

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

M.N. MOHRIR<sup>1</sup>

Pratishthan Mahavidyalaya, Paithan-431 107 Dist. Aurangabad, India.

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 selection<sup>1</sup>, 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 F<sub>1</sub> hybrids of cotton. This may give clue to identify the potential recombinant in F<sub>2</sub> and subsequent generation from the identified variable cotton hybrids.

The experiment consisting with 21 advance stage F<sub>1</sub> 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 variance<sup>2</sup>; Genotypic and phenotypic coefficient of variation<sup>3</sup>; heritability in broad sense<sup>4</sup> and genetic advance and genetic advance expressed as percent of mean<sup>5</sup>.

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 reported<sup>6</sup>. 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 reported<sup>7</sup>. 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 alone<sup>5</sup>. 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 zone<sup>8</sup>. Therefore, it is advocated that the recombinant breeding using this hybrid will greatly facilitate in isolation of high yielding plants.

The author expressed sincere thanks to Mr. Z.G.Quraishi, CMD Nimbkar Seeds Pvt. Ltd. Phaltan for encouragement and help.

### References

1. Manivasakam P and Kamalanathan S 1987, Variability in yield and other quantitative characters in

**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

*Gossypium barbadense* L. Madras. *Agri J.* 74 (8-9) 360-364.

- Panse V G and Sukhatme P V 1967, Statistical methods for agricultural workers. Published by Indian council for Agricultural Research, New Delhi p. 381.
- Burtqn, G. W. 1952. Quantitative inheritance in grasses. Proc. 6<sup>th</sup> Inter. Grassland Congr. 1277-183.
- Lush J L 1950, Intra-sire correlation and regression of offspring on dams as method of estimating heritability of characters. *Proc. Amer. Soc. Animal Prodn.* 1950 33 293-301
- Johnson H W, Robinson H F, Comstock R E 1955, Genotypic and phenotypic correlations in Soybean and their implication in selection. *Agron. J.* 47 477-483.
- Sambhamurthy J S V, Reddy D M, Reddy K H G 1995, Genetic variability correlation and path analysis in cotton (*Gossypium hirsutum* L.). *J. Indian Soc. Cott. Improv.* 20 133-138.
- Sankarapandian R., Krishnadoss, D., Muppithathi, N., and Ananda Kumar C. R. 1998. Genetic variability over environments and stability analysis of rainfed cotton (*G. hirsutum* L.). *J. Indian Soc. Cott. Improv.*, 23:144-146.
- Anonymous 2005-06 Annual Report, All India Coordinated Cotton Improvement Project. PP 131.