View metadata, citation and similar papers at core.ac.uk
brought to you by CORE
provided by Illinois Digital Environment for Access to Learning and Scholarship Repository

SECTION 9

Evaluation of foliar-applied insecticides to control insect pests of alfalfa in Illinois, 2008

Joshua R. Heeren, Hannah N. Imlay, Ronald E. Estes, Nicholas A. Tinsley, Kevin L. Steffey, and Michael E. Gray

Location

We established two trials, one located at the David and Carol Cook Farm near Morrison (Whiteside County), and the other located on a University of Illinois Animal Sciences farm near Urbana (Champaign County).

Experimental Design and Methods

The experimental design was a randomized complete block with four replications. The plot size for each treatment was 20 ft x 30 ft. Insecticides were applied to designated plots on 26 June in Morrison and on 19 August in Urbana. Densities of potato leafhoppers and other insects were assessed at each location prior to the foliar insecticide application by taking 20 sweeps per plot with a 15-inch diameter sweep net. Densities of potato leafhoppers and other insects after foliar insecticide applications were assessed on 2 July (7 days after treatment, DAT), 10 July (14 DAT), and 17 July (21 DAT) in Morrison and on 26 August (7 DAT), 2 September (14 DAT), and 9 September (21 DAT) in Urbana.

Insecticide Application

Insecticides were applied on 26 June in Morrison and on 19 August in Urbana with a CO_2 backpack sprayer and a 10-ft hand boom. TeeJet 80015VS spray tips were calibrated to deliver a volume of 20 gal per acre.

Active ingredients for all chemical insecticides, except those with experimental numbers, are listed in Appendix II.

Climatic Conditions

Temperature and precipitation data are presented in Appendix III.

Statistical Analysis

Data were analyzed using ARM 7 (Agricultural Research Manager), revision 7.4.2. (Copyright© 1982–2008 Gylling Data Management, Inc., Brookings, SD).

Results and Discussion

Densities of potato leafhoppers, grasshoppers, blister beetles, meadow spittlebugs, and tarnished plant bugs collected from Morrison and Urbana are presented in Tables 9.1–9.4. Although there were some differences in densities of insects across plots before foliar insecticides were applied, the focus of this discussion will be on the densities of insects on the dates following the foliar insecticide applications.

At Morrison, there were no significant differences in densities of grasshoppers among any of the treatments. Differences in densities of potato leafhoppers, blister beetles, meadow spittlebugs, and tarnished plant bugs among treatments were observed only on isolated dates, and there was no apparent trend with the differences. For example, on 2 July (7 DAT), the mean densities of potato leafhoppers and tarnished plant bugs were significantly smaller in plots treated with Mustang Max than in plots treated with GF 2153. However, on 10 July (14 DAT), the Mustang Max-treated plots had significantly more blister beetles than the plots treated with either Lorsban-4E or the low rate of Cobalt 2.55 EC. On 17 July (21 DAT), plots treated with the low rate of Cobalt 2.55 EC had significantly fewer meadow spittlebugs than plots treated with 2153.

At Urbana, there were no grasshoppers, blister beetles, or meadow spittlebugs found in any of the sweep samples taken. There were no significant differences in densities of potato leafhoppers among treatments on any dates, however, there were significant differences in densities of tarnished plant bugs among treatments. On 26 August (7 DAT), plots treated with Mustang Max and Warrior 1CS had significantly fewer tarnished plant bugs than plots treated with Lorsban-4E, the low rate of Cobalt 2.55 EC, and the UTC. However, this trend was reversed, to an extent, by 2 September (14 DAT); the plots treated with Warrior 1CS and Mustang Max had significantly more tarnished plant bugs than the plots treated with Lorsban-4E. On 9 September (21 DAT), the plots treated with the high rate of Cobalt 2.55 EC had significantly fewer tarnished plant bugs than plots treated with the low rate of Cobalt 2.55 EC

ALFALFA

TABLE 9.1 • Evaluation of products to control insect pests of alfalfa, Morrison, University of Illinois, 2008

Product	Rate[2]	Potato leafhopper[1]				Grasshopper[1]				Blister beetle[1]			
		26 June	2 July (7 DAT)[3]	10 July (14 DAT)[3]	17 July (21 DAT)[3]	26 June	2 July (7 DAT)[3]	10 July (14 DAT)[3]	17 July (21 DAT)[3]	26 June	2 July (7 DAT)[3]	10 July (14 DAT)[3]	17 July (21 DAT)[3]
Cobalt 2.55 EC	7	4.25 a	1.75 ab	4.25 a	16.75 a	0.00 b	0.00 a	0.50 a	0.75 a	0.25 a	0.00 a	0.00 b	0.25 a
Cobalt 2.55 EC	13	1.50 ab	1.75 ab	5.50 a	12.75 a	0.00 b	0.00 a	1.00 a	0.25 a	0.00 a	0.00 a	0.50 ab	0.25 a
GF2153	16	1.00 b	5.75 a	5.25 a	12.50 a	0.00 b	0.00 a	0.25 a	0.75 a	0.00 a	0.00 a	0.25 ab	0.50 a
Lorsban-4E	16	2.00 ab	2.50 ab	0.75 a	12.75 a	0.00 b	0.00 a	0.50 a	1.00 a	0.00 a	0.00 a	0.00 b	0.25 a
Mustang Max	4	3.50 ab	0.00 b	4.75 a	10.25 a	0.00 b	0.00 a	0.50 a	1.25 a	0.00 a	0.25 a	0.75 a	0.00 a
UTC[4]	—	2.50 ab	3.75 ab	2.75 a	19.25 a	1.00 a	0.00 a	0.25 a	0.50 a	0.00 a	0.00 a	0.25 ab	0.25 a

[1] Means were derived from the number of insects per 20 sweeps using a 15-inch diameter sweep net. Means followed by the same letter do not differ significantly ($P = 0.05$, Duncan's New Multiple Range Test).
[2] Rates of application of foliar-applied insecticides are ounces (oz) of product per acre.
[3] DAT = days after treatment (with foliar-applied insecticides).
[4] UTC = untreated check.

TABLE 9.2 • Evaluation of products to control insect pests of alfalfa, Morrison, University of Illinois, 2008

Product	Rate[2]	Meadow spittlebug[1]				Tarnished plant bug[1]			
		26 June	2 July (7 DAT)[3]	10 July (14 DAT)[3]	17 July (21 DAT)[3]	26 June	2 July (7 DAT)[3]	10 July (14 DAT)[3]	17 July (21 DAT)[3]
Cobalt 2.55 EC	7	0.00 a	0.00 a	0.50 a	0.00 b	1.50 a	4.00 a	3.00 a	4.00 a
Cobalt 2.55 EC	13	0.75 a	0.00 a	0.00 a	0.25 ab	2.50 a	2.00 ab	2.50 a	3.00 a
GF2153	16	0.00 a	0.75 a	0.25 a	0.75 a	3.25 a	4.25 a	4.00 a	3.50 a
Lorsban-4E	16	0.00 a	0 .25 a	0.50 a	0.25 ab	2.25 a	2.50 ab	4.00 a	4.25 a
Mustang Max	4	0.25 a	0.00 a	0.25 a	0.25 ab	3.00 a	0.75 b	4.00 a	3.50 a
UTC[4]	—	0.75 a	1.50 a	0.50 a	0.25 ab	2.00 a	1.75 ab	1.25 a	3.00 a

[1] Means were derived from the number of insects per 20 sweeps using a 15-inch diameter sweep net. Means followed by the same letter do not differ significantly ($P = 0.05$, Duncan's New Multiple Range Test).
[2] Rates of application of foliar-applied insecticides are ounces (oz) of product per acre.
[3] DAT = days after treatment (with foliar-applied insecticides).
[4] UTC = untreated check.

TABLE 9.3 • Evaluation of products to control insect pests of alfalfa, Urbana, University of Illinois, 2008

Product	Rate[2]	Potato leafhopper[1]				Tarnished plant bug[1]			
		19 August	26 August (7 DAT)[3]	2 September (14 DAT)[3]	9 September (21 DAT)[3]	19 August	26 August (7 DAT)[3]	2 September (14 DAT)[3]	9 September (21 DAT)[3]
Cobalt 2.55 EC	7	0.75 a	0.75 a	3.00 a	1.50 a	0.50 a	7.75 a	10.25 bc	8.50 a
Cobalt 2.55 EC	13	1.25 a	0.50 a	3.75 a	1.50 a	1.25 a	6.25 ab	12.25 bc	1.75 b
GF2153	16	2.25 a	0.50 a	6.00 a	2.75 a	1.25 a	7.25 ab	13.00 bc	5.75 ab
Lorsban-4E	16	2.25 a	1.00 a	5.75 a	0.75 a	1.25 a	8.50 a	8.75 c	5.25 ab
Mustang Max	4	1.25 a	0.00 a	2.50 a	0.75 a	0.50 a	2.50 bc	17.50 ab	5.50 ab
Warrior 1CS	3.2	1.25 a	0.25 a	2.25 a	1.75 a	0.25 a	1.00 c	22.75 a	3.75 ab
UTC[4]	—	1.50 a	0.25 a	4.50 a	1.00 a	1.25 a	8.75 a	12.50 bc	4.00 ab

[1] Means were derived from the number of insects per 20 sweeps using a 15-inch diameter sweep net. Means followed by the same letter do not differ significantly (P= 0.05, Duncan's New Multiple Range Test).
[2] Rates of application of foliar-applied insecticides are ounces (oz) of product per acre.
[3] DAT = days after treatment (with foliar-applied insecticides).
[4] UTC = untreated check