

## Genetic Variability in Horsegram (*Dolichos biflorus* L.)

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Genotypic coefficients of variation, heritability estimates and expected genetic advance were estimated for ten characters in eleven varieties of horsegram. All the characters except pod length and seeds per pod, showed higher heritability estimates. Number of pods per plant, number of nodules per plant, number of branches, plant height and yield per plant showed higher genetic gain values associated with higher heritability estimates. Therefore for effecting improvement through selection, number of pods per plant, number of nodules per plant, plant height and yield per plant should be considered.

Information on genetic variability among growth as well as yield components in various pulse crops have been reported by many workers, but not much efforts have been made for its improvement. Agarwal and Kang (1976) have investigated the genetic variability and correlation of various agronomic characters with yield in this dry pulse crop. In addition to all the characters studied by Agarwal and Kang (1976) number of nodules per plant has also been included in the present study.

### MATERIALS AND METHODS

Eleven varieties of horsegram, viz., Hebbal 1, Hebbal 2, HPK 1, HPK 2, HPK 3, HPK 4, HPK 5, HG 76, HG 93, BGM and Co 1 were sown during 1976 at the Central Farm, Agricultural College and Research Institute, Madurai in a randomised block design with four replicates under rainfed condition. Each plot had twelve rows spaced 25 cm apart with a

length of 4 m. Five plants were chosen at random from each plot. Data on ten characters viz., plant height, number of days to flowering, number of days to maturity, pod length, number of pods per plant, number of nodules per plant, number of seeds per pod, 100 grain weight, number of branches per plant and yield per plant were collected.

The genotypic coefficients of variation (GCV), heritability estimates and expected genetic advance (GA) and genetic advance as percentage of mean were worked out using the formulae suggested by Burton (1952) and Johnson *et al.* (1955) respectively.

### RESULTS AND DISCUSSION

The range, mean, phenotypic and genotypic variance, coefficient of genotypic variation, heritability, genetic advance and genetic advance as percentage of mean are presented in Table.

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TABLE. Genetic Parameters for different characters in horsegram

Characters	Range	Mean	Variance		G.C.V.	Heritability	Genetic advance	Genetic advance as % of mean
			Phenotypic	Genotypic				
Plant height (cm)	22.6–104.4	48.093	2461.080	2411.070	102.10	97.96	100.10	208.16
No. of days to flowering	38.0–56.0	45.295	143.241	138.564	25.99	96.73	23.85	52.65
No. of days to maturity	92.0–120.0	102.182	798.255	798.255	27.65	100.00	58.20	56.95
Pod length (cm)	4.0–5.3	4.748	0.201	0.085	6.14	42.29	0.39	8.21
No. of pods per plant	14.0–67.0	28.900	661.878	617.010	85.95	93.22	49.40	170.93
Seeds per pod	3.2–6.4	4.820	2.820	0.220	9.73	7.80	9.73	5.59
100 grain weight(g)	3.3–6.3	4.625	3.265	3.264	29.07	99.98	3.72	80.43
No. of branches	4.8–14.8	8.227	6.829	2.567	19.47	37.59	2.02	24.55
No. of nodules per plant	14.0–69.0	30.909	645.995	639.615	81.82	99.01	51.84	167.72
Yield per plant (g)	4.0–12.3	7.268	36.122	35.410	81.88	98.03	12.14	167.03

Plant height, number of pods per plant and number of nodules per plant among varieties ranged widely. The phenotypic as well as genotypic variances were similar in most of the characters (Table).

The co-efficients of genotypic variation were the lowest (6.14%) for pod length and highest (102.1%) for plant height. Days to maturity showed the highest heritability value (100%), where as the heritability estimate was the lowest for number of seeds per pod (7.8%).

The value of genetic gain for plant height was the highest (208.16%) and lowest for seeds per pod (5.59%).

Genetic gain for number of pods per plant was also high.

Heritability estimates and genetic advance for different characters varied considerably. High heritability estimates are helpful in making selection of superior genotype on the basis of phenotypic performance of quantitative characters. But Johnson *et al.* (1955) have reported that heritability estimates along with genetic gain will be more useful than heritability value alone in predicting the resultant effect for selecting the best individuals. In the present investigation high heritability for days to maturity and days to flowering was not associating with high genetic gain.

This means that there is less scope for further improvement by selection for these characters. But in the case of plant height, number of pods per plant, number of nodules per plant and yield per plants, the higher heritability was associated with the higher genetic gain indicating the presence of additive gene effects for these characters (Panse, 1957). Therefore it might be worthwhile to select plants for these characters. This is similar to the findings of Agarwal and Kang (1976),

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