

## GENETIC VARIABILITY OF YIELD AND COMPONENT CHARACTERS IN COWPEA (*Vigna unguiculata* (L.) WALP.)

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### ABSTRACT

The genetic variability studies carried out with seven parents and their  $F_1$ 's had shown that there existed moderate variability for plant height, number of clusters per plant, number of pods per plant and yield per plant. Days to 50 per cent flowering, days to maturity, plant height, pod length, number of seeds per pod and 100 grain weight recorded higher heritability estimates. Both the estimates of heritability and genetic advance were high for plant height, number of seeds per pod and 100 grain weight.

**KEY WORDS:** Cowpea, Genetic variability, Heritability, Genetic advance.

A knowledge of genetic parameters, such as genotypic coefficient of variation, heritability and expected genetic advance is a pre-requisite in the genetic improvement of a crop. The present investigation was therefore undertaken to study the extent of genetic variation present in seven parents and their twelve hybrids of cowpea for yield and its component characters that would be useful in formulating an appropriate breeding programme.

Research Centre, Pudukottai, Tamil Nadu during Kharif 1984, in a randomized block design with three replications in plots of two rows, 45 cm apart, with 15 cm between plants. Days to 50 percent flowering, days to maturity, plant height, number of primary branches per plant, number of clusters per plant, number of pods per plant, pod length, seeds per pod, 100 grain weight and yield per plant were recorded on five random plants in each plot.

### MATERIALS AND METHODS

Seven parents and their twelve  $F_1$ s of cowpea were evaluated at the National Pulses

Analysis of variance was done according to the method given by Panse and Sukhatme (1961). Heritability in broad

sense and genetic advance expressed as percentage of mean were calculated according to Burton (1952).

## RESULTS AND DISCUSSION

The genotypes showed significant differences for all the characters studied (Table). The genetic analysis of data showed a wide range of variation for all the characters. The pcv ranged from 5.25% for pod length to 25.62% for yield per plant and was low ( $< 10\%$ ) for days to 50 per cent flowering, days to maturity, pod length and seeds per pod, moderate (10-20%) for number of primary branches per plant and 100 grain weight. The relative magnitude of pcv and gcv indicated a higher degree of environmental fluctuations in the plant height, number of primary branches per plant, number of clusters per plant, number of pods per plant and yield per plant, in general and gcv revealed the same pattern of genetic variability as shown by the pcv. Plant height, number of clusters per plant, number of pods per plant and yield per plant showed moderately high genotypic coefficient of variation thereby suggesting their improvement

genetically. Balakrishnan (1978), Pandita et al. (1982) and Dharmalingam and Kadambavanasundaram (1984) reported that number of pods per plant and seed yield had recorded high genetic variability in cowpea.

The low value of genetic coefficient of variation for days to 50 per cent flowering, days to maturity and pod length indicated their limited scope for improvement. Similar results were reported by Rashid and Islam (1982) in soybean and Radhakrishnan and Jebaraj (1982) in Cowpea.

Days to 50 per cent flowering, days to maturity, plant height, pod length, number of seeds per pod and 100 grain weight showed high heritability, while number of primary branches per plant, number of clusters per plant, number of pods per plant and yield per plant exhibited low estimate of heritability. Plant height has recorded a higher heritability estimate coupled with the highest gcv indicating the predominance of additive gene effects in controlling this trait.

Table. Estimates of range, mean, phenotypic coefficient of variation (PCV), genotypic coefficient of variation (GCV), heritability and genetic advance (GA) of ten characters in cowpea.

Characters	Range	Mean ± S.E	PCV (%)	GCV (%)	Heritability (%)	G.A	G.A. as % of mean
Days to 50% flowering	40.66-48.66	44.05 ±0.46	5.59	5.24	89.02	4.49	10.19
Days of maturity	59.00-70.00	64.40 ±0.85	5.27	4.74	81.01	5.66	8.78
Plant height (cm.)	54.20-163.09	126.19 ±9.44	22.86	18.83	67.85	40.33	31.95
Primary branches/plant	4.73-6.70	5.73 ±0.36	14.57	9.51	42.63	0.73	12.73
Clusters/plant	9.13-18.33	13.52 ±1.52	23.85	13.70	33.00	2.19	16.19
Pods/plant	14.53-29.66	21.73 ±2.48	23.02	11.71	25.88	2.66	12.24
Pod length (cm.)	15.34-18.52	17.06 ±0.28	5.25	4.42	70.84	1.31	7.67
Seeds/pod	12.93-17.40	15.37 ±0.37	7.77	6.55	71.24	1.77	11.36
100 grain weight (g)	9.94-13.28	12.25 ±0.29	10.37	9.47	83.39	2.18	17.79
Yield/plant (g)	23.49-41.84	32.30 ±3.99	25.62	14.05	30.25	5.15	15.94

In the present material the characters like plant height, number of seeds per pod and 100 grain weight showed large genetic gains and higher heritability estimates. Though the heritability estimates for number of primary branches per plant, number of clusters per plant, number of pods per plant and yield per plant were low they also exhibited large genetic gains. These character could be considered important affecting the selection for improving seed yields in cowpea.

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