(1997). Of all the characters, plant height (0.88), total dry matter (0.88) and straw yield (0.91) seems to be highly correlated with the grain yield of rice. The dry matter production and grains per panicle though showed significant and positive correlation with grain yield (r = 0.88 and 0.12 respectively) of rice, yet had negative values (-0.270 and -0.370 respectively) in their direct effects.

The path analysis revealed that plant height, number of leaves, LAI, tiller number, productive tillers, length of panicle, filled grains per panicle, test weight and straw yield were found to be most cardinal characters of grain yield as they had positive direct influence on grain yield of rice (Table 2). These results are in conformity with the findings of Sharma *et al.* (1997). The dry matter production and grains per panicle of rice had negative indirect effect on all characters under study. The effect of residual factors (0.214) over the grain yield of rice indicates 21 per cent variability. It means characters studied in the present experiment accounted for 79 per cent of the variability.

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Research Notes

Genetical Studies In Rice *(Oryza sativa* L.) Under Saline Situation

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Variation is the basis of plant breeding. The success of any crop improvement programme will largely depend on the magnitude and range of variability in the available genetic stock. A critical estimate of genetic variability is a prerequisite for initiating appropriate breeding procedures in crop improvement programmes. The heritable variation is masked by non-heritable variation, which creates difficulty in exercising selection. Hence, it becomes necessary to spilt over- all variability into its heritable and non-heritable components with the help of certain genetic parameters, which may enable the breeders to plan out proper breeding programme, since many characters of economic importance are highly influenced by environmental conditions. Therefore, the progress of a population mainly depends upon the amount

Table 1. Estimates of different genetic parameters in Rice

Characters	Days to flowering	Days to maturity	No.of effective tillers/ plant	No.of leaves/ main tiller	Height of plant	Length of boot leaf	Length of panicle	No.of branches/ panicle	No.of Fertile florets/ panicle	1000 grain weight	Straw yield/ plant	Total biological yield/ plant	Harvest index %	Grain yield/ plant
Genotypic coefficient of variability (%)	12.59	9.29	8.65	9.61	14.28	8.14	7.62	15.98	22.99	10.29	27.80	23.59	11.89	24.68
Phenotypic coefficient of variability (%)	12.58	8.88	18.08	10.17	15.02	10.41	9.02	16.28	25.31	11.12	32.21	27.52	12.95	29.32
Heritability (%)	99.80	99.20	23.14	85.80	87.30	79.89	79.80	93.40	88.80	97.60	74.90	74.20	82.50	73.20
Genetic advance(%)	24.89	24.46	1.13	1.34	24.87	4.32	3.62	3.12	58.49	4.54	11.31	18.43	11.48	8.88
Genetic advance as % of mean	26.44	19.39	8.60	18.01	27.58	15.08	13.98	31.99	45.13	21.22	49.42	42.12	23.10	43.43
Grand mean	97.12	128.47	11.31	6.02	89.89	26.04	25.16	10.48	129.30	22.32	22.07	43.21	50.13	21.01
Coefficient of variation (%)	0.71	0.81	16.30	4.21	5.16	4.85	4.38	4.03	8.13	2.10	19.02	14.07	5.48	15.34
Critical difference at 5%	1.178	1.622	3.213	0.361	8.878	1.473	1.514	0.187	2.402	1.013	5.718	9.719	4.359	5.237

and magnitude to genotypic variability present in the population. Information of genetic variability among growth as well as yield components in rice had been reported by many workers (Sivasubramanian and Madhava Menon, 1973; Latif and Zamin, 1965).

The experimental material used in the present study included 36 genotypes of rice. The material was obtained from the plant breeding farm, Faculty of Agriculture, Annamalai University, Annamalainager, during June-Sept., 2004. The experimental field was under saline condition with pH of 7.9 and EC of 4.8 dSm^{-1}. These genotypes were grown with all the recommended cultural practices. The experiment was laid out in Randomized Block Design, consisting of three replications. The crop was spaced at row-to-row 20 cm and plant-to-plant 15 cm. Observations were obtained on five competitive plants for days to 50% flowering, days to maturity, number of effective tillers/plant, number of leaves/main tiller, height of plant, length of panicle, length of boot leaf, number of branches/panicle, number of fertile florets/panicle, 1000-gain weight, straw yield/ plant, total biological yield/ plant, harvest index per cent and grain yield/plant. The coefficient of variation was estimated as suggested by Burton (1952), and heritability according the formula suggested by Hanson *et al.* (1956). Expected genetic advance was estimated as suggested by Allard (1960).

Analysis of variance showed highly significant differences due to treatments for all the characters. In general, estimates of phenotypic coefficient of variability (PCV) were higher than those due to genotypic coefficient of variability for all characters (Table-1). This view had also been reported by Das *et al.* (2001) and Majumdar *et al.* (1971).

The genotypic coefficient of variability was found maximum for straw yield/plant followed by grain yield/plant, total biological yield/plant, number of fertile florets/panicle, number of branches/panicle and minimum for length of panicle followed by length of boot leaf (Karthikeyan, 2003). High variability had been reported in rice for grain yield/plant and number of fertile florets/panicle (Das *et al.*, 2001; Sundram *et al.* 1988; Chaudhary *et al.*, 1973) and minimum for length of panicle by Das *et al.* (2001). The heritabiiity was found highest in all the characters except number of effective tillers/plant. Maximum heritabiiity values were observed for days to 50% flowering, days to maturity, 1000-grain weight, number of branches/panicle, number of fertile florets/panicle, height of plant, number of leaves/main tiller, harvest index, length of panicle, length of boot leaf and minimum heritability for number of effective tillers/plant. This trend was also observed in the rice for days to 50% flowering, 1000-grain weight and plant height by Ali *et al.* (2000), Sun (1979) and Maurya (1976). Number of grains/panicles was similar to the findings of Ali *et al.* (2000) and Maurya (1976). Burton (1952) suggested the genetic coefficient of variation along with heritability gave clear picture of the amount of advance to be achieved from selection. The character, which exhibited high heritability, indicated the presence of additive gene action and such character could be fixed by resorting to selection (Panse, 1957). In the present studies, the character *viz.*, 1000-grain weight, number of leaves/main tillers, length of panicle, straw yield/plant and grain yield/plant had high heritability values. However, exhibited low genetic advance. Similar result for length of panicle and 1000-grain weight was reported earlier (Das *et al.*, 2001). This indicated the presence of non-heritable variability. High heritability coupled with genetic advance will be more useful in selection. A relative comparison of heritable estimates and expected genetic advance expressed as precentage of mean will give an idea about a nature of gene action governing a particular character. A comparison of heritability and genetic advance as percentage of mean revealed that number of branches/panicle, straw yield/plant, number of fertile florets/plant, total biological yield/ plant and grain yield/plant had high heritability coupled with high-expected genetic advance as percentage of mean. This showed the substantial contribution of additive genetic variance in the expression of these characters. These findings were in confirmation with earlier report of Johnson *et al.* (1995) while, number of fertile florets/panicle and grain yield/plant were found similar to the observations of Shivani and Sree Rama Reddy (2000).

On the basis of heritability estimates and expected genetic advance as percent of mean for different characters studied in the present study, selection criteria based on number of branches/panicle, straw yield/plant, number of fertile florets/plant, total biological yield/plant and grain yield/plant would be useful in further improvement of rice.

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Research Notes

Effect of seed harvesting and pelleting in sorghum under rainfed conditions

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In rainfed cultivation, sorghum seeds are sown as premonsoon sowing, where in seeds must emerge out with the available moisture. Thus, to impart drought resistance to young plants seed hardening is given as presowing management technique which is a boon for dryland agriculture. Short term hydration of seed before planting, greatly benefits stand establishment, but use of chemicals in water like potassium or sodium phosphate will give additional advantage (Basu and Pal, 1980). Apart from seed hardening, pelleting with nutrients or leaf powders is recommended, for absorbing and regulating the soil moisture and to enhance the better seed soil relationship under stress conditions. With this in view, the present investigation was carried out to study the effect of hardening combined with DAP pelleting on productivity and the storability of hardened seeds of sorghum var. APK 1 under rainfed cultivation.

The field experiment was laidout in randomized block design with six treatments and four replications. The treatments were (T_1) control, (T_2) hardening with 2% KH_2PO_4, (T_3) 2% KH_2PO_4 hardening + pelleting with DAP 100g / kg, (T_4) pelleting with DAP 100 g / kg of seeds, (T_5) hardening with 2% KH_2PO_4 and stored for 15 days, (T_6) hardening with 2% KH_2PO_4 and stored for 30 days. Seeds of APK 1 sorghum soaked for 16h and dried back to its original moisture content before pelleting. For pelleting, DAP was powdered and rice gruel was used as a sticker and pelleting was done one day before sowing. Hardened seeds were stored for 15 and 30 days as per the treatments in cloth bags. The germination percentage was assessed in laboratory conditions as per ISTA, (1999). The results were subjected to analysis of variance and tested for significant differences (P=0.05) as described by Panse and Sukhatme (1967). Percentage values were transformed to arcsine value prior to statistical analysis.