

## GROWTH OF MOTHER PLANT AND SEED YIELD IN CSH 5 HYBRID SORGHUM SEED CROP AS INFLUENCED BY SPACING LEVELS

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A field trial was laid out using the parental lines of CSH 5 in the monsoon and winter seasons to compare the different intra-row spacing levels namely (i) 20 cm; (ii) 15 cm; (iii) 10 cm and (iv) 5 cm given to the mother parent, ms 2077A with a common spacing of 45 cm between the rows. Season of sowing significantly influenced all the plant growth parameters. Influence of spacing was significant on a days to 50 per cent flowering, culm diameter, fourth leaf area, earhead length and seed yield.

CSH 5 occupies the maximum area of sorghum seed production in Tamil Nadu. Among the different agronomic factors spacing plays an important role on seed quality. The spacing recommended for a grain crop is 45 x 15 cm. However, seed producers follow very narrow within-row spacing. Hence, studies were initiated to know the effect of different spacing levels on the growth of ms 2077A plants and the hybrid seed yield.

### MATERIALS AND METHODS

Field trials were laid out with the parental lines of CSH 5 (ms 2077A and CS 3541) during monsoon (June sowing) (S<sub>1</sub>) and winter season (January sowing) (S<sub>2</sub>) adopting randomised block design with six replications. The inter-row spacing was maintained at 45 cm and various intra-row spacing of 20 cm (T<sub>1</sub>), 15 cm (T<sub>2</sub>), 10 cm (T<sub>3</sub>) and 5 cm (T<sub>4</sub>) were followed for the mother plants. Pollen parent was given 245 cm spacing. Planting ratio adopted was 6:2 of female:

male. The pollen parent was sown 12 and 16 days after the female parent during winter season and simultaneously during monsoon. A fertilizer dose of 50; 100; 50 kg of N, P and K was applied as basal and 50 kg of N/ha was applied as top dressing. The gross size of the plot was 4.8 m x 2.7 m.

Data were collected in the mother plant on days to half-bloom and in five randomly marked plants on plant height, number of leaves, diameter of culm, area of fourth leaf and boot leaf, length and diameter of peduncle and earhead length at the time of harvest.

The female lines were harvested when the seed moisture content was around 20 per cent. The earheads were dried, threshed and the seeds graded after cleaning using hand wire mesh sieves having 6x6, 7x7 and 8x8 square perforations per square inch.

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Table 1. Growth parameters in ms 2077A and hybrid seed yield as influenced by spacing levels

	Days to half-bloom			Plant height (cm)			No. of leaves			Culm diameter (cm)			4th leaf area		
	S <sub>1</sub>	S <sub>2</sub>	Mean	S <sub>1</sub>	S <sub>2</sub>	Mean	S <sub>1</sub>	S <sub>2</sub>	Mean	S <sub>1</sub>	S <sub>2</sub>	Mean	S <sub>1</sub>	S <sub>2</sub>	Mean
T <sub>1</sub>	64.5	73.6	69.1	122.2	91.7	107.0	9.3	6.9	8.1	2.0	1.6	1.8	401	252	326
T <sub>2</sub>	63.5	72.3	67.9	115.5	94.0	104.8	9.1	7.3	8.2	2.0	1.6	1.8	392	260	326
T <sub>3</sub>	63.0	72.5	67.6	150.0	90.0	107.5	9.0	6.8	7.9	1.8	1.4	1.6	381	250	315
T <sub>4</sub>	63.2	69.8	66.5	125.0	90.8	107.8	9.0	6.7	7.9	1.7	1.4	1.6	337	223	280
Mean	63.5	72.0		121.9	91.6		9.1	6.9		1.9	1.5		378	246	

	CD	CD	CD	CD	CD
S	2.2	4.1		0.3	0.01
T	0.8	NS		NS	0.02
ST	1.9	NS		NS	0.03

Table 1 Contd.,

	Boot leaf area cm <sup>2</sup>			Peduncle length (cm)			Peduncle diameter (cm)			Earhead length (cm)			Seed yield (kg/ha)		
	S <sub>1</sub>	S <sub>2</sub>	Mean	S <sub>1</sub>	S <sub>2</sub>	Mean	S <sub>1</sub>	S <sub>2</sub>	Mean	S <sub>1</sub>	S <sub>2</sub>	Mean	S <sub>1</sub>	S <sub>2</sub>	Mean
T <sub>1</sub>	146	116	131	54.5	35.4	45.0	1.20	0.90	1.1	34.0	28.8	31.4	3331	1650	2491
T <sub>2</sub>	153	104	128	48.5	37.5	43.0	1.08	0.90	1.0	32.2	29.1	30.6	4312	1685	2999
T <sub>3</sub>	120	118	119	58.2	35.3	46.7	1.02	0.90	1.0	32.3	27.5	29.9	4576	1854	3215
T <sub>4</sub>	142	110	126	53.4	36.4	44.9	0.95	0.80	0.9	32.4	27.3	29.9	3982	1591	2787
Mean	140	111		53.7	36.1		1.1	0.9		32.7	28.2		4050	1695	

	CD	CD	CD	CD	CD
S	11.5	4.2		0.12	0.69
T	NS	NS		NS	0.98
ST	22.5	NS		NS	NS

CD (P=0.05)

Table 2 Recovery of seeds of CSH 5 hybrid in different size grades as influenced by spacing levels

	Seed recovery (Angular values of percentages)					
	6X6	S <sub>1</sub>		6X6	S <sub>2</sub>	
		7X7	8X8		7X7	8X8
T <sub>1</sub>	28.4	61.3	4.4	15.0	70.5	11.9
T <sub>2</sub>	31.2	58.5	4.2	13.9	73.6	8.4
T <sub>3</sub>	28.3	61.2	4.6	16.9	71.7	6.6
T <sub>4</sub>	27.6	62.0	6.3	12.6	75.6	6.6
Mean	28.9	60.7	4.8	14.6	72.9	8.4

CD (P=0.05)

S	NS
G	1.6
T	NS
SG	3.5
ST	NS
GT	3.3

S<sub>1</sub> — Monsoon  
S<sub>2</sub> — Winter  
G — Size grade

## RESULTS AND DISCUSSION

Between the crops sown in the monsoon and winter seasons, monsoon sown crop recorded better plant growth and more yield (Table 1 & 2). Krishnasamy (1982) reported that winter sowing (November-December) was good for a seed crop. However, in the present experiment, moisture stress due to drought could have been the cause for the poor performance of the winter sown crop.

Differences between the spacings were significant for culm diameter, fourth leaf area, and earhead length. Plants spaced at a wider spacing of 20 cm recorded significantly more values as compared to those given narrow spacing of 5 cm. Wide space would have enabled the plants to have access to higher amount of moisture and nutrients resulting in better growth (Reddy *et al.*, 1976). However, seed yield was significantly more (3215 kg/ha) in the plants at 45x10 cm spacing. Plant population as high as 50,000/ha registered higher yield, as compared to low population (Anon., 1980). However, Bhalerao and Choudhari (1978) recorded higher yield at wider spacing. Optimum spacing for a crop varied among varieties (Boquat and Walker, 1981). Recovery of large seed was more in the plants spaced at

15 cm in the monsoon and at 10 cm in the winter sown crops. Such seed size variation due to spacing has been reported by Vanangamudi (1982) in bajra.

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