2013 Sorghum Variety Trial
Yield and Estimated Costs/Returns (per Acre)

Acknowledgements: M&N Yeary Farm, Mike Yeary, Lee Yeary
Chris Cernosek, Daniel Gonzalez, Grant Groene, Frank Escobedo, and Luis Ribera
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Varieties	NK266	SP3425	NK5418	NK585	NK4420	NK6638	KS735	SP6929	SP7868	NK8416	DKS37-07	DKS53-67	DKS54-00	P83G19	P84G62	P86G32
Yield (bu)	42.32	52.82	57.64	59.39	59.66	56.01	46.82	62.01	42.31	43.53	50.74	57.67	52.48	70.46	63.17	43.93
Price ($/bu)	6.95															
Gross Return ($/ac)	294.14	367.08	400.60	412.79	414.66	389.30	325.41	430.96	294.05	302.57	352.63	400.80	364.76	489.66	439.06	305.29
Seed																
$/bag	178.00	186.00	181.00	183.00	160.00	163.00	166.00	183.00	186.00	181.00	186.00	186.00	182.00	182.00	176.00	182.00
Seeds/lb	13200.00	17760.00	13500.00	12240.00	21500.00	16300.00	14300.00	14600.00	16790.00	13570.00	15000.00	15000.00	15500.00	14100.00	14100.00	14100.00
Seeds lbs/bag	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Seeds/bag	660000	888000	675000	612000	1075000	815000	715000	730000	839500	678500	750000	750000	775000	705000	705000	705000
Seeds/ac	45000															
Seed $/ac	12.14	9.43	12.07	13.46	6.70	9.00	10.45	11.28	9.97	12.00	11.16	11.16	10.57	11.62	11.23	11.62
Hauling & Handling																
Rate ($/bu)	0.22															
H&H ($/ac)	9.48	11.83	12.91	13.30	13.36	12.55	10.49	13.89	9.48	9.75	11.37	12.92	11.76	15.78	14.15	9.84
VC ($/ac)	153.60															
FC ($/ac)	111.84															
Total Costs	287.06	286.70	290.42	292.20	285.50	286.99	286.38	290.61	284.89	287.20	287.97	289.52	287.76	292.84	290.82	286.90

	NK266	SP3425	NK5418	NK585	NK4420	NK6638	KS735	SP6929	SP7868	NK8416	DKS37-07	DKS53-67	DKS54-00	P83G19	P84G62	P86G32
Net Returns	7.08	80.39	110.18	120.59	129.16	102.31	39.03	140.35	9.16	15.37	64.66	111.28	76.99	196.82	148.23	18.39

0	Net Returns	Rank
NK266	7.0821519	16
SP3425	80.385689	9
NK5418	110.18106	7
NK585	120.59089	5
NK4420	129.15703	4
NK6638	102.30983	8
KS735	39.031324	12
SP6929	140.34529	3
SP7868	9.1626439	15
NK8416	15.371799	14
DKS37-07	64.662429	11
DKS53-67	111.28218	6
DKS54-00	76.991226	10
P83G19	196.82366	1
P84G62	148.23032	2
P86G32	18.391239	13

EFFECTIVENESS OF INSECTICIDES ON CORN EARWORM AND FALL ARMYWORM ON SORGHUM HEADS

M&N Yeary Farm, Kleberg County, 2013

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SUMMARY: Two headworm infesting caterpillars to include corn earworm and fall armyworm were present in the test with corn earworm numbers far exceeding the fall armyworm. All insecticides reduced corn earworm numbers with Besiege reducing their numbers to zero by 1 DAT at which level they remained throughout the test. The Centric treatment was the least effective insecticide, and numbers in that treatment did not vary statistically from the untreated on two of the inspection dates. No differences were observed in fall armyworm due to their initial low numbers. The results from combining the two species in the analysis were similar to that of the corn earworm alone.

OBJECTIVES: Compare the effectiveness of insecticides on insect pests attacking sorghum and determine if treatments cause injury to sorghum.

MATERIALS/METHODS: The field study was conducted on the M&N Yeary Farm in Kleberg County (latitude 27.456648° longitude -97.892495°) on DKC 3707 hybrid sorghum with a single application of the treatments made on May 30, 3013. Insecticides were applied with a Spider Trac sprayer traveling at 4 mph equipped with 4X hollow cone nozzles (2/row) in a total spray volume of 5 gpa and at 40 psi. Plots were 6 rows wide on 38-inch centers and 40 feet long. Treatments were arranged in a randomized complete block experimental design with 4 replications. Due to wind speed the number of treated rows was reduced to two for each plot.

Treatments were assessed by shaking 5 sorghum heads in each plot into a 2.5 gallon beat bucket. Pretreatment counts were made one day before treatments were applied on 5/29 followed by counts 1, 2, 4, and 11 DAT [days after treatment]. The two headworm species were counted separately. Rice stink bug counts were made at 4 and 11 DAT. Their numbers were so low that they are not be shown in the data tables.

Agriculture Research Manager (ARM revision 6.1.13) computer software was used to conduct analysis of variance, and means were separated by LSD at the 0.05 probability level.

RESULTS/DISCUSSION: One day before treatments were applied corn earworm numbers exceeded treatment threshold, but 1 DAT (days after treatment) their numbers had been significantly reduced by all the tested insecticides (Table 1). However, counts at 2 DAT showed that in the Centric treated sorghum corn earworm numbers were not statistically different from the untreated sorghum. Similar results were observed for the Centric treatment throughout the evaluation period. The Karate treatment was the only insecticide that was not different from the Centric as measured for the post-treatment average counts. Corn earworm numbers in the Besiege treated plots were reduced to zero by 1 DAT and remained at zero throughout the evaluation period.

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The other headworm species (fall armyworm) numbers were relatively low in pretreatment counts and remained at low levels through the testing period (Table 2). No statistical differences were found in any of the fall armyworm counts on any inspection date as a result of these low numbers. It should be noted, however, that just as was seen with corn earworm Besiege treated sorghum did not have any caterpillars present following the insecticide treatment on any inspection date. Data from the combined two headworms followed the same pattern since the fall armyworm numbers were not high enough to have much impact on the results (Table 3). However, statistically there was not a difference in the Endigo ZCX, Karate Z, or the Centric treatments on any inspection date, but caterpillar numbers were always higher in the Centric treatment.

Rice stink bug counts were made on two dates, but their numbers were so low that the data is not presented.

ACKNOWLEDGMENTS: Thanks are extended to Syngenta Crop Protection for monetary support and to Mike and Lee Yeary for providing the test site and help with the test. We thank the Texas Grain Sorghum Producers Board since some of their funding was used in support of this project. Rudy Alaniz and Clint Livingston, Demonstration Assistants are acknowledged for their help in conducting the study.

Table 1. Corn earworm on sorghum heads following insecticide treatment, M&N Yeary Farm, Kleberg County, TX, 2013.

Treatment (rate)	Corn earworm per 5 sorghum heads					
	Pretreat	1 DAT[2/]	2 DAT	4 DAT	11 DAT	Post-treat avg.
Endigo ZCX 2.71 (4.0 oz/acre)	5.5[a]	0.5[b]	0.8[bc]	0.5[b]	0.3[a]	0.5[c]
Karate Z 2.08 (1.92 oz/acre)	4.0[a]	0.8[b]	1.5[bc]	0.8[b]	0.3[a]	0.8[bc]
Centric 40 WG (3.5 oz/acre)	4.8[a]	1.3[b]	2.3[ab]	3.3[a]	0.5[a]	1.8[b]
Besiege 1.252 (9.0 oz/acre)	5.3[a]	0.0[b]	0.0[c]	0.0[b]	0.0[a]	0.0[c]
Lannate LV 2.4 (16.0 oz/acre)	3.8[a]	0.0[b]	0.8[bc]	0.0[b]	0.0[a]	0.2[c]
Untreated	5.0[a]	4.5[a]	4.3[a]	2.0[ab]	1.5[a]	3.1[a]
LSD (P = 0.05)	NS[1/]	1.41	2.00	2.13	1.44	1.15
P > F	.3527	.0001	.0058	.0319	.2832	.0003

Means in a column followed by the same letter are not significantly different by ANOVA.
[1/]NS = Not Significant
[2/]DAT = Days After Treatment

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Table 2. Fall armyworm on sorghum heads following insecticide treatment, M&N Yeary Farm, Kleberg County, TX, 2013.

Treatment (rate)	Fall armyworm per 5 sorghum heads					
	Pretreat	1 DAT[2/]	2 DAT	4 DAT	11 DAT	Post-treat avg.
Endigo ZCX 2.71 (4.0 oz/acre)	2.0[a]	0.5[a]	0.3[a]	1.0[a]	0.0[a]	0.4[a]
Karate Z 2.08 (1.92 oz/acre)	1.5[a]	0.5[a]	0.0[a]	1.3[a]	0.0[a]	0.4[a]
Centric 40 WG (3.5 oz/acre)	0.8[a]	0.5[a]	0.0[a]	1.0[a]	0.0[a]	0.4[a]
Besiege 1.252 (9.0 oz/acre)	1.5[a]	0.0[a]	0.0[a]	0.0[a]	0.0[a]	0.0[a]
Lannate LV 2.4 (16.0 oz/acre)	1.8[a]	0.3[a]	0.0[a]	0.5[a]	0.0[a]	0.2[a]
Untreated	0.0[a]	0.5[a]	0.8[a]	1.0[a]	0.5[a]	0.7[a]
LSD (P = 0.05)	NS[1/]	NS	NS	NS	NS	NS
P > F	.2751	.7951	.1869	.5278	.4509	.1301

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. Corn earworm and fall armyworm on sorghum heads following insecticide treatment, M&N Yeary Farm, Kleberg County, TX, 2013.

Treatment (rate)	Corn earworm & fall armyworm per 5 sorghum heads					
	Pretreat	1 DAT[2/]	2 DAT	4 DAT	11 DAT	Post-treat avg.
Endigo ZCX 2.71 (4.0 oz/acre)	7.5[a]	1.0[bc]	1.0[bc]	1.5[a]	0.3[a]	0.9[bc]
Karate Z 2.08 (1.92 oz/acre)	5.5[a]	1.3[bc]	1.5[bc]	2.0[a]	0.3[a]	1.3[bc]
Centric 40 WG (3.5 oz/acre)	5.5[a]	1.8[b]	2.3[b]	4.3[a]	0.5[a]	2.2[b]
Besiege 1.252 (9.0 oz/acre)	6.8[a]	0.0[c]	0.0[c]	0.0[a]	0.0[a]	0.0[c]
Lannate LV 2.4 (16.0 oz/acre)	5.5[a]	0.3[c]	0.8[bc]	0.5[a]	0.0[a]	0.4[c]
Untreated	5.0[a]	5.0[a]	5.0[a]	3.0[a]	2.0[a]	3.8[a]
LSD (P = 0.05)	NS[1/]	1.43	2.06	NS	NS	1.35
P > F	.4177	.0001	.0019	.0502	.1355	.0003

Means in a column followed by the same letter are not significantly different by ANOVA.
[1/]NS = Not Significant
[2/]DAT = Days After Treatment

EVALUATION OF INSECTICIDES FOR CONTROL OF CATERPILLAR PESTS IN SORGHUM

M&N Yeary Farm, Kleberg County, 2013

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SUMMARY: Two species of sorghum headworm (corn earworm and fall armyworm) were present in the test site where various insecticides were evaluated. All insecticides provided effective control, but Stallion treated sorghum on each inspection date had higher numbers of corn earworm than the other treatments but not statistically different from the other tested insecticides. Fall armyworm numbers were low and no statistical differences were observed on any of the sampling dates.

OBJECTIVES: Compare the effectiveness of insecticides on caterpillar pests attacking sorghum.

MATERIALS/METHODS: The field study was conducted on the M&N Yeary Farm in Kleberg County (latitude 27.456648° longitude -97.892495°) on DKC 3707 hybrid sorghum with a single application of the treatments made on May 30, 3013. Insecticides were applied with a Spider Trac sprayer traveling at 4 mph equipped with 4X hollow cone nozzles (2/row) in a total spray volume of 5 gpa and at 40 psi. Plots were 6 rows wide on 38-inch centers and 40 feet long. Due to wind speed the number of treated rows was reduced to two for each plot. Treatments were arranged in a randomized complete block design with 4 replications.

Treatments were assessed by shaking 5 sorghum heads in each plot into a 2.5 gallon beat bucket. Pretreatment counts were made one day before insecticides were applied on 5/29 followed by counts 1, 2, 4, and 11 DAT [days after treatment]. The two headworm species were counted separately. Rice stink bug counts were made at 4 and 11 DAT. Their numbers were so low that they are not be shown in the data tables.

Agriculture Research Manager (ARM revision 6.1.13) computer software was used to conduct analysis of variance, and means were separated by LSD at the 0.05 probability level.

RESULTS/DISCUSSION: One day before treatments were applied corn earworm numbers exceeded treatment threshold, but 1 DAT (days after treatment) their number were significantly reduced in all insecticide treated sorghum (Table 1). At 1 DAT Stallion provided statistically a lower level of control compared with all other tested materials, but by 2 DAT there were no significant differences among the insecticides. However, numerically Stallion treated sorghumcontinued to have the greater number of corn earworm. Prevathon and Belt treated sorghum reduced corn earworm numbers to zero by 4 DAT. Few caterpillars remained in the test site by 11 DAT.

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The fall armyworm was at relatively low population in the sorghum test (Table 2), and no statistical differences were observed in the test data for this caterpillar. When both species were combined, statistical differences were observed in the pretreatment counts possibly due to random clumping and/or sampling errors (Table 3). However, by 1 DAT all insecticides were found to be effective.

ACKNOWLEDGMENTS: Thanks are extended to DuPont Crop Protection, Bayer CropScience, and FMC Corporation for monetary support and to Mike and Lee Yeary for providing the test site and help with the test. We thank the Texas Grain Sorghum Producers Board since some of their funding was used in support of this project. Rudy Alaniz and Clint Livingston, Demonstration Assistants are acknowledged for their help in conducting the study.

Table 1. Effect of insecticides on corn earworm infesting sorghum heads, M&N Yeary Farm, Kleberg County, TX, 2013.

Treatment (rate)	Corn earworm per 5 sorghum heads					
	Pretreat	1 DAT[2/]	2 DAT	4 DAT	11 DAT	Post-treat avg.
Prevathon 0.43SC (10.0 oz/acre)	5.5[a]	0.5[c]	0.0[b]	0.0[b]	0.0[a]	0.1[c]
Prevathon 0.43SC (14.0 oz/acre)	6.5[a]	0.3[c]	0.0[b]	0.0[b]	0.0[a]	0.1[c]
Prevathon 0.43SC (20.0 oz/acre)	8.0[a]	0.0[c]	0.3[b]	0.0[b]	0.0[a]	0.1[c]
Prevathon 0.43SC + Asana XL (10.0 oz/acre) + (5.8 oz/acre)	6.3[a]	0.0[c]	0.0[b]	0.0[b]	0.0[a]	0.0[c]
Belt 4.0SC (3.0 oz/acre)	8.5[a]	0.8[c]	0.5[b]	0.0[b]	0.0[a]	0.3[c]
Stallion 3.03 (11.75 oz/acre)	5.8[a]	3.0[b]	1.5[b]	0.8[b]	0.3[a]	1.4[b]
Mustang MAXX 0.8 (4.0 oz/acre)	5.3[a]	0.3[c]	0.3[b]	0.3[b]	0.0[a]	0.2[c]
Untreated	7.0[a]	5.5[a]	3.5[a]	2.3[a]	0.5[a]	2.9[a]
LSD (P = 0.05)	NS[1/]	1.88	1.56	1.28	NS	0.64
P > F	.0788	.0001	.0013	.0159	.1503	.0001

Means in a column followed by the same letter are not significantly different by ANOVA.
[1/]NS = Not Significant
[2/]DAT = Days After Treatment

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Table 2. Effect of insecticides on fall armyworm infesting sorghum heads, M&N Yeary Farm, Kleberg County, TX, 2013.

Treatment (rate)	Fall armyworm per 5 sorghum heads					
	Pretreat	1 DAT[2/]	2 DAT	4 DAT	11 DAT	Post-treat avg.
Prevathon 0.43SC (10.0 oz/acre)	1.8[a]	0.0[a]	0.0[a]	0.0[a]	0.0[a]	0.0[a]
Prevathon 0.43SC (14.0 oz/acre)	1.8[a]	0.0[a]	0.0[a]	0.0[a]	0.0[a]	0.0[a]
Prevathon 0.43SC (20.0 oz/acre)	1.3[a]	0.5[a]	0.0[a]	0.0[a]	0.0[a]	0.1[a]
Prevathon 0.43SC + Asana XL (10.0 oz/acre) + (5.8 oz/acre)	0.8[a]	0.0[a]	0.0[a]	0.0[a]	0.0[a]	0.0[a]
Belt 4.0SC (3.0 oz/acre)	0.5[a]	0.8[a]	0.0[a]	0.0[a]	0.0[a]	0.2[a]
Stallion 3.03 (11.75 oz/acre)	0.3[a]	0.0[a]	0.0[a]	0.5[a]	0.3[a]	0.2[a]
Mustang MAXX 0.8 (4.0 oz/acre)	1.5[a]	0.3[a]	0.0[a]	0.3[a]	0.0[a]	0.1[a]
Untreated	0.5[a]	0.8[a]	0.3[a]	0.8[a]	0.0[a]	0.4[a]
LSD (P = 0.05)	NS[1/]	NS	NS	NS	NS	NS
P > F	.4430	.2578	.4586	.1567	.4586	.0845

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 the combination of corn earworm and fall armyworm infesting sorghum heads, M&N Yeary Farm, Kleberg County, TX, 2013.

Treatment (rate)	Corn earworm & fall armyworm per 5 sorghum heads					
	Pretreat	1 DAT[2/]	2 DAT	4 DAT	11 DAT	Post-treat avg.
Prevathon 0.43SC (10.0 oz/acre)	7.3[bcd]	0.5[c]	0.0[c]	0.0[b]	0.0[b]	0.1[c]
Prevathon 0.43SC (14.0 oz/acre)	8.3[abc]	0.3[c]	0.0[c]	0.0[b]	0.0[b]	0.1[c]
Prevathon 0.43SC (20.0 oz/acre)	9.3[a]	0.5[c]	0.3[bc]	0.0[b]	0.0[b]	0.2[c]
Prevathon 0.43SC + Asana XL 10.0 oz/acre) + (5.8 oz/acre)	7.0[cd]	0.0[c]	0.0[c]	0.0[b]	0.0[b]	0.0[c]
Belt 4.0SC (3.0 oz/acre)	9.0[ab]	1.5[bc]	0.5[bc]	0.0[b]	0.0[b]	0.5[c]
Stallion 3.03 (11.75 oz/acre)	6.0[d]	3.0[b]	1.5[b]	1.3[b]	0.5[a]	1.6[b]
Mustang MAXX 0.8 (4.0 oz/acre)	6.8[cd]	0.5[c]	0.3[bc]	0.5[b]	0.0[b]	0.3[c]
Untreated	7.5[a-d]	6.3[a]	3.8[a]	3.0[a]	0.5[a]	3.4[a]
LSD (P = 0.05)	1.95	2.43	1.39	1.46	0.42	0.66
P > F	.0284	.0003	.0001	.0028	.0442	.0001

Means in a column followed by the same letter are not significantly different by ANOVA.
[1/]NS = Not Significant
[2/]DAT = Days After Treatment