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DRYMATTER PRODUCTION AND HARVEST INDEX IN *SAMAI* (LITTLE MILLET)

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ABSTRACT

Twenty genotypes of *Samai* (little millet - *Panicum sumatrense* (Roth Ex Roem & Schult) were studied for dry matter production and harvest index along with grain yield and other seven characters. Considerable variability was found for all characters studied. High heritability and high genetic advance were observed for total dry matter, root weight and grain yield per plant suggesting that these characters may be governed by additive gene effect. As there is no significant correlation between harvest index and grain yield per plant, selection for grain yield is the reliable parameter. Characters like total dry matter per plant, straw weight, ear head weight, basal tillers and plant height which are associated positively with grain yield may also be made use of.

KEY WORDS : *Samai*, Dry matter Production, Harvest Index

Among the minor millets, *samai* (little millet) *Panicum sumatrense* (Roth Ex Roem X Schult) occupies a considerable area in India. It is a hardy crop which can withstand drought better than most of the other cereal crops and also water-logging to a certain degree. If the crop fails, the cultivator stands to loose very little, for the cost of production is very small and the assessment of the land very low (Rangaswami Ayyangar and Achyutha Wariar, 1941). Therefore, the present investigation was taken up to study the drymatter production of *samai*.

MATERIALS AND METHODS

The materials consist of 20 *samai* genotypes maintained in the germplasm collections of Millet Breeding Station, School of Genetics, Tamil Nadu Agricultural University, Coimbatore. They were grown in randomised blocks with three replications during *rabi*, 1984 in plots of size 3m x 1.8 m with a spacing of 22.5 cm between rows. Plants were thinned to have 10 cm between on tenth day. All the agronomic practices were carried out periodically. The biometrical observations were made randomly on 10 plants in each plot for plant height, number of tillers per plant, days to 50 per cent bloom, days to harvest, total drymatter, root weight, straw weight, earhead weight and grain yield per plant. Harvest index was worked out for grain yield and total dry matter. The mean values for the characters were subjected to statistical analysis. The analysis of variance (Panse and Sukhatme, 1957). heritability (Robinson *et al.*, 1949) and correlation were worked out.

Table 1. Phenotypic range, mean, phenotypic coefficient of variability (PCV) genotypic coefficient of variability (GCV), heritability percentage and genetic advance as percentage of mean in *samai*

Character	Phenotypic range	Mean	PCV	GCV	Heritability %	Genetic advance as % of mean
Grain yield per plant	0.44-1.89	1.15	63.82	30.87	23.39	30.75
Total drymatter per plant	5.17-22.0	12.40	75.13	42.26	31.64	48.97
Straw weight per plant	0.94-7.39	3.57	77.23	42.27	29.96	47.66
Earhead weight per plant	1.44-6.67	2.96	43.88	19.71	20.17	18.23
Root weight per plant	0.33-3.33	0.93	76.99	35.30	21.03	33.35
Harvest index	3.58-26.78	10.22	56.09	27.71	19.41	22.43
Plant height	26-99	67.85	44.79	23.12	26.65	24.59
Number of tillers	8-19	14.23	26.20	11.68	18.97	10.48
Days to 50% bloom	36-78	57.77	39.37	22 73	33.32	27.02
[illegible]	6- 25	93 0	32.45	18.74	33.33	22.28

Table 2. Association of characters in *samai*

	X1	X2	X3	X4	X5	X6	X7	X8	X9
Y	*6369**	*5913	*7673**	*8888**	*9191**	*6385*	*5905	*5245	*3363
X1	–	*5874	*7455**	*5324	-*2742	*8503**	*8428*	*5063	-*3638
X2		–	*6675**	*6540**	*3037	*6043	*4890	*5041	*0101
X3			–	*7433**	*0764	*8375**	*6476	*6002	-*1435
X4				–	*2667	*5902	*5328	*3408	*3794
X5					–	0.459	*2152	*0835	*2471
X6						–	*8127**	*7748**	-.2442
X7							–	*4117	-.1854
D8								–	-.3484

Y = Grain yield per plant: X1 = Total dry matter per plant; X2 = Root weight; X3 = Straw weight; X4 = Earhead weight; X5 = Basal tiller per plant; X6 = plant height; X7 = Days to 50% blooms: X8 = Days to maturity; X9 = Harvest index
* P = 0.005; ** P = 0.01.

RESULTS AND DISCUSSIONS

The results (Table 1,2) show that there is a considerable variability and a wider phenotypic variance for all the characters studied. Heritability ranged from 18.97 to 33.33 and the genetic advance as percentage of mean ranged from 10.48 to 48.97. High heritability and larger genetic advance were observed for total dry matter per plant, straw weight per plant, root weight and grain yield per plant suggesting that variability was due to additive gene effects (Allard, 1960). High or medium heritability and medium genetic advance were observed for harvest index, plant height, days to 50 per cent bloom and days to maturity. This is due to the fact that these characters may be governed by the additive gene effects partially. Number of tillers per plant has low heritability and low genetic advance indicating that this character may be governed by non-additive gene effects.

Correlation studies showed that the grain yield was associated positively and significantly with drymatter. Straw weight, earhead, number of tillers and plant height had positive correlations and also were significant. Dry matter had significant, positive correlation with straw weight, plant height and days to 50 per cent bloom. Root weight is positively associated with straw weight. This may be due to the reason that well established root system makes the plant to absorb more nutrient and increases both grain and straw yields. Day to 50 per cent bloom and days to maturity are positively correlated with plant height. Longer the duration, taller the plant growth. Harvest index was not associated significantly with any of the characters studied. In the present materials, selection for the improvement of grain yield through harvest index will not be of any use rather than direct selection for grain yield, or selection through positively correlated characters like dry matter per plant, earhead weight, straw weight, basal tillers per plant and plant height. The selection of one will also improve the others since they are mutually correlated

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