

**HETEROSIS AND INBREEDING DEPRESSION IN WHEAT
[TRITICUM AESTIVUM L. AND T. DURUM DESF.]**

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Twelve genotypes of *Triticum aestivum* L. and *T. durum* Desf. Viz. HI 1011, HW 965, Hindi 62, DL 803-3, MP 938, A 206 (d), Raj 1555(d), JWJ 2914, HI 1077, HUW 201, GW 190 and JWJ 866 were crossed to obtain F₁'s during the year 1993-94. The F₁ seeds obtained were divided into two halves. One half was stored on cold storage while other half was used to obtain F₂ seeds. In the final trial, P₁, P₂, F₁ and F₂ of seven crosses, were planted in a randomized block design with four replications during rabi 1995-96. Parents and F₁ were grown in a single row plots and the F₂'s were grown in two rows plots. The plot consisted of 2 metre row length spaced at 20 cm and 10 cm between and within row, respectively. Five competitive plants for each row to each replication in all the populations were selected to record observations on nine traits. Heterosis and inbreeding depression for all the traits were estimated as per standard procedures.

Cross JWJ 2914 × HI 1077 exhibited significant negative heterobeltiosis for the traits like days to heading, 1000-grain weight and grain yield per plant (Table 1). This cross could be used for developing early maturity hybrids. Similar findings were also reported earlier for days to heading[1]; for 1000-grain weight and grain yield per plant[2]. Crosses like Hindi 62 × DL 803-3, Hindi 62 × MP 938 and A 206 × Raj 1555 showed negative heterosis for plant height could be of use in developing short statured hybrids.

Significant positive heterobeltiosis was observed for the traits like number of tillers per plant, number of spikelets per spike, 1000-grain weight, grain yield per plant and biological yield per plant in A 206 × Raj 1555 and Hindi 62 × DL 803-3. Similar results have also been reported for number of tillers per plant [3], grain yield per plant and for number of spikelets per spike [4] and for 1000-grain weight[5].

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Table 1. Heterosis percentage (H) and inbreeding depression percentage (ID) for yield and its components in seven crosses of wheat

Cross		Days to heading	Plant height (cm)	Number of tillers/plant	Spike length (cm)	Number of spikelets/spike	Number of grains/spike	1000 grain weight (g)	Grain yield/plant (g)	Biological yield/plant (g)
HI-1011 ×	H	1.12	-3.80**	5.93**	0.80	-0.12	2.15*	1.61**	6.11**	4.94**
HW-965	ID	-5.38**	1.75	0.93**	-2.31**	-4.32**	-7.60**	5.42**	2.84**	2.29
Hindi-62×	H	0.50	-5.88**	5.00**	4.53**	7.00**	3.30	14.38**	7.12**	13.86**
DL-803-3	ID	-2.50	-20.03**	0.60**	-1.19**	-0.95**	5.71**	24.68**	-15.53**	-30.27**
Hindi-62×	H	5.00	-16.50**	1.75*	2.42**	5.00	4.48	18.64	0.90*	13.15**
MP-938	ID	2.00	-5.03**	-2.72	-2.55*	-1.65	-1.30	22.00	-2.68*	-15.42**
A-206×	H	2.00**	-4.32**	3.15**	1.66*	2.00**	-2.31	15.57**	3.56*	4.82**
Raj-1555	ID	-5.00**	-14.80**	3.55**	-1.97**	-6.10**	4.96*	11.98**	-4.93**	-3.70*
JWJ-2914×	H	-5.00**	4.50**	3.00**	3.59	2.58**	-6.30	-1.19**	-0.97**	-7.62**
HI-1077	ID	-8.50**	-15.00**	-5.30**	-0.03	-3.79**	-1.25	5.88**	-13.56**	-1.51
HUW-201×	H	5.00**	0.29**	6.29**	-0.28	1.58*	2.73	3.80**	4.29**	4.71**
GW-190	ID	-4.50**	-32.52**	-0.74**	-2.07	-2.60*	-6.71**	-3.70**	-7.65**	-8.39**
JWJ-866×	H	0.50**	34.44*	1.67**	10.30**	9.84**	3.38**	-2.62	2.47**	19.22**
GW 190	ID	5.00**	3.50*	-4.70**	7.62**	3.60**	6.31**	4.00**	8.86**	-29.34**

*, ** = Significant at 5 < 1% level respectively.

The significant negative heterosis followed by negative inbreeding depression was observed for days to heading and grain yield per plant in cross JWJ 2914 × HI 1077 indicating the occurrence of additive gene effects which would result in the appearance of transgressive segregants in the F_2 and subsequent generations, hence the isolation of superior yielding genotypes may be possible by isolating desirable segregants from the segregating population of this cross. These findings are in confirmation with [1] for days to heading; and for grain yield per plant [2].

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