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FOLIAR INSECTICIDE TREATMENTS FOR MANAGEMENT OF THE LYGUS BUG IN RED RIVER VALLEY SUGARBEET

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Introduction:

The tarnished plant bug (TPB), also referred to as the “Lygus bug” is a plant bug that feeds on crop and weed hosts by using piercing and sucking mouthparts. In feeding, the insect pierces the plant, injects a toxin break down and liquify the tissue, and sucks up the resulting liquid. Tarnished plant bug outbreaks have occurred throughout the Red River Valley (RRV) sugarbeet production area since at least the 1998 growing season; however, the insect has most likely always been present in the Valley since it is widely distributed throughout North America and it has a known host range of over 400 cultivated plant and weed species. Population levels of the TPB in western Minnesota and eastern North Dakota have fluctuated during the past 5 years. Severe outbreaks occurred in 1998 and 2001 with sporadic localized outbreaks occurring in the interim years. Additionally, high infestation levels were so extensive during 2001 that over 7,000 acres of sugarbeet were treated with foliar insecticides in attempts to prevent economic losses. Since the TPB is a recently recognized insect pest of sugarbeet for RRV producers, few registered insecticide choices are currently available. Therefore, we sought to evaluate the performance of registered and experimental foliar insecticide treatments for control of TPB in sugarbeet.

Materials & Methods:

The site chosen for this experiment was an established sugarbeet field near Cavalier in northeastern North Dakota. Registered insecticides evaluated included Asana XL 0.66EC, Dibrom 8 Emulsive, Lorsban 4E, Malathion 57EC, and Mustang 1.5EW. The only products had a specific listing of Lygus bug on the sugarbeet portion of their label were Dibrom, Lorsban 4E, and Mustang. However, the remaining commercially labeled materials were legal to apply in sugarbeet. Since Lorsban 4E (applied at 1 pt [0.5 lb]/ac) was most commonly used by sugarbeet producers for TPB control in the growing area, two other commercially available products (Asana and Mustang) were compared at their respective rates that corresponded with the price of the Lorsban treatment. The experimental material tested was F-1785, a compound owned by FMC corporation. As requested by the vendor of Dibrom 8, the water used in all Dibrom-containing treatments was buffered to pH 6.0 prior to mixing. A total of ten treatment combinations were arranged in a randomized complete block design with four replications. Individual plots were 35 ft long and 7 rows (22-inch spacing) wide, and plant-free alleys were established between replicates by using a rototiller. Whole-plant visual counts were taken before treatment applications on five plants per treatment plot on 29 August, 2002, and indicated that a pretreatment infestation level of 4.0 TPB (adults and nymphs combined) existed per plant. All treatments were broadcast applied on 29 August using a CO₂ backpack cannister spray system with a 6-ft wide boom that was equipped with 4 Teejet 11002 nozzles. The system was calibrated to deliver a finished spray volume of 20GPA while traveling at 3 mph. Assessments of control were carried out at 14 days after treatment (DAT) using whole-plant visual counts on five plants per plot. The inner 2 rows of each plot were harvested 30 September using a 2-row mechanical harvester, and subsamples were sent to

the American Crystal sugarbeet quality laboratory in East Grand Forks, MN, for sugarbeet quality analyses.

Results & Discussion:

All registered insecticide treatments, irrespective of whether applied alone or in combination with other compounds, provided significant ($P < 0.05$) reductions in TPB counts in comparisons with counts recorded in the untreated controls. Unfortunately, the experimental compound (F-1785) was the only insecticide that failed to achieve a significant levels of control. No significant differences in raw sugarbeet tonnage or total recoverable sucrose yield were observed between any treatments in this study. This finding could have occurred as a result of confounding effects caused by the somewhat inconsistent plant stand due to a moderate infestation of *rhizoctonia solani* in the field.

Table 1. Performance evaluation of foliar insecticide treatments for control of the tarnished plant (Lygus) bug, Cavalier, ND, 2002.

Treatment/ formulation	Rate lb (AI/ac)	Recoverable sucrose	Yield (T/ac)	Sucrose (%)	TPB/ plant (14 DAT)
		(lb/ac)			
Asana 0.66EC	0.036	5368 a	19.7 a	15.1 a	1.05 c
Dibrom 8	1	5261 a	18.8 a	15.5 a	1.1 bc
Dibrom 8 + Lorsban 4E	0.5 0.5	5283 a	18.6 a	15.6 a	1.15 bc
Dibrom 8 + Mustang 1.5EW	0.5 0.028	5697 a	20.8 a	15.2 a	0.35 c
F-1785 50DF	0.053	5453 a	19.5 a	15.4 a	2.15 a
F-1785 50DF	0.088	5568 a	19.6 a	15.7 a	1.9 ab
Lorsban 4E	1	5814 a	20.2 a	15.8 a	0.55 c
Malathion 57EW	1.5	5819 a	21.2 a	15.2 a	0.6 c
Mustang 1.5EW	0.036	5273 a	19.3 a	15.2 a	0.55 c
Check	---	5208 a	19.5 a	14.8 a	2.1 a

Means within a column sharing the same letter are not significantly ($P > 0.05$) different (LSD).