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ESTIMATES OF GENETIC PARAMETER IN BREAD WHEAT (*Triticum aestivum L.*)

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ABSTRACT

The nature and magnitude of genetic variability and their heritability percent along with genetic advance as percent of mean were studied for nine quantitative characters in 44 F_1 and 15 parents of bread wheat. highly significant difference for almost all character was found among the genotypes. A wide range of variability was observed for plant height. days to 75 percent flowering. number of grains per spike and 1000- grain weight in both parents and crosses. High estimates of heritability along with high value of genetic advance as percent of mean and genotypic and phenotypic coefficient of variation for grain yield. spike length. number of spike per plant. no. of grains per spike among crosses revealed the immense importance for further improvement through selection in segregating generations.

KEY WORD: Bread Wheat, Variability, Heritability

Bread wheat (*Triticum aestivum* L.) is one of the staple cereal crops next to rice in both area and production. In plateau region of Bihar, wheat cultivation was introduced after the famine during 1967's. The present investigation was carried out for selecting suitable parents and crosses for further improvement in wheat.

MATERIALS AND METHODS

The study was carried out during 1994-95. Forty four F_1s and fifteen parents were sown in the experimental field of Birsa Agricultural University, Ranchi. The materials were obtained from Department of Plant Breeding and Genetics, B.A.U, Ranchi. The entries were sown in 3 rows of 2 m length in Randomized Block Design with three replications. The row to row distance was maintained 23 cm. Recommended agronomic practices were followed. Observations for nine quantitative characters namely, days to 75 percent flowering, plant height (cm). spike length (cm)., no. of spike per plant, no. of grains per spike. grain weight per spike, 1000-grain weight. biological yield per plant. and grain yield per plant were recorded on ten randomly selected plants. The mean data was analysed for variance and co-variance (Panse and Sukhatme, 1967), coefficient of variation at phenotypic and genotypic level (Burton, 1952), heritability in broad sense (Lush, 1940) and genetic advance as per cent of mean (Johnson *et al.*, 1955).

RESULTS AND DISCUSSION

It is revealed that the analysis of variance there was highly significant difference among the parents and crosses for almost all characters which showed the presence of inherent genetic differences among the parents as well as in the crosses. For the character 1000-grain weight, non-significant difference was observed among the female parents.

A wide range and mean was observed in the characters *viz.*, plant height, no.of grains per spike, grain yield per plant among the parents and crosses, while moderately high range was found for days to 75 percent flowering, no.of spike per plant and 1000-grain weight among the crosses. Tikka *et al.* (1973) also found similar trend for these characters.

The estimates of heritability along with genetic advance as percent of mean was found high for spike length. no.of spike per plant and grain yield whereas, no.of grains per spike and days to 75 percent flowering recorded moderate heritability among the crosses. High estimates of heritability with high genetic advance was recorded for spike length while high heritability with moderate genetic advance was found for days to 75% flowering among the parents. Similar results were also found by many wheat worders viz: Gandhi *et al* (1964). Tikka *et al.* (1973) and Mallo (1984).

Coefficient of variation at genotypic and phenotypic level was recorded high for grain yield per plant. no. of spike per plant and no.of grains per spike while, medium for spike length and grain weight per spike among the crosses. High genotypic coefficient of variation and phenotypic

Table 1. Estimation of genetic parameters in bread wheat for nine quantitative characters

	Range		Mean		Heritability		Genetic advance as % of mean		Coefficient of variation			
									Genotypic		Phenotypic	
	P	C	P	C	P	C	P	C	P	C	P	C
Days to 75% flowering	64.33-83.00	74.00-87.66	76.35	82.63	90.07	74.41	19.04	5.72	6.16	3.22	6.49	3.73
Plant height	79.50-107.93	74.73-98.46	94.18	87.07	60.30	58.15	11.30	11.45	7.07	7.90	9.09	9.59
Spike length	7.53-13.40	7.83-14.70	10.13	10.86	83.15	82.28	29.80	27.95	15.86	14.87	17.40	16.29
No. of spike per plant	4.36-5.83	3.83-8.03	5.12	5.72	26.09	79.03	5.28	1.60	5.23	15.30	10.24	17.21
No. of grains per spike	32.66-46.66	33.00-62.00	39.55	43.68	59.78	75.72	18.33	27.05	11.51	15.09	14.88	17.34
Grain weight per spike	1.15-1.80	1.15-2.15	1.42	1.60	60.29	66.66	22.70	23.88	14.23	14.21	18.34	17.44
1000-grain weight	35.60-50.27	34.66-49.40	39.29	39.56	72.39	57.34	17.27	11.09	9.85	7.08	11.58	9.31
Biological yield per plant	13.88-25.30	16.71-26.83	18.25	22.27	79.05	70.71	32.23	19.98	17.59	11.53	19.79	13.71
Grain yield	5.55-10.49	5.83-12.25	7.11	9.09	69.70	86.42	30.51	44.20	17.74	23.08	21.25	24.83

P = Parent ; C = Crosses

coefficient of variation was also found for the character grain yield per plant and biological yield per plant among the crosses. gill and Brar (1973) and Mallo (1984) also reported high genotypic coefficient of variation for grain yield, no.of spike per plant and no.of grains per spike.

Moreover it is therefore concluded that grain yield per plant and number of spike per plant having high heritability, high genetic advance and high genotypic coefficient of variation had a maximum scope of improvement through selection in segregating generation. In case of spike length, high heritability and high genetic advance were associated with moderate genotypic coefficient of variation which may be useful for future selection improvement. The narrow range of difference between genotypic coefficient of variation in traits like grain yield per plant, days to 75% percent flowering and plant height further indicated that these characters were least influenced by environment and thus helpful in breeding for earliness, dwarfness coupled with high yield in wheat.

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