CORN AND GRAIN SORGHUM PROMOTION BOARD
2006 Annual Progress Report

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

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Status: Second Year

Crop: Corn and Grain Sorghum

Planting Date: NEREC – April 24, 2006
Marianna – April 26, 2006
Rohwer – April 12, 2006

Corn

Insect pressure was generally light at the NEREC and Rohwer locations. There was significant pressure from annual white grubs and southern corn rootworm larvae at the Marianna location (Table 1). Root damage ratings were taken based on a 0 to 5 scale with 0 = no damage and 5 = severe root pruning. All treatments numerically had lower root damage (Table 1). There was some light flea beetle pressure at the Keiser location (Table 2). All treatments significantly suppressed flea beetles with the exception of Premiere and Lorsban (Table 2). The granular treatments in general had lower plant stand counts than either the untreated check or the seed treatments at both NEREC and Marianna locations. This may be due to some negative effect the granular materials may have had on germination.

There were slight differences in yield at the Marianna location (Table 1) and more drastic effects detected at the NEREC location (Table 2). However, it is difficult to correlate yield losses to insects at either location. The effect of low plant stand at these two locations seems to correlate somewhat and may be confounding the effects from insect feeding. There were no significant yield differences at the Rohwer location (Table 3).

Only Cruiser and Poncho had yield increases over the untreated check when averaged across all three locations this season. All of the in-furrow granular insecticides averaged 10-12 bushel/acre losses. This is most likely due to the effect on germination at the NEREC and Marianna locations effecting yields negatively.

Summary

Yield increases from treatments were not consistent from 2005 to 2006. In 2005, all treatments with the exception of Counter resulted in significant yield increases over the untreated check. In 2005, all yield increases also resulted in increased profits of $10-$20 per acre. In 2006, only the Cruiser and Poncho treatments resulted in yield increases. However, only the Cruiser treatment resulted in a large enough yield increase to result in a profit. Based on the data from the two years of the study, a grower could expect an at-planting insecticide to result in a yield increase that would pay for the cost of the treatment about 50% of the time. However, in 2006 the granular treatments did have an effect on plant stand and/or emergence at two of the locations as noted earlier. Further investigation did turn up information that most of the granular insecticides can have a detrimental effect on germination under extreme conditions. Environmental conditions at the Marianna and Keiser locations were cool and wet soon after planting. These conditions in and of themselves, can result in a negative effect on germination. The effect of these environmental conditions coupled with the effect of the insecticides resulted in a significant decrease in germination and lower yields at these two locations. These results confirm the need to avoid planting into conditions that are adverse to germination, particularly when using a granular insecticide.

Table 1. Plant stand, grubs and rootworm, corn root damage and yield at Marianna in 2006.

Treatment	Rate per 1000 feet	Plants per Acre	White Grubs /5 plants	Southern Corn Rootworm /5 plants	Root Damage 0-5 scale	Yield Bushels /acre
Untreated		32966 ab	1.50 a	4.50 a	3.25 a	143 ab
Cruiser	0.25 mg	34683 a	0.00 c	0.00 b	1.75 a	142 ab
Cruiser	1.25 mg	31249 abc	0.00 c	0.25 b	2.00 a	147 ab
Gaucho	0.6 mg	27129 a-d	0.00 c	0.25 b	1.75 a	145 ab
Gaucho	1.34 mg	31936 ab	0.75 abc	0.25 b	2.00 a	150 a
Poncho	0.25 mg	25755 bcd	0.25 bc	0.25 b	2.24 a	138 ab
Poncho	1.25 mg	32623 ab	0.25 bc	0.00 b	2.00 a	151 a
Premiere	0.036 oz	27472 a-d	0.75 abc	1.25 b	2.00 a	138 ab
Lorsban 15G	8 oz	20261 de	1.00 ab	0.50 b	2.00 a	145 ab
Aztec 2.1G	6.7 oz	22664 de	0.50 bc	0.50 b	1.50 a	141 ab
Force 3G	5 oz	16140 e	0.25 bc	0.50 b	1.75 b	136 b
Counter 20G	6 oz	24725 cd	0.50 bc	0.25 b	1.50 a	134 b

Table 2. Plant stand, grubs and rootworm, corn root damage and yield at Keiser, 2006.

Treatment	Rate per 1000 feet	Plants per Acre	Percent Flea Beetle Damage	Southern Corn Rootworm /5 plants	Root Damage 0-5 scale	Yield Bushels /acre
Untreated		27650 abc	5.00 a	2.50 a	2.25 a	138 abc
Cruiser	0.25 mg	28350 ab	2.50 ab	0.00 b	1.00 b	161 a
Cruiser	1.25 mg	27650 abc	0.00 b	0.00 b	1.00 b	138 abc
Gaucho	0.6 mg	27300 abc	2.50 ab	0.00 b	0.75 b	121 bcd
Gaucho	1.34 mg	25900 abc	3.75 a	0.00 b	1.00 b	134 a-d
Poncho	0.25 mg	24850 abc	1.25 b	0.00 b	1.25 b	146 ab
Poncho	1.25 mg	28700 a	1.25 b	0.00 b	1.00 b	126 a-d
Premiere	0.036 oz	24150 a-d	3.75 a	2.25 a	2.00 a	107 cd
Lorsban 15G	8 oz	17850 de	1.25 b	1.50 a	2.00 a	114 bcd
Aztec 2.1G	6.7 oz	17150 e	5.00 a	0.00 b	0.50 b	96 d
Force 3G	5 oz	20650 cde	6.25 a	0.25 ab	1.00 b	96 d
Counter 20G	6 oz	21350 b-e	6.25 a	0.00 b	1.00 b	119 bcd

Table 3. Plant stand and yields at Rohwer, 2006.

Treatment	Rate per 1000 feet	Plants per Acre	Yield Bushels /acre
Untreated		35370 abc	216 a
Cruiser	0.25 mg	36400 abc	217 a
Cruiser	1.25 mg	33310 bc	216 a
Gaucho	0.6 mg	33310 bc	220 a
Gaucho	1.34 mg	32280 c	199 a
Poncho	0.25 mg	37431 ab	223 a
Poncho	1.25 mg	35714 abc	218 a
Premiere	0.036 oz	36057 abc	214 a
Lorsban 15G	8 oz	36400 abc	199 a
Aztec 2.1G	6.7 oz	36400 abc	223 a
Force 3G	5 oz	34683 bc	225 a
Counter 20G	6 oz	39491 a	222 a

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 was some measurable flea beetle damage at the NEREC location. All treatments with the exception of Gaucho reduced flea beetle damage. The Cruiser treatment at the Marianna location was the only one that had yield that was significantly higher than the untreated check.

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.

Table 4. Flea beetle damage and grain sorghum yields in pounds per acre at all three locations.

Insecticide	Rate/Acre	Percent Flea Beetle Damage NEREC	Yield lbs/acre NEREC	Yield lbs/acre Marianna	Yield lbs/acre Rohwer
Untreated		4.50 a	5028 a	4636 b	4452 ab
Gaucho		2.75 ab	5879 a	4547 b	4749 ab
Cruiser		2.00 b	5079 a	4935 a	4073 b
Poncho		2.00 b	5494 a	4428 b	5022 a
Temik 15G	6.7 lbs	1.00 b	5116 a	4105 c	4703 ab