

## **Average performance of parents and their F3-lines for seven Quantitative Characters in Wheat(Triticum eastivum)**

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### **Abstract**

Seven F3 lines and two parents of (*Triticum eastivum* L.) were tested at the Botanical Garden of Sind University of Agriculture Tandojam in the year 1993-94. Highly significant differences were observed for all the observed characters. Plant height ranged from 72.57 to 102.17 for line-8 and line-6, respectively. Number of fertile tillers for Parant-16.42 and line-7 was 10.03. Spike length per spike 10.74 to 12.54 for line-8 and line-3 respectively while Spike lets per spike Parant1 was height 19.85 by Parent -1 and Line-5 17.59. Number of grain per spike 42.23 to 53.78 by line-7 and line-4 respectively. Seed Index (gm) line-6, 35.57 was heights while, line-4, 19.49 was the lowest. Grain yield line-7 attained the height yield of 12.17 gram per plant while for line-8 showed the lowest yield of 8.47 gram per plant. These variation in yield and other characters predict the positive response of the segregating population and its ultimate utilization in the future breeding programme for variety development

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### **INTRODUCTION**

Wheat is one of the leading cereal crops of the world including Pakistan. It is favorite food of 35% of world population. The importance of wheat grain is due to physical and chemical properties of its gluten, which assists in the production of bread loaf.

It is primary source of staple diet for poor and rich alike. Wheat is a high nutritive value i.e. it provides 20% of total food calories assumed by man. It contains 70% of carbohydrates, 12% proteins 2.2% crude fibers, 2%fat 12% water and about 1.8% minerals

Wheat is the most important food crop of the world. The largest cropped area is devoted to wheat and the quantity produced is more than any other crop. Leading wheat-producing countries were china, Russia, India, the United State, Canada and France.

In Pakistan wheat is the most important single crop. During the ten-year period from 1982-83 to 1991-92 it was planted on 37% of the cropped area of the country. With a yield of 1560 kg/hac which is for less than the world average.

Keeping in view of the above facts, it is important to increase the yield per unit area through the utilization of genetic diversity in the plant population and the present study was an endeavor to observe the divergent population in the segregating generation.

Olivvero. et al. (1989). Wheat Breeding heritability and correlation among yield components in hybrids population. Pawar et al. (.1989). Study of heritability and genetic advance in three-wheat population, Lonc et al.

(1886). Gene action for agronomic characters in winter wheat. Gill et al.(1979). Gene action in a seven parent in diallal cross of macroni wheat, Fonseca et al.(1968). Hybrid vigor in the seven parent diallal cross of macroni wheat. , Movchan et al..(1986) Variability and heritability of characters in hybrids of winter wheat with spring wheat. Alexander,et al.(1977) A genetic Study of yield components of winter wheat. Sayed et al.(1978). Inheritance of quantitative characters of breed wheat.

## Material and methods

The experiment was carried out on 7 F3 line and two wheat varieties Kohinoor and Johar were carried out in the Botanical Garden Sind Agriculture University Tandojam in the year 1993-94.

The seed were dibbled by hand keeping the space at 15cm between plant to plant and 30cm distance between row to row. 15 plants per replication of each F3 Line were selected randomly while ten plants per replication from parents were also selected randomly all the selected plants were labeled for study.

The observation for each character under study was recorded. Irrigation and all other cultural practices were carried out uniformly to raise a successful crop.

Data were recorded on plant height, number of tillers per plant, main spike length, number of spikelets per spike, number of grains per spike, seed index and grain yield per plant. The data were statistically analyzed using analysis of variance technique and LSD at 5% probability was used to compare the difference among variety means (Steel and Torie 1980)

## RESULT AND DISCUSSION

### Plant height: -

Result presented in the table –1 reveals those F3 progenies very highly significant for plant height. Table –2 shows that the tallest plants were produced by line six attaining the height (102.17) followed by line –5 (100.82 cm) the shortest plant height was reveal by line –8 (72.57cm) this is in conformity with Lonc et al. (1986). Ovivero et al. (1989) high heritability and genetic advancement for plant height.

### Number of fertile tillers per plant

Highly significant differences were observed for number of fertile tillers per plant (table-1) heights number of fertile tillers per plant 10.03 by line –7 followed by (9.09) by line-3 while the lowest was attained by Parant-1 Johar (6.42) Alexander et al. (1977) found high to moderate heritability estimate for tiller number in wheat.

### Spike length (cm) per spike

Data were highly significant for spike length per spike (table-1) while the average performance Table-2 showed that line –3 was the heights spike length per spike (12.54cm) followed by (12.50) by line-5 while the shortest length was shown by line-8 (10.74) Gill et al. (1979) Also supported the above study.

### Spike let per spike

Highly significant differences were observed for spike let per spike (table-1) highest number of spike let per spike 19.85 by line –5 followed by (19.68) by line-3 while the lowest was attained by Parant-1 Johar (17.59) Pawar et al. (1989) found high heritability estimate and genetic advancement for spike let per spike in wheat.

### Number of Grain per spike

Data were highly significant for number of grain per spike (table-1) while the average performance Table-2 showed that line –4 was the highest number of grain per spike (53.78) followed by (53.68) by line-3 while the

lowest number of grain per spike was shown by line-7 (42.23) Movchan et al. (1986) concluded that effective selection for number of grain per spike was also possible.

### Seed index (gm)

The data revealed highly significant differences for seed index (table 1) Highest seed index was observed by line -6 (35.57) followed by Parent-1 Johar (34.20) the lowest seed index expressed by line 4 (19.49) it is obvious that the seed index have direct relation with the seed yield Fonseca et al. (1968) is in conformity with the above results.

### Grain Yield (gm)

Grain yield also indicated that the combined analysis of variance (mean square) showed that the difference among the F3-lines and parent were highly significant (Table -1) from the average performance (table-2) showed that both the parents, P1-Johar (9.06) and P2-Kohinoor (10.58) were almost in the middle order. While line-7 (12.17) attained the highest grain yield followed by line-5(10.87) The lowest yield was indicated by line-8 (8.47). This indicates that some of the segregating population was the highest and some were the lowest in comparison with the parents. Udachin et al. (1985) reported high variation in the segregation generation for grain yield per plant.

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(Table: 2) Average Performance of Parents and their F3 Lines for Seven Quantitative Characters.

S. No	Geno Type	Plant Height (cm)	No; Fertile Tillers	of Spike length per spike (cm)	No; Spikelets per spike	Number of Grain per spike	Seed Index (gm)	Grain Yield (gm)
<i>Parents</i>								
1	P1-Johar	89.12	6.42	10.93	17.59	42.90	34.20	9.06
2	P2-Kohinoor	82.82	7.87	10.82	18.13	44.86	31.92	10.58
<b>F3 Lines of Johar &amp; Kohinoor</b>								
3	Line -2	87.02	8.99	11.37	17.75	44.81	23.21	9.66
4	Line-3	90.87	9.09	12.54	19.68	53.68	20.97	9.98
5	Line -4	78.27	8.93	12.25	19.61	53.78	19.49	9.05
6	Line-5	100.82	8.99	12.50	19.85	44.79	28.71	10.87
7	Line-6	102.17	6.78	11.47	19.23	42.94	35.57	9.69
8	Line-7	90.72	10.03	11.08	18.68	42.23	28.28	12.17
9	Line-8	72.57	7.98	10.74	17.88	43.85	24.31	8.47
Mean:		88.269	8.36	11.52	18.71	45.98	27.407	9.94
L.S.D at 0.01 =		8.301	1.825	0.8422	1.307	4.698	4.095	2.048

(Table: 1) Analysis of variance (Means squares) for plant height, yield and  
Yield components of two parents & their seven F3 Lines of wheat.

S.No	Source of Variation	Degree of Freedom	Plant Height	Number of Fertile Tillers	Spike length per spike (cm)	Number of Spikelets per spike	Number of grain per spike	Seed index (gm)	Grain yield per plant (gm)
1	Genotype	8	** 370.976	** 5.52	** 2.101	** 3.293	** 80.774	** 133.496	** 5.046
2	Replication	3	27.708	1.99	0.067	0.0126	26.307	15.52	2.156
3	Error	24	17.616	1.56	0.330	0.829	10.363	7.813	1.97

\* Significant at 0.05 5.0%  
 \*\* Significant at 0.01 1.0%  
 \*\*\* Significant at 0.001 0.1%