

RESEARCH NOTES:

Madras agric. J. 62 (7) : 456—457, July, 1975.

Heterosis in Tall and Dwarf Indica Rice Varieties

With a view to incorporate the yield potential and the quality attribute to a strain, seeds of two varieties of rice, namely ASD. 1 and Dee-Geo-Woo-Gen of the tall and dwarf *indica* groups respectively were obtained from the Paddy Breeding Station, Coimbatore and raised. Crossing was effected in kharif season of 1971 and F1 hybrids were raised along with the parents adopting a spacing of 60 cm × 30 cm. Twelve hybrids were isolated, selfed and heterosis was studied for different metrical characters.

The quantitative attributes of F1s in comparison with ASD. 1 and Dee-Geo-Woo-Gen are furnished in Table 1.

The F1 plants showed heterosis for height of plant recording 3.86 per cent over the better parent and 20.06 per cent over the midparent value. Heterosis manifested for the number of productive tillers to 100 per cent increase over better parent and 150 per cent over midparent value. In respect of yield of grain per plant, 8.69 per cent increase over better parent and 91.86 per cent over mid parent value were recorded. In the case of mean yield of straw, the

hybrids recorded 138.24 per cent increase over better parent and 148.17 per cent over mid parent value. In the case of first, third and fourth internodes, the hybrids expressed 15.49, 5.93 and 9.43 per cent increase in length over better parent and 34.42, 13.08 and 16.00 per cent over mid parent value respectively. The spikelet sterility recorded in hybrids was 47.07 per cent which exceeded both the parents. The hybrids registered 138.24 per cent increase yield of straw over better parent and 148.47 per cent over mid parent value. Decrease in length and breadth of the boot leaf, in number of spikelets per panicle as well as length, breadth and weight of 100 grains were observed in the F1s.

The author expresses his gratitude to Dr. P. Chandrasekharan, Professor and Head, Department of Agricultural Botany, Agricultural College and Research Institute Madurai for guidance in this study and to the Tamil Nadu Agricultural University for the permission accorded to publish this part of the M. Sc. (Ag.), dissertation.

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TABLE 1. Quantitative attributes of F_{11} in comparison with parents.

Characters	Mean values of				Mid parental value	Percentage increase/decrease over better parent	Percentage increase/decrease on mid-parental value
	ASD. 1	ASD 1. X DGWG	3	4			
1	2				5	6	7
Height of plant (cm)	124.2		129.0	90.7	107.45	+ 3.85	+ 20.06
Number of productive tillers	10		20	6	8	+100.00	+150.00
Panicle length (cm)	26.5		21.7	21.8	24.15	- 18.11	- 10.15
Number of spikelet per panicle	135.0		129.8	148.2	141.6	- 12.30	- 8.33
Length of grain (m. m.)	8.02		7.29	7.97	8.00	- 9.10	- 8.87
Breadth of grain (m. m.)	3.17		2.88	3.19	3.18	- 9.72	- 9.43
L/B ratio of grain	2.52		2.52	2.45	2.49	- 0.00	+ 1.20
Thickness of grain	1.98		2.01	1.87	1.93	+ 1.51	+ 4.14
Weight of 100 grain (gm.)	2.925		2.245	2.498	2.712	- 23.25	- 17.22
Yield of grain per plant (gm.)	7.499		20.491	18.852	10.680	+ 8.69	+ 91.86
Yield of straw per plant (gm.)	17.000		40.500	15.600	16.300	+138.24	+148.17
Length of boot leaf (cm)	36.7		35.7	25.0	30.9	- 2.72	+ 15.53
Breadth of boot leaf (cm)	1.3		1.0	1.4	1.4	- 28.57	- 28.57
Length of internode First (cm)	7.1		8.2	5.1	6.1	+ 15.49	+ 34.42
Second (cm)	18.2		16.3	15.8	17.0	- 10.44	- 4.12
Third (cm)	25.3		26.8	22.1	23.7	+ 5.93	+ 13.08
Fourth (cm)	31.8		34.8	28.3	30.0	+ 9.43	+ 16.00
Spikelet sterility %	14.90		47.07	19.84	17.37	+137.25	+170.98

TABLE 1. Quantitative attributes of F_1 in comparison with parents.

Characters	Mean values of				Mid parental value	Percentage increase/decrease over better parent	Percentage increase/decrease on mid-parental value
	ASD. 1	ASD 1. X DGWG	Dee-Geo-Woo-Gen				
1	2	3	4	5	6	7	
Height of plant (cm)	124.2	129.0	90.7	107.45	+ 3.85	+ 20.06	
Number of productive tillers	10	20	6	8	+100.00	+150.00	
Panicle length (cm)	26.5	21.7	21.8	24.15	— 18.11	— 10.15	
Number of spikelet per panicle	135.0	129.8	148.2	141.6	— 12.30	— 8.33	
Length of grain (m. m.)	8.02	7.29	7.97	8.00	— 9.10	— 8.87	
Breadth of grain (m. m.)	3.17	2.88	3.19	3.18	— 9.72	— 9.43	
L/B ratio of grain	2.52	2.52	2.45	2.49	— 0.00	+ 1.20	
Thickness of grain	1.98	2.01	1.87	1.93	+ 1.51	+ 4.14	
Weight of 100 grain (gm.)	2.925	2.245	2.498	2.712	— 23.25	— 17.22	
Yield of grain per plant (gm.)	7.499	20.491	18.852	10.680	+ 8.69	+ 91.86	
Yield of straw per plant (gm.)	17.000	40.500	15.600	16.300	+138.24	+148.17	
Length of boot leaf (cm)	36.7	35.7	25.0	30.9	— 2.72	+ 15.53	
Breadth of boot leaf (cm)	1.3	1.0	1.4	1.4	— 28.57	— 28.57	
Length of internode First (cm)	7.1	8.2	5.1	6.1	+ 15.49	+ 34.42	
Second (cm)	18.2	16.3	15.8	17.0	— 10.44	— 4.12	
Third (cm)	25.3	26.8	22.1	23.7	+ 5.93	+ 13.08	
Fourth (cm)	31.8	34.8	28.3	30.0	+ 9.43	+ 16.00	
Spikelet sterility %	14.90	47.07	19.84	17.37	+137.25	+170.98	