

GENETIC VARIATION ANALYSIS IN ADVANCE STAGE HYBRIDS OF COTTON (*GOSSYPIUM HIRSUTUM* L.) UNDER RAINFED CONDITION

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The genetic variability studies were carried out in twenty-one advance stage hybrids. This may give clue for identification of potential recombinants in segregating generation, which could, strengthen breeding programme. Six important characters were undertaken for study. In present study, high values were obtained for heritability and genetic advance for seed cotton yield. Therefore, phenotypic selection in segregating generation will help in developing cotton varieties.

Keywords: Cotton; Genetic advance; GCV; Heritability; PCV.

Cotton improvement programme mainly depends upon availability of magnitude of genetic variation in the population. Since variability indicates the extent of recombination for initiative effective selection¹, heritability and genetic advance helps to determine the direction and magnitude of selection. Therefore, the present investigation was undertaken with the main aim of studying the variability in advance F₁ hybrids of cotton. This may give clue to identify the potential recombinant in F₂ and subsequent generation from the identified variable cotton hybrids.

The experiment consisting with 21 advance stage F₁ hybrids of cotton was conducted at Nimbkar Seeds Pvt. Ltd. Phaltan during 2005-06 under All India Coordinated Cotton Improvement Project programme. The hybrids were sown in RBD design on June 26-2005 with three replications in a four rows plot spaced at 90 and 70 cms. distance between and within rows respectively. The improved recommended cultural practices were followed. At the time of maturity five plants were randomly selected for recording observations like mean boll weight, number of bolls per plant, ginning out turn, Seed cotton yield per plant. The seed cotton yield and lint yield kg/ha. was estimated on plot yield basis.

The variability parameters were estimated following the standard procedure as suggested by Analysis of variance²; Genotypic and phenotypic coefficient of variation³; heritability in broad sense⁴ and genetic advance and genetic advance expressed as percent of mean⁵.

The results obtained for variability parameters for six yields and yield contributing components are presented (Table 1). The results indicated that except mean

boll weight all the characters revealed significant differences. This is evidence by displaying wide range of variation. The magnitude of GCV and PCV differences were less for most of the characters except number of bolls per plant. This has indicated the influence of least role of environment. Similar observations were reported⁶. The heritability estimates were high enough for ginning out turn and seed cotton and lint yield which showed the involvement of less role of environment. The moderate heritability estimates were obtained for mean boll weight and number of bolls per plant. In support of this, high heritability for seed cotton yield was reported⁷. The heritability estimates alone does not imply the role of gene action for particular character. Therefore, it was suggested that heritability along with genetic advance would be more useful in predicting yield under phenotypic selection than heritability alone⁵. In the present study the characters, seed cotton and lint yield kg/ha. were found with high estimates of heritability and genetic advance. Accordingly, the phenotypic selection in segregating generation will help in developing improved cotton varieties.

In the present evaluation the hybrid code 5196 yielded 58.70% higher compared to highest zonal check (NHH-44). At the same time, the said hybrid stood in first rank in central zone⁸. Therefore, it is advocated that the recombinant breeding using this hybrid will greatly facilitate in isolation of high yielding plants.

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Table 1. Estimates of Range, Mean, P.C.V., G.C.V., Heritability (B.S.), Genetic advance and Genetic Advance as Percent of Mean in Cotton

Character	Mean	Range	Coefficient of variation (%)		Heritability broad (%) sense	Genetic advance	Genetic advance as expressed percent of mean
			Genotypic	Phenotypic			
Mean boll weight (g.)	4.07	3.0-5.1	12.12	14.92	81.21	1.30	32.04
No. of bolls per plant	17.53	13-23	64.32	72.49	88.72	6.52	37.17
Ginning out turn (%)	36.73	33.9-40	20.03	21.25	94.27	5.43	14.77
Seed cotton yield/plant (g)	46.00	31-57	281.46	293.83	95.79	23.04	49.66
Seed cotton yield/ha. (Kg.)	1658.00	1148-2069	9949.20	10055.30	98.94	832.41	50.19
Lint yield/ ha (Kg.)	608.00	423-809	3427.69	3490.56	98.20	294.72	48.46

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