

2-1973

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Manglitz, G. R.; Schalk, J. M.; Andersen, L. W.; and Pruess, K. P., "Control of the Army Cutworm on Alfalfa in Nebraska" (1973).

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Published in *Journal of Economic Entomology* 66:1 (February 1973), p. 299; doi: 10.1093/jee/66.1.299.

Published by the Entomological Society of America and Oxford University Press.

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Submitted August 15, 1972; published February 1, 1973.

Control of the Army Cutworm¹ on Alfalfa in Nebraska^{2,3}

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The army cutworm, *Euxoa auxiliaris* (Grote), is a frequent early spring pest of alfalfa in the western Plains States. Good control with endrin was reported by Burkhardt (1954), Pfadt (1955), and DePew (1959). Also, endosulfan appeared to give good control on alfalfa (Pfadt 1960) and on small grains (K. P. Pruess, 1959, University of Nebraska, Department of Entomology, unpublished report) but not on sugarbeets (DePew 1959). The purpose of the present study was to test some of the newer insecticides, particularly those that have been effective against other species of cutworms. Three tests were conducted at various locations in south-central and southwest Nebraska during the 3-year period 1968–70.

Materials and Methods

The tests were made as follows: in 1968, northwest of Lexington in an established alfalfa field; in 1969, southwest of McCook in an alfalfa field seeded the previous fall; and in 1970, south of Curtis in an alfalfa field seeded the previous fall. The experimental design in all tests was a randomized complete block with 3 replications. Plot size varied from year to year: 1968, 44 × 165 ft; 1969, 22 × 165 ft; and 1970, 22 × 82.5 ft. All spray treatments were applied with a jeep-mounted John Bean Sprayer equipped with a 22-ft boom, operated at 100 in.² and calibrated to deliver the desired amount of insecticide in 10 gal of water/acre. The bait treatment was applied with a push-type 4 ft Gandy fertilizer spreader.

The plots were evaluated once; at 5 days posttreatment in 1968, at 7 days posttreatment in 1969, and at 8 days posttreatment in 1970. The evaluation was made by counting all larvae in 10 randomly selected 1 ft² areas in each plot (only 7 in 1968).

Results

In 1968, the numbers of larvae per square foot in the plots treated with diazinon at rates of 1 lb and ½ lb/acre, with carbaryl at 1½ lb/acre and with trichlorfon at 1 lb/acre were significantly less ($P = 0.05$) than the numbers of larvae per square foot in the untreated plots (Table 1).

Table 1. Control of army cutworms at Lexington (1968), McCook (1969), and Curtis (1970), Nebr.

Treatment, formulation, and rate AI/acre (lb)	Larvae/ft ² ^b		
	1968	1969	1970
Azinphosmethyl EC	1.0	—	0.83 a
	2.0	—	.46 ab
Mevinphos EC	0.25	—	3.27 a
	.5	—	2.67 ab
Carbaryl: molasses	1.5	—	2.63 ab
Carbaryl: flowable	1.5	0.7 bc	—
	1.0	1.5 ab	—
	2.0	—	.63 a
Trichlorfon spray	.5	—	.40 abc
	1.0	1.0 abc	—
Trichlorfon bait	.4	.9 bc	2.67 abc
	.8	—	1.87 bcd
Carbofuran EC	.5	—	2.57 abc
	1.0	—	2.33 abc
	1.5	—	—
Diazinon EC	.5	2.20 bcd	—
	1.0	—	1.80 bcd
	1.5	—	.43 ab
Monocrotophos EC	.5	.9 bc	2.37 abc
	1.0	.6 c	1.13 de
	1.5	—	—
Endosulfan EC	.3	—	.40 ab
	.6	—	—
Control	1.0	1.53 cde	—
	1.5	—	0.83 e
Control	1.0	—	.13c
	1.5	—	.13 c
Control	1.8 a	2.00 bcd	.60 a

a. Counts were made 5–8 days posttreatment.

b. Means shown are actual counts, analysis of variance was conducted with square root transformations.

Mean separations shown are based on Duncan's multiple range test ($P = 0.05$).

In 1969, only monocrotophos at 0.6 lb/acre was significantly different ($P = 0.05$) from the control. However, this treatment with monocrotophos was not significantly different from diazinon at 1 lb/acre or monocrotophos at 0.3 lb/acre.

In the 1970 test, all the materials tested, at least at higher rates, appeared to exert some controlling influence on the larvae. However, only the plots treated with diazinon at 1 lb/acre or with endosulfan at 1.0 and 1.5 lb/acre had significantly fewer larvae ($P = 0.05$) than the control.

Thus, diazinon gave good to fair results in all 3 years. Monocrotophos produced the best results in 1969 but was used only in that test. Endosulfan appeared promising in the 1970 test and was used only in that test.

Larvae were saved during the posttreatment counts in all 3 years. Those collected in 1969 and 1970 were all *E. auxiliaris*. However, in 1968, 85.2% were *E. auxiliaris*, 13.0% were the dingy cutworm, *Feltia subgothica* (Haworth), and 1.8% were unknown.

Also in the 1968 test, we made a pretreatment count which averaged 3.5 larvae/ft², but when we made the posttreatment count in the untreated plots, the population seemed to be declining with an average of 1.8 larvae/ft². We have no data to confirm that similar natural declines in population were occurring during the tests in 1969 and 1970, but we are quite certain that populations were declining. Nevertheless, such great damage was done by the army cutworms that we feel strongly that earlier treatments are needed to prevent damage. In the established field (1968), this feeding damage was soon obscured by plant growth, but in the fields seeded the previous fall (1969, 1970) the stands were so reduced that reseedling was necessary. This contrast substantiated other observations we have made which indicate that the most serious damage by the army cutworm in alfalfa occurs in seedling fields.

Notes

1. Lepidoptera: Noctuidae.
2. Mention of a pesticide or proprietary name does not constitute recommendation or endorsement by the USDA.
3. In cooperation with the Nebraska Agricultural Experiment Station. Published with the approval of the Director as paper no. 3109 Journal Series, Nebraska Agricultural Experiment Station Project no. 17-5. Contribution no. 362, Department of Entomology, University of Nebraska. Received for publication Aug. 15, 1972.
4. Forage Insect Laboratory, Agric. Res. Ser., USDA.
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6. The authors acknowledge assistance from the following in the application or evaluation of one or more of the tests reported: H. J. Stevens, Jr., ARS-USDA; David L. Keith, Department of Entomology, University of Nebraska-Lincoln; Wayman Lipsey, Chemagro Corp.; and Edward Binford, Union Carbide Corp.

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