

Genetic Variability in Metric Characters in Wheat (*Triticum aestivum* L. em. Thell)

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ABSTRACT

An investigation was carried out with ten varieties of wheat to find out the information on genetic variability present among them which could be useful as sound basis for selection of superior ones. The analysis showed higher genetic variability in number of productive tillers per one metre length, height of plant and duration. Heritability estimates revealed that almost all characters except number of grains per panicle have high heritability value. Genetic coefficient of variation is highest for the grain weight per plot followed by height of plant. High heritability value combined with high genetic advance has been exhibited by the height of plant, duration in days, length of panicle and grain weight per plot.

INTRODUCTION

The variation in yield components is due to both genetic and non-genetic factors. The genotype - environment interactions and response among these components have to be studied before effecting any useful selections. With this objective in view, investigation was undertaken to estimate the amount of genetic variability present among the different varieties, the genetic co-efficient of variation, heritability and genetic advance in the important components of yield.

MATERIALS AND METHODS

Ten varieties of wheat, Sharbathi Sonara, Kalyan Sona, UP 301, UP 215, HW 152, Safed Ierma, HD 4502, NI 749-19, MACS 9, and NI 5439 were grown in a randomised block design with four replications at the Regional Research Station, Kaveripattinam during October, 1974. Each plot

had eleven rows spaced 23 cm apart with a length of 2.7 M. The seed rate of 60 Kgs. per acre was adopted. Observations were recorded on five plants marked from middle row of each plot for one metre length. A uniform population was maintained in all the plots. Seven characters, namely height of plant, duration in days, length of panicle, number of grains per panicle, 1000 grain weight, grain weight per plot and number of tillers per one metre length were studied.

The genotypic coefficient of variation (G.C.V.), heritability estimates and expected genetic advance (G. A.) and G. A. as percentage of mean were worked out as per the formulae suggested by Burton (1952) and Johnson *et al.* (1955) respectively.

RESULTS AND DISCUSSION

The analysis of variance worked out for each character revealed the

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presence of significant differences among the entities for different characters. The range, mean, phenotypic variance, genotypic coefficient of variation, heritability, genetic advance and genetic advance as percentage of mean are presented in Table. The genotypic and phenotypic variance were found to be almost similar in the

case of height of plant, duration and length of panicle, which indicated that the variations in these characters are mostly due to genetic causes.

The range was high for grain weight per plot, height of plant, number of productive tillers and length of panicle which is also indicated by

TABLE. Genetic parameters for different characters in Wheat

Character	Range	Mean	Variance		G. C. V.	Heritability	G. A.	G. A. as % of mean
			Phenotypic	Genotypic				
Height of plant	43.2 — 78.95	61.74	132.48	122.65	17.92	92.58	22.08	35.77
Duration in days	86.50 — 105.00	97.65	46.45	46.07	6.95	99.11	13.89	14.22
Length of panicle in cm.	4.55 — 7.05	5.99	0.43	0.42	10.68	97.67	1.312	21.86
No. of grains per panicle	22.30 — 29.65	27.08	5.49	1.98	5.17	34.24	1.64	6.05
1000 grain weight in g.	31.5 — 42.5	36.15	11.71	7.11	7.35	60.71	4.32	11.95
No. of productive tillers/1 metre length	68.00 — 131.00	102.42	431.18	262.00	15.79	60.76	26.08	25.46
Grain weight per plot in Kg.	0.86 — 2.29	1.390	0.145	0.113	23.66	77.93	0.61	43.95

the higher genetic coefficient of variation exhibited in these four characters. This is in accordance with the observations made by Singh *et al.* (1973).

The heritability was high for height of plant, duration, length of panicle and grain weight per plot with moderately high values for 1000 grain weight and number of productive tillers for one metre length. Singh

et al. (1973) have also reported a similar finding. Even though the high heritability value can be utilised as a basis for selection based on phenotype alone, the heritability estimate along with genetic gain is more useful than heritability alone in predicting the effect of selection (Johnson *et al.*, 1955). In the present investigation, the characters, height of plant, duration, length of panicle and grain weight per plot showed high

heritability combined with high genetic advance as percentage of mean which might be due to additive gene effects (Panse, 1957). This is similar to the findings of Singh *et al.* (1973). The number of productive tillers and 1000 grain weight showed high genetic advance, but they have low heritability values which suggests the probability of non-additive gene effects (Panse, 1957). The present study revealed the possibility of effecting improvement through individual plant selection for such characters as yield, duration, panicle length and height of plant.

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