

(Triticum aestivum L.)

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Estimation of Heterosis and Heritability in Bread Wheat (*Triticum aestivum* L.)

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ABSTRACT

Six varieties of bread wheat *Triticum aestivum* L. (Sham 4, Adnaniya, Iba 95, Tamoz 2, Eratom, Abo-Graib) and their half diallel crosses were used to estimate heterosis, broad and narrow sense heritability for the following quantitative characters: heading time, number of tillers per plant, plant height, flag leaf area, number of spikes per plant, spike length, number of spiklet per spike, number of grains per spike, 100 grain weight, grain yield per plant and the harvest index. Most hybrids appeared significant and desirable values for heterosis. The broad sense heritability was high for plant height, spike length and number of spiklet per spike while, it was moderate for harvest index, and low for heading time, number of tillers per plant, flag leaf area, number of spike per plant, number of grains per spike, 100 grain weight and grain yield per plant. The narrow sense heritability was high for plant height and harvest index, and moderate for heading time, spike length, number of spiklet per spike, 100 grains weight while it was low for number of tillers per plant, flag leaf area, number of spike per plant, number of grains per spike and grain yield per plant.

Keywords: Wheat, Heterosis, Broad and narrow sense heritability.

(Rangare *et al.*, 2010)

poaceae

(*Triticum aestivum* L.)

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%12

%70

%20

(Mahpara, 2008)

%1.8

%12

%2

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Randomized complete block design

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.(Soomro and Aksel, 1976)

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299.4

%57.77

(24.27

-10.36

-:

Heading time

-1

Number of tillers per plant

-2

Plant height

-3

Flag leaf area

-4

×

.(Muller , 1991) 0.74×

Number of spikes per plant

-5

15

Spike length

-6

Number of spiklet per spike

-7

Number of grains per spike

-8

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$$100 \times \frac{\text{حاصل الحبوب (غم)}}{\text{عدد السنابل} \times \text{وزن 100 حبة}} =$$

100 grains weight

100

-9

100

Grain yield per plant

-10

Harvest index

-11

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$$\frac{\text{حاصل الحبوب بالنبات (غم)}}{\text{الحاصل البايولوجي بالنبات (غم)}} = \text{دليل الحصاد} \quad (H)$$

$$: \quad \bar{P}_j \quad \bar{P}_i \quad F_1$$

$$\text{Heterosis (H)} = \overline{F_{1ij}} - \frac{(\bar{P}_i + \bar{P}_j)}{2}$$

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.ith jth

$$= \bar{F}_1$$

.ith

$$= \bar{P}_i$$

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$$= \bar{P}_j$$

: t t

$$t = \frac{H}{\sqrt{V(H)}}$$

:

$$V(H)$$

$$V(H) = 3/2 \frac{\sigma^2 e}{r}$$

:

$$= \sigma^2 e$$

$$= r$$

:

$$H^2(b.s) = \frac{\sigma^2 G}{\sigma^2 p} = \frac{\sigma^2 A + \sigma^2 D}{\sigma^2 A + \sigma^2 D + \sigma^2 e}$$

$$H^2(n.s) = \frac{\sigma^2 A}{\sigma^2 p} = \frac{\sigma^2 A}{\sigma^2 A + \sigma^2 D + \sigma^2 e}$$

:

$$: H^2(b.s)$$

$$: H^2(n.s)$$

$$: \sigma^2 G$$

$:\sigma^2 A$
 $:\sigma^2 D$
 $:\sigma^2 e$
 $:\sigma^2 p$

.(1987)

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(5×6) ,(4×6) ,(4×5) ,(2×6) %1

(1×2) %5

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(2×5) ,(1×5) %1 (2×4) ,(2×3)

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:(2×6) %1

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0.003	**2.263	**0.311	-6.425 **	*0.597	**1.332	**1.6	*0.617	**10.230	**8.053	0.135	1×2
-0.020	** -6.602	**0.361	-4.319 **	0.054	*0.707	-4.108 **	0.429	-1.182 **	-0.243	**2.884	1×3
0.064	**8.034	0.017	**2.038	**1.273	**1.711	**3.644	**10.681	**9.113	**5.839	-3.796 **	1×4
-0.005	**3.452	0.45	-6.608 **	0.362	*0.676	**2.166	**5.248	**2.718	*0.855	-3.713 **	1×5
0.035	**14.972	*0.149	-5.485 **	-1.317 **	0.047	-8.655 **	-0.177	-9.272 **	-12.155 **	**5.388	1×6
-0.013	** -4.790	-0.310 **	-0.331	*-0.681	-0.41	-0.109	*-0.727	**2.928	**1.736	**2.674	2×3
-0.017	**2.987	-0.255 **	**8.230	*0.627	0.447	-1.022 **	**2.120	**4.634	**3.413	-0.324	2×4
-0.003	*0.799	0.038	0.129	**1.437	*0.575	0.311	-1.594 **	*0.808	*0.556	-0.324	2×5
-0.039	** -5.213	0.033	-6.146 **	-0.021	**1.769	-0.966 **	-1.134 **	-0.122	0.120	*0.745	2×6
0.012	** -7.623	-0.207 **	-5.507 **	-0.450	-0.63	-0.774	0.400	**1.189	*-0.674	*-0.645	3×4
-0.008	** -6.747	-0.236 **	0.016	*0.614	*-0.624	-1.897 **	** -1.27	-2.033 **	-3.455 **	**2.308	3×5
-0.004	-11.586 **	-0.130	-16.388 **	-1.082 **	0.55	*0.869	-5.486 **	-14.290 **	-1.912 **	**4.853	3×6
-0.010	**1.803	-0.322 **	-1.343 **	0.024	-0.062	**1.777	-1.065 **	**5.655	0.114	*0.498	4×5
0.038	** -1.265	-0.055	**8.106	0.018	**1.960	-3.155 **	-3.628 **	-1.333 **	-3.858 **	*0.827	4×6
0.004	** -1.125	0.111	-1.528 **	-0.008	**1.558	0.489	*0.576	**3.048	-6.645 **	*0.758	5×6

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(Memon *et al.*, 2007)

(Ali *et al.*, 2008)

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(Mangl *et al.*, 2010)

(Rangar *et al.*, 2010)

(Laghari *et al.*, 2010) 100
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(Novoselovic *et al.*, 2004)

Munir *et al.*,)

(Adel-Nour *et al.*, 2005)

(Abd-EL-Haleem, 2009)

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(Khattab *et al.*, 2010)

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h²(n.s)	h²(b.s)	
0.309	0.444	
0.179	0.284	
0.708	0.788	
0.149	0.233	
0.060	0.109	
0.323	0.616	
0.481	0.661	
0.035	0.350	
0.336	0.369	100
0.063	0.167	
0.571	* 0.571	

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