



HEADWORM AND RICE STINK BUG CONTROL ON SORGHUM HEADS WITH SELECTED INSECTICIDES

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Summary

Declare, Lannate, Cobalt Advanced, Stallion, and Mustang Max effectively reduced headworms in sorghum, but as expected, Dimethoate was the least effective tested insecticide on headworms. All products tested reduced rice stink bug, but there numbers overall were low at the test site. No yield effects were observed in the relatively low headworm infestation.

Objective

The insecticide evaluation was conducted on sorghum to measure the impact of products on headworms and rice stink bug and to determine if there was any effect of the treatments on production factors.

Materials/Methods

Treatments were applied to Pioneer 83G19 hybrid sorghum planted March 9, 2011 on County Road 30 about 0.75 miles west of the intersection with FM 892 on the David Mayo Farm. Some of the seed was already in soft dough when insecticides were applied. Treatments were applied to 4 rows of 40-foot plots, and 3 nontreated rows were maintained on the side of each plot to prevent drift to evaluated rows. Treatments were arranged in a randomized complete block design with 4 replications of each treatment. Plots to which treatments were applied in each replication were established down the field rows so that each treatment in each replication was on the same set of rows. This arrangement was also used to limit the width of the test to allow the grower an easier way to skip over the test when applying treatment to the remainder of the field.

Insecticides were applied on 6/1 with a Spider Trac sprayer calibrated to deliver 5.1 gpa total volume through 4X hollow cone nozzles at 40 psi and at a speed of 4.2 mph.

Treatments were assessed by (1) shaking 10 heads exhibiting headworm damage into a 2.5 gallon bucket to count corn earworm, fall armyworm and rice stink bug on 5/31 [pretreatment], 6/3 [2 DAT], and 6/5 [4 DAT] from a different row section on each field visit on the outside treated rows; and (2) harvesting 13.75 feet row from one of the center rows in plots on 6/30. Sorghum samples were threshed on a laboratory machine, grain moisture and bushel weights were obtained for each plot, and grain yields were converted to 14% moisture.

Agriculture Research Manager (ARM revision 6.1.13) software was used to conduct analysis of variance and means were separated by LSD.

Results/Discussion

All but one insecticide tested provided effective control of headworms (96% corn earworm) by 2 DAT (Table 1). Dimethoate was ineffective, as expected, in providing significant headworm control. Declare (gamma-cyhalothrin), Lannate (methomyl), Cobalt (chlorpyrifos + gamma-cyhalothrin), Stallion (zeta-cypermethrin), and Mustang Max (zeta-cypermethrin) all provided excellent control of the headworms.

Rice stink bugs were reduced significantly by all insecticides even though several have been found not to provide the level of control needed in commercial sorghum fields (Table 2). The low number of rice stink bugs encountered at the test site probably did not create enough pressure to show the insecticide weakness. Dimethoate in previous studies has provided a high degree of rice stink bug control.

No differences were observed in grain moisture, bushel weight, or yield in any of the treatments (Table 3). Rapid crop maturity, decline in headworm numbers as they were about to reach the last instar, and a relatively low level infestation likely contributed to the lack of yield response with the insecticide treatments.

Table 1. Effect of insecticides on headworm numbers on sorghum heads, David Mayo Farm, Nueces County, TX, 2011.

Treatment (rate)	Headworms / 10 heads ^{2/}			
	Pretreat	2 DAT ^{3/}	4 DAT	Post-treatment Average
Declare 1.25 SC (1.54 oz/acre)	3.0 ^a	0.0 ^c	0.0 ^d	0.0 ^c
Dimethoate 4E (8.0 oz/acre)	5.0 ^a	1.5 ^b	2.0 ^{ab}	1.8 ^b
Declare + Dimethoate (1.54 oz/acre + 8.0 oz/acre)	3.0 ^a	0.0 ^c	0.0 ^d	0.0 ^c
Lannate 2.4 LV (24.0 oz/acre)	3.5 ^a	0.0 ^c	0.5 ^{cd}	0.3 ^c
Cobalt Advance 2.628EW (13.0 oz/acre)	2.8 ^a	0.0 ^c	1.3 ^{bc}	0.6 ^c
Stallion 3EC (11.7 oz/acre)	1.8 ^a	0.3 ^c	0.0 ^d	0.1 ^c
Mustang Max 0.8EC (4.0 oz/acre)	3.3 ^a	0.0 ^c	0.0 ^d	0.0 ^c
Nontreated	3.5 ^a	3.5 ^a	2.8 ^a	3.1 ^a
LSD (P=0.05)	NS ^{1/}	0.97	0.84	0.77
P > f	.6019	.0001	.0001	.0001

Means in a column followed by the same letter are not significantly different by ANOVA.

^{1/}NS = Not Significant

^{2/}96% headworms were corn earworm

^{3/}DAT = Days After Treatment

Table 2. Effect of insecticides on rice stink bug on sorghum heads, David May Farm, Nueces County, TX, 2011.

Treatment (rate)	Rice stink bugs/10 heads			
	Pretreat	2 DAT ^{2/}	4 DAT	Post-treatment Average
Declare 1.25 SC (1.54 oz/acre)	0.8 ^a	0.0 ^b	0.5 ^b	0.3 ^b
Dimethoate 4E (8.0 oz/acre)	0.3 ^a	0.3 ^b	0.3 ^b	0.3 ^b
Declare + Dimethoate (1.54 oz/acre + 8.0 oz/acre)	0.0 ^a	0.0 ^b	0.5 ^b	0.3 ^b
Lannate 2.4 LV (24.0 oz/acre)	0.3 ^a	0.0 ^b	0.0 ^b	0.0 ^b
Cobalt Advance 2.628EW (13.0 oz/acre)	0.5 ^a	0.5 ^b	0.3 ^b	0.4 ^b
Stallion 3EC (11.7 oz/acre)	0.5 ^a	0.3 ^b	0.5 ^b	0.4 ^b
Mustang Max 0.8EC (4.0 oz/acre)	2.5 ^a	0.0 ^b	0.0 ^b	0.0 ^b
Nontreated	0.8 ^a	1.5 ^a	4.5 ^a	3.0 ^a
LSD (P=0.05)	NS ^{1/}	0.67	2.11	1.25
P > f	.6609	.0017	.0039	.0010

Means in a column followed by the same letter are not significantly different by ANOVA.

^{1/}NS = Not Significant

^{2/} DAT = Days After Treatment

Table 3. Effect of insecticides on production factors on sorghum, David Mayo Farm, Nueces County, TX, 2011.

Treatment ^{1/} (rate)	Grain moisture %	Bushel Weight lb.	Yield ^{2/} lb/acre
Declare 1.25 SC (1.54 oz/acre)	9.6 ^a	55.0 ^a	4166 ^a
Dimethoate 4E (8.0 oz/acre)	9.8 ^a	54.9 ^a	4272 ^a
Declare + Dimethoate (1.54 oz/acre + 8.0 oz/acre)	9.8 ^a	55.0 ^a	4156 ^a
Lannate 2.4 LV (24.0 oz/acre)	9.6 ^a	54.5 ^a	3983 ^a
Cobalt Advance 2.628EW (13.0 oz/acre)	9.8 ^a	55.8 ^a	4134 ^a
Stallion 3EC (11.7 oz/acre)	9.6 ^a	55.5 ^a	4143 ^a
Mustang Max 0.8EC (4.0 oz/acre)	9.6 ^a	55.3 ^a	3994 ^a
Nontreated	9.6 ^a	55.3 ^a	4131 ^a
LDS (P – 0.05)	NS ^{1/}	NS	NS
P > F	.8071	.5665	.8568

Means in a column followed by the same letter are not significantly different by ANOVA.

^{1/}NS = Not Significant

^{2/}Yield at 14% moisture sorghum.

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