

## EVALUATION OF AT-PLANTING INSECTICIDES ON SORGHUM

Darby and Howard Salge Farm, Bee County, 1999

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**OBJECTIVES:** Several insect species reduce sorghum production by damaging seed, underground roots and crown, and above ground plant parts. Liquid, granular and seed treatment insecticides have proven to be effective in reducing this damage and subsequent yield increases often exceed treatment costs. This study was established to compare Gaucho and Sorghum Guard seed treatments, and Counter granular insecticide for effect on insect pests and grain yield.

**MATERIALS/METHODS:** DK52 hybrid sorghum seed (Concept III treated) was planted at 5 lb/acre (14,000 seed/lb) on 5 Mar in a mixed Victoria clay soil farmed under dryland conditions in northwest San Patricio County. Sorghum was planted at the site in 1998. The soil profile contained excellent moisture on the planting date and at the 4-inch depth was 68°F. Fertilizer applied was 50-5-0+0.3 Zn and Dual II (1.0 qt/acre) + Roundup (0.75 qt/acre) were broadcast for weed control at-planting. Plots were 6 rows (30-inch centers) x 1,656 ft and 3 replications were arranged in a randomized complete block design. A John Deere MaxEmerge model 7300 air planter and granular applicator were used to plant sorghum and apply Counter in a T-band. Sorghum Guard was mixed with the seed as a planter box treatment.

Treatment effects were assessed by (1) counting the number of greenbugs on 10 lower leaves and estimating the number of corn leaf aphids in 10 plant whorls on 6 Apr (31 days after planting = DAP), 17 Apr, 1 May and 8 May, (2) counting the number of plants on 10 row ft in the center rows of each plot on 6 Apr, (3) visually assigning a plant damage rating (1 = no damage up to 5 = reduced vigor, uneven growth and yellowing) in each plot on 6 Apr and (4) harvesting 0.55 acres of each plot on 27 Jul with a commercial combine. Harvested grain weights were adjusted to a 14% moisture standard.

**RESULTS/DISCUSSION:** Greenbugs were not observed in plots until 56 DAP (Table 1). Numerically, Counter and Gaucho treated sorghum contained substantially fewer greenbugs 56 DAP. Both Counter and Gaucho treated sorghum contained significantly fewer greenbugs by 63 DAP compared with the Sorghum Guard and untreated check plants; it was also true of the season average. However, at no time did greenbugs reach economically damaging numbers.

Significantly fewer corn leaf aphids were found 31 and 42 DAP in Counter and Gaucho treated compared with Sorghum Guard treated and the untreated check sorghum (Table 2). Although numerically fewer aphids were found in these same two treatments by 56 DAP, no statistical differences were detected. By 63 DAP, corn leaf aphids were significantly lower than the untreated check in only the Gaucho treatment as was true for the season average. Plant populations, damage ratings and yields are provided in Table 3. Plant populations were not different and the damage rating on 6 Apr (31 DAP) was lower in Counter and Gaucho treated sorghum. Yield differences were not detected. At harvest, many plants containing heavy heads were lodged

due to charcoal rot. We believe this adversely affected insecticide treated sorghum; note that the Counter and Gaucho treated sorghum actually had numerically lower yields compared to the untreated check. Obviously, a positive dollar return was not obtained by insecticide use.

**ACKNOWLEDGMENTS:** Darby and Howard Salge are thanked for their time, effort and equipment used in conducting this study. Support of this work by American Cyanamid and Gustafson, Inc. is appreciated.

Table 1. Number of **greenbugs** per 10 lower leaves on sorghum comparing insecticide treated seed and at-planting granular insecticide, Darby and Howard Salge Farm, Bee County, TX, 1999.

Treatment/rate	Days after planting (DAP)				Season avg
	31	42	56	63	
Counter 15G (4.4 oz/1000 ft)	0	0	13.7 a	25.0 b	9.7 b
Gaucho 480 F (8 oz/cwt seed)	0	0	33.3 a	11.0 b	11.1 b
Sorghum Guard <sup>a</sup> (5.34 oz/cwt seed)	0	0	80.0 a	154.3 a	58.6 a
Untreated	0	0	127.0 a	163.3 a	72.6 a
LSD (P=0.05)			NS	98.86	16.72
P>F			.1073	.0154	.0002

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

<sup>a</sup> Sorghum guard is a mixture of captan (32.75%), lindane (16.6%) and graphite.

Table 2. Number of **corn leaf aphids** per 10 plants on sorghum comparing insecticide treated seed and at-planting granular insecticide, Darby and Howard Salge Farm, Bee County, TX, 1999.

Treatment/rate	Days after planting				Season avg
	31	42	56	63	
Counter 15G (4.4 oz/1000 ft)	0.0 b	50.0 b	96.7 a	683.3 a	208 b
Gaucho 480 F (8 oz/cwt seed)	0.0 b	0.0 b	78.3 a	150.0 b	57 c
Sorghum Guard <sup>a</sup> (5.34 oz/cwt seed)	143.0 a	333.3 a	126.7 a	700.0 a	326 a
Untreated	157.0 a	250.0 a	183.3 a	460.0 a	263 ab
LSD (P=0.05)	<u>b</u>	175.4	NS	358.7	67.9
P>F	.0205	.0099	.2104	.0294	.0004

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

<sup>a</sup> Sorghum guard is a mixture of captan (32.75%), lindane (16.6%) and graphite.

<sup>b</sup> The P > F is based on transformed  $\sqrt{x + 1}$  data values; it is inappropriate to list LSD values based on transformed data.

Table 3. Plant population, insect damage rating and yield of sorghum comparing insecticide treated seed and at-planting granular insecticide, Darby and Howard Salge Farm, Bee County, TX, 1999.

Treatment/rate	Plants (1000's/acre)	Plant damage rating <sup>b</sup>	Yield (lb/acre)	Loss (\$) over untreated <sup>c</sup>
Counter 15G (4.4 oz/1000 ft)	58.4 a	1.0 b	2556 a	-9.58
Gaucho 480 F (8 oz/cwt seed)	57.8 a	1.0 b	2500 a	-8.52
Sorghum Guard <sup>a</sup> (5.34 oz/cwt seed)	46.2 a	2.0 a	2574 a	-0.44
Untreated	52.6 a	3.8 a	2580 a	
LSD (P=0.05)	10.33	.999	NS	
P>F	.0848	.0018	.1120	

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

<sup>a</sup> Sorghum guard is a mixture of captan (32.75%), lindane (16.6%) and graphite.

<sup>b</sup> Damage ratings were made on 4/6 and range from 1 = no damage to 5 = reduced vigor, uneven growth and yellowing.

<sup>c</sup> Sorghum value based on \$3.15/cwt; costs include Counter 15G (\$1.85/lb), application (\$0.25/acre for Counter), Gaucho (\$1.20/lb seed for 5 lb/acre planting rate), Sorghum Guard (\$0.20/acre), and application for Sorghum Guard at \$0.05/acre.