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# Performance of Forage Sorghum Hybrids in Lower South Texas

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**Summary**

Sixteen commercial cultivars consisting predominately of sorghum x sudangrass hybrids were evaluated for their potential forage production during 1984. Total seasonal yields ranged from 8,014 lb/A to 20,239 lb/A for two harvests. Crude protein percentage averaged 9.0 and 9.2 percent respectively for the two harvests. Stalk borer (*Eoreuma loftini* [Dyar]) damage was observed in all entries and mean number of larvae per tiller differed according to genotype. Attempts to relate larval numbers with selected plant morphological characters failed to account for a significant amount of the total variation.

## Introduction

Forage sorghums are widely grown throughout the South. Because of their drought tolerance and potential to produce large quantities of dry matter, they are generally utilized in South Texas as a hay crop to supplement native ranges. In this region, little information exists as to the yield potential or quality of sorghum x sudangrass hybrids. Variety tests from Angleton (Evers, 1975), Beaumont (Evers et al., 1972), and College Station (Holt, 1965) have reported that yields of 3,500 to 16,000 lb/A are possible depending on rainfall and nitrogen fertility.

The objectives of this study were to determine the yield potential and protein content of commercially available sorghum x sudangrass hybrids in South Texas, and to determine the susceptibility of these hybrids to insect or disease.

KEYWORDS: Sorghum x sudangrass/forage yield/crude protein/rice borer/*Eoreuma loftini.*

## Procedures

Seed of sixteen forage sorghum hybrids and one millet (Table 1) were planted on March 14, 1984 at a rate of 20 lb pure live seed (PLS)/A on a Willacy fine sandy loam. The entries were arranged in a randomized complete block design with four replications and fertilized with 50 lb nitrogen (N)/A at planting and at the beginning of the regrowth period.

Supplemental irrigation was applied at planting and 4 weeks after the first harvest to alleviate uneven tillering due to moisture stress during regrowth.

Two harvests were made for yield by harvesting a 3.3-foot section from the center row of each plot. To estimate yield, harvests were made when the plants were in the soft dough stage of development while forage quality samples were obtained at early head emergence.

Estimates of borer (*Eoreuma loftini* [Dyar]) damage were made by taking a 10-tiller sample per plot. Sampling was destructive as whole tillers were harvested, split longitudinally, and number of borer larvae recorded. Tiller density, tiller diameter, and tiller height measurements were made on the center row of each plot and related to larval numbers per tiller.

**TABLE 1. SORGHUM X SUDANGRASS YIELD AND CRUDE PROTEIN, 1984 HARVEST**

| Variety | Yield (lb/A) | Crude Protein percent[1] |
|---|---|---|
| NK Trudan 8 | 13,768 | 9.02 |
| Pioneer 877F | 13,728 | 8.55 |
| Asgrow Beefbuilder | 13,365 | 8.00 |
| Funk HW5574 | 11,788 | — |
| R.C. Young Sweet Chew DMR | 11,636 | 8.64 |
| DeKalb SX 17 | 11,425 | 7.32 |
| King 6 1 DR | 11,207 | 9.60 |
| King Sugart Sweet | 11,167 | 8.88 |
| DeKalb FS25A | 10,870 | 8.25 |
| Funk HW5111 | 10,672 | 8.36 |
| TE Goldmaker T | 10,626 | 9.45 |
| Pogue Honeygraze II | 10,501 | 8.50 |
| Pioneer XSG21 | 9,887 | 9.52 |
| Funk FP-4 | 8,837 | 8.82 |
| Warner 2 Way DR | 7,979 | 9.21 |
| Bamert Dixe Haygrazer Millet | 7,009 | 11.94 |
| Bamert Early Sumac | 6,587 | 9.41 |
| Mean | 10,650 | 8.97 |
| LSD (0.05) | 2,576 | |

[1]Expressed as whole plant percent.

## Results

Total dry matter production ranged from 8,014 lb/A to 20,239 lb/A (Tables 1 and 2). This production greatly exceeded yields reported for forage sorghum hybrids from other locations in Texas (Jones and Read, 1982 and 1984; Evers, 1975; and Conrad, 1976), even though total rainfall during the growing season at Weslaco was below normal (Table 3).

While yields exceeding 20,000 lb/A were obtained in 1984, some cultivars performed better during the first growing period than during the regrowth period indicating the potential of a cultivar x season interaction for yield (Tables 1 and 2). Limited rainfall after the first harvest may have contributed to a lower yield of certain entries for the second cutting. Stand densities during regrowth were considerably less than during the initial growing period.

Whole plant crude protein averaged 9.0 and 9.2 percent for harvest 1 and 2 respectively, and agrees with values reported previously for sorghum hybrids (Jones and Read, 1984). The single millet entry in the test 'Dixie Haygrazer Millet' was consistently higher in crude protein (11.9 and 13.3 percent) than the sorghum hybrids for both harvest dates.

The yield of pearl millet was consistently less than most of the sorghum sudangrass cultivars although it exceeded the yield of 'early summac' (Red Top Cane) and slightly exceeded the performance of millets in other Texas locations (Evers et al., 1972).

Damage attributed to borers (*E. loftini* [Dyar]) was observed during both harvests in 1984. During the second harvest, the planting was sampled to quantify the level of borer infestation (Table 2). While some cultivars appeared to be more resistant, larvae were recorded from all entries including pearl millet. Attempts to relate larval numbers (level of infestation) with morphological characteristics of the plants were unsuccessful. Plant height accounted for the largest amount of variation (Table 3). The inclusion of tiller density, tiller diameter, and tiller growth stage into the model did little to improve the overall fit (Table 4).

**TABLE 2. SORGHUM X SUDANGRASS YIELD, CRUDE PROTEIN, AND BORER RATINGS FOR SEPTEMBER 1984 HARVEST**

| Variety | Yield (lb/A) | Crude protein percent[1] | Rice borers (in 10 tillers) |
|---|---|---|---|
| Asgrow Beefbuilder | 6,874 | 7.98 | 1.25 |
| Funk HW5111 | 5,868 | 6.48 | 2.50 |
| Dekalb SX17 | 5,577 | 7.56 | 1.25 |
| Funk HW5574 | 5,490 | 8.25 | 3.75 |
| Warner 2 Way DR | 5,043 | 9.44 | 3.75 |
| Pioneer SXG21 | 4,845 | 10.07 | 3.00 |
| Pioneer 877F | 4,152 | 11.04 | 2.25 |
| DeKalb FS25A | 3,592 | — | 3.00 |
| King Sugar Sweet | 3,438 | 8.06 | 2.25 |
| Pogue Honeygraze II | 3,257 | 9.53 | 5.25 |
| RC Young Sweet Chew DMR | 3,227 | 8.97 | 3.50 |
| Funk FP-4 | 2,928 | 8.98 | 6.75 |
| King 61DR | 2,647 | 9.13 | 4.50 |
| Bamert Dixe Haygrazer Millet | 2,460* | 13.37 | 1.00 |
| TE Goldmaker T | 2,075 | 8.47 | 5.00 |
| NK Trudan 8 | 1,907 | 11.23 | 2.00 |
| Bamert Early Sumac | 1,427 | 8.55 | 4.00 |
| Mean | 3,896 | 9.19 | 3.24 |
| LSD (0.05) | 1,896 | | |

[1]Expressed as whole plant percent.

*Only 1 replication was harvested.

**TABLE 3. RAINFALL, TEMPERATURE, AND CLASS A PAN EVAPORATION AT WESLACO (MARCH 1 TO SEPTEMBER 15, 1984)**

| | Temp. (°F) max. | Temp. (°F) min. | Rainfall inches | Evaporation inches |
|---|---|---|---|---|
| March | 82 | 61 | 0.09* | 4.76 |
| April | 89 | 66 | 0.01 | 5.23 |
| May | 89 | 71 | 2.48 | 6.22 |
| June | 93 | 74 | 0.60 | 7.04 |
| July | 94 | 75 | 0.83* | 6.81 |
| August | 96 | 75 | 0.73 | 7.51 |
| September | 85 | 71 | 2.79 | 2.85 |
| Total | | | 7.53 | 40.42 |

*Supplemental irrigation—3.0 inches.

**TABLE 4. RELATIONSHIP BETWEEN BORER SUSCEPTIBILITY (LARVAE/TILLER) AND SELECTED PLANT MORPHOLOGICAL CHARACTERISTICS**

| Dependent variable | Independent variable | $R^2$ |
|---|---|---|
| Larvae/tiller | Tiller density (NUM) | 0.004 |
| | Tiller diameter (SDM) | 0.082 |
| | Growth stage (GS) | 0.104 |
| | Tiller height (HT) | 0.270* |
| | NUM HT GS SDM | 0.281* |

*Indicates significance at 0.05 level.

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