

Jaggery yield showed strong and positive association with juice yield alone. In the inter correlation studies, green stalk yield showed positive and significant association with length of fourth internode and stem girth in the ratoon crop alone. Similarly plant height also showed positive and significant association with stem girth and number of nodes in ratoon crop (Table 2). Juice yield showed high positive direct effect which was reflected in its positive and significant correlation with jaggery yield both in main and ratoon crop (Table 3). Other than juice yield, no other character had high positive direct effect with jaggery yield and this was exhibited by their non significant association with jaggery yield. It can be inferred from the variability studies, genotypic correlation co-efficients and path co-efficient analysis that juice yield which recorded significant positive association having high positive direct effect on jaggery yield might be regarded as the prime character for selection. This might be effective in obtaining superior genotypes.

Madras Agric. J., 83(10): 631-633 October 1996  
<https://doi.org/10.29321/MAJ.10.A01068>

## EVALUATION OF F<sub>2</sub> RATOON CROP OVER MAIN CROP IN FODDER SORGHUM

M. RAVEENDRAN, S.R.SREE RANGASAMY AND N. SENTHIL

School of Genetics  
 Tamil Nadu Agricultural University  
 Coimbatore 641 003

### ABSTRACT

In fodder sorghum, mean performance of the ratoon crop over the main crop was assessed in the F<sub>2</sub> generation of the cross between Co-27 and *Sorghum halepense* (2n=40). The results revealed that there was reduction in biomass yield in ratoon crop, even though it had increase in number of tillers. The intergeneration correlation study showed that there was no relationship between F<sub>2</sub> main crop and ratoon crop.

**KEY WORDS :** Fodder Sorghum, Ratoon Crop, Evaluation

Evolving a multicut fodder type is the main objective in the fodder sorghum breeding programme. The hybrids should have high regeneration ability and should show increase in their vegetative characters while ratooning. Keeping this in view, the present study was formulated to study the ratooning ability of the interspecific hybrid derivatives (F<sub>2</sub> generation of the cross between Co-27 and *Sorghum halepense* (2n=40)) in sorghum by assessing the mean performance of the ratoon crop over the main crop.

Further, the bearing of the main crop on its successive ratoon crop was also assessed by estimating the inter generation correlation and heritability in the ratoon crop.

### MATERIALS AND METHODS

The experimental material consisted of 20 open pollinated and 10 self pollinated earheads of F<sub>1</sub> in the cross between Co-27 and *S. halepense* (2n=40). Seeds collected from each earhead were grown as individual F<sub>2</sub> families in a randomised

### REFERENCES

- BAPAT, D.R., JADHAV, H.D., and SALUNKE, C.B. (1987). Screening and development of sweet sorghum varieties for syrup/jaggery production. Paper presented at Annual Sorghum Workshop held at Parbhani, 25 - 27 May 1987.
- BURTON, G.W. (1952). Quantitative inheritance in grasses. Proc. 6th Int Grassland Congr., 1: 356 - 363.
- DEWEY, O.R. and LU, K.H. (1959). A correlation and path co-efficient analysis of components of crested wheat grass seed production. Agron. J., 51 : 515 - 518.
- GHANEKAR, A.R. (1986). A new technique for jaggery (raw sugar) production from sweet sorghum juice. Sorghum Newsl., 29 : 31.
- JOHNSON, H.W., ROBINSON, H.F. and COMSTOCK, R.E. (1955). Estimates of Genetic and environmental variability in soybeans. Agron. J., 47 : 314 - 318.
- LUSH, J.L. (1940). Intra-sire correlation and regression of offspring on dams as a methods of estimating heritability of characters. Proc. Am. Soc. Animal Prod., 33 : 293 - 301.
- PEDERSON, J.F. (1981). Variability of forage quality, silage quality and agronomic traits in forage sorghum. Diss. Abstr. International B 1981.42 : 1264 B.

(Received : March 1996 Revised : June 1996)

Table 1. Mean performance of Ratoon crop over the main crop in the F<sub>2</sub> generation

Character	Main Crop		Ratoon Crop		Performance of ratoon crop over the main crop in (%)	
	OP F <sub>2</sub>	SP F <sub>2</sub>	O.P.	S.P.	O.P.	S.P.
Days to 50 % flowering	62.9	64.3	54.1	57.0	-13.9	-11.4
Number of tillers	3.4	2.9	4.0	3.3	17.6	13.8
Number of nodes	8.1	9.4	6.6	7.1	-18.5	-24.5
Number of leaves	9.1	10.2	6.5	7.3	-28.5	-28.4
Leaf L/B ratio	15.4	14.7	20.8	18.6	26.0	26.5
Earhead L/B ratio	2.7	3.0	2.6	2.2	-3.7	-26.7
Plant height (cm)	269.7	294.0	218.7	241.5	-18.9	-17.9
Stem girth (cm)	4.4	4.7	2.7	3.0	-38.6	-36.0
Biomass yield/	558.0	554.0	352.6	403.0	-36.8	-27.3

OP F<sub>2</sub> = Open pollinated F<sub>2</sub> ; SP F<sub>2</sub> = Self pollinated F<sub>2</sub>

block design with two replications at Department of Forage Crops, Tamil Nadu Agricultural University, during summer 1994. The main crop was cut uniformly by leaving two nodes for regeneration. Biometrical observations were recorded at 50 per cent flowering in both main and ratoon crop for fodder characters and the mean performance of the ratoon crop over the main crop was calculated. The intergeneration correlation between the main crop and ratoon crop was calculated by taking the mean value of main crop as X-variable and mean of the ratoon crop as Y-variable. The heritability in the ratoon crop was calculated (Mahmud and Kramer, 1951).

## RESULTS AND DISCUSSION

The overall mean performance of ratoon crop over the main crop was given in the Table 1. The F<sub>2</sub> population showed almost 95 per cent regeneration ability. In the ratoon crop, both the open and self pollinated populations showed earliness over the main crop. Further the ratoon crop showed increase

in the number of tillers (17.6% and 13.8% for open and self pollinated F<sub>2</sub>'s respectively) and leaf 1/b ratio (26% and 26.5%). This is a good trend for the fodder types in evolving early flowering, multicut fodder sorghum hybrids that are perennial.

But both the open and self pollinated F<sub>2</sub> populations showed 36.8 per cent and 27.8 per cent reduction in biomass yield. This reduction may be due to earliness in flowering, reduction in height, number of nodes, number of leaves and decrease in stem diameter exhibited in the ratoon crop of the F<sub>2</sub>'s. So selection of segregants showing increase in yield or no less in stable yield and other yield attributes in ratoon generation will be useful. From the intergeneration correlation study, it was found that the correlation coefficient estimates between mean values of ratoon crop and main crop were not significant in open as well as in self pollinated populations with an exception for earhead 1/b ratio in the self pollinated population was observed (Table 2). This indicates that there is no relationship between F<sub>2</sub> main crop and its ratoon

Table 2. Inter Generation correlation, regression, and heritability between the main crop and ratoon crop

Character	Intergeneration correlation coefficient (r)		Regression value (b)		Heritability (%)	
	O.P.	S.P.	O.P.	S.P.	O.P.	S.P.
Days to 50 % flowering	0.2996	0.3413	0.3668	0.2182	42.7	24.6
Number of tillers	0.0700	-0.2878	0.1504	-0.2391	12.8	-
Number of nodes	-0.0596	-0.1024	-0.0544	-0.1231	-	-
Number of leaves	-0.2989	-0.0312	-0.2091	-0.0342	-	-
Leaf L/B ratio	0.2800	-0.1934	0.5644**	-0.5168	41.8	-
Earhead L/B ratio	0.0159	0.7166**	0.0299	0.8558**	3.2	-
Plant height (cm)	0.1763	0.2172	0.2172	-0.1083	26.8	116.7
Stem girth (cm)	-0.3468	0.5809	-0.4062	0.3333	-	52.2
Biomass yield/plant (g)	-0.0947	-0.1345	-0.0497	-0.1533	-	-

\*\* = Significant at 1 % level ; - = Not calculated since the b value is negative

OP = Open pollinated ; SP = Self pollinated

