

Title: Evaluating the Profitability of Corn and Grain Sorghum Insect Management with Seed Treatment and Standard At-Planting Insecticides

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Status: Third Year - Final

Crop: Corn and Grain Sorghum

Planting Date: NEREC – April 27, 2007
Marianna – May 3, 2007
Rohwer – May 1, 2007

Corn

Insect pressure was generally light at the NEREC location (node injury rating of 0.52 for the untreated plots, Table 2). There was higher pressure at the Marianna and Rohwer locations (Tables 1 & 3). Root damage ratings were taken based on the Iowa State node injury scale. This is a 0 to 3 scale with 0 = no damage, 1= root pruning on an entire node, 2= root pruning on 2 entire nodes and 3= root pruning on 3 entire nodes. All treatments numerically had lower root damage ratings at Rohwer and Marianna, but only the RootGard variety had significantly lower damage at the Marianna location.

There were slight differences in yield at the Marianna location (Table 1). Morning glory's over-ran some plots at Marianna late in the season and therefore yields are not reported for the Gaucho and Poncho treatments because too many plots were adversely affected by morning glory's in these treatments. Cruiser and Poncho had both positive yield increases and positive economic returns at Marianna (Table 1). All treatments except the Rootgard line had positive yield increases and positive economic returns at NEREC (Table 2). All treatments except for Force gave positive yield increases at Rohwer (Table 3). However, only the seed treatments gave a positive economic return at the Rohwer location (Table 3).

Summary

The average yield increase and economic returns for all three locations (NEREC, Marianna and Rohwer) and all three years (2005, 2006 and 2007) of the study are summarized in Table 4 and Figure 2. Economic returns were calculated using a market price of \$3/bushel for corn and the dollar cost of each of the insecticide treatments. Seed treatments cost on average \$7/acre, Lorsban - \$17/acre, Aztec - \$36.50/acre, Force - \$22/acre, Counter - \$17/acre. The last column in Table 4 represents the percentage of times each treatment resulted in a positive economic return across all locations and years of the study. For example, Cruiser resulted in a positive economic return 77.8% of the time in the study. Looking at the seed treatments as a whole resulted in an average of \$31/acre return across years (Table 4). Granular treatments grouped together resulted in an average negative return or loss of \$16.71/acre across years (Table 4).

No

Based on the results of this study a grower could expect an increase of about 10 bushels/acre from a seed treatment insecticide and an increase of about 2 bushels/acre from granular insecticides. Since granular insecticides cost between \$17-\$36/acre the odds of an economic return are slim. Due to their lower cost and higher yield increase, seed treatments appear to be a much better investment for insect control.

Table 1. Plant stand, grubs and rootworm, corn root damage and yield at Marianna in 2007.

Treatment	Rate per 1000 feet	Plants per Acre	Node Injury Damage 0-3 scale	Yield Bushels /acre	Yield Increase Bushels/acre	Net Return \$/Acre
Untreated		28960 a	1.04 a	186 abc		
Cruiser	0.8 mg	31386 a	0.63 ab	205 a	19	\$50.00
Gaucho	0.6 mg	31221 a	0.63 ab	--		
Poncho	0.8 mg	29921 a	0.53 ab	--		
Lorsban 15G	8 oz	27935 a	0.51 ab	170 c	(-16)	(-\$65.04)
Aztec 2.1G	6.7 oz	28557 a	0.51 ab	173 bc	(-13)	(-\$75.51)
Force 3G	5 oz	30632 a	0.60 ab	202 ab	16	\$25.69
Counter 15G	8 oz	27724 a	0.79 ab	169 c	(-17)	(-\$68.31)
RootGard		30211 a	0.45 b	180 bc	(-31)	
RootGard Sis		29646 a	0.75 ab	211 a		

Table 2. Plant stand, grubs and rootworm, corn root damage and yield at Keiser, 2007.

Treatment	Rate per 1000 feet	Plants per Acre	Plant Height (inches) 3 wks	Node Injury Damage Scale 0-3	Yield Bushels /acre	Yield Increase Bushels /Acre	Net Return \$/Acre
Untreated		28170 a	8.91 a	0.52 a	211 b		
Cruiser	0.8 mg	34010 a	7.46 b	0.20 a	222 ab	11	\$26.00
Gaucho	0.6 mg	31605 a	7.61 b	0.23 a	269 ab	58	\$167
Poncho	0.8 mg	30574 a	8.52 a	0.50 a	222 ab	11	\$26.00
Lorsban 15G	8 oz	27483 a	6.89 b	0.51 a	222 ab	10	\$12.96
Aztec 2.1G	6.7 oz	26452 a	7.36 b	0.53 a	235 ab	24	\$35.49
Force 3G	5 oz	30574 a	7.09 b	0.25 a	243 ab	31	\$70.69
Counter 15G	8 oz	26108 a	8.46 a	0.51 a	231 ab	20	\$42.69
RootGard		32292 a	7.41 b	0.23 a	256 ab	(-25)	
RootGard Sis		30918 a	7.08 b	0.50 a	281 a		

Table 3. Plant stand and yields at Rohwer, 2007.

Treatment	Rate per 1000 feet	Plants per Acre	Node Injury Scale 0-3	Yield Bushels /acre	Yield Increase Bushels /Acre	Net Return \$/Acre
Untreated		30778 a	1.15 a	178 a		
Cruiser	0.8 mg	31036 a	0.89 a	183 a	5	\$8.00
Gaicho	0.6 mg	31466 a	0.66 a	184 a	6	\$11.00
Poncho	0.8 mg	30606 a	0.56 a	190 a	12	\$29.00
Lorsban 15G	8 oz	30090 a	0.71 a	183 a	5	(-\$2.04)
Aztec 2.1G	6.7 oz	30520 a	0.74 a	183 a	5	(-\$21.51)
Force 3G	5 oz	31208 a	0.91 a	178 a	0	(-\$22.31)
Counter 15G	8 oz	31036 a	1.08 a	179 a	1	(-\$14.31)
RootGard		32153 a	1.00 a	196 a	19	
RootGard Sis		28800 a	0.58 a	177 a		

Figure 1. Average Yield Across all Locations 2007.

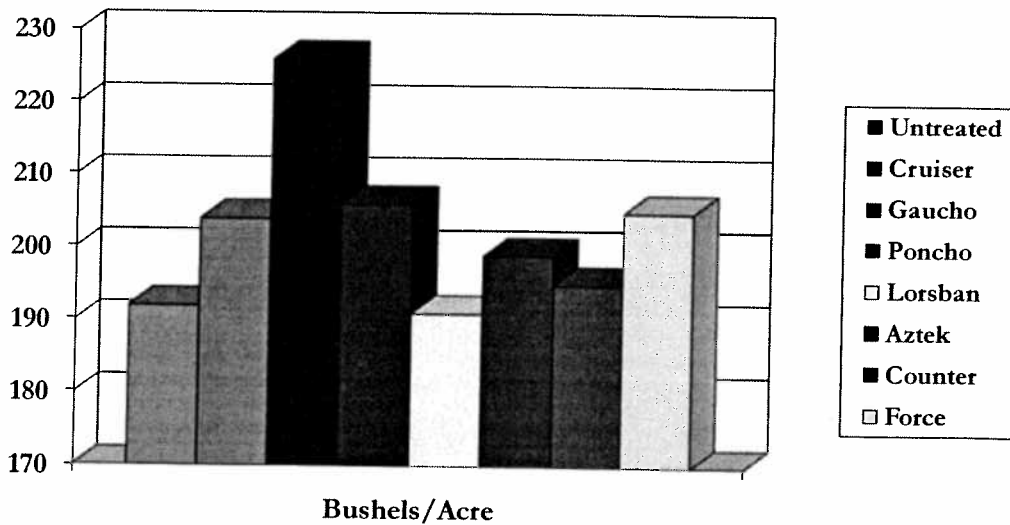
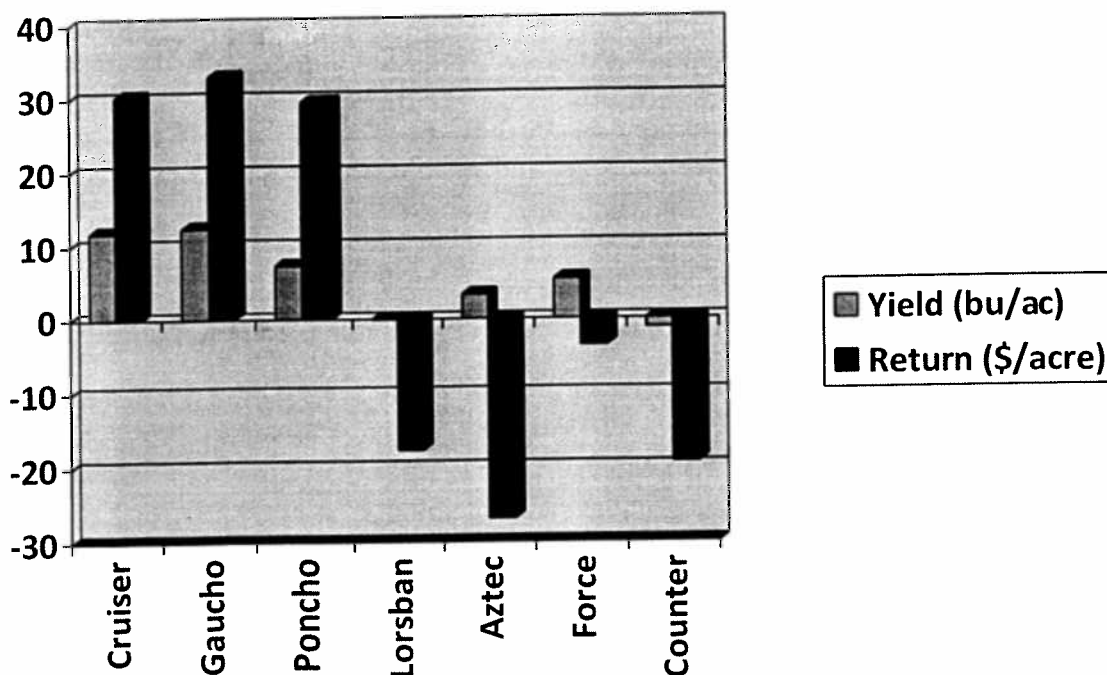


Table 4. Yield Increase and Economic Return across All Locations and All Years.

Treatment	Average Yield Increase (Bu/Ac)	Average Return (\$/Acre)	Percent Positive Return
Cruiser	11.8	\$30.33	77.8
Gaucho	12.4	\$33.00	60.0
Poncho	7.3	\$29.50	40.0
Lorsban 15G	(-0.1)	(-\$17.71)	22.2
Aztec 2.1G	3.3	(-\$26.84)	33.3
Force 3G	5.4	(-\$3.64)	55.6
Counter 15G	(-1.2)	(-\$19.31)	33.3
RootGuard			33.3
Seed Treatments		\$31.00	72.0
Granular Trts		(-\$16.71)	36.0
Granular Trts (without 2006)		(-\$4.12)	46.4

Figure 2. Yield Increase and Economic Return Across All Locations and All Years.



Grain Sorghum

Insect pressure was also very light at all three locations in the grain sorghum test plots as well. Plots were planted on the same day as the corn plots above at each location. There were no significant yield differences between treatments in 2007 (Table 5). Table 6 gives the average yield increase across all locations and all years. Gaucho was the only treatment that gave an average positive increase.

Summary

Average yield increase across all three locations was minimal and was not statistically significant. Seed treatments apparently do not give any yield benefits in the absence of insect pressure in grain sorghum. The low and/or negative yield increase, coupled with the cost of each material, indicate the use of a prophylactic insecticide treatment at planting in grain sorghum is not economical.

Table 5. Grain sorghum yields in pounds per acre at all three locations in 2007.

Insecticide	Rate/Acre	Yield lbs/acre NEREC	Yield lbs/acre Marianna	Yield lbs/acre Rohwer	Ave. Yield Difference
Untreated		5375 a	5825 a	3313 a	
Gaucho 480	8 oz/cwt	5522 a	5420 a	3455 a	-116
Cruiser	5.1 oz/cwt	5430 a	5471 a	3255 a	-119
Poncho	5.1 oz/cwt	5377 a	5172 a	2426 a	-513
Temik 15G	6.7 lbs	5371 a	5450 a	2682 a	-337

Table 6. Grain sorghum yield increase averaged across locations and years.

Insecticide	Rate/Acre	Ave Yield Increase (lbs/acre)	Ave Cost (\$/acre)
Gaucho 480	8 oz/cwt	118	\$4.25
Cruiser	5.1 oz/cwt	(-74)	\$4.25
Poncho	5.1 oz/cwt	(-118)	\$4.25
Temik 15G	6.7 lbs	(-264)	\$20

