

# Phenotypic Stability Analysis in Italian Millet Utilizing Regression and AMMI Models for Yield Characters

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## ABSTRACT

Twenty Italian millet genotypes were evaluated for several characters over 16 environments (8 sowing dates with 2 fertility levels). The analysis of variance of Eberhart and Russell indicated that  $G \times E$  interaction was significant for all 5 characters under study and that genotypes differed significantly. AMMI is a useful tool for interpreting genotype  $\times$  environment interaction in multi environment trials. Among the AMMI component first four IPCA axis were explained most of the portion of  $G \times E$  interaction than other IPCA axis for the five characters under study. The ANOVA indicated non-significant  $G \times E$  interaction for 1000 grain weight and ANOVA of (Eberhart and Russell, 1966) indicated non-significant  $G \times E$  (linear) interaction for productive tillers per plant, ear length, 1000 grain weight, when tested against pooled deviation. As per AMMI analysis the IPCA<sub>1</sub> significantly contributed to productive tillers per plant, ear length, ear weight, 1000 grain weight and grain yield per plant while IPCA<sub>2</sub> contributed significantly to  $G \times E$  interaction for productive tillers per plant, ear length, ear weight and 1000 grain weight. This brings out clearly the advantage of AMMI ANOVA in bringing out  $G \times E$  interaction through IPCA<sub>1</sub>, which gets combined with error in the other two ANOVA and points out the utility of AMMI models in studying the significant  $G \times E$  interaction and identifying stable genotypes for characters which so undetected in the other analysis. According to AMMI analyses the genotypes GS 463 and GS 480 (for productive tillers plant<sup>-1</sup>); GS 477, GS 486 and SRL (for ear length); GS 467, GS 477, GS 479 and NSR (for ear weight); GS 440, GS 444 and NSR (for 1000 grain weight); most of the genotypes (for grain yield plant<sup>-1</sup>) were more stable as the IPCA score was near zero indicating less interaction with environments. According to Eberhart and Russell the genotypes GS 480 and GS 489 (for productive tillers plant<sup>-1</sup>); GS 487 and GS 444 (for ear length); GS 440 and GS 477 (for ear weight); SRL (1000 grain weight); GS 450 and GS 467 (for grain yield plant<sup>-1</sup>) showed stage performance.

**Key words :** AMMI, Foxtail millet, Stability.