

## Stability analysis of yield and quality contributing characters in muskmelon (*Cucumis melo* L.)

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### ABSTRACT

Fifty genotypes of muskmelon (*Cucumis melo* L.) were evaluated for stability with respect to yield/ha, fruit length, fruit diameter, flesh thickness, F:C ratio, fruit shape index and total soluble solids in three consecutive environments. The mean sum of squares due to genotypes, when tested against G x E and pooled deviation were highly significant for all the traits studied. Environmental variances, when tested against G x E were also highly significant for all the traits indicating genetic variability among the genotypes and environments were effective in influencing the performance of the genotypes except F:C ratio. The mean sum of squares due to G x E interaction, when tested against pooled deviation was highly significant for all the attributes. However, G x E (L) effects were found to be highly significant for all the attributes indicated that major components of differences in stability was due to both linear and non linear components and the performance can be predicted over the environments except F:C ratio and fruit shape index. The non-linear components (pooled deviation) were found to be significant for all the characters except flesh thickness. Based on the environmental indices, the environment E<sub>3</sub> was most favourable for all the characters under studied except F:C ratio. Considering the stability parameters of individual genotypes, it is revealed that the genotypes DVRM-2 and IAM Mono-1-1 had regression coefficient  $b_i \cong 1$  with non-significant deviation from regression ( $S^2_{di}$ ) displayed wider stability for almost all the traits except fruit shape index and these genotypes can be utilized in further breeding improvement programmes.

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In India, muskmelon (*Cucumis melo* L.) is one of the most important desert cucurbits grown extensively both in the garden land as well as riverbeds-an indigenously developed cucurbits growing system. Precise knowledge of the nature and magnitude of genotype x environment interaction is very important in understanding the stability of different traits of a particular genotype, before it has recommended for commercial cultivation. The different sources of variation including genotype x environment interaction are of great importance to the plant breeders for deciding appropriate testing and selection procedure for planning an efficient plant-breeding programme.

The ultimate aim of plant breeder is to evolve cultivars of high yield potential with consistent performance over diverse environments. Compared with most of the vegetables crops, muskmelons are extremely susceptible to environmental variation and genotype x environment interaction may be responsible for lack of widely adapted cultivars (Timothy *et al.*, 1980). The present study was, therefore, aimed to screen and isolate promising and potential genotypes of muskmelon (*Cucumis melo* L.) possessing stable performance over varying environmental conditions.

### MATERIALS AND METHODS

The mean performance of fifty genotypes of muskmelon consisting of all India level germplasm collections and recommended varieties were evaluated in Randomized Block Design with three replications in three different environments *i.e.* early *khariif* (E<sub>1</sub>- 4<sup>th</sup> April, 1999), *rabi* (E<sub>2</sub>-18<sup>th</sup> November, 1999) and summer (E<sub>3</sub>- 21<sup>st</sup> February, 2000) at Experimental Farm, Department of Horticulture, Mahatma Phule Krishi Vidyapeeth, Rahuri.

The plot size was kept at 2.00 x 4.20 m<sup>2</sup>. The channels were prepared by keeping the distance of 2.00 m between the two channels. Seeds were directly sown on hills spaced at 60 cm. Seven hills/plants in each genotypes in each replication were maintained. After germination, two seedlings were retained at each hill and data were recorded on five plants in each genotype in each replication. All cultural practices recommended for this crop were adopted timely in all three environments/ growing seasons. Observations were recoded on yield/ha, fruit length, fruit diameter, flesh thickness, F:C ratio, fruit shape index and total soluble solids. The data were analyzed to test the significance of genotype x