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Genetic Variability For Seed Yield And Its Component Characters In Wheat (*Triticum Aestivum* L.) Under Allahabad Agro-Climatic Conditions.

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***Abstract*-- The present investigation was carried out with 40 genotypes during *Rabi* 2006-07 in RBD having three replications of field Experimentation Center of Department of Genetic and Plant Breeding, Sam Higginbottom Institute of Agriculture, Technology & Sciences, Allahabad. The mean performance of genotypic IBWSN 1062, IBWSN 1056, IBWSN 1069, IBWSN 1068 and IBWSN 1077 was recorded highest for yield and yield per plant, days to maturity , plant height, spike length, 1000 grain weight, grain yield per plant, respectively. The analysis of variance revealed highly significant differences studied. The highest genetic variability was observed for yield per plant followed by number of grains per spike, 1000 grain weight and plant height. The highest phenotypic coefficient of variance (PCV) was recorded for yield per plant followed 1000 grain weight and number of grains per spike. The highest genotypic coefficient variance (GCV) was observed for yield per plant while the characters 1000 grains weight, grain per spike and spike length showed moderate value of GCV indicating that there could be used as selection indices for yield improvement. Higher heritability, in broad sense, was recorded for yield per plant, 1000 grain weight, grain per spike and plant height while moderate heritability observed for days to heading days to maturity and spike length. High heritability indicates that heritability may be due to higher contribution of genetic component and thus the traits may be improved by progeny selection. Estimates of genetic advance as percent of mean were highest for yield per plant, grains per spike and 1000 grain weight**

***Keyworld*-- Wheat, Genetic Advance, Heritability (Broad Sense), Genotypic Variance, Phenotypic Variance, GCV and PCV**

I. INTRODUCTION

Wheat (*Triticum aestivum* L.) is one of the most important staple food grains of human race and also the world's most widely cultivated food crop and second most important staple food crop next to rice in India **(FAO 2007).** Among the cultivated food cereals, it occupies a pride place. In respect to area and production it occupies the second position, being exceeded only by rice.

In the India sub continent wheat has been under cultivation from pre historic time. It provides 20 percent of the total food calories of human requirement. It contributes towards food front to the time 36 percent of world population and provides 20 persent of total calorie supply. India stands fourth in both the area and production of wheat in the world. The study of genetic variability and heritability is the pre-requisites for any crop improvement program. Success in recombination breeding depends on the suitable exploitation of genotypes as parents for obtaining high heterotic cross and transgressive segregates heritability and genetic advance are other important selection parameters. The estimates of heritability help the plant breeders in determining the character for which selection would be rewording. The breeders are interested in selection of superior genotypes based on their phenotypic expression. The major function of heritability estimates is to provide to the progeny. Heritability estimates can anticipate improvement by selection of useful characters.

II. MATERIALS AND METHODS

The experiment was conducted during *Rabi* seasons of 2006–2007 at Sam Higginbottom Institute of Agriculture, Technology & Sciences, Allahabad, Research Farm in Department of Genetic and Plant breeding. The experiment comprising of 40 genotypes were conducted in a randomized block design with three replications. Each genotypes was accommodated in a double row two meters length spaced at 25 cm with an approximate plant to plant spacing 4 cm and data were recorded on five randomly selected plants from each treatment and each replication for days to heading, days to maturity, plant height, spike length, number of grains per spike, yield per plant, 1000 grains weight. Analysis of variance **(Table No.1)** for all characters were carried out using the method of **Burli *et al.* (2004)** and individual comparison of varietals mean**.**

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Genetic, Coefficient of variation (GCV & PCV) and heritability, genetics advance were calculated to observe the different traits **Johnsen *et al.* (1955), Hanson *et al.* (1963) and Burton and Devane (1953).**

III. Results And Discussion

The analyses of variance for different 7 characters are present in **Table 1**. The result showed significant difference for mean sum of square at 5 and 1% level for all the characters under study among 40 genotypes. These characters are Days to 50% heading, Days to maturity, Plant height (cm) ,Grain per spike, Yield per plant (gm), 1000 grain weight (gm) and Spike length (cm).This suggested that the genotype selected for research were quite variable and constant levels of variability are present among them. Thus indicating amply scope for selection of different qualitative characters in wheat improvement.

Genetic parameters of yield and their components are given in **Table 2**.In the present study, the highest genetic variability and phenotypic variability was observed for yield per plant (gm) followed by grain per spike , 1000 grain weight, Plant height, days to 50% heading, days to maturity and spike length (cm) indicating that the genotypes. Similar findings were reported by **Ansari *et al.* (2005), Khan *et al.* (2004).** The highest value of phenotypic coefficient of variation (PCV) was higher than that of the genotypic coefficient of variation (GCV) for all the recorded observation was its yield per plant (gm) followed by grain per spike , 1000 grain weight, Plant height, days to 50% heading, days to maturity and spike length (cm). Environmental coefficient of variation was very low as compared to phenotypic and genotypic coefficient of variation indicating less environmental influence. Earlier workers namely. **Singh *et al.* (2006), Sharma and Garg (2002).** Heritability and genetic advance are two complementary concepts. The estimates of heritability in broad sense in the present study were found to be high for yield per plant, 1000 grain weight and grains per spike. It was estimated to be moderate for plant height, days to heading, days to maturity while it was low for spike length. High value indicates that heritability may be due to higher contribution of genotypic component. Thus the traits may be improved by progeny selection. High heritability estimates were reported by **Gupta *et al.* (2004), and Mittal and Sethi (2005).**

The estimates of expected genetic advance showed that the highest genetic advance was exhibited by yield per plant (gm) followed by grain per spike, 1000 grain weight and plant height. Similar finding was reported by **Gupta and Verma (2000), Pawar *et al.* (2002), Singh *et al.* (2006).**

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Table No. 1
Analysis of Variance for 40 wheat genotypes.

S.N.	Characters	Means Sum of Squares		
		Replications (d. f. = 1)	Treatments (d. f. = 39)	Error (d. f. = 39)
1.	Days to 50% heading	01.51	18.41**	02.33
2.	Days to maturity	07.20	06.38**	02.12
3.	Plant height (cm)	22.89**	49.85**	01.11
4.	Grain per spike	00.45	72.71**	01.12
5.	Yield per plant (gm)	03.94*	144.13**	00.77
6.	1000 grain weight (gm)	7.07**	55.89**	00.65
7.	Spike length (cm)	01.63*	1.05**	00.37

**, ** indicates significance @ 5% and 1% respectively*

Table: 2
Genetic parameters of 7 quantitative characters for 40 wheat genotypes.

S. No.	Characters	σ^2g	σ^2p	GCV %	PCV%	ECV %	h^2 (bs)%	GA	GG
1.	**Days to 50% heading**	8.04	10.37	3.45	3.90	1.85	77.51	5.14	6.22
2.	**Days to maturity**	2.09	4.22	1.20	1.70	1.20	49.64	2.10	1.73
3.	**Plant height (cm)**	24.39	25.45	4.79	4.89	1.00	95.82	9.96	9.65
4.	**Grain per spike**	35.79	36.91	12.51	12.70	2.21	96.97	12.14	25.38
5.	**Yield per plant (gm)**	71.68	72.45	37.78	37.98	3.92	98.94	17.35	77.42
6.	**1000 grain weight (gm)**	27.62	28.27	12.60	12.75	1.93	97.71	10.70	25.66
7.	**Spike length (cm)**	0.34	0.71	5.28	7.66	5.55	47.56	0.83	7.51

Where as:- ***σ^2g Genotypic Variability, σ^2p Phenotypic variability, GCV %*** *Genotypic Coefficient of Variation* ***PCV%*** *Phenotypic coefficient of variation* ***ECV %*** *Environmental coefficient of variation,* ***h^2 (bs)%*** *Heritability (braod Sence)* **, *GA*** *Genetic Advance* **, *GG*** *Genetic Gain*