Short Communication

HETEROSIS FOR YIELD AND YIELD COMPONENTS IN RICE (*ORYZA SATIVA* L.)

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A set of 10 × 10 diallel crosses excluding reciprocals were made with 10 rice cultivars. The 45 F_1's and ten parents were grown in randomized complete block design with three replications. Each entry was represented by single row of 5m length with 30 cm spacing between rows and 20 cm between plants. Observations on six quantitative traits were recorded on five random competitive plants from each row. Heterosis was estimated over the better parent.

Out of the 45 crosses under study, ten most promising combination on the basis of *per se* performance were identified and their heterotic value for major yield components analysed. None of the top heterotic cross was heterotic for all traits simultaneously (Table 1). The cross Birsa Dhan 105 × IR 36 exhibited the maximum *per se* performance for grain yield per plant with corresponding highly significant positive heterosis over better parent for grain yield per plant (99.6%) and number of ear-bearing tillers per plant (83.8%). The cross Birsa Dhan 202 × Rajendra Dhan 202 was the second best cross with respect to *per se* performance for grain yield per plant with corresponding significant positive heterosis for grain yield per plant (81.6%), number of ear-bearing tillers per plant (55.2%) and number of grains per panicle (18.5%). High magnitude of heterosis in these crosses was indicative of high degree of dominance or epistasis or both. Similar results were reported by earlier workers [1, 2]. In most cases, significant positive heterosis for grain yield was associated with heterosis for flag leaf, number of ear-bearing tillers per plant and 1000-grain weight.

In general, the varieties Birsa Dhan 105, IR 36, Birsa Dhan 202, Rajendra Dhan 202 and Rasi were promising parents giving high heterosis for most of the traits. The present study suggested that these lines could be utilized in rice breeding programme including heterosis breeding.

Table 1. Ten best crosses as per their *per se* performance with corresponding heterosis in some major yield traits in rice

Cross	*per se* performance (grain/yield plant) (g)	Heterosis over better parent (%)					
		Grain yield per plant	Flag leaf area	No. of ear bearing tillers/ plant	No. of grains per panicle	1000-grain weight	Harvest Index
Birsa Dhan 105 × IR-36	34.7	99.6**	0.9	83.8**	10.7	6.2	8.8
Birsa Dhan 202 × Rajendra Dhan 202	33.6	81.6**	18.9*	55.2**	18.5*	2.2	9.2
IR-36 × Birsa Dhan 202	30.7	66.3**	1.7	34.4**	6.2	14.3**	16.0*
Birsa Dhan 104 × Birsa Dhan 201	28.6	60.4**	0.5	−4.5	0.9	4.7	12.5*
RAU 4004-105 × IR-36	28.0	131.7**	28.4**	28.2**	16.7*	18.2**	−0.7
Birsa Dhan 105 × Birsa Dhan 202	27.9	50.6**	12.3	21.2*	−1.5	7.4	7.5
Birsa Dhan 103 × Birsa Dhan 201	26.7	58.8**	25.3**	21.7**	−29.1**	21.3**	−3.3
Birsa Dhan 105 × Rasi	26.5	52.3**	−1.9	29.6**	−2.7	11.5**	4.3
RAU 4004-105 × Rajendra Dhan 202	24.5	97.3**	20.9**	71.5**	−9.7	3.1	−11.6
Birsa Dhan 106 × Birsa Dhan 201	23.3	42.3**	−0.6	−2.9	−2.4	3.2	−0.6

*, ** Significant at 5% and 1% levels, respectively.

REFERENCES

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