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 64.67 ha\(^{-1}\) followed by F-9603 (63.41 ha\(^{-1}\)) and Hegari (60.39 ha\(^{-1}\)). The check variety JS-263 produced a green fodder yield of 59.52 ha\(^{-1}\).

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. (1999) 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. (1993) 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-8 produced the highest fodder yield of 281.24 ha\(^{-1}\) followed by CSH-11 (209.44 ha\(^{-1}\)) and CSH-13 (183.38 ha\(^{-1}\)). The plant height ranged from 129 (04021) to 226 cm (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 (22.22 ha\(^{-1}\)) ranked top in fodder yield followed by the hybrids CSH-9 (20.31 ha\(^{-1}\)) and ICSV-206 (18.17 ha\(^{-1}\)). ICSV-210 was the tallest variety having a plant height of 239 cm followed by SPV-462 (218 cm). Hussain et al. (1996), 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 16.98 to 88.44 ha\(^{-1}\). Number of leaves per plant varied from 9.0 to 13.78, while plant height ranged from 101.11 to 209.44 cm. Leaf area varied from 264.12 to 379.44 cm\(^2\) and stem thickness ranged from 1.1 to 1.67 cm. This study was conducted to identify new high fodder yielding varieties of sorghum.

Materiels 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 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 8 m long and 30 cm apart thus having a plot size of 18 m\(^2\). Seed rate used were 75 kg ha\(^{-1}\). Fertilizers were applied at a rate of 60-60-00 NPK kg ha\(^{-1}\). 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 15 kg ha\(^{-1}\) 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\(^2\)), stem thickness (cm) and green fodder yield (t ha\(^{-1}\)).

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 209.16 cm (check variety JS-263) to 220.91 cm (F-9603). The variety F-9601 (225.1 cm) ranked second in plant height followed by F-9706 (219.67 cm), Hegari (210.15 cm) and JS-88 (214.58 cm). Hussain et al. (1993 and 1995), Naeem et al. (1993 and 2002) and Nasim et al. (1993) reported similar results.

The variety F-9601 (16.53) 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 (19.65) 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>
<thead>
<tr>
<th>Variety</th>
<th>Plant height (cm)</th>
<th>No. of leaves per plant</th>
<th>No. of tillers per meter row</th>
<th>Leaf area (cm(^2))</th>
<th>Stem thickness (cm)</th>
<th>Green fodder yield (t ha(^{-1}))</th>
</tr>
</thead>
<tbody>
<tr>
<td>F-9601</td>
<td>225.41</td>
<td>16.33</td>
<td>21.49</td>
<td>399.58</td>
<td>2.51</td>
<td>64.67</td>
</tr>
<tr>
<td>F-9603</td>
<td>229.91</td>
<td>16.16</td>
<td>18.51</td>
<td>394.62</td>
<td>2.48</td>
<td>63.41</td>
</tr>
<tr>
<td>Hegari</td>
<td>210.16</td>
<td>15.98</td>
<td>19.66</td>
<td>393.13</td>
<td>2.55</td>
<td>60.39</td>
</tr>
<tr>
<td>F-9706</td>
<td>219.57</td>
<td>15.88</td>
<td>18.33</td>
<td>415.61</td>
<td>2.58</td>
<td>59.75</td>
</tr>
<tr>
<td>JS-263</td>
<td>209.16</td>
<td>15.99</td>
<td>18.25</td>
<td>382.65</td>
<td>2.53</td>
<td>59.52</td>
</tr>
<tr>
<td>JS-88</td>
<td>214.58</td>
<td>15.98</td>
<td>19.58</td>
<td>419.93</td>
<td>2.60</td>
<td>59.12</td>
</tr>
<tr>
<td>L.S.D. 5%</td>
<td>0.49</td>
<td>1.63</td>
<td>2.77</td>
<td>3.34</td>
<td>2.85</td>
<td>4.97</td>
</tr>
</tbody>
</table>

Means followed by the same letters do not differ significantly at P<0.05 NS: non-significant.
Leaf area ranged from 382.65 (check variety JS-283) to 419.93cm² (JS-88), F-9706 (415.61cm²) ranked second in leaf area followed by F-9601 (396.66cm²), F-9603 (394.62cm²) and Hegari (382.13cm²) (Table 1). Hussain et al. (1991 and 1995) and Naem et al. (2002) reported similar findings. The variety F-9501 (2.61cm) produced the maximum stem thickness followed by JS-88 (2.60cm), F-9706 (2.58cm) and Hegari (2.56cm). The checks variety JS-283 showed a stem thickness of 2.53cm (Table 1). Naem et al. (2002) also made similar observations.

The variety F-9501 produced the highest green fodder yield of 64.67t ha⁻¹ followed by F-9603 (63.41t ha⁻¹), Hegari (60.34 t ha⁻¹), F-9706 (59.95 t ha⁻¹), check variety JS-283 (59.52 t ha⁻¹) and JS-88 (59.12 t ha⁻¹).


References

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