

Genotype- Environment Interaction Studies For Seed Cotton Yield and Its Component Characters

S. B. DESHMUKH^{1*}, M. B. MISAL¹, S. S. GOMASHE¹, S. B. SARODE² AND H. V. KALPANDE¹

¹Department of Agricultural Botany, Marathawada Agricultural University, PARBHANI (M.S.) INDIA

²Department of Agricultural Botany, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, AKOLA (M.S.) INDIA

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The stability of 58 genotypes of American cotton comprising of 10 parents, their 45 hybrids produced in diallel fashion (without reciprocals) were evaluated in three environments for yield and its component characters. Significant E+(G x E) interactions showed differential response of genotypes under different environments. Stability parameters revealed that the hybrids NH-452 x RAH-2211, DHY-286-1R x JK-276-10-5 and NA-1325 x RAH-101 found stable over the locations with high seed cotton yield, regression near unity and non significant deviation from regression.

Key words: Stability, Regression coefficient, G x E interaction

INTRODUCTION

Cotton cultivation in India covers an area of approximately 9 million hectares representing about one quarter of the global area of 35 million hectares under cotton. Stability in yield is a major consideration in breeding of rainfed cotton which is highly influenced by erratic and uncertain rainfall. Development of stable genotypes with high yield potential under rainfed condition is need of the day to meet domestic demands of medium and superior medium staple cotton. Stability analysis by Eberhart and Russell (1966) helps in identifying stable genotypes over the environments.

MATERIALS AND METHODS

Ten genetically diverse parental lines were crossed in diallel fashion (without reciprocals) to generate 45 hybrids. These hybrids along with their parents and three checks *viz*; PH-348, NHH-44 and Bunny were evaluated at three locations *viz*; Parbhani (E1), Nanded (E2) and Badnapur (E3) during *kharif*, 2003 under rainfed condition. These genotypes were sown in randomized block design with two replications. Two rows of each genotype were planted at a distance of 60 cm. The row length was 6.0 meter with 10 dibbles spaced at a distance of 60 cm. Five plants were randomly selected in each treatment per replication for recording the observations.

Stability parameters were computed for number of sympodia per plant, number of bolls per plant, boll weight (g), ginning percentage, seed index (g) and seed cotton

yield per plant (g) as per the methodology suggested by Eberhart and Russell (1966).

RESULTS AND DISCUSSION

The analysis of variance (Table 1) revealed that the differences among the genotypes and environments were significant for all the characters indicating the variability among the genotypes and the variation in environments. Significant E + (G x E) interactions for all the characters showed differential response of genotypes under different environment. Highly significant variance due to environment (linear) indicated that environments were differing from each other. The G x E (linear) interaction was significant for all the characters suggested the prediction of performance of these characters in different environment is possible. Pavaasia *et al.* (2002) and Narisi Reddy and Satyanayana (2003) reported importance of both linear and non linear component for various characters. Highly significant pooled deviation for the characters *viz*; number of sympodia per plant, number of bolls per plant, seed index and seed cotton yield per plant indicated that genotypes differed considerably with respect to stability for these characters.

Estimates of environmental indices (I_j) in Table 2 revealed that Parbhani environment (E₁) was favourable for all the traits except seed index for which environment of Nanded (E₂) was good. The signs of environmental indices were negative for Nanded (E₂) and Badnapur (E₃) for all the characters except for seed index suggesting

* Author for Correspondence