STABILITY OF POD YIELD IN BUNCH VARIETIES OF GROUNDNUT (Arachis hypogaea L).

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Five promising bunch varieties of groundnut (Arachis hypogaea L.) were evaluated for level and stability of performance for pod yield over four locations in Maharashtra State. The diferences in stability were mainly due to the linear regression. The variety JL 24 had above average stability and high level of performance of pod yield and hence it was an ideal variety in the material under study.

Groundnut is an important source of vegetable oil in India. However, there are greater flectuations in its annual production particularly in Maharashtra. One of the reasons for this seems to be the sensitive behaviour of the varieties to available variable environments at growing conditions. Then there is an urgent need to breed varieties which perform consistantly better over environments and possess higher levels of pod-yield.

A statistical technique to rank varieites for stability of their performance developed by Finlay & Wilkinson (1963) suggested a linear regression as a measure of stability in barely (Hordeum vulgare L). Ebarhart & Russell (1966) emphasied that both linear (bi) and non-linear (S²di) components of geneotype environment intraction should be considered while judging the phenotypic stability of a genotype. They suggested that an ideal genotype should have mean, linear regression and non-linear as samll

as possible (i. e. approaching to zero). Joshi et al, (1972) reported stability parameters for few bunch genotypes of groundnut Arachis hypogaea L).

MATERIAL AND METHODS

A trial consisting of five varieties for evaluating a genotype which has the least amount of intraction with the environment was conducted at four centres viz , Jalgaon, Akola, Amravati and Badnapur situated in different agro-climatic zones in kharif 1978. The trial was laid out in a randomized block design replicated five times. The polt size was 5.0 x 4.2m with the spacing of 30 x 10cm. The agronomic practices and fertilizer doses i. e. 20 : 40 : 20 NPK Kg/ha were kept the same at all the places.

The model suggested by Eberbart and Russell (1966) was used to compare the varieties for stability performance. The yield data were analysed for partitioning the genotypes x environmental interaction of each variety i. e.

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(i) Variation due to the response of the variety under different environmental indices.

(ii) The unexplainable deviations from the linear regression.

RESULTS AND DISCUSSION

The stability analysis of variance (Table 1) showed that the genotypic differences among the genotypes for their regression on environmental index was significant, indicating presence of diffential genetic response to environments in yield. The varietal index alone was highly significant. Significant deviation from linear regression was observed in only one variety. i.e. JL 24.

The mean performance of the varieties over environments (Table 2) showed that JL 24 was the best with 49.3 per-cent yield over grand mean, while SB XI, AK-12-24, TG-3 and TG-17 gave lower yields than the general mean.

All these varieties showed regrssion co efficient around one, indicating average stability. The range varied from 0.89 for JL 24 to 1.20 for AK-12-24. JL 24 showed good stability and produced high yields in all locations indicating its general adaptability. However, the other varieties viz. SB XI, AK-12-24, TG-3 and TG-17 has regression co efficient above one, indicating average stability but all these consistantly gave below average yields (Table 3), sho-

wing its poor adaptability to all these environments. It is necessary to mention that the importance of knowledge of stability without which one could have selected the genotypes on the basis of their good performance in favourable environments but same of them would have resulted in total failure in a adverae environmental conditions. JL 24 performed consistantly well under poor as well as good enviornmental conditions when compared with SB XI.

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Table 1 : Analysis of variance for bunch groundnut.

Source of variation	Degrees of freedom	Mean sum of squares
Total	19	54.37
Varieties	4	10 69**
Environment		
Variety x Environment	15	43.67**
Environment (Linear)	1	37 94**
Variety x Environment (Linear)	4	158 93**
Pooled deviation	10	29.63
JL - 24	2	10.48
SB XI	2	9.70
AK-12-24	2	4.35
TG-3	2	3 01
TG-11	2	2.09
Pooled error	10	0.43

** Significant at 1% level

Table 2 : Stability parameters for bunch groundnut

Variety	Mean yield (Kg/ha.)	b_i	S^2 d_i	percent ever grand mean
JL-24	1214	0.89	5.23**	49.3
SB XI	760	1.08	4 84**	
AK-12-24	722	1.20	2.17	
TG-3	672	1.76	1.50	
TG-17	695	1.13	1 03	
Grand mean	813			

** Significant at 1% level

Table 3 : Yield of groundnut pods (Kg/ha).

Environment	JL-24	SB-XI	AK-12-24	TG-3	TG-11	Centre Mean
Jalgaon	1168	353	162	190	597	494
Akola	562	287	281	199	289	324
Amravati	1653	960	1172	1012	954	1150
Badnapur	1472	1342	1273	1285	934	1461
Varietal mean	1214	760	722	672	695	813