Bermuda Grass Insect Control

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INTRODUCTION

More than 90 percent of the world's supply of bermuda grass seed for forage and turf plantings is produced in southwestern Arizona and southern California. In 1987, approximately 33,000 acres were designated for the production of bermuda grass seed in this region.

Certain insects have long been thought to cause economic damage to bermuda grass grown for seed. Thrips (Chirothrips falsus and C. mexicanus) cause damage by feeding upon developing seed. Planthoppers, although not directly feeding on the seed, affect harvesting and seed quality as a result of honeydew production. Other insect pests associated with bermuda grass seed production include armyworms, mealy bugs, mites, plant bugs and whiteflies.

This test was conducted to evaluate the potential damage caused by insects in bermuda grass grown for seed and the efficacy of five insecticides registered for their control.

MATERIALS AND METHODS

This test was conducted in Roll, Arizona on a three-year-old field of common bermuda grass. Five commercially registered and available insecticides were applied twice; once on May 26, 1988 and once on June 14, 1988 according to standard grower practices. All treatments were applied in 25 gallon per acre spray volumes with a 42.5 foot wide tractor-drawn ground sprayer. Plot sizes measured 85 X 1300 ft. set in a randomized complete block design with four replications.

Plots were monitored 1, 4, 11, and 18 days following the first application and 1, 7 and 13 days following the second application. Samples were taken with a 15 inch diameter sweep net. Fifty sweeps were made per plot early in the season (at 1, 4, and 11 days) due to low insect populations. All subsequent samples consisted of 10 sweeps per plot.

Yields were measured at harvest on July 11 and July 12, 1988 with an Arkfield weigh wagon. Subplots measuring 30.5 X 1225 ft. were harvested with a modified John Deere combine.

RESULTS AND DISCUSSION

Differences between insecticides were observed with the ethyl-methyl parathion treatment having significantly lower yields than other treatments (Figure 3).This yield reduction may be due in part to possible phytotoxicity of this insecticide as data did not indicate this much yield reduction due to insects alone. This data supports the belief that thrips are the most serious yield reducing insect pest.

Yield differences between insecticide treatments having good thrips control (i.e. all except ethyl methyl parathion) appear to be closely correlated with early season mirid numbers (Figure 3), a pest not previously thought to affect yield. Planthopper numbers did not have any effect upon seed yield nor were populations high enough to cause stickiness due to honeydew.

Figure 1. **CONTROL OF MIRIDS, PLANTHOPPERS, THRIPS, AND BIG EYED BUGS AT 11 DAYS AFTER INSECTICIDE APPLICATION** 1/
(Number of insects per 50 sweep in bermudagrass seed fields)

TREATMENT	PLANTHOPPERS (Adult + nymph) Mean ± St.Dev.	MIRIDS (Adult + nymph) Mean ± St.Dev.	THRIPS Mean ± St.Dev	BIG EYED BUGS (Adult + nymph) Mean ± St.Dev.
Ethyl-Methyl Parathion (6-3)	abc 328.0 ± 199.6	abc 199.3 ± 37.1	a 30.5 ± 41.2	ab 29.3 ± 24.4
Orthene (Acephate)	abc 186.3 ± 65.4	a 83.8 ± 5.3	a 2.5 ± 3.0	a 2.5 ± 1.9
Furadan (Carbofuran)	ab 132.5 ± 62.9	ab 161.5 ± 25.5	a 4.0 ± 2.4	ab 23.3 ± 11.3
Cymbush (Cypermethrin)	a 77.0 ± 19.0	bc 315.3 ± 54.5	a 25.5 ± 27.3	ab 23.8 ± 15.0
Di-Syston	c 455.8 ± 157.4	ab 163.0 ± 61.4	a 14.8 ± 26.2	ab 43.3 ± 32.9
Untreated Check	bc 403.8 ± 163.8	c 384.0 ± 209.8	a 47.7 ± 34.6	b 63.0 ± 38.7

Figure 2. **CONTROL OF PLANTHOPPERS, MIRIDS, THRIPS AND BIG EYED BUGS AT 18 DAYS AFTER TREATMENT IN BERMUDAGRASS SEED FIELDS**
(Number of insects per 10 net sweeps)

TREATMENT	PLANTHOPPERS (Adult + nymph) Mean ± St.Dev.	MIRIDS (Adult + nymph) Mean ± St.Dev.	THRIPS Mean ± St.Dev.	BIG EYED BUGS (Adult + nymph) Mean ± St.Dev.
Ethyl-Methyl Parathion (6-3)	b 113.3 ± 34.8	bc 157.3 ± 42.8	a 40.0 ± 35.5	ab 7.3 ± 3.3
Orthene (Acephate)	ab 80.8 ± 10.9	a 38.8 ± 7.0	a 12.0 ± 10.9	a 0.0 ± 0.0
Furadan (Carbofuran)	a 43.0 ± 18.6	a 37.5 ± 3.9	a 0.5 ± 1.0	ab 7.3 ± 7.8
Cymbush (Cypermethrin)	a 52.0 ± 4.5	c 231.5 ± 18.9	a 4.8 ± 3.8	b 18.8 ± 12.3
Di-Syston	b 133.3 ± 42.2	ab 75.0 ± 30.3	a 15.3 ± 16.2	ab 7.3 ± 8.8
Untreated Check	ab 93.0 ± 28.2	c 194.5 ±102.9	a 50.3 ± 42.2	b 17.3 ± 7.6

1/ Means followed by the same letter are not significantly different at the 0.05 level (Student-Newman-Keuls test).

Figure 3.

PERCENT CONTROL OF VARIOUS INSECTS AT 11 AND 18 DAYS POST TREATMENT

INSECTICIDE (# ai/A)	Thrips 11	Thrips 18	Planthoppers 11	Planthoppers 18	Mirids 11	Mirids 18	Yield (#/A)	
6-3 (1.0)	36.1	20.5	18.6	-21.8	48.1	19.2	956.8	a
Orthene (1.0)	94.6	76.1	53.8	13.1	78.2	80.1	1,223.1	b
Furadan (1.0)	91.6	99.0	67.1	53.8	57.9	80.7	1,187.6	b
Cymbush (0.15)	46.5	90.5	80.9	44.1	17.9	-19.0	1,153.7	b
Di-Syston (1.0)	69.0	69.6	-13.1	-43.3	57.6	61.4	1,195.1	b
Untreated	--	--	--	--	--	--	1,019.9	ab

Figure 4.

MIRID PLANT BUG POPULATIONS IN BERMUDAGRASS SEED FIELDS

FOLLOWING MAY 26TH INSECTICIDE TREATMENTS

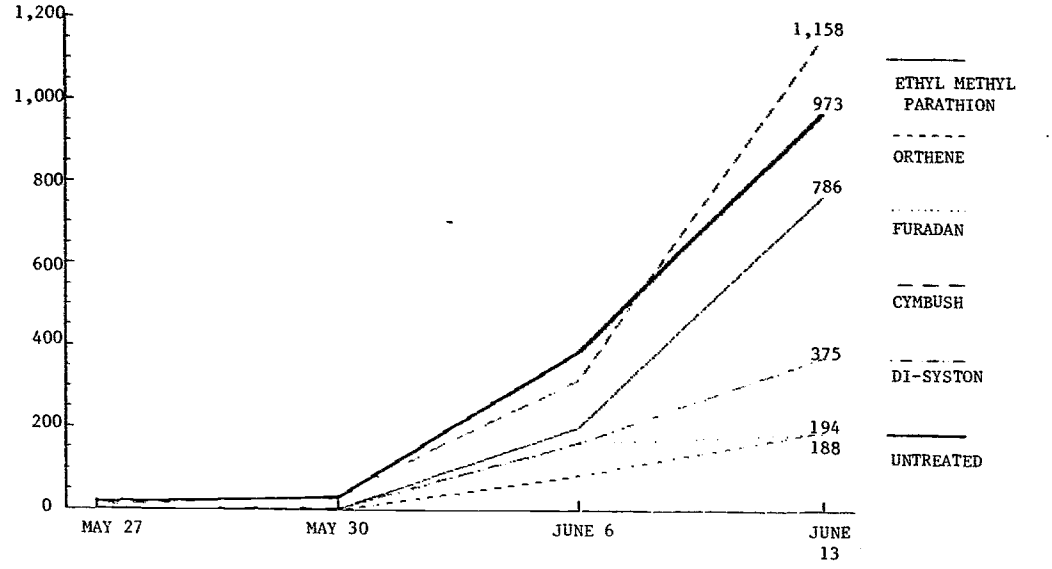


Figure 5.

PLANTHOPPER COMPLEX POPULATIONS IN BERMUDAGRASS SEED FIELDS

FOLLOWING MAY 26TH INSECTICIDE TREATMENTS

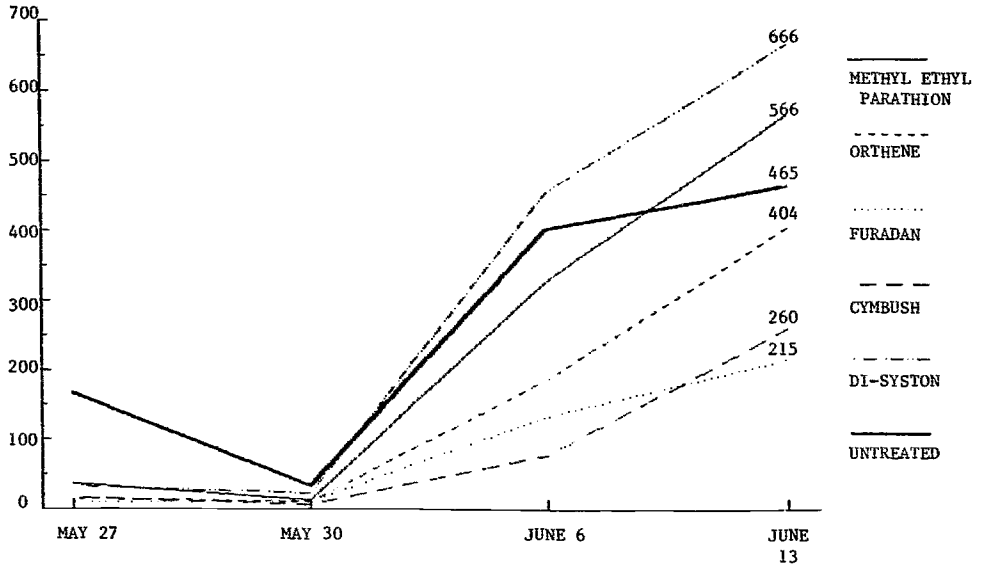


Figure 6.

THRIPS POPULATIONS IN BERMUDAGRASS SEED FIELDS

FOLLOWING MAY 26TH INSECTICIDE TREATMENTS

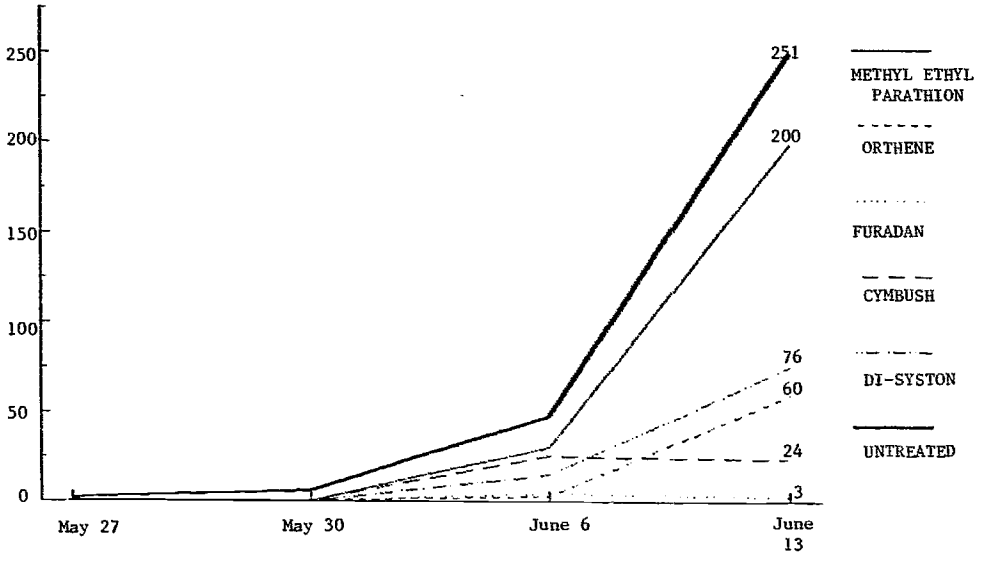
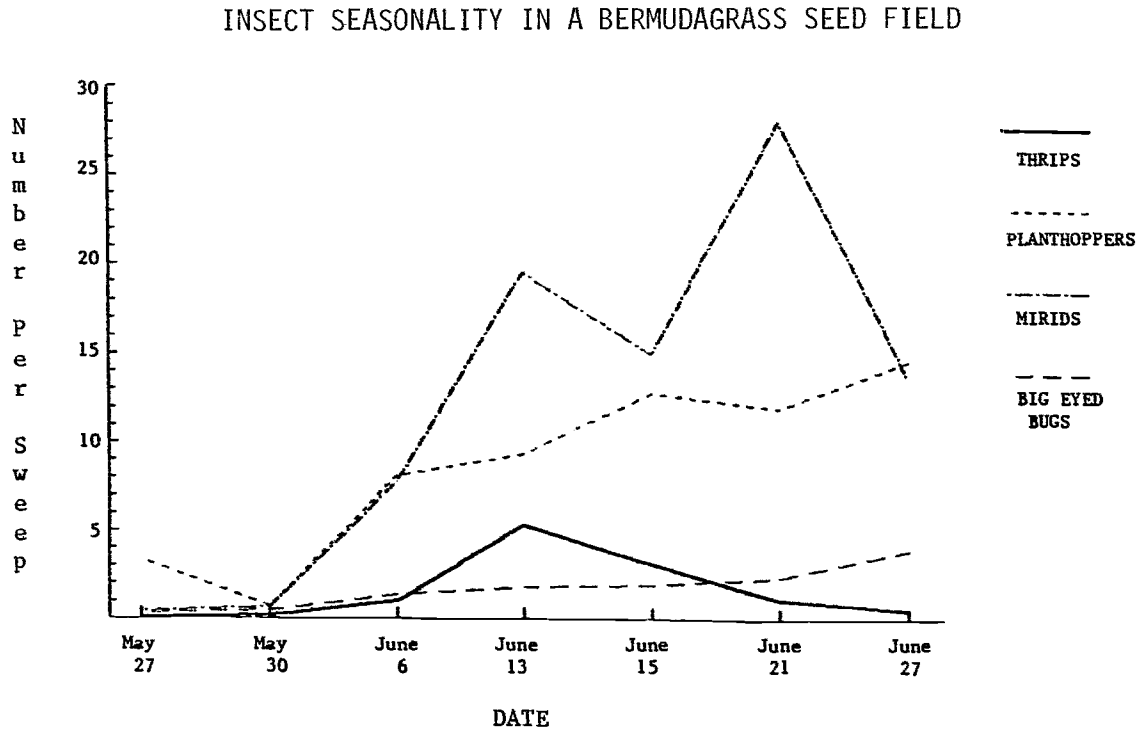


Figure 7. MEAN NUMBER OF BERMUDAGRASS SEED PEST INSECTS[1] FOLLOWING A MID SEASON INSECTICIDE APPLICATION

TREATMENT	Thrips			Plant Hoppers			Mirids		
	1 Day Pre	1 Day Post	7 Days Post	1 Day Pre	1 Day Post	7 Days Post	1 Day Pre	1 Day Post	7 Days Post
Ethyl Methyl Parathion	40.0	20.5	14.3	113.3	61.0	61.0	157.3	3.0	34.8
Orthene	12.0	2.3	3.3	80.8	57.3	52.3	38.8	1.5	8.5
Furadan	0.5	0.5	0.5	43.0	21.8	41.8	37.5	0.5	31.8
Cymbush	4.8	3.5	3.3	52.0	9.5	14.8	231.5	21.0	112.3
Di-Syston	15.3	5.5	12.3	113.3	44.3	71.8	75.0	1.8	49.3
Untreated	50.3	30.8	11.0	93.0	128.3	119.5	194.5	150.0	280.5

[1]Mean number of insects/10 sweeps, 4 replications

Figure 8.


INSECT SEASONALITY IN A BERMUDAGRASS SEED FIELD
Number Per Sweep
30
25
20
15
10
5
May 27
May 30
June 6
June 13
June 15
June 21
June 27
DATE
THRIPS
PLANTHOPPERS
MIRIDS
BIG EYED BUGS