I J PS INTERNATIONAL JOURNAL OF PLANT SCIENCES
Volume 7 | Issue 2 | July, 2012 | 383-387

RESEARCH ARTICLE

Analysis of crossover and non-crossover GxE interaction to identify suitable genotypes of barley (*Hordeum vulgare* L.) for rainfed conditions of Himalayas

■ OM VIR AND SHEIKH M. SULTAN

SUMMARY

To identify suitable genotype(s) of barley for cultivation in the rainfed conditions of Kashmir valley 30 accessions of barley were evaluated for seven quantitative traits in *Rabi* 2005-2006, 2006-2007 and 2007-2008 in nine environments created by applying three different doses of nitrogen *i.e.* 120 kg N/ha, 140 kg N/ha and 160 kg N/ha each year and data were subjected to regression analysis and also the analysis to detect the presence of crossover and non crossover interactions. Ten genotypes namely, IBCB-05-90, IBCB-05-89, IBCB-05-85, IBCB-05-91, IBCB-05-93, IBCB-05-101, IBCB-05-20, IBCB-05-82, IBCB-05-86 and IBCB-05-83, were identified to be significantly superior to the check DL 85 in terms of mean seed yield. The performance of two genotypes namely, IBCB-05-85 and IBCB-05-93 were identified to be stable using regression analysis and crossover and non crossover analysis concept. Four genotypes IBCB-05-90, IBCB-05-91, IBCB-05-20, and IBCB-05-86 were identified to be instable using both technique *i.e.* regression analysis and crossover and non crossover interaction analysis techniques and out of these three genotypes IBCB-05-90, IBCB-05-91 and IBCB-05-20 had specific adaptability and found to be responsive to higher fertility regimes by both regression analysis and crossover and non-crossover interaction concept. The genotypes IBCB-05-89 and IBCB -05-101 were identified to be stable ones using regression analysis whereas they fail to qualify the stability test of crossover and non-crossover interaction analysis concept. The genotype IBCB-05-82 exhibited instability for seed yield using regression analysis techniques whereas its performance was stable by crossover and non-crossover interaction concept. Thus, genotypes had specific adaptability to the specific environment rather than possessing general adaptation.

Key Words : Barley, Rainfed, Low yielding environment, Regression analysis, Crossover and non crossover, Genotype x Environment interaction, Specific adaptability

How to cite this article : Vir Om and Sultan, Sheikh M. (2012). Analysis of crossover and non-crossover GxE interaction to identify suitable genotypes of barley (*Hordeum vulgare* L.) for rainfed conditions of Himalayas. *Internat. J. Plant Sci.*, **7** (2) : 383-387.

Article chronicle : Received : 17.02.2012; **Revised :** 27.05.2012; **Accepted :** 18.06.2012

Genotype x environment (GxE) interaction introduces inconsistency in the relative rating of genotypes across environments and plays a key role in the developing strategies for crop improvement (Becker and Leon, 1984). The GxE interaction can be either qualitative (crossover type) or only quantitative (non-crossover type). Since presence of cross over type interaction has a strong implication for breeding for specific adaptation, therefore, it is important to assess the presence and magnitude of cross over interactions. In general, selection of genotypes is based on their evaluation in a number of environments. The relative response of the genotypes varies over the environments indicating a change in the superiority of one genotype over the others with respect to the environment including a change in the rank of the genotypes. Selection of genotypes with an objective of yield maximization in the case of rank change over environments is complicated (Haldane, 1947; Weber and Wricke, 1990) due to non separatibility of response behaviour (Gregorius and Namkoong, 1986).

MEMBERS OF THE RESEARCH FORUM

Author to be contacted :
OM VIR, Department of Plant Breeding, Regional Centre, National Bureau of Plant Genetic Resources, SRINAGAR (J&K) INDIA
Email: omvir2007@rediffmail.com

Address of the Co-authors:
SHEIKH M. SULTAN, Department of Economic Botany, Rangreth, Regional Research Station, SRINAGAR (J&K) INDIA
Email: sheikhmsultan@gmail.com