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Short Communication

STABILITY ANALYSIS OF GREEN POD YIELD IN FRENCH BEAN

R.K. Tyagi* and B.D. Joshi

National Bureau of Plant Genetic Resources,
Regional Station, Shimla 171 004 (Himachal Pradesh)

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French bean (*Phaseolus vulgaris* L.) is a sensitive crop to the vagaries of environment. Consequently, yield fluctuates with variations in environments. Hence, a study was conducted to assess genotype × environment interactions and stability of 13 genotypes in Shimla conditions.

Thirteen exotic collections (hereafterward referred to as EC) *viz.* - EC 14907, EC 22367, EC 24646, EC 39439, EC 42960, EC 43036, EC 57080, EC 94469, EC 99539, EC 10080, EC 102711, EC 108101 and Premier, imported from various sources, were tested in a randomised block design with 4 replicates in 5 years (1985-1989). Each genotypes was sown in 4-row plots, each row was 2 m long and spaced at 0.5 m apart. Plant to plant distance was 10-15 cm. At the time of sowing, nitrogen @25 kg/ha, phosphorus @70 kg/ha, and potassium @50 kg/ha were applied. Data on green pod yield (Q/ha) was calculated on the basis of plot (2 × 1.5 m) yield and used for statistical analysis for stability parameters (Eberhart and Russell, 1966).

The differences were highly significant among the genotypes for green pod yield (Table 1). Environment played a major role in expression of green

Table 1. Analysis of variance of stability for green pod yield of 13 genotypes of French bean

Source of variation	d.f.	S.S.	M.S.
Genotypes	12	13643.74	1135.97**
Environment + (G × E)	52	28601.35	550.02**
Environment (Linear)	1	15891.85	15891.85**
Genotype × Environment (Linear)	12	6128.58	510.17**
Pooled deviation	39	5834.50	149.60

**P = 0.01

**Present address* : NFPTCR, NBPGR, New Delhi 110 012

pod yield. The environment (linear) component was significant, indicating that environments differ markedly and thereby satisfying the requirement of stability analysis. Significant genotype × environment (linear) interaction indicated genotypic differences for regression over environmental means (Table 1), and that genotypes behaved differently in different environments during 5 years of study.

Regression 'b' and deviation from regression 'S^2d' (Eberhart and Russell, 1966) were considered to adjudge the stability of genotypes. A genotype with maximum yield expression for unit 'b' value and non-significant 'S^2d' value would be ideal for general cultivation.

For green pod yield, EC 57080 and EC 108101 with higher mean values (127.28 and 112.86) with significant 'b' value of 1.22 and 0.9 and non-significant deviations from regression might be stable over the years in a favourable environment. Also, the genotypes such as EC 100680 and Premier showed relatively better mean values with low 'b' values (0.006 and 0.31) indicating their better performance in poor environments (Table 2).

Table 2. Estimates of stability parameters (mean, b and S^2d) for green pod yield (Q/ha) in French bean

Genotype	Source	Mean	'b'	S^2d
EC 14907	U.S.A.	86.92	1.37	316.74**
EC 22367	U.S.A.	89.40	0.82**	366.86**
EC 24646	Sweden	70.78	0.76**	559.74**
EC 39439	U.S.A.	96.92	0.64	288.94**
EC 42960	U.S.A.	87.76	1.76	498.16**
EC 43036	U.S.A.	112.90	0.71	12.68
EC 57080	Australia	127.28	1.22**	-20.91
EC 94469	Bulgaria	99.58	2.48	35.09**
EC 99539	U.S.S.R.	89.48	1.32	78.59**
EC 100680	Netherlands	96.72	0.006	68.27**
EC 102711	Australia	85.84	0.33	-563.76**
EC 108101	U.S.A.	112-86	0.91**	9.35
Premier	U.S.A	79.58	0.31	153.85**

Grand mean – 94.93; S.Em. – 6.12; C.D. – 16.96; **P = 0.01

On the basis of green pod yield, EC 57080 (*ex* Australia) and EC 108101 (*ex* U.S.A.) were adjudged as stable genotypes in Shimla conditions and may prove popular. In India, these two genotypes should be tested in different locations over the years to establish their superiority and stability.

REFERENCE

Eberhart S.A. and W.A. Russell. 1966. Stability parameters for comparing crop varieties. *Crop Science* **6** : 36-40.