Evaluation of Insecticides on the Control of Flea Beetles in Sugarbeets

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Flea beetle infestations have been present in many of the sugarbeet areas within the state for the past three years. Although several kinds of flea beetles have been present, the pale-stripped flea beetle, *Systena blanda*, is by far the most prevalent and nearly all of the apparent damage can be attributed to this insect.

Flea beetles have a wide range of host plants and will invade seedling beet fields from adjacent crops or any number of host weeds. In most fields the presence of flea beetles will coincide with seedling emergence and it is then that the most severe damage can occur to seedling beets. They feed primarily on the leaves, eating out circular holes referred to as "shot holes." They may also feed on the roots near the ground surface.

An evaluation experiment was conducted at the Mesa Experimental Farm to determine the effectiveness of certain insecticides on the control of flea beetles and to evaluate this control on subsequent leaf damage. Since flea beetles are not generally difficult to control where foliage is not dense, low dosage rates per acre were also compared with recommended rates.

Flea beetles in seedling beets are difficult to assess in population numbers. The plants are too small to use a sweep net and the rapid jumping movement makes it nearly impossible to count accurate numbers. To evaluate this test, a system based on the amount of leaf damage was utilized. This system was based on three methods of determining plant damage. First, 400 plants from each insecticide treatment was examined for flea beetle injury and a value for the percent of plants damaged determined. Secondly, from each of these 400 plants two new leaves were examined to determine the percent of damaged leaves. In this way, leaves were picked for evaluation that had not been previously used. Thirdly, the number of shot holes on each leaf was counted.

Table 1 shows the insecticides and rates used, the damage estimates at pre-treatment and the subsequent damage evaluations after insecticides had been applied. All of the insecticides used, and at both rates, appeared to be effective in reducing the amount of flea beetle damage. Two applications applied after the pre-treatment evaluation indicated a reduction in the percent of plant and leaf damage by approximately 50 percent. The third application reduced this amount even further.

The most striking results occurred in the number of shot holes per leaf. The number of shot holes were reduced from about 4 per leaf at pre-treatment to nearly one-half per leaf after 2 applications. The untreated check remained at almost 4 per leaf.

It would appear that damage from flea beetle feeding can be greatly reduced by utilization of insecticidal control. More research is needed to determine the proper timing of applications, rate of application and intervals between applications in order to insure more efficient and effective use of insecticides on this pest.

Table 1. Effects of Insecticides on Flea Beetle Feeding

Treatment[1]	Rate Lbs/A	Percent Damaged Plants			Percent Damaged Leaves			Shot Holes[2] per Leaf		
		Pre-Trtmt 10/1	10/8	10/17	Pre-Trtmt 10/1	10/8	10/17	Pre-Trtmt 10/1	10/8	10/17
Check	--	96.0	94.0	92.0	94.0	91.5	84.5	4.01	3.90	2.80
Pounce	0.1	92.0	46.0	32.0	93.0	45.5	26.0	4.12	0.56	0.30
Pounce	0.05	90.0	46.0	32.0	92.0	50.0	29.0	3.96	0.57	0.33
Methomyl	0.45	94.0	42.0	19.0	91.0	37.0	16.0	3.86	0.43	0.21
Methomyl	0.22	95.0	44.0	24.0	92.0	44.0	20.5	4.11	0.54	0.27
Diazinon	0.50	100.0	34.0	16.0	91.0	39.5	14.5	4.09	0.43	0.18
Diazinon	0.25	94.0	38.0	25.0	91.0	41.5	20.0	3.84	0.54	0.24
Vydate	0.50	98.0	36.0	25.0	93.5	40.5	19.0	3.99	0.43	0.29
Vydate	0.25	98.0	40.0	31.0	93.5	50.5	23.0	3.89	0.47	0.31
Methomyl + Diazinon	0.22 + 0.25	96.0	28.0	15.0	93.0	33.0	13.0	3.97	0.46	0.16

[1]Three applications applied - Oct. 1, 4 and 10.

[2]Characteristic circular holes in leaf caused by flea beetle feeding.