International Journal of Agricultural Sciences
Volume 13 | Issue 2 | June, 2017 | 192-203 ■ e ISSN-0976-5670
DOI:10.15740/HAS/IJAS/13.2/192-203
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RESEARCH PAPER

Analysis of genotype-by-environment interaction for growth and earliness traits of eggplant in Rajasthan

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Abstract : Numerous common eggplant varieties have been developed in India, which when grown under variable environments, the magnitude of the growth and flowering is influenced by them. In order to determine the reasons for such variations the effect of the growing conditions on growth and flowering from the eggplant cultivars with the region specific in production were investigated. The cultivars were investigated during four successive environments at two different locations in Rajasthan with contrasting environmental components such as soil and climate. The phenotypic response of the genotypes was followed with a focus on the size of the growth and the direction of flowering within the group of genotypes as a result of each factor: season, location of growing, genotype and their complex interactions. The collected data were analyzed and provided sufficient information on the genotype x environment interaction. Significant differences were found among the investigated genotypes by growth and earliness traits regardless of their specific response to the year conditions and the location. The genotype x environment interaction was significantly high and non-linear. This means that under changeable environments the different cultivars react differently and can, therefore, be grouped according to the growth and earliness stability. This is very clear from the environmental mean scores, environments E_1 was more stable with a lowest mean value for earliness traits and highest mean value had the highest genotypic response for growth traits. Seven genotypes were found to be stable across the environments for days to anthesis of first flower, eight genotypes were found stable for days to 50 per cent flowering and ten genotypes were also found stable for days to first fruit picking. Among the stable genotypes for earliness the Pusa Upkar and Punjab Sadabahar x Pusa Upkar were found to be stable for all the earliness traits. They earliness below the average mean days of all the genotypes under test, with a slope of unity and the mean square due to deviation from regression equal to zero. The five genotypes were identified for leaf area, four genotypes for plant height, three genotypes for plant spread and two genotypes for number of branches per plant as most widely adapted genotypes for growth parameters based on stability analysis. Thus, these stable genotypes can be recommended for commercial cultivation over wide range of environments or can be used in further breeding programmes.

Key Words : Eggplant, Environment, Genotype, Interaction

View Point Article : Dhaka, S.K., Kaushik, R.A. and Jat, Laxman (2017). Analysis of genotype-by-environment interaction for growth and earliness traits of eggplant in Rajasthan. *Internat. J. agric. Sci.*, **13** (2) : 192-203, **DOI:10.15740/HAS/IJAS/13.2/192-203.**

Article History : Received : 27.01.2017**; Revised :** 04.04.2017**; Accepted :** 18.04.2017

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