EVALUATION OF PROMISING SORGHUM GENOTYPES FOR THEIR YIELD AND QUALITY

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ABSTRACT

A field experiment was conducted during the kharif season of 1999-2000. For obtaining higher grain and fodder yield, better protein content, application of 80 kg N + 40 kg P₂O₅ ha⁻¹ was found to be the best. The most promising genotypes in respect of yield and protein content are SPH-964 and SPH-981, and most promising genotype in respect of reducing and non-reducing sugar content is CSV-15.

Sorghum is one of the most important cereal crop grown under rainfed conditions in various parts of India including Vidarbh region. The area under this crop in Maharashtra state is about 21.5 lakh ha, producing about 39.11 lakh tones of grain (Anonymous, 1998).

Mineral nutrition plays a prominent role in agricultural production along with improved seed and irrigation. Fertilizers use is determined primarily by soil fertility status and nutrient requirement of crop. Balanced and optimum use of fertilizers would be the strategy of fertilizers technology for efficient utilization of inputs and higher crop returns.

In the recent years, though attempts were made to increase the yield, limited research work has been done to improve the quality aspects of sorghum such as carbohydrates, proteins and mineral content of grain and straw. The information is needed to know the influence of fertilization on chemical composition and nutritive value of sorghum crop varieties and hybrids.

A field trial was conducted at the Sorghum Research unit, Central Research Station, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola during the kharif season of 1999-2000. The experimental soil was fine, clayey, montmorillonitic, hyperthermic family of Typic Ustochrepts. The experiment was laid out in split plot design with sorghum genotypes as main plot and fertility levels in subplot. The details of treatments are given below.

Main plot Treatments

1. CSV-15 (G₁)
2. CSH-16 (G₂)
3. SPV-1430 (G₃)
4. SPH-837 (G₄)
5. SPH-964 (G₅)
6. SPH-981 (G₆)
7. SPH-1037 (G₇)
8. SPH-1065 (G₈)

Sub plot treatments

(F₀) 00:00:00 NPK kg ha⁻¹
(F₁) 40:20:00 NPK kg ha⁻¹
(F₂) 80:40:00 NPK kg ha⁻¹

The fertilizer doses (as per treatment) were applied in row before sowing and placed 2-3 cm below the seed. Half of the N+ full dose of P was applied at sowing and remaining N was top dressed 30 days after sowing.

The soil before the start of experiment had pH 8.4, EC 0.14 dSm⁻¹ and organic carbon 0.45 per cent. The available P and available K were 24.5 and 236 kg ha⁻¹, respectively.

Yield

The data in respect of grain and fodder yields are presented in Table 1. The highest and lowest grain yield was recorded by the genotype SPH-964 (32.4 q ha⁻¹) and CSV-15 (22.61 q ha⁻¹), respectively. The grain and fodder yield increased with every increment in
Table 1. Grain and Fodder yield (q ha⁻¹), Protein (%) and sugars (%) as influenced by different treatments

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Yield q ha⁻¹</th>
<th>Protein (%)</th>
<th>Reducing Sugar (%)</th>
<th>Non Reducing Sugar (%)</th>
<th>Total Sugar (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sorghum genotypes (8)</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>G₁, CSV-15</td>
<td>22.61</td>
<td>102.80</td>
<td>7.78</td>
<td>0.940</td>
<td>5.05</td>
</tr>
<tr>
<td>G₂, CSVH-16</td>
<td>29.59</td>
<td>89.42</td>
<td>7.96</td>
<td>0.786</td>
<td>4.23</td>
</tr>
<tr>
<td>G₃, SPV-1430</td>
<td>25.48</td>
<td>101.74</td>
<td>8.41</td>
<td>0.817</td>
<td>4.34</td>
</tr>
<tr>
<td>G₄, SPH-837</td>
<td>31.13</td>
<td>83.24</td>
<td>8.41</td>
<td>0.769</td>
<td>5.31</td>
</tr>
<tr>
<td>G₅, SPH-964</td>
<td>32.47</td>
<td>86.33</td>
<td>8.57</td>
<td>0.688</td>
<td>4.59</td>
</tr>
<tr>
<td>G₆, SPH-981</td>
<td>32.62</td>
<td>90.44</td>
<td>8.58</td>
<td>0.816</td>
<td>4.58</td>
</tr>
<tr>
<td>G₇, SPH-1037</td>
<td>27.84</td>
<td>81.19</td>
<td>8.27</td>
<td>0.673</td>
<td>3.89</td>
</tr>
<tr>
<td>G₈, SPH-1065</td>
<td>30.93</td>
<td>90.44</td>
<td>8.33</td>
<td>0.680</td>
<td>4.81</td>
</tr>
<tr>
<td>CD P=0.05</td>
<td>2.96</td>
<td>10.05</td>
<td>-</td>
<td>0.055</td>
<td>0.370</td>
</tr>
<tr>
<td>Levels of fertility</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>F₀, 00:00:00 NPK kg ha⁻¹</td>
<td>22.61</td>
<td>73.6</td>
<td>7.07</td>
<td>0.767</td>
<td>4.20</td>
</tr>
<tr>
<td>F₁, 40:20:00 NPK kg ha⁻¹</td>
<td>29.37</td>
<td>90.179</td>
<td>8.78</td>
<td>0.770</td>
<td>4.21</td>
</tr>
<tr>
<td>F₂, 80:40:00 NPK kg ha⁻¹</td>
<td>35.14</td>
<td>18.68</td>
<td>9.10</td>
<td>0.775</td>
<td>4.33</td>
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<tr>
<td>CD P=0.05</td>
<td>1.71</td>
<td>3.87</td>
<td>0.239</td>
<td>0.045</td>
<td>-</td>
</tr>
</tbody>
</table>

The higher yield observed under higher fertility levels might be due to enhancement in the yield contributory character and higher biomass. The results were in conformity with Khuswaha and Khuswaha (1991), Wanjari et al. (1992) and Vashishtha and Dwivedi. (1994).

Quality

The data in Table 1 showed that the varietal difference in respect of protein content were non-significant. Significantly the highest protein content was recorded by the treatment F₂ (9.1%) followed by F₁ (8.78%). It clearly indicated that fertility levels can contribute to higher protein content in the grain. Similar results were also reported by Rao and Reddy (1973), Warsi and Wright (1973) and Patil et al. (1984).

The highest and lowest reducing sugar content was observed in the genotype CSV - 15 (0.94%) and SPH-1037 (0.67%) respectively (Table 1). The non reducing sugar content was within the range of 3.61% and 5.05%.

The results indicated that the hybrids were more responsive in respect of yield and protein content.

REFERENCES