis Rating Means ¹
Force 1.5G	0.125	7"B	2.43 a
Counter 15G	1.00	1F	2.75 ab
Brace 10G	0.50	7"B	2.89 abc
Counter 15G	1.00	7"B	2.93 abc
Lorsban 15G	1.00	7"B	3.02 abc
Dyfonate 20GM	1.00	7"B	3.06 abc
Force 1.5G	0.10	7"B	3.18 abc
Aastar 15G	1.00	7"B	3.33 abcd
Thimet 20G	1.00	7"B	3.66 bcde
Furadan 15G	1.00	7"B	3.72 bcde
Dyfonate 20G	1.00	7"B	3.81 bcde
Lance 15G	0.75	7"B	3.85 cde
Lance 15G	1.00	7"B	3.97 cde
Mocap 15G	1.00	BPW	4.31 def
Broot 15GX	1.00	7"B	4.52 ef
Control	-	-	5.00 f

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 2), Cosby, Missouri, 1987.

Insecticide	Rate (lb ai/A)	Placement	General Root, Rating Means ¹
UBI-B8451 15G	1.00	7" B	2.50 a
UBI-B8451 15G	0.50	7" B	2.50 a
Lorsban 15G	1.00	7" B	2.75 ab
UBI-B8451 15G	0.75	7" B	2.75 ab
SC-0567 10G	0.75	1F	2.75 ab
Dyfonate 20G	1.00	7" B	2.75 ab
Counter 15G	1.00	7" B	2.81 ab
Dyfonate 20G	1.00	1F	2.87 ab
Fortress 15G	0.50	7" B	2.87 ab
Fortress 10G	0.50	1F	2.93 ab
Dyfonate 20G	0.50	7" B	2.93 ab
SC-0567 10G	1.00	7" B	3.00 ab
Fortress 10G	0.35	7" B	3.00 ab
Counter 15G	0.50	7" B	3.00 ab
SC-0567 10G	0.75	7" B	3.00 ab
Fortress 10G	0.50	7" B	3.06 ab
SC-0567 10G	1.00	1F	3.06 ab
Fortress 10G	0.65	7" B	3.06 ab
SC-0567 10G	0.50	1F	3.06 ab
Counter 15G	1.00	1F	3.18 ab
SC-0567 10G	0.50	7" B	3.43 bc
Dyfonate 4E	1.00	7" B	4.12 cd
ASD 3879 4E	0.50	7" B	4.12 cd
ASD 3922 4E	1.00	7" B	4.18 cd
ASD 3879 4E	1.00	7" B	4.43 d
Control	-	-	4.62 d
ASD 3922 4E	0.50	7" B	4.75 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 (Test 2), Cosby, Missouri, 1987.

Insecticide	Rate (lb ai/A)	Placement	Combined Analysis Rating Means ¹
UBI-B8451 15G	1.00	7" B	2.81 a
UBI-B8451 15G	0.50	7" B	2.91 a
UBI-B8451 15G	0.75	7" B	2.95 a
Dyfonate 20G	1.00	7" B	3.04 ab
SC-0567 10G	0.75	IF	3.08 ab
Lorsban 15G	1.00	7" B	3.10 ab
Counter 15G	1.00	7" B	3.18 ab
Dyfonate 20G	1.00	IF	3.20 ab
Fortress 10G	0.50	IF	3.20 ab
SC-0567 10G	1.00	7" B	3.20 ab
Fortress 10G	0.65	7" B	3.22 ab
Fortress 15G	0.50	7" B	3.25 ab
Dyfonate 20G	0.50	7" B	3.37 ab
SC-0567 10G	1.00	IF	3.37 ab
Fortress 10G	0.50	7" B	3.37 ab
Counter 15G	1.00	IF	3.39 ab
SC-0567 10G	0.50	IF	3.39 ab
Counter 15G	0.50	7" B	3.41 ab
SC-0567 10G	0.75	7" B	3.47 abc
Fortress 10G	0.35	7" B	3.62 abcd
SC-0567 10G	0.50	7" B	3.83 bcde
Dyfonate 4E	1.00	7" B	4.18 cdef
ASD 3879 4E	0.50	7" B	4.29 def
ASD 3922 4E	1.00	7" B	4.39 ef
ASD 3879 4E	1.00	7" B	4.60 f
ASD 3922 4E	0.50	7" B	4.60 f
Control	-	-	4.66 f

¹ Mean 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 (Test 2), Novelty, Missouri, 1987.

Insecticide	Rate (lb ai/A)	Placement	General Root, Rating Means ¹
UBI-B8451 15G	1.00	7" B	2.31 a
Fortress 10G	0.50	1F	2.50 a
Counter 15G	1.00	7" B	2.50 a
SC-0567 10G	1.00	1F	2.50 a
UBI-B8451 15G	0.50	7" B	2.62 a
SC-0567 10G	0.50	1F	2.68 a
UBI-B8451 15G	0.75	7" B	2.68 a
SC-0567 10G	0.75	1F	2.68 a
Fortress 15G	0.50	7" B	2.68 a
Counter 15G	1.00	1F	2.68 a
Fortress 10G	0.65	7" B	2.68 a
Counter 15G	0.50	7" B	2.81 a
Fortress 10G	0.50	7" B	2.93 a
SC-0567 10G	1.00	7" B	2.93 a
Fortress 10G	0.35	7" B	3.00 a
Lorsban 15G	1.00	7" B	3.06 a
SC-0567 10G	0.50	7" B	3.06 a
SC-0567 10G	0.75	7" B	3.06 a
Dyfonate 20G	1.00	1F	3.87 b
Dyfonate 20G	0.50	7" B	4.25 bc
Dyfonate 4E	1.00	7" B	4.50 bc
ASD 3922 4E	1.00	7" B	4.50 bc
Dyfonate 20G	1.00	7" B	4.56 bc
ASD 3879 4E	1.00	7" B	4.56 bc
ASD 3922 4E	0.50	7" B	4.75 c
Control	-	-	4.81 c
ASD 3879 4E	0.50	7" B	5.00 c

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, 1987.

Insecticide	Rate (lb ai/A)	Placement	Combined Analysis Rating Means ¹
UBI-B8451 15G	1.00	7" B	2.64 a
Counter 15G	1.00	7" B	2.81 ab
SC-0567 10G	1.00	1F	2.85 ab
Fortress 10G	0.50	1F	2.87 ab
Counter 15G	1.00	1F	2.87 ab
UBI-B8451 15G	0.50	7" B	2.91 ab
UBI-B8451 15G	0.75	7" B	2.93 ab
Counter 15G	0.50	7" B	2.95 ab
SC-0567 10G	0.75	1F	2.97 ab
Fortress 10G	0.65	7" B	2.97 ab
Fortress 15G	0.50	7" B	3.00 ab
SC-0567 10G	0.50	1F	3.02 ab
Fortress 10G	0.50	7" B	3.18 ab
SC-0567 10G	0.75	7" B	3.29 ab
SC-0567 10G	1.00	7" B	3.31 ab
SC-0567 10G	0.50	7" B	3.41 b
Fortress 10G	0.35	7" B	3.41 b
Lorsban 15G	1.00	7" B	3.50 b
Dyfonate 20G	1.00	1F	4.37 c
Dyfonate 20G	0.50	7" B	4.45 c
ASD 3847 4E	1.00	7" B	4.56 c
Dyfonate 4E	1.00	7" B	4.62 c
ASD 3922 4E	1.00	7" B	4.66 c
Dyfonate 20G	1.00	7" B	4.72 c
ASD 3922 4E	0.50	7" B	4.83 c
Control	-	-	4.89 c
ASD 3879 4E	0.50	7" B	4.95 c

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 3), Cosby, Missouri, 1987.

Insecticide	Rate (lb ai/A)	Placement	General Root, Rating Means ¹
Dyfonate 20G	1.00	7"B	2.68 a
Counter 15G	1.00	1F	2.81 a
Lorsban 15G	1.00	7"B	2.81 a
Force 1.5G	0.10	7"B	2.81 a
Force 1.5G	0.125	7"B	2.87 a
Force 1.5G	0.075	7"B	3.00 ab
Force 1.5G	0.10	1F	3.00 ab
Force 1.5G	0.125	1F	3.06 abc
Force 1.5G	0.075	1F	3.25 abc
Force 1.5G	0.10	Cult	3.68 bcd
Force 1.5G	0.075	Cult	3.81 cd
Force 1.5G	0.125	Cult	4.18 d
Control	-	-	4.31 d

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), Cosby, Missouri, 1987.

Insecticide	Rate (lb ai/A)	Placement	Combined Analysis Rating Means ¹
Dyfonate 15G	1.00	7"B	3.00 a
Counter 15G	1.00	IF	3.16 ab
Lorsban 15G	1.00	7"B	3.16 ab
Force 1.5G	0.125	7"B	3.16 ab
Force 1.5G	0.10	7"B	3.22 ab
Force 1.5G	0.075	7"B	3.25 ab
Force 1.5G	0.10	IF	3.27 ab
Force 1.5G	0.125	IF	3.50 abc
Force 1.5G	0.075	IF	3.58 abc
Force 1.5G	0.10	Cult	3.91 bcd
Force 1.5G	0.075	Cult	4.14 cd
Force 1.5G	0.125	Cult	4.31 d
Control	-	-	4.52 d

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

TABLE 11. Comparison of Soil Insecticide Efficacy for Control of Western and Northern Corn Rootworm Larvae (Test 3), Novelty, Missouri, 1987.

Insecticide	Rate (lb ai/A)	Placement	General Root, Rating Means ¹
Counter 15G	1.00	IF	2.43 a
Force 1.5G	0.10	7"B	2.81 ab
Force 1.5G	0.125	7"B	2.81 ab
Force 1.5G	0.075	IF	2.87 ab
Force 1.5G	0.125	IF	2.87 ab
Lorsban 15G	1.00	7"B	2.93 ab
Force 1.5G	0.075	7"B	2.93 ab
Force 1.5G	0.10	IF	3.00 ab
Dyfonate 20G	1.00	7"B	3.06 ab
Force 1.5G	0.125	Cult	3.12 ab
Force 1.5G	0.10	Cult	3.37 bc
Force 1.5G	0.075	Cult	3.93 cd
Control	-	-	4.50 d

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

TABLE 12. Comparison of Soil Insecticide Efficacy for Control of Western and Northern Corn Rootworm Larvae (Test 3), Novelty, Missouri, 1987.

Insecticide	Rate (lb ai/A)	Placement	Combined Analysis Rating Means ¹
Counter 15G	1.00	IF	2.85 a
Force 1.5G	0.125	7"B	3.02 ab
Force 1.5G	0.075	7"B	3.08 ab
Force 1.5G	0.10	IF	3.18 ab
Force 1.5G	0.075	IF	3.20 ab
Force 1.5G	0.10	7"B	3.25 ab
Dyfonate 20G	1.00	7"B	3.31 ab
Force 1.5G	0.125	IF	3.33 ab
Lorsban 15G	1.00	7"B	3.45 ab
Force 1.5G	0.125	Cult	3.45 ab
Force 1.5G	0.10	Cult	3.54 bc
Force 1.5G	0.075	Cult	4.10 cd
Control	-	-	4.58 d

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

TABLE 12a. Ten Year Comparison of Performance¹ for Recommended Corn Rootworm Insecticides Applied at 1 lb ai/A in a Seven-Inch Band at Planting

<u>Insecticide</u>	A 1978	A 1979	A 1980	B 1981	A 1982	A 1983	B 1984	A 1985	B 1986	A 1987						
carbofuran 10G (Furadan) 15G	3.56	2.75	3.19	2.13	3.56	3.44	4.00	2.06	3.25	2.19	3.19	2.31	3.06	3.93	3.12	3.43
chlorpyrifos (Lorsban) 15G	2.88	2.75	3.50	3.06	3.00	2.44	3.13	3.06	3.13	2.52	3.13	2.94	3.00	3.00	3.00	2.75
ethoprop 10G (Mocap) 15G	2.94	2.69	2.89	2.75	3.56	3.00	3.88	2.81	3.63	2.18	3.50	3.13	3.68	3.75	3.68	4.06
fonofos 10G (Dyfon- 15G ate) 20G	2.63		3.13	2.38												
phorate 15G (Thimet) 20G		2.44		2.31	2.53	3.50	3.00	2.94	4.50		3.13	4.25	3.12	2.87	3.31	3.18
phorate + flucythrinate (Aastar) 15G											3.00	3.44	2.75	2.93	2.62	3.12
terbufos 15G (Counter)	2.44	2.03	2.13	2.56	2.10	2.56	2.19	3.19	4.00	2.28	2.63	3.00	2.93	2.93	2.43	2.43
trimethacarb 15G (Broot)						3.06	3.50	2.88	3.19		3.31	2.88	3.62	3.00	3.18	4.37
CONTROL	5.06	5.06	3.97	4.03	5.55	4.00	4.63	3.06	4.56	3.75	4.00	5.13	4.50	4.75	4.00	5.00

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 and rescue insecticide evaluations for control of black cutworm (BCW), *Agrotis ipsilon* Hufn.) were conducted in barrier plots on the University of Missouri-Columbia 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 7-inch banders to obtain the desired placement. Corn was planted in a conventional manner at the same time. Band (7"B), broadcast (Bd), and rescue sprays were applied through a tractor-mounted compressed air sprayer at 30 psi. Planting time treatments (band and broadcast) were applied in 11 gallons of finished spray per acre, whereas rescue treatments were applied in 40 gallons. Pre-plant incorporated (PPI) treatments were applied as a broadcast spray and incorporated with a 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 inches in height) were driven approximately 3 inches into the soil to enclose portions of the 35-foot plots (15 feet x 2 rows). Twenty 3rd- to 5th-instar laboratory-reared black cutworm larvae were released in the barriers at seedling emergence. Rescue treatments were applied within the barriers approximately one hour after release of cutworms. Efficacy of the treatments was evaluated by counting the number of plants cut on three different dates during the test period.

TABLE 13. Comparison of Registered and Experimental Insecticide Efficacy for Black Cutworm Planting Time and Rescue Treatments (Test 1) In Corn, Columbia, Missouri, 1987.

Insecticide	Rate (lb ai/A)	Placement	Mean % Cut Plants			
			Days Post-Infestation			Total ¹
			1	3	10	
Asana 1.9EC	0.05	Rescue	0.98	0.81	0.81	2.60 a
Baythroid 2EC	0.015	Rescue	3.39	1.41	0.00	4.81 ab
Force 1.5G	0.10	7" B	7.34	2.44	0.00	9.78 abc
Baythroid 0.375G	0.033	7" B	6.60	2.94	0.72	10.26 abc
Pounce 3.2EC	0.10	Bd	9.24	0.00	1.76	11.01 abc
F6063 1.5G	0.125	7" B	10.07	1.57	0.00	11.64 abc
Pounce 3.2EC	0.10	Rescue	10.37	0.00	1.85	12.22 abc
Force 1.5G	0.075	7" B	11.94	1.87	0.00	13.82 abc
Lorsban 15G	1.00	7" B	13.05	1.75	0.00	14.80 abc
F7943 1.5G	0.15	7" B	12.56	2.68	0.00	15.25 abc
Pounce 1.5G	0.10	7" B	14.45	1.69	0.00	16.15 abc
F7943 1.5G	0.10	7" B	14.22	2.45	0.00	16.67 bc
F6063 1.5G	0.15	7" B	15.81	0.98	0.00	16.79 bc
Ambush 2E	0.10	Rescue	13.82	3.84	0.00	17.66 bc
Lorsban 4E	1.00	Rescue	16.09	1.63	0.00	17.72 bc
Aastar 15G	1.00	7" B	13.09	5.09	0.00	18.18 bc
Control	-	-	17.16	0.95	0.75	18.87 bc
Ambush 2E	0.10	Bd	14.79	4.73	0.88	20.41 c
Asana 1.9EC	0.05	Bd	17.00	3.40	0.79	21.20 cd
Baythroid 2EC	0.033	Bd	16.62	4.99	0.77	22.39 cd
F6063 1.5G	0.10	7" B	19.62	3.10	0.00	22.72 cd
Pounce 3.2EC	0.10	PPI	19.81	3.39	0.00	23.20 cd
F7943 1.5G	0.125	7" B	17.18	5.82	0.98	23.98 cd
TF 3722	12.3 oz/cwt	ST	23.62	7.75	3.06	34.43 d

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

TABLE 14. Comparison of Registered and Experimental Insecticide Efficacy for Black Cutworm Planting Time and Rescue Treatments (Test 2) in Corn, Columbia, Missouri, 1987.

Insecticide	Rate (lb ai/A)	Placement	Mean % Cut Plants			
			Days Post-Infestation 1	3	7	Total ¹
Lorsban 15G	1.00	7"B	5.80	0.75	0.00	6.56 a
Pounce 3.2EC	0.10	Rescue	4.56	4.61	3.73	12.91 ab
XRD-429 2G	2.00	7"B	12.32	1.87	0.00	14.20 ab
XRD-522 0.3EC	0.019	Rescue	4.69	8.81	0.90	14.40 ab
XRD-522 0.3EC	0.015	Rescue	3.00	7.65	4.26	14.92 ab
Pounce 1.5G	0.10	7"B	7.13	7.06	4.38	18.59 abc
XRD-429 2G	1.00	7"B	10.54	8.58	0.90	20.03 abc
XRD-522 0.3EC	0.019	7"B	10.04	13.32	4.15	27.52 bcd
Lorsban 4E	1.50	PPI	12.58	16.20	3.93	32.72 cd
Pounce 3.2EC	0.10	Bd	14.37	11.93	6.80	33.10 cd
Pounce 3.2EC	0.15	Bd	14.43	10.76	8.10	33.29 cd
XRD-429 2G	0.50	IF	14.69	14.35	5.67	34.72 cde
XRD-429 2G	0.50	7"B	12.25	19.63	5.24	37.13 de
Control	-	-	15.66	15.50	6.10	37.27 de
XRD-429 2G	2.00	IF	15.30	16.14	7.22	38.66 de
XRD-522 0.3EC	0.019	PPI	10.90	20.01	9.58	40.49 de
XRD-429 2G	1.00	IF	14.96	18.11	8.20	41.28 de
XRD-522 0.3EC	0.038	PPI	17.53	28.22	5.21	50.97 e

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 Planting Time Treatments (Test 3) in Corn, Columbia, Missouri, 1987.

Insecticide	Rate (lb ai/A)	Placement	Mean % Cut Plants			Total ¹
			Days Post-Infestation 1	4	11	
Fortress 10G	0.60	7" B	6.26	4.00	3.95	14.22 a
Fortress 10G	0.60	1F	7.77	6.40	1.38	15.57 a
Aastar 15G	1.00	1F	6.68	9.85	0.00	16.54 a
Aastar 11 20:1	1.00	7" B	4.53	8.04	6.91	19.49 ab
Lorsban 15G	1.00	7" B	8.19	8.09	3.54	19.83 ab
Fortress 15G	0.50	7" B	8.16	8.19	5.06	21.42 ab
Fortress 10G	0.50	7" B	9.50	10.21	2.22	21.94 ab
Aastar 15G	1.00	7" B	11.96	4.53	6.44	22.95 ab
SC-0567 10G	1.00	7" B	9.34	9.72	4.20	23.26 ab
Aastar 11 30:1	1.00	7" B	6.73	10.57	7.43	24.74 ab
Dyfonate 20G	1.00	7" B	12.95	8.95	4.68	26.59 ab
SC-0567 10G	0.50	7" B	5.06	15.05	9.53	29.65 ab
Dyfonate 20GM	1.00	7" B	8.17	15.56	6.56	30.30 ab
Counter 15G	1.00	7" B	9.16	14.09	7.34	30.59 ab
Mocap 15G	1.00	BPW	6.47	15.80	10.03	32.30 ab
AC 301467 20G	1.00	7" B	17.69	12.21	8.15	38.06 ab
Control	-	-	12.75	22.45	5.80	41.01 b

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

WIREWORM INSECTICIDE EVALUATIONS

Insecticide evaluations for wireworm control were conducted at two locations in 1987. The first location, near Hartsburg, Boone County, was planted to corn in 1986 and a reduction in stand was observed by the farmer. The stand reduction was attributed to wireworm Melanotus species. The second location was near Shelbyville, Shelby County. According to the land owner and farmer-cooperator, 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 percent stand loss. Evaluation plots have been located in this portion of the field since 1984.

In 1987, the farmer-cooperator at the Hartsburg site placed 10 wireworm baits in the field during the first week in April. The baits were removed and examined by the farmer and Entomology personnel. An average of over 100 wireworms (Melanotus sp.) per bait was found throughout the field. Plots were placed in areas of heaviest wireworm concentration at both locations. Individual plots were two 35-foot rows and replicated four times according to a randomized complete block design. Performance of treatments was evaluated by counting the number of live and dead 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 7100 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. Seeds pre-treated with seed treatments (ST) were planted through a cone seeder to uniformly distribute a precounted number of treated seeds over the 35 foot rows.

TABLE 16. Comparison of Registered and Experimental Insecticide Efficacy for Control of Wireworms in Corn (Test 1), Hartsburg, Missouri, 1987.

Insecticide	Rate (lb ai/A)	Placement	Plant Emergence (Standcount) Mean No. Emerged Plants/35 row ft.
Counter 15G	1.50	IF	45.12 a
TF 3722	12.3 oz/cwt	ST	43.62 ab
Fortress 10G	0.75	7"B	43.50 ab
Fortress 10G	0.50	IF	43.37 ab
Force 1.5G	0.10	IF	43.25 ab
SC-0567 10G	1.00	7"B	43.12 ab
Fortress 10G	0.75	IF	43.00 ab
Counter 15G	1.00	IF	42.62 ab
Aastar 15G	1.00	7"B	42.37 ab
Counter 15G	1.00	7"B	42.12 ab
Thimet 20G	1.00	7"B	42.12 ab
F6063 1.5G	0.125	IF	41.12 ab
SC-0567 10G	0.50	IF	41.00 ab
F6063 1.5G	0.15	IF	41.00 ab
F7943 1.5G	0.15	IF	41.00 ab
Mocap 15G	1.00	BPW	41.00 ab
Dyfonate 20G	1.00	7"B	40.62 ab
Fortress 10G	0.50	7"B	40.50 ab
SC-0567 10G	0.50	7"B	40.50 ab
TF 3746	3.6 oz/cwt	ST	40.50 ab
SC-0567 10G	1.00	IF	40.37 ab
Agrox DL Plus	3.6 oz/cwt	ST	40.25 ab
Control	-	-	40.25 ab
UBI-B8451 15G	1.00	7"B	40.00 ab
Force 1.5G	0.125	IF	40.00 ab
Lorsban 15G	1.00	7"B	39.12 b
F7943 1.5G	0.125	IF	38.62 b
Furadan 15G	1.00	7"B	38.37 b

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

TABLE 17. Comparison of Registered and Experimental Insecticide Efficacy for Control of Wireworms in Corn (Test 1), Hartsburg, Missouri, 1987.

Insecticide	Rate (lb ai/A)	Placement	% Damaged Plants	
			% Damaged Plants/ 35' Row	Mean % ¹ Damaged Plants (Arcsin Transformation)
Counter 15G	1.00	IF	3.10	0.168 a
Mocap 15G	1.00	BPW	5.56	0.235 ab
Furadan 15G	1.00	7" B	6.43	0.251 ab
SC-0567 10G	0.50	7" B	6.93	0.260 ab
Counter 15G	1.00	7" B	7.72	0.261 ab
Fortress 10G	0.75	7" B	6.93	0.261 ab
Fortress 10G	0.50	IF	8.10	0.262 ab
SC-0567 10G	0.50	IF	8.62	0.267 ab
UBI-B8451 15G	1.00	7" B	10.24	0.270 ab
SC-0567 10G	1.00	7" B	8.38	0.277 ab
Fortress 10G	0.75	IF	8.49	0.291 ab
F6063 1.5G	0.125	IF	9.79	0.297 ab
Counter 15G	1.50	IF	10.88	0.303 ab
Aastar 15G	1.00	7" B	10.70	0.319 ab
Dyfonate 20G	1.00	7" B	10.46	0.323 ab
SC-0567 10G	1.00	IF	11.66	0.323 ab
Force 1.5G	0.10	IF	12.05	0.324 ab
TF 3722	12.3 oz/cwt	ST	11.85	0.337 ab
Agrox DL Plus	3.6 oz/cwt	ST	12.17	0.343 ab
Thimet 20G	1.00	7" B	12.59	0.351 ab
TF 3746	3.6 oz/cwt	ST	14.19	0.365 ab
Control	-	-	13.85	0.377 ab
Force 1.5G	0.125	IF	19.51	0.419 b
Fortress 10G	0.50	7" B	17.50	0.421 b
F7943 1.5G	0.125	IF	17.51	0.424 b
Lorsban 15G	1.00	7" B	20.33	0.444 b
F6063 1.5G	0.15	IF	19.31	0.444 b
F7943 1.5G	0.15	IF	22.81	0.456 b

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

TABLE 18. Comparison of Registered and Experimental Insecticide Efficacy for Control of Wireworms in Corn (Test 1), Hartsburg, Missouri, 1987.

Insecticide	Rate (lb ai/A)	Placement	Live Plant Count Mean No. Live Plants/35 row ft.
Counter 15G	1.00	IF	41.25 a
Fortress 10G	0.75	7" B	40.50 ab
Counter 15G	1.50	IF	40.25 abc
Fortress 10G	0.50	IF	39.75 abc
SC-0567 10G	1.00	7" B	39.50 abc
Fortress 10G	0.75	IF	39.37 abc
Counter 15G	1.00	7" B	39.00 abc
Mocap 15G	1.00	BPW	38.75 abc
TF 3722	12.3 oz/cwt	ST	38.50 abc
Force 1.5G	0.100	IF	38.25 abc
Aastar 15G	1.00	7" B	37.87 abc
SC-0567 10G	0.50	7" B	37.75 abc
SC-0567 10G	0.50	IF	37.50 abc
F6063 1.5G	0.125	IF	37.12 abc
Thimet 20G	1.00	7" B	36.87 abc
Dyfonate 20G	1.00	7" B	36.50 abc
UBI-B8451 15G	1.00	7" B	36.12 abc
Furadan 15G	1.00	7" B	36.00 abc
SC-0567 10G	1.00	IF	35.75 abc
Agrox DL Plus	3.6 oz/cwt	ST	35.50 abc
Control	-	-	34.75 abc
TF 3746	3.6 oz/cwt	ST	34.75 abc
Fortress 10G	0.50	7" B	33.50 abc
Force 1.5G	0.125	IF	33.50 abc
F6063 1.5G	0.150	IF	33.12 abc
F7943 1.5G	0.150	IF	32.37 abc
F7943 1.5G	0.125	IF	31.87 bc
Lorsban 15G	1.00	7" B	31.25 c

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

TABLE 19. Comparison of Registered and Experimental Insecticide Efficacy for Control of Wireworms In Corn (Test 1), Shelbyville, Missouri, 1987.

Insecticide	Rate (lb ai/A)	Placement	Plant Emergence (Standcount) Mean No. Emerged Plants/35 row ft.
Fortress 10G	0.50	IF	42.38 a
F6063 1.5G	0.15	IF	42.25 ab
Fortress 10G	0.50	7"B	42.13 abc
F6063 1.5G	0.125	IF	42.00 abc
F4943 1.5G	0.150	IF	41.88 abc
UBI-B8451 15G	1.00	7"B	41.75 abc
SC-0567 10G	1.00	7"B	41.38 abcd
Counter 15G	1.00	7"B	41.38 abcd
Counter 15G	1.50	IF	41.00 abcd
Fortress 10G	0.75	IF	41.00 abcd
SC-0567 10G	0.50	IF	40.88 abcd
Fortress 10G	0.75	7"B	40.75 abcd
Force 1.5G	0.10	IF	40.63 abcd
Thimet 20G	1.00	7"B	40.63 abcd
Furadan 15G	1.00	7"B	40.13 abcd
Aastar 15G	1.00	7"B	40.13 abcd
F7943 1.5G	0.125	IF	40.00 abcd
Dyfonate 20G	1.00	7"B	39.88 abcd
SC-0567 10G	1.00	IF	39.88 abcd
Counter 15G	1.00	IF	39.75 abcd
TF 3722	12.3 oz/cwt	ST	39.63 abcd
Force 1.5G	0.125	IF	39.00 abcd
Mocap 15G	1.00	BPW	38.87 abcd
TF 3746	3.6 oz/cwt	ST	38.37 abcd
SC-0567 10G	0.50	7"B	38.25 abcd
Control	-	-	37.25 bcd
Lorsban 15G	1.00	7"B	37.12 cd
Agrox DL Plus	3.6 oz/cwt	ST	36.62 d

¹ Mean 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, 1987.

Insecticide	Rate (lb ai/A)	Placement	% Damaged Plants	
			% Damaged Plants/ 35' Row	Mean % ¹ Damaged Plants (Arcsin Transformation)
Counter 15G	1.00	7" B	6.66	0.213 a
Aastar 15G	1.00	7" B	5.67	0.238 a
Counter 15G	1.00	1F	5.76	0.239 ab
UBI-B8451 15G	1.00	7" B	6.66	0.256 abc
Furadan 15G	1.00	7" B	7.11	0.259 abc
Thimet 20G	1.00	7" B	7.00	0.260 abc
Force 1.5G	0.10	1F	7.38	0.262 abc
Fortress 10G	0.50	7" B	7.42	0.268 abc
Counter 15G	1.50	1F	7.60	0.271 abc
Fortress 10G	0.50	1F	8.45	0.287 abcd
F6063 1.5G	0.125	1F	8.48	0.287 abcd
Fortress 10G	0.75	7" B	8.90	0.299 abcd
Force 1.5G	0.125	1F	9.06	0.301 abcde
F6063 1.5G	0.15	1F	9.35	0.305 abcde
Fortress 10G	0.75	1F	10.40	0.323 abcdef
SC-0567 10G	1.00	7" B	10.30	0.326 abcdef
SC-0567 10G	0.50	1F	10.63	0.328 abcdef
F7943 1.5G	0.125	1F	11.46	0.330 abcdef
F7943 1.5G	0.15	1F	11.08	0.335 abcdef
SC-0567 10G	0.50	7" B	12.03	0.348 bcdef
TF 3746	3.6 oz/cwt	ST	12.13	0.353 bcdef
Mocap 15G	1.00	BPW	13.24	0.365 bcdef
Lorsban 15G	1.00	7" B	13.79	0.379 cdef
Dyfonate 20G	1.00	7" B	13.91	0.381 cdef
Agrox DL Plus	3.6 oz/cwt	ST	14.15	0.383 cdef
SC-0567 10G	1.00	1F	16.37	0.412 def
Control	-	-	17.48	0.431 ef
TF 3722	12.3 oz/cwt	ST	18.95	0.448 f

¹ Mean 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, 1987.

Insecticide	Rate (lb ai/A)	Placement	Live Plant Count Mean No. Live Plants/35 row ft.
Fortress 10G	0.50	7"B	39.00 a
UBI-B8451 15G	1.00	7"B	39.00 a
Fortress 10G	0.50	IF	38.75 a
Counter 15G	1.00	7"B	38.62 a
F6063 1.5G	0.125	IF	38.50 a
F6063 1.5G	0.15	IF	38.25 ab
Aastar 15G	1.00	7"B	37.87 abc
Counter 15G	1.50	IF	37.87 abc
Thimet 20G	1.00	7"B	37.75 abc
Force 1.5G	0.10	IF	37.75 abc
Counter 15G	1.00	IF	37.50 abcd
F7943 1.5G	0.15	IF	37.25 abcd
Furadan 15G	1.00	7"B	37.25 abcd
Fortress 10G	0.75	7"B	37.12 abcd
SC-0567 10G	1.00	7"B	37.12 abcd
Fortress 10G	0.75	IF	36.75 abcde
SC-0567 10G	0.50	IF	36.50 abcde
F7943 1.5G	0.125	IF	35.75 abcde
Force 1.5G	0.125	IF	35.50 abcde
Dyfonate 20G	1.00	7"B	34.37 abcde
Mocap 15G	1.00	BPW	33.87 abcde
TF 3746	3.6 oz/cwt	ST	33.75 abcde
SC-0567 10G	0.50	7"B	33.62 abcde
SC-0567 10G	1.00	IF	33.37 abcde
TF 3722	12.3 oz/cwt	ST	32.12 bcde
Lorsban 15G	1.00	7"B	32.00 cde
Agrox DL Plus	3.6 oz/cwt	ST	31.50 de
Control	-	-	30.75 e

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), Hartsburg, Missouri, 1987.

Insecticide	Rate (lb ai/A)	Placement	Plant Emergence (Standcount) Mean No. Emerged Plants/35 row ft.
AC 301467 20G	1.00	1F	41.00 a
Counter 15G	1.00	1F	40.87 a
AC 301467 20G	1.00	7"B	39.62 ab
AC 301467 15G	1.00	7"B	39.50 ab
Counter 15G	1.00	7"B	39.37 ab
AC 301467 15G	1.00	1F	38.87 ab
AC 301467 24G	1.00	7"B	37.87 ab
AC 301467 24G	1.00	1F	37.25 ab
Control	-	-	35.50 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), Hartsburg, Missouri, 1987.

Insecticide	Rate (lb ai/A)	Placement	% Damaged Plants	
			% Damaged Plants	Mean % ¹ Damaged Plants (Arcsin Transformation)
AC 301467 20G	1.00	7"B	3.18	0.146 a
AC 301467 20G	1.00	IF	4.46	0.190 a
Counter 15G	1.00	IF	9.10	0.285 ab
AC 301467 15G	1.00	7"B	10.49	0.317 abc
AC 301467 24G	1.00	7"B	10.23	0.322 abc
AC 301467 24G	1.00	IF	13.85	0.356 abc
AC 301467 15G	1.00	IF	16.97	0.412 bc
Counter 15G	1.00	7"B	25.76	0.516 c
Control	-	-	25.51	0.522 c

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), Hartsburg, Missouri, 1987.

Insecticide	Rate (lb ai/A)	Placement	Live Plant Count Mean No. Live Plants/35 row ft.
AC 301467 20G	1.00	IF	39.25 a
AC 301467 20G	1.00	7"B	38.37 a
Counter 15G	1.00	IF	37.25 ab
AC 301467 15G	1.00	7"B	35.37 ab
AC 301467 24G	1.00	7"B	34.00 abc
AC 301467 24G	1.00	IF	32.50 abc
AC 301467 15G	1.00	IF	32.25 abc
Counter 15G	1.00	7"B	29.37 bc
Control	-	-	26.50 c

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

TABLE 25. Comparison of Registered and Experimental Insecticide Efficacy for Control of Wireworms in Corn (Test 2), Shelbyville, Missouri, 1987.

Insecticide	Rate (lb ai/A)	Placement	Plant Emergence (Standcount) Mean No. Emerged Plants/35 row ft.
AC 301467 20G	1.00	IF	42.62a
Counter 15G	1.00	7"B	41.37 ab
AC 301467 15G	1.00	7"B	41.37 ab
AC 301467 24G	1.00	7"B	41.00 ab
Counter 15G	1.00	IF	40.50 ab
AC 301467 20G	1.00	7"B	40.25 ab
Control	-	-	40.12 ab
AC 301467 24G	1.00	IF	39.50 ab
AC 301467 15G	1.00	IF	38.25 b

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

TABLE 26. Comparison of Registered and Experimental Insecticide Efficacy for Control of Wireworms in Corn (Test 2), Shelbyville, Missouri, 1987.

Insecticide	Rate (lb ai/A)	Placement	% Damaged Plants	
			% Damaged Plants	Mean % ¹ Damaged Plants (Arcsin Transformation)
Counter 15G	1.00	7"B	9.56	0.296 a
AC 301467 15G	1.00	7"B	10.60	0.311 ab
Counter 15G	1.00	1F	10.33	0.321 ab
AC 301467 24G	1.00	7"B	11.78	0.324 ab
AC 301467 15G	1.00	1F	10.43	0.326 ab
AC 301467 20G	1.00	7"B	14.05	0.373 ab
AC 301467 20G	1.00	1F	16.55	0.415 ab
AC 301467 24G	1.00	1F	17.63	0.416 ab
Control	-	-	19.98	0.461 b

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

TABLE 27. Comparison of Registered and Experimental Insecticide Efficacy for Control of Wireworms in Corn (Test 2), Shelbyville, Missouri, 1987.

Insecticide	Rate (lb ai/A)	Placement	Live Plant Count Mean No. Live Plants/35 row ft.
Counter 15G	1.00	7"B	37.37 a
AC 301467 15G	1.00	7"B	37.00 a
Counter 15G	1.00	IF	36.37 a
AC 301467 24G	1.00	7"B	36.25 a
AC 301467 20G	1.00	IF	35.62 a
AC 301467 20G	1.00	7"B	34.75 a
AC 301467 15G	1.00	IF	34.25 a
AC 301467 24G	1.00	IF	32.62 a
Control	-	-	32.25 a

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, 1987.

	ROOTWORM		CUTWORM			WIREWORM		
	Cosby	Novelty	Columbia Boone County			Hartsburg	Shelbyville	
Location	Andrew County	Knox County	Test 1	Test 2	Test 3	Boone County	Boone County	
Planting Date	April 29	May 6	May 20	June 4	Sept. 16	April 22	April 24	
Corn Hybrid	Pioneer 3377	Pioneer 3377	Garst 8345	Garst 8345	Garst 8345	Garst 8345	Garst 8345	
Evaluation Date	July 22	July 30	May 28 June 1 4	June 10 12 17	Oct. 1 5 12	May 11	May 12	
Insect Population	Eggs 1.5/pint of soil Adult Population 31% western 69% northern		2/pint of soil Adult Population 49% western 51% northern			All cutworm tests were infested with laboratory-reared black cutworms.		Average wireworms/bait 100+ 6.34 (1986 ave.)

1987 Soil Test Results for Insecticide Evaluation Sites

Location	pHs	% OM	NA me 100g	P-I ¹	P-II ²	CA lbs/A	Mg lbs/A	K lbs/A	% Sand	% Silt	% Clay	Soil Type
Cosby	6.2	3.2	1.5	135	431	6140	606	549	20.0	47.3	32.7	Silty Clay Loam
Novelty	6.8	2.3	0.0	91	374	5220	372	439	17.8	53.5	28.7	Silty Clay Loam
South Farms	4.9	2.1	5.0	58	213	2390	299	285	17.8	55.6	26.6	Silt Loam
Hartsburg	7.5	1.6	0.0	183	815	3750	389	590	53.6	32.1	14.3	Sandy Loam
Shelbyville	7.2	2.8	0.0	82	372	6270	385	284	22.0	51.4	26.6	Silt Loam

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

²P-II, 1bs P₂O₅/A extracted with 0.100 normal HCL

Daily Rainfall and Temperature Data for Cosby, Missouri, 1987¹

Day	*May 1987			June 1987			July 1987		
	Temp (°F)		Rainfall (inches)	Temp (°F)		Rainfall (inches)	Temp (°F)		Rainfall (inches)
	Max	Min		Max	Min		Max	Min	
1	86	46		82	62		80	57	
2	84	60		77	60		82	58	
3	76	58	0.97	74	52	0.16	84	65	
4	60	49	0.20	77	46	0.06	80	67	0.22
5	64	44	0.08	80	52	0.06	80	58	0.31
6	72	49		84	63	0.06	87	65	0.20
7	72	48		84	55	0.06	80	64	1.20
8	76	52		87	62	0.06	82	65	0.35
9	78	55		82	64		82	64	
10	84	58		76	60	1.35	85	67	
11	84	64		82	63	0.16	88	70	
12	80	50		92	65		84	62	2.80
13	87	57		89	60	0.20	72	56	0.22
14	84	62		94	65		75	49	
15	80	51		93	66		83	53	
16	80	55		94	67		85	60	
17	85	62		90	67		87	66	
18	86	62		87	62		85	65	
19	88	62	0.14	83	64		89	72	
20	86	64		80	64	0.85	89	67	
21	77	65		88	67		88	65	
22	66	50		87	67		89	65	
23	68	42		86	65		90	66	
24	68	54	0.56	93	62		93	68	
25	87	64	0.21	82	55	0.85	94	70	
26	80	63		77	54		93	68	
27	78	67	0.55	82	55		92	68	
28	78	64	0.15	86	58		94	72	
29	75	65	0.42	80	62	0.20	94	68	
30	80	58		70	59	0.30	96	72	
31	83	57					98	70	

¹Weather data was recorded at the Amity station, approximately 15 miles west of plots.

*The high and low on April 29 was 88° and 50° and 86° and 52° on April 30, no precipitation.

Daily Rainfall and Temperature Data for Novelty, Missouri, 1987

Day	May 1987			June 1987			July 1987		
	Temp (°F)		Rainfall (inches)	Temp (°F)		Rainfall (inches)	Temp (°F)		Rainfall (inches)
	Max	Min		Max	Min		Max	Min	
1	70	47		86	62	74	65	0.06	
2	85	61		87	71	83	64		
3	85	60	0.55	79	56	87	68		
4	67	52	0.25	76	51	75	64		
5	66	46		76	57	87	63		
6	67	46		81	53	75	64	0.41	
7	75	56		83	58	91	69	0.62	
8	76	53		86	60	75	68	0.69	
9	78	49		90	69	89	70		
10	81	60		74	56	88	73		
11	83	62		75	57	88	65		
12	85	55		79	69	90	64	1.40	
13	75	48		80	69	80	62		
14	85	67		80	68	73	65		
15	85	52		98	70	76	60	0.93	
16	77	47		98	73	84	64		
17	83	57		93	71	87	69		
18	86	64	0.32	93	71	86	69		
19	85	65	0.20	91	71	84	72		
20	72	85		82	70	90	73		
21	87	66	0.50	89	68	91	70		
22	86	54	0.05	89	69	91	70		
23	62	49	Trace	93	69	90	70		
24	69	46	Trace	86	72	90	72		
25	63	53	0.06	92	68	96	68		
26	80	61		81	59	96	73		
27	85	70		79	52	95	72		
28	87	67	0.04	91	55	94	72		
29	80	70		88	59	94	72		
30	84	67		83	67	97	73		
31	85	63				97	75		

Daily Rainfall and Temperature Data for Shelbyville, Missouri 1987¹.

Day	April 1987			May 1987		
	Temp (°F)		Rainfall (Inches)	Temp (°F)		Rainfall (Inches)
	Max	Min		Max	Min	
1	53	41		78	56	
2	51	35		76	57	
3	46	30		76	51	0.45
4	51	34		73	54	
5	61	40		75	55	
6	68	46		77	52	
7	69	40		80	58	
8	75	37		83	59	
9	72	40		81	61	
10	64	42		81	59	
11	72	47		79	62	
12	68	34		81	63	
13	65	49	1.00	82	63	
14	64	46	0.80	84	67	
15	67	47	0.05	86	57	
16	66	47		86	52	
17	71	50		86	68	
18	68	49		86	64	0.25
19	81	60		89	69	0.95
20	94	64		90	69	
21	90	58		89	70	0.50
22	74	50		75	59	0.42
23	60	43		73	53	
24	66	47		70	59	
25	71	48		77	62	0.20
26	77	52		90	68	
27	76	50		88	66	
28	82	44		87	68	
29	80	51		86	66	
30	81	60		89	70	
31				88	71	

¹Weather data was recorded at the Shelbina weather station, approximately 11 miles south of wireworm plots.

Daily Rainfall and Temperature Data for University of
Missouri South Farms, Columbia, Missouri, 1987¹

Day	April 1987			May 1987			June 1987		
	Temp (°F)		Rainfall (inches)	Temp (°F)		Rainfall (inches)	Temp (°F)		Rainfall (inches)
	Max	Min		Max	Min		Max	Min	
1	52	28		72	52		86	64	0.03
2	60	28		85	54		86	69	
3	44	21		82	60	0.33	86	57	0.63
4	46	21		70	55		77	50	
5	52	26		67	50		76	52	
6	61	43		69	51		80	57	
7	54	37		70	46		85	61	
8	68	39		75	45		86	64	
9	74	42		77	46		91	66	
10	76	47		82	49		89	61	
11	61	38	0.22	83	59		85	62	
12	61	30		84	58		85	63	0.05
13	60	30	0.77	77	53		91	65	
14	56	46	0.98	85	61		94	68	
15	56	45	0.05	89	51	0.19	98	70	
16	60	48	0.03	76	50		94	68	
17	68	45		82	53	0.35	93	67	
18	77	44		84	63	0.22	92	70	
19	78	58		86	64		90	70	
20	84	59		87	67	0.02	88	68	0.38
21	89	57		88	68	0.23	85	66	0.25
22	64	47		91	58		89	69	
23	61	43		71	48		88	65	1.55
24	55	43		72	55		86	69	
25	68	44		72	57		88	67	
26	78	46		81	62	0.26	82	57	
27	88	62		84	63		80	53	
28	76	43		87	68		80	62	
29	73	45		82	66	0.49	87	67	
30	87	57		84	66	0.06	86	67	0.05
31				83	65				

¹This weather data was also used for the wireworm plots located at Hartsburg, MO, which is approximately 15 miles south of the UMC weather station.

Daily Rainfall and Temperature Data for University of Missouri South Farms, Columbia, Missouri, 1987.

Day	September 1987			October 1987		
	Temp (°F)		Rainfall (inches)	Temp (°F)		Rainfall (inches)
	Max	Min		Max	Min	
1	78	46		74	45	
2	81	49		78	44	
3	82	53		56	30	
4	84	57		60	30	
5	91	61		72	49	
6	90	62		69	47	
7	90	63	1.16	62	36	0.02
8	77	63	0.03	55	30	
9	83	54		66	33	
10	79	55		65	39	0.14
11	77	55		41	30	0.02
12	82	56	0.13	54	28	
13	73	53		62	37	
14	83	53		67	39	
15	82	65	0.70	72	43	
16	73	60	0.27	77	45	
17	81	60	0.05	67	38	0.23
18	76	60		62	41	
19	65	49	0.10	73	47	
20	74	47		54	34	0.30
21	70	45		50	25	
22	69	47		49	31	
23	70	45		63	37	
24	74	52		65	39	0.65
25	82	52		57	34	
26	80	56		52	38	0.25
27	87	58		54	34	
28	84	61		57	27	
29	73	53	1.54	59	43	
30	70	44		72	47	
31				80	51	

COOPERATING COMPANIES

Company

Insecticide

American Cyanamid Company

Aastar
Counter
Thimet
AC 301467

BASF-Wyandotte Corporation

Lance

Chipman Chemicals

Agrox DL Plus
TF3756
TF3722

Ciba-Geigy Corporation

Brace

Dow Chemical U.S.A.

Lorsban
XRM-429
XRM-522

E. I. DuPont De Nemours & Co.

Asana
Fortress

EM Industries Inc.

ASD 3922
ASD 3879

FMC Corporation

Furadan
Pounce
F-6063
F-7943

ICI Americas Inc.

Ambush
Force

Mobay Chemical Corporation

Baythroid

Rhone-Poulenc Chemical Company

Mocap

Stauffer Chemical Company

Dyfonate
SC-0567

Union Carbide Agricultural Products Co., Inc.

Broot

Uniroyal Chemical Company

UBI-B8451