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INFLUENCE OF TIME OF SOWING ON THE YIELD OF SORGHUM CSH 1 AND SWARNA

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ABSTRACT

Sorghum grain production has been boosted in the recent years, mainly due to the evolution of high yielding strains as C S H 1 and Swarna. The impact of seasonal variation on the yield of these two sorghum genotypes, is conspicuous. Information available on the influence of time of sowing on the yield of C S H 1 and Swarna under Coimbatore conditions is meagre. With a view to elicit information on the influence of time of sowing on the yield of C S H 1 and Swarna, a trial was conducted at the Millet Breeding Station, Coimbatore for two years from 1969 to 1971. Twelve monthly sowings in a year and the two sorghum genotypes formed the main plot and subplot treatments for the studies.

In both the years of study, significantly higher yield was obtained from March sown crops, consistently. The straw yields of March and April sowing have surpassed all the other mothly sowings. The results of the trial clearly indicated that March is the ideal time for sowing C S H 1 and Swarna under Coimbatore conditions.

INTRODUCTION

Evolution of photo-insensitive short-duration high yielding hybrid CSH 1 and the strain Swarna in Indian Agriculture, has revolutionised the sorghum production. Though these strains possess wide adaptability, their yield considerably vary in different locations and in different seasons. Singh *et al.* (1969) observed a reduction in grain yield in CSH 1 and Swarna with the delay in sowing from 26th June to 24th July. Singh and Jha (1969) have reported that CSH 1 crop sown during the ides of November yielded more than the crops sown during 30th October and after 30th November. Under Bangalore conditions, Linge Gowda *et al.* (1971) obtained significantly superior yield from CSH 1 sorghum sown during the 3rd week of June, among the fortnightly sowings taken up from the 1st week of June, to 3rd week of September. The expression of yield potential of CSH 1 and Swarna differ widely under varying seasonal conditions Due to the paucity of such information the present trial was undertaken to study the performance of CSH1 and Swarna by undertaking different monthly sowings.

MATERIALS AND METHODS

A trial was conducted at the Millet Breeding Station, Coimbatore for two

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years from 1969 to 1971. The sowings were done on 8th of every month commencing from August 1969, in plots of size 6 x 3.6 m. Twelve monthly sowings in a year were assigned to the main plot treatments and the two sorghum genotypes CSH 1 and Swarna formed the sub-plot treatments of a split plot design experiment with three replications. The recommended spacings of 45 x 15 cm for CSH 1 and 30 x 15 cm for Swarna were adopted. The manurial schedule comprising of 45 kg N, 45 kg P_2O_5 and 45 kg K_2O per hectare was applied over a basal application of 25 tonnes of Farmyard manure/ hectare, prior to the sowing. The plots were top dressed at the rate of 45 kg N/ha, a month after sowing. The crops were raised under protective irrigation and uniformly protected from the incidence of pests and diseases by adhering to the recommended plant protection measures.

Biometric observations on the plant height, number of leaves per plant, length and breadth of 4th leaf, thickness of stem and length and breadth of panicles were gathered in respect of 10 plants at random in each of the three replications of each treatment, in both the years. The number of days taken to flower and harvest were also recorded. The grain and straw yields obtained were analysed statistically.

RESULTS AND DISCUSSION

The yield pattern of grain and straw over the months differed in the two years of study (Table-1). The grain yield differences were significant between the twelve monthly sowings and March sown crop gave highest grain yield consistently in both the years. The grain yield differences were not significant between the two genotypes. The lowest grain yields obtained during the two years of trial were not concurrent. The mean grain yield recorded during the two year period for both the genotypes, showed an upward trend from December to March sowings with a sudden decline in April sown crop. CSH1 and Swarna are short statured and broad leaved varieties developed for the maximum utilization of solar radiation. The mean daily sun shine hours recorded during the two years showed a gradual increasing trend from December to March followed by a decline thereafter. The maximum yield obtained under the sowing of March might have been due to an efficient utilization of solar energy. The poor yields obtained from the winter sowings might be attributed to the lack of availability of the minimum quantum of solar energy.

Maximum straw yields were obtained under April and March sowings during 1970 and 1971 respectively. During 1970 the straw yields obtained from April and May sown crops were on par. In the latter year the straw yield recorded from March sown crop was on par with the straw yield of April and January sowings. Considering the genotypes, the strain Swarna was superior to the hybrid CSH 1 in respect of

TABLE-I GRAIN, STRAW YIELD AND OTHER ANCILLARY CHARACTERS

Months	Mean grain yield in kg/ha			Mean straw yield in kg/ha			Mean sun shine hour per day		Mean for two years				
									Days to flower		Days to harvest C S H, 1 and Swarna	Stem thickness in cm	
	1969-70	1970-71	Mean	1969-70	1970-71	Mean	1969—70	1970—71	CSH 1	Swarna		CSH.1	Swarna
August	1857	787	1072	27780	19832	23806	7.17	5.27	54	59	104	1.75	1.69
September	468	17	243	21452	19716	20584	6.64	7.40	51	55	108	1.70	1.55
October	42	2801	1422	17363	15240	16302	5.65	6.09	60	64	118	1.60	1.41
November	114	787	451	21020	17363	19192	6.62	5.55	53	59	112	1.66	1.48
December	375	1751	1063	11498	17208	14353	5.56	9.05	60	65	104	1.40	1.29
January	27	2266	1147	17548	23690	20619	8.55	7.73	58	65	103	1.69	1.66
February	483	3400	1942	16637	20989	18813	9.97	10.05	51	57	95	1 63	1·62
March	3514	5796	4655	24539	24886	24713	10.24	10.03	53	62	100	2.08	1.96
April	187	869	528	48306	24269	36288	8.67	9.11	51	62	92	2.15	2.02
May	1733	911	1322	46146	17903	32025	6.46	7.36	51	60	93	1.78	1.79
June	838	735	787	22996	14122	18559	6.57	3.52	53	58	93	1.77	1.78
July	18	778	398	44911	15881	30396	4.49	5.3[illegible]	53	60	106	1.81	1.80
F Test	**	**	—	**	**	—	—	—	—	—	—	—	—
C. D. Main Plot	241.68	957.94	—	2959.96	3543.80	—	—	—	—	—	—	—	—
Sub-Plot	—	—	—	1009.34	1607.99	—	—	—	—	—	—	—	—

** Significant at 1% level.

straw yield, during both the years of trial

There was no interaction between months and genotypes for grain as well as the straw yield in either of the two years. There was no appreciable variation in flowering duration among the twelve monthly sown crops As regards the maturity of the crop, the crop sown in April required the shortest period of 92 days as against the longest period of 118 days recorded by the October sown crop. The maximum grain yield consistently secured by the March sown crop and the straw yields recorded by March and April sowings, have clearly substantiated the superiority of hot weather period for the cultivation of CSH 1 and Swarna. Joseph *et al.* (1970) have recognised the hot and longer day light periods as congenial for sorghum cultivation. A similar record on rice crop has also been made by Sheik Dawood *et al.* (1973) relating the short statured varieties.

Plant height, number of leaves, length of the 4th leaf, breadth of the 4th leaf, length of panicle, and breadth of panicle did not show any concomitant variation with the yield trend. In the case of mean thickness of stem, measured in different monthly sowings for the two years, the fluctuation was similar to the mean straw yield. A steep rise of straw yield and a corresponding increase of stem thickness was observed from February to April sowings.

The present study clearly indicated that March is the optimum month of sowing sorghum CSH 1 and Swarna to boost the grain and straw production. Thus the March sown crop has recorded an average grain yield of 4655 kg/ha. On the other hand the grain yield was very adversly affected recording as low as 243 kg/ha in the crop sown during September. The sowings done in June and July have also recorded conspicuously poor yields when compared to the March sowing. Thus the time of sowing has a strong bearing on the yield of CSH 1 and Swarna. The extension of sowing time to June-July as practiced at present and also to any other winter months of the year may affect the sorghum production adversely.

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