Performance of rabi Sorghum (*Sorghum bicolor* L.) Genotypes under rainfed conditions at varying fertility levels.

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**ABSTRACT:** Field experiments were carried out during winter season for two years viz., 1997-98 and 1998-99, at Sorghum Improvement Project, Rahuri, to study the performance of rabi grain Sorghum genotypes under rainfed conditions at varying fertility levels. The pooled data, indicated that the hybrid CSH-15R and improved variety SPV-1155 gave significantly higher grain and fodder yield than SPV – 1359 and M-35-1 during both years. The growth and yield contributing parameters viz., grain weight 1000 grain weight and harvest index were higher in the variety SPV-1155 Application of 60 kg N+30 kg P$_2$O$_5$/ha, significantly increased the grain and fodder yield over the control during both years in pooled data. The same trend was observed in growth & yield contributing characters.

Sorghum is one of the major crops of the semi-arid tropics as well as in several parts of the world. In Maharashtra, rabi sorghum is a predominant crop occupying 60% of the total area and productivity of rabi sorghum in the country. However yield is very low (500 kg/ha). Constraints for low productivity of rabi sorghum are identified as lack of improved high yielding cultivars, delayed sowing, low fertilizers use and improper adoption of management techniques. The cultivation of rabi sorghum is mostly confined to vertisols of Maharashtra and Karnataka, which are poor in nitrogen. Therefore, the present objective of the study was to know the response to nitrogen application on these soils for 2 years viz., 1997-98 and 1998-99. Four hybrids & varieties viz, CSH-15R, SPV-1155, SPV-1359 and M-35-1 were used in main plots at 3 fertilizer levels (N+P) viz, 0, 30+15, 60+30 kg/ha in subplots. The gross plot and net plot sizes were 4.5 x 6.0m and 2.7 x5.0m. The on a medium black with depth of 90 cms. It was poor in available N (174.5/kg/ha), medium in available P$_2$O$_5$ (15.6 kg/ha) and rich in available K$_2$O (668 kg/ha), while it was alkaline in reaction (PH – 8.6) with electrical conductivity of 0.12 mmhos/cm. The rainfall of 468.6 and 442 mm was received during crop growth period in 1997-98 and 1998-99 respectively. Meteorologically the rainfall distribution was good during both the years.

**Materials and Methods:**

The investigation was conducted at the Sorghum Improvement Project, M.P.K.V., Rahuri, adopting split plot design with 3 replications

**Results and Discussion:**

**Effect of Genotypes:**

The grain and fodder yields were significantly
influenced by the genotypes during 1997-98, 1998-99 and in pooled data (Table-2). The variety SPV – 1155 produced significantly higher grain and fodder yield and it was at par with the hybrid. CSH-15R in pooled data, for grain yield while it was better than hybrid for fodder yield. (Table –2). The growth and yield contributing characters viz., grain wt/ear, 1000 grain wt. And harvest index were higher in the variety SPV –1155. Higher grain yield was recorded in hybrid CSH-15R during the year 1998-99, than the improved varieties. Cripps and Matocha (1987) also reported similar findings.
Effect of N and P fertilization

The grain and fodder yields of sorghum irrespectively of genotypes increased significantly with increasing NP fertilization in both years 1997-98, 1998-99 and also in pooled data (Table-2). Fertilizer treatment, N$_{60}$P$_{30}$ (60 kg N+30 kg P$_2$O$_5$/ha) produced significantly higher grain and fodder yields than lower doses of fertilizations in both years as well as pooled, due to best combination of N and P fertilization, under rainfed conditions. The higher yield of grain and fodder at higher fertility levels was due to higher growth and yield contributing characters. Umrani & Bhoi (1981) Umrani and Patil (1985) and Jadhav et al. (1991) also reported 50 kg N/ha at sowing for winter (rabi) sorghum on deep vertisols as deal.

Interaction effects were found to be non-significant

Conclusion

The improved variety SPV-1155 and hybrid, CSH-15R, could be grown for higher grain & fodder yields with the application of 60kg N/ha + 30 kg P$_2$O$_5$/ha in vertisols of Maharashtra under the rainfed conditions.

References


