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## Green Fodder Yield Performance of Different Varieties of Sorghum

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**Abstract:** Six varieties of sorghum including a check were evaluated. Significant differences were observed among the varieties for plant height, while differences for number of leaves per plant, number of tillers per meter row, stem thickness, leaf area and green fodder yield were non significant. The variety F-9601 showed the highest green fodder yield potential of 64.67t ha<sup>-1</sup> followed by F-9603 (63.41t ha<sup>-1</sup>) and Hegari (60.39t ha<sup>-1</sup>). The check variety JS-263 produced a green fodder yield of 59.52t ha<sup>-1</sup>.

**Key words:** Evaluation, *Sorghum bicolor* L., varieties, yield, plant height

### Introduction

Sorghum (*Sorghum bicolor* L.) is an important Kharif crop of Pakistan. It has a potential of producing both high grain fodder yield even under the conditions where moisture is a limiting factor. It can be grown successfully throughout the country both under irrigated and rainfed conditions. There is dire need to develop new high green fodder yielding sorghum varieties to increase fodder production in Pakistan.

Hussain *et al.* (1990) concluded that two sorghum cultivars No.94 and No.95 provided a better compromise of green fodder and dry matter yields and crude protein contents. Hussain *et al.* (1991) observed that higher fodder yield in Sudan grass was positively and significantly correlated with yield component characters viz., plant height, tillers per plant, leaves per tiller and leaf area. Naeem *et al.* (1993), evaluated six sorghum hybrids for grain and fodder yield. Significant differences were observed for fodder yield and plant height. The hybrid CSH-9 produced the highest fodder yield of 28t ha<sup>-1</sup> followed by CSH-11 (20.44t ha<sup>-1</sup>) and CSH-1 (13.33t ha<sup>-1</sup>). The plant height ranged from 129 (904021) to 226cm (CSH-1). Nasim *et al.* (1993), studied the performance of five varieties and six hybrids of sorghum. They observed significant differences for fodder yield and plant height. The variety ICSV-210 (22.22t ha<sup>-1</sup>) ranked top in fodder yield followed by the hybrids CSH-9 (20.33t ha<sup>-1</sup>) and ICSH-205 (18.17t ha<sup>-1</sup>). ICSV-210 was the tallest variety having a plant height of 233cm followed by SPV-462 (219cm). Hussain *et al.* (1995), evaluated the performance of seven cultivars of forage sorghum for various morphological characters and fodder yield. They noted that genotypes like No.94, Hegari, Roma and No.119 were medium in plant height had more leaf area and higher green fodder yield. Hence these varieties were recommended for general cultivation. Naeem *et al.* (2002) evaluated eleven varieties of sorghum for their green fodder yield potential and its components. They observed that green fodder yield ranged from 18.06 to 69.44t ha<sup>-1</sup>. Number of leaves per plant varied from 9.0 to 13.78, while plant height ranged from 101.11 to 209.44cm. Leaf area varied from 264.12 to 379.44cm<sup>2</sup> and stem thickness ranged from 1.1 to 1.67cm. This study was conducted to identify new high green fodder yielding varieties of sorghum.

### Materials and Methods

Five varieties of sorghum viz., F-9601, F-9603, F-9706, JS-88, Hegari and a check variety JS-263 were planted at Fodder Research Sub-station, Ayub Agricultural Research Institute, Faisalabad during kharif 2000. The design of the trial was randomized complete block and each plot consisted of 10 rows 6m long and 30cm apart thus having a plot size of 18m<sup>2</sup>. Seed rate used was 75Kg ha<sup>-1</sup>. Fertilizers were applied @ of 60-60-00 NPKkg ha<sup>-1</sup>. The trial was planted on 05.05.2000 and harvested on 20.07.2000 at the completion of 50% flowering. Three irrigations were applied. Furadan granules were applied at the rate of 15kg ha<sup>-1</sup> at the time of sowing for control of shoot fly and at six-leaf stage for control of stem borer. Data for the following plant characters were recorded:

Plant height (cm), number of leaves per plant, number of tillers per meter row, leaf area (cm<sup>2</sup>), stem thickness (cm) and green fodder yield (t ha<sup>-1</sup>).

The data recorded was statistically analyzed using the analysis of variance technique and least significant differences at 5% probability (Steel and Torrie, 1960).

### Results and Discussion

Data showed (Table 1) that significant differences were observed for plant height, while differences for number of leaves per plant, number of tillers per meter row, leaf area, stem thickness and green fodder yield were non-significant. The plant height ranged from 209.16cm (check variety JS-263) to 229.91cm (F-9603). The variety F-9601 (225.41cm) ranked second in plant height followed by F-9706 (219.57cm), Hegari (210.16cm) and JS-88 (214.58cm). Hussain *et al.* (1993 and 1995), Naeem *et al.* (1993 and 2002) and Nasim *et al.* (1993) reported similar results.

The variety F-9601 (16.33) produced the maximum number of leaves per plant followed by F-9603 (16.16), JS-88 (16.08) and check variety JS-263 (15.99) (Table 1). Hussain *et al.* (1991) and Naeem *et al.* (2002) made similar observations. The variety F-9601 (21.49) produced the highest number of tillers per meter row followed by Hegari (19.66) and JS-88 (19.58). The check variety JS-263 (18.25) produced the lowest number of tillers per meter row (Table 1). Hussain *et al.* (1991) also reported similar results.

Table 1: Mean plant height, number of leaves per plant, number of tillers per meter row, leaf area, stem thickness and green fodder yield

Variety	Plant height (cm)	No. of leaves per plant	No. of tillers per meter row	Leaf area (cm <sup>2</sup> )	Stem thickness (cm)	Green fodder yield (t ha <sup>-1</sup> )
F-9601	225.41a	16.33	21.49	399.58	2.61	64.67
F-9603	229.91a	16.16	18.51	394.62	2.48	63.41
Hegari	210.16c	15.58	19.66	392.13	2.56	60.39
F-9706	219.57ab	15.58	18.33	415.61	2.58	59.95
JS-263 (Check)	209.16c	15.99	18.25	382.65	2.53	59.52
JS-88	214.58bc	16.08	19.58	419.93	2.60	59.12
L.S.D. (5%)	009.47	NS	NS	NS	NS	NS
C.V (%)	013.63	4.86	9.77	5.34	6.85	4.97

Means followed by the same letters do not differ significantly at P>0.05

NS: non-significant

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Leaf area ranged from 382.65 (check variety JS-263) to 419.93cm<sup>2</sup> (JS-88). F-9706 (415.61cm<sup>2</sup>) ranked second in leaf area followed by F-9601 (399.58cm<sup>2</sup>), F-9603 (394.62cm<sup>2</sup>) and Hegari (392.13cm<sup>2</sup>) (Table 1). Hussain *et al.* (1991 and 1995) and Naeem *et al.* (2002) reported similar findings. The variety F-9601 (2.61cm) produced the maximum stem thickness followed by JS-88 (2.60cm), F-9706 (2.58cm) and Hegari (2.56cm). The check variety JS-263 showed a stem thickness of 2.53cm (Table 1). Naeem *et al.* (2002) also made similar observations.

The variety F-9601 produced the highest green fodder yield of 64.67t ha<sup>-1</sup> followed by F-9603 (63.41t ha<sup>-1</sup>), Hegari (60.39t ha<sup>-1</sup>), F-9706 (59.95t ha<sup>-1</sup>), check variety JS-263 (59.52t ha<sup>-1</sup>) and JS-88 (59.12t ha<sup>-1</sup>).

Bangarwa *et al.* (1989), Hussain *et al.* (1990, 1991, 1995), Lodhi and Bangarwa (1983), Mohammad, (1989), Naeem *et al.* (1993, 2002), Nasim *et al.* (1993), Perez and Arevalo (1981), Rao *et al.* (1985) and Reddy and Rao (1982) reported similar results.

Although the differences for most of the plant characters were non-significant still the varieties F-9601 and F-9603 possess high green fodder yield potential and could be considered for general cultivation.

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