Relative Effectiveness of Soil-Applied Granular Insecticides on Spinich Carrion Beetle

Y. M. Yun and M. B. Spaur *

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INTRODUCTION

The spinach carrion beetle, Silpha bituberosa LeConte, causes sporadic damage to sugarbeets in the Big Horn Basin area of northern Wyoming, particularly near Powell.

Both the adults and larvae appear in the spring and feed on the leaves of young sugarbeet plants. The most severe damage occurs during thinning time. Insect damage sometimes reduces plant stand and root yield (1, 2, 3). Control is needed in some fields but no insecticide is registered for control of the insect at the present time.

The main objective of this experiment was to evaluate the effectiveness of three soil insecticides, aldicarb (Temik), carbofuran (Furadan), and terbufos (Counter) on the spinach carrion beetle. All three insecticides, currently registered for sugarbeet root maggot control, are extensively used by local sugarbeet growers.

MATERIALS AND METHODS

This experiment was conducted at Powell, Wyoming in a grower's field. Aldicarb 15G, carbofuran 10G, and terbufos 15G were applied to soil immediately before planting, in a 5-inch band using a 6-row belt applicator. The chemicals were incorporated to a depth of 2-inches by means of a 6-row power incorporator. In another placement or modified in-furrow application, insecticides were simply dropped in a narrow band directly in front of the planter disks so that some insecticide granules would be carried into the seed furrow.

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* The authors are Sr. Entomologist and former Technical Assistant, respectively, Agricultural Research Center, The Great Western Sugar Company, Longmont, CO 80501. Numbers in parenthesis refer to literature cited.

Sugarbeet seeds, GW Mono Hy D2 variety, were then planted in the center of the treated area. Both the belt applicator and power incorporator were attached to the planter and the entire unit was drawn by a tractor.

Test plots were treated and planted on April 21, and the number of dead beetles in each plot area was counted on May 26, 1977. Each plot, 2 rows wide and 50 ft. long, was replicated four times in a radomized complete block design. An F-test was used to analyze the data.

RESULTS AND DISCUSSION

Carbofuran at all three rates was highly effective whereas terbufos and aldicarb were ineffective on the spinach carrion beetle (Table 1). The number of dead beetles in carbofuran treated plots was significantly greater when compared to the untreated check and plots treated with aldicarb or terbufos. As the data indicate, the number of dead beetles increased as the dosage of carbofuran increased.

The conventional approach to control this type of foliar insect is to apply an aerial spray, which has been done in the past to control the beetle. However, no insecticide is currently registered for control of this specific insect. Absence

Table 1. Relative effectiveness of aldicarb, carbofuran, terbufos on the spinach carrion beetle--Powell, Wyoming, 1977.

Insecticide	Form	Dosage: lb. ai/A	Application Method*	No. Dead Beetles per 100 ft. Row
Carbofuran	10G	2.0	BI	35.0
Carbofuran	10G	1.0	MIF	29.7
Carbofuran	10G	0.75	MIF	17.3
Terbufos	15G	0.75	MIF	4.0
Terbufos	15G	1.5	BI	2.5
Terbufos	15G	0.5	MIF	1.5
Aldicarb	15G	1.0	MIF	1.0
Check	---	---	---	0.5
Aldicarb	15G	1.5	BI	0.5
Aldicarb	15G	0.75	MIF	0
F-test				H.S.
L.S.D. .05				2.5
L.S.D. .01				2.77

*BI = Band incorporation, MIF = Modified in-furrow, both at planting.

of registered insecticides for spinach carrion beetle control is due to 1) lack of reliable experimental data in recent years, and 2) it is a small localized problem in terms of total infested acreage.

The sugarbeet root maggot, Tetanops myopaeformis (Roder), is the most serious in the Big Horn Basin area and many local sugarbeet growers use granular soil insecticides to control the insect. However, the effect of such soil-applied insecticides on the spinach carrion beetle was unknown until this experiment was conducted in 1977.

It is not yet clear whether the insect kill in carbofuran treated plots was due to 1) contact action, 2) through ingestion of water containing carbofuran, or 3) through ingestion of a lethal dose of systemically translocated carbofuran in plant tissue.

This experiment indicated that sugarbeet growers in the Powell, Wyoming area can obtain a beneficial side effect, controlling the spinach carrion beetle, by using carbofuran applied to control the sugarbeet root maggot.

SUMMARY

The spinach carrion beetle, Silpha bituberosa LeConte, causes damage to sugarbeets in the Big Horn Basin area in Wyoming and chemical control is sometimes necessary. In the past, parathion and carbaryl were used for control of this insect, but no insecticide is registered at the present time. Granular insecticides such as aldicarb, carbofuran and terbufos are extensively used by growers for sugarbeet root maggot control. Among the three insecticides tested, carbofuran applied to soil at planting was highly effective on the spinach carrion beetle, and aldicarb and terbufos were ineffective.

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