

STABILITY OF YIELD IN GROUNDNUT

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Six promising varieties of groundnut were evaluated for level and stability of yield over four environments in Western Maharashtra. The differences in stability were mainly due to linear regression. The variety M-13 had good stability and was second best in yielding ability while TMV-10 had given the highest yield with moderate stability. Hence, M-13 and TMV-10 were observed to be ideal genotypes for yield.

Groundnut is an important source of edible oil in India. The annual production fluctuates due to varying environmental conditions. Hence the identification of a high yielding stable genotype is necessary for stabilizing and increasing production. Finlay and Wilkinson (1963) suggested linear regression as a measure of adaptation. Eberhart and Russell (1966) emphasized that both linear (b_i) and non linear (S^2d_i) components of the genotype environment interaction should be considered while testing the phenotypic stability of a genotype. They have suggested that an ideal genotype should have high mean, linear regression and s^2d_i as small as possible (i.e. approaching zero). Joshi *et al* (1972) reported stability parameters in bunch varieties of groundnut while Mohindar Singh *et al*. (1975) reported stability of pods yield in spreading groundnut. In the present investigation, an attempt has been made to evaluate six promising varieties of groundnut for their level and stability of performance for yield.

MATERIAL AND METHODS

The material comprised of 6 promising varieties viz. TG-1, TG-17,

TG-18 from BARC, Trombay, Shulamith from Israel, M-13 from Punjab and TMV-10 from Tamil Nadu were tested at four different locations in Western Maharashtra during kharif 1976, 1977, 1978. At each location, the material was sown in a randomized block design with four replications. The plot size was 5.0 x 4.5m with a row to row and plant to plant spacing of 45 x 15cm. The agronomic practices and fertilizer doses (20 : 40 NP kg/ha) were kept the same as all the places and during all years. The data on yield was recorded on plot basis. The stability analysis was done by following the method given by Eberhart and Russell (1966).

RESULTS AND DISCUSSION

The analysis of variance (Table 1) showed that environmental differences were highly significant indicating diverse type of environment confronting the genotype during crop growth. The mean differences between genotypes and genotype environmental interaction components were highly significant. The genotypes x environmental (linear) interaction was significant

which indicate clear differences among the regression coefficients pertaining to various genotypes on the environmental means.

The phenotypic stability was measured by three parameters, viz. mean performance over environments, the linear regression and deviation from regression function. The mean performance of varieties over environments (Table 2) showed that TMV-10 was the best with 21.6 percent yield over grand mean. All these varieties showed regression coefficient around 1.0, indicating average stability. The range varied from 0.85 for Shulamith to 1.21 for TMV-10. The variety TMV-10 had high mean performance with 1.12 which is not significantly different from the unity indicating average stability. The variety M-13 also had high mean yield with $b_i = 0.99$

which showed a good stability. The varieties M-13 and TMV-10 could be considered to possess good stability and least responsiveness to environmental fluctuations.

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Table 1 Analysis of variances

Source of Variation	D. F.	S. S	M. S. S.	F. Cal.
Total	71	635.346		
Varieties	5	29.694	5.938	4.63**
Environment Variety Environment	66	605.651		
Environment (Linear)	1	521.544		
Variety X Environment	5	7.137	1.427	1.11 N. S.
Pooled deviation	60	76.977	1.282	
TG-1	10	5.399	0.539	
TG-17	10	29.813	2.981	
TG-18	10	10.027	1.002	
Shulamith	10	12.968	1.296	
M-13	10	4.316	0.431	
TMV-10	10	32.689	0.151	
Pooled error	216	32.689	0.151	

**Significant at 1 percent level of probability

Table 2: Stability parameters for groundnut

Variety	Mean yield Kg/ha	bi	S ² di	Percent over grand mean
TG-1	1330	1.01	0.3583	—
TG-17	1223	0.91	2.7997	—
TG-18	1274	1.02	0.8211	—
Shulamith	1221	0.85	1.1152	—
M-13	1503	0.99	0.2500	9.0
TMV-10	1664	1.12	1.2635	21.6
Grand mean	1369			

Table 3: Pod yield of groundnut varieties.

Environment	Pod yield (Kg/ha)						Centre mean
	TG 1	TG-17	TG-18	Shulamith	M-13	TMV-10	
Pune	1998	1703	1658	1412	1782	1749	1517
Karad	1115	1290	1120	1135	1265	1505	1240
Digraj	732	566	757	595	1070	1129	825
Kolhapur	2076	1333	1550	1743	1894	2185	1797
Varietal Mean	1330	1223	1274	1221	1503	1664	1369