

Insecticide Efficacy Ratings for *Empoasca* sp. Leafhoppers and Threecornered Alfalfa Hoppers, and Comparative Insecticidal Application Effects on Big-Eyed Bugs

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Abstract

*This report summarizes data from several studies conducted along the Colorado River in recent years for control of *Empoasca* sp. leafhoppers, threecornered alfalfa hoppers, and western big-eyed bugs. Data were re-arranged and presented in an easy to understand format for insect pests control utilizing a time sequence corresponding to sampling dates after application, a method not always readily available.*

Introduction

Comparative knowledge of insecticide efficacies against target pests assists growers and professional crop advisors (PCAs) to be more effective and should increase economic returns. Data are often available for target pests, but are not as readily available for comparative effects on beneficial insects.

Western big-eyed bugs (*Geocoris pallens* Stål) are one of the most prevalent predators in fall alfalfa, feeding on many other insects such as lygus bugs, beet armyworms and other insects as available. Insect treatments for a pest could result in an increase in other pests due to reduction/elimination of this and other predators. Comparative data for insecticidal effects on big-eyed bugs is not often readily available to assist those making insecticide control decisions.

This report combines data from several studies conducted along the Colorado River in recent years to collect and make such readily available to those interested.

Methods and Materials

Data from three recent fall alfalfa insecticide trials that were conducted along the Colorado River in both Arizona and California (Parker, 1995; Blythe, CA, 1999, 2000; see Literature Cited for further information about studies) were utilized to construct a data base for insecticide efficacy for potato leafhopper complex (*Empoasca* sp.) leafhoppers and threecornered alfalfa hoppers (*Spissistilus festinus* Say). Adequate data were also available from these field trials on some beneficial insects that were also present in fall alfalfa such as western big-eyed bugs.

Available data were used to calculate percent reduction in insect pest numbers compared with the untreated check

at the various sample dates post treatment. This was also done for big-eyed bugs. A letter 'grade' was assigned for each sampling period (as data allowed) post treatment to facilitate both longevity on control as well as for ease of data comparisons for the leafhoppers and threecornered alfalfa hoppers. The letter grade assignment was not done for the big-eyed bugs, as preservation of these beneficial insects can be important in control of other alfalfa insects.

Results

Data as summarized in accompanying tables show that all rates of Baythroid 2 tested were very effective in controlling both leafhoppers and threecornered alfalfa hoppers throughout the sampling periods. This chemistry also reduced big-eyed bug numbers by over 60% for the duration of the studies.

WarriorT applications reduced big-eyed bugs more than other chemistries tested thus far. Rate responses were noted for control of leafhoppers as well, with control diminishing by 10 days post treatment. WarriorT was highly effective for control of threecornered alfalfa hoppers through 10 days post treatment.

Lannate LV was initially very effective for the first seven days against both leafhoppers and threecornered alfalfa hoppers, with a decline in leafhopper control at 10 days post treatment. This chemistry also decreased big-eyed bug numbers by 75% initially, but numbers of this insect were only reduced at this sample date.

Applications of Pounce at the 4 oz./acre rate resulted in similar leafhopper control to that of the 0.5 lbs. AI/acre rate of Dimethoate 2.67. Pounce provided slightly better control of the leafhoppers, while the application of Dimethoate was less disruptive to big-eyed bug numbers. Rate responses for big-eyed bugs were noted for Lorsban 4E, with the 2 pt/acre rate eliminating about 50% of the big-eyed bugs, while the 1 pt/acre rate only reduced numbers of this insect by 11-35%.

Additional testing is necessary to test more insecticides and their rates to further develop these data sets. It is expected that this information will enhance the efforts of PCAs and growers in management of fall insect pests in the desert southwest.

Literature Cited

- Rethwisch, M. D., E. Kruse, and M. D. Kruse. 1997. Comparison of Lorsban 4E and Spinosad 4SC for control of summer insects in alfalfa. Pp. 15-21. In 1997 University of Arizona College of Agriculture Forage and Grain Report, series P-110. M. Ottman, ed. 169 pp.
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Table 1. Ratings of insecticides and rates for control of threecornered alfalfa hopper and *Empoasca* sp. leafhoppers from field trials conducted utilizing ground application (20 gpa).

<u>Insecticide</u>	<u>Rate/acre</u>	<u>Empoasca Leafhoppers</u>				<u>Threecornered alfalfa hoppers</u>			
		<u>Days post treatment</u>				<u>Days post treatment</u>			
		<u>1</u>	<u>3-4</u>	<u>7</u>	<u>10</u>	<u>1</u>	<u>3-4</u>	<u>7</u>	<u>10</u>
Baythroid 2	2.8 oz	A+	A+	A+		A+	A+	A+	
Baythroid 2	2.4 oz	A	A+	A+	A+	A+	A+	A+	A+
Baythroid 2	2.0 oz	A+	A+	A+		A+	A+	A+	
Baythroid 2	1.6 oz	A+	A+	A+		A+	A+	A	

Dimethoate	0.5# ai/acre	C	B+	C+	D+	D+	C	C	C+

Lannate LV	1.5 pts	A	A+	B	D	A+	A	B	B

Lorsban 4E	2 pt	F	F	C		F	F	F	
Lorsban 4E	1 pt	F	F	F		F	F	F	

Pounce 3.2	4 oz	B+	B+	C	C+	C+	C+	D	D

WarriorT	3.84 oz	B	A	B+	C+	A	A+	A+	A+
WarriorT	3.2 oz	C+	B+	B	D+	A	A+	A+	A

Note: Both WarriorT ratings and the 2.4 oz/acre rate of Baythroid 2 are based on data from two field experiments. All other insecticide ratings are based on field experiment data which have not been compared in more than one field experiment.

Ratings are as follows (compared with untreated check):

A+ = 95-100% control; A = 90-94.9% control;
 B+ = 85-89.9% control; B= 80.0-84.9% control;
 C+ = 75-79.9% control; C= 70.0-74.9% control;
 D+ = 65-69.9% control; D= 60.0-64.9%;
 F =<60.0% control

Table 2. Comparative reduction percentages of western big-eyed bugs (*Geocoris pallens*) numbers in fall alfalfa following insecticide applications for control of fall alfalfa pests.

		Percent reduction of total big-eyed bugs			
		Days post treatment			
<u>Insecticide</u>	<u>Rate/acre</u>	<u>1</u>	<u>3-4</u>	<u>7</u>	<u>10</u>
Baythroid 2	2.8 oz			67.8	
Baythroid 2	2.4 oz	75.2	81.7	66.2	68.2
Baythroid 2	2.0 oz			61.0	
Baythroid 2	1.6 oz			64.4	

Dimethoate	0.5# ai/acre	24.8	++	12.5	9.0

Lannate LV	1.5 pts	75.2	++	++	13.6

Lorsban 4E	2 pt	50.5	47.6	55.4	
Lorsban 4E	1 pt	19.6	34.4	10.7	

Pounce 3.2	4 oz	49.6	45.5	32.5	++

WarriorT	3.84 oz	100.0	100.0	82.5	95.5
WarriorT	3.2 oz	75.0	70.0	76.2	81.9

Note: Both WarriorT ratings and the 2.4 oz/acre rate of Baythroid 2 are based on data from two field experiments. All other insecticide ratings are based on field experiment data which have not been compared in more than one field experiment. Numbers shown are percent reduction compared with the untreated check. The symbol ++ indicates that more big-eyed bugs were present than in the check, rather than a reduction.