

Research
Paper

Stability analysis for green fodder yield and its component traits in sorghum [*Sorghum bicolor* (L.) Moench]

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ABSTRACT

Sorghum is an important fodder crop. Pooled results showed that genotypic variance when tested against $G \times E$ were significant for all the traits under study. However, when tested against pooled deviation these variance revealed significant difference for all the traits except number of tillers per plant, leaf : stem ratio, and HCN content. Environment variances were significant for all the traits. Partition of $G \times E$ interaction showed that pooled deviation effect was significant for all the traits except number of leaves per plant, crude protein yield per plant. $G \times E$ (linear) was significant for leaf length, leaf width. Stem thickness, green fodder yield per plant, dry matter yield per plant, crude protein content, crude protein yield per plant when tested against pooled deviation. Among the parents Indore 9A form female and HC 308 and PB 181 from male were stable under better environment where as S 1049, and IS 2472 adopted under poor environment. Among hybrids, Indore 9A x ASFS 7, Indore 9A x IS 21475. Indore 9A x PB 22 were found stable under better environment whereas, 3660 A x PB 78 and 3660 A x PB 181 were found suitable for poor environment.

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Key words : Sorghum, Stability, Environment, Hybrid

INTRODUCTION

Sorghum [*Sorghum bicolor* (L.) Moench] rank first among the cereal fodder crops because of its growing ability in poor soil, fast growth habit, high yield, palatable and nutritious quality. It gives almost uniform green fodder yield throughout the year. It is an important fodder crop of dry land agriculture and locally known as Jowar. It is highly necessary to develop a high yielding hybrid which can withstand under changing environmental condition. Present green fodder availability is 224.08 million tones against demand of 611.99 million tones which showed 63.38% deficit (Appaji *et al.*, 2003).

Phenotype is defined as a linear function of genotype (G), environment (E), and $G \times E$ interaction effects. Relative importance of main and interaction effects may vary from genotype to genotype and with environment. The study $G \times E$ interaction serves as a guide for various environmental niches. It is possible to identify genotypes that have stability for high yields. It has been suggested by many workers that stability is a genetical characters (Bains and Gupta, 1974 and Cross, 1977). Stability of yield may be dependant upon stability for yield components.

Paroda and Hayes (1971) suggested that the linear regression (bi) could simply be regarded as a measure of response of a particular genotype where as deviation from regression (s^2_{di}) should be considered as a measure of stability.

MATERIALS AND METHODS

The experimental material comprised of three male sterile lines as a female parents and sixteen genotypes used as a male parent. These females and males were crossed in a line x tester mating system. In *Kharif* 2005-06, the seeds of 48 F_1 were prepared by hand pollination. The experiment was laid out in Randomized Block Design with three replications, over three environments created by different date of sowing *viz.*, 15th June, 1st August and 15th September, 2005 at Plant Breeding Farm, Anand Agricultural University, Anand. Each net plot had single row of 4.5 m each, the inter row spacing being 30 cm apart. The border rows were provided all around each replication. The crop was raised as per recommended package of practices. Five competitive plants were selected at random from each plot and tagged. The