

## Response of *dhaincha* (*Sesbania aculeata*) genotypes to sowing dates and row spacing

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### ABSTRACT

A field study was carried out at Research Farm of CCS HAU at Hisar during rainy seasons (*kharif*) of 2002 and 2003 to evaluate the performance of new *dhaincha* [*Sesbania aculeata* (L.) Walp.] genotypes for seed production in relation to sowing dates and row spacing. The crop sown on 20 June gave significantly higher seed yield (13.2 and 17.1 q/ha during 2002 and 2003 respectively) of *dhaincha* compared with that sown on 10 July (11.2 and 10.7 q/ha). Genotype 'DH 1' (13.3 and 15.5 q/ha) significantly outyielded 'Ses ND 3' (11.2 and 14.4 q/ha during 2002 and 2003) in respect of grain yield. Wider row spacing of 45 (12.6 and 15.6 q/ha) and 60 cm (12.9 and 15.8 q/ha) gave significantly more yield than that of 30 cm (11.2 and 13.3 q/ha).

**Key words :** *Dhaincha*, Sowing date, Row spacing, Genotype, Yield

*Dhaincha* (*Sesbania* sp.), being quick growing, succulent and easily decomposable, is grown as green-manure crop to increase crop productivity and to sustain the soil fertility. It also withstands salinity or alkalinity and poor drainage situation better than other crops. A lot of work on its utility as green-manure crop has been done (Shah *et al.*, 2000). But no serious efforts are made to develop proper agronomic practices for seed crop of *dhaincha*. Keeping this in view the present study was undertaken to evaluate the seed production of *Sesbania* genotypes under different sowing dates and row spacing.

### MATERIALS AND METHODS

The experiment was conducted at Agronomy Research Farm of CCS HAU at Hisar during rainy seasons (*kharif*) of 2002 and 2003. The soil was sandy loam, with pH 8.4, and contained 189 kg/ha available N, 17.4 kg/ha available phosphorus and 315 kg/ha available potassium. The experiment was laid out in split-plot design replicated thrice, keeping combination of two genotypes and three sowing dates in main plots and three row spacings (Table 1) in subplots. A basal dose of 20 kg N/ha and 40 kg P<sub>2</sub>O<sub>5</sub>/ha was applied through urea and single superphosphate respectively at sowing time. The crop was harvested on 6 November 2002 and 13 November 2003. The rainfall during the crop period was 178.7 and 430.9 mm in 2002 and 2003 respectively, out of which 60.0, 5.2, 14.7 and 20% was received in June, July, August and September in the first year, and 1.7, 60.7, 32.0 and 5.8% in the corre-

sponding months in the second year.

### RESULTS AND DISCUSSION

#### Sowing date

Seed yield of *dhaincha* was 21.8% higher in 2003 compared with that in 2002, owing to the receipt of adequate rainfall and its proper distribution during the crop period. Early planting, *i.e.*, 1 and 20 June, being at par, gave significantly higher seed yield of *dhaincha* compared with 10 July sowing. The increase in yield over late planting was 33.9 and 38.1% respectively. The crop sown on 1 and 20 July produced significantly more number of pods/plant (25.2 to 33.2%) and number of branches/plant (15.2 to 8.4%) compared with that sown on 10 July. However, both the early dates were at par in this aspect. Significantly bolder grains were produced in 1 June planting than in 10 July planting during both the years. The differences between 20 June and 1 June, and 20 June and 10 July remained non-significant. The pod length and grains/pod were not affected due to different dates of sowing. Primarily more number of yield attributes developed with early planting contributed to higher yield under these sowing dates. Also, significantly better growth in terms of plant height in early planting might have resulted in better development of yield attributes and translocation of food reserve, leading to higher seed yield. Ranglakshmi and Purushothaman (1999) also reported similar findings. The highest net income and benefit : cost ratio were recorded in 20 June sowing during both the years. Average data of

**Table 1.** Yield and its attributes as affected by dates of sowing, variety and row spacing in *dhaincha*

Treatment	Plant height (m)		No. of pods/plant		No. of branches/plant		No. of grains/pod		1,000-grain weight (g)		Seed yield (q/ha)		Net income (Rs/ha)		B : C ratio	
	2002	2003							2002	2003	2002	2003	2002	2003	2002	2003
			2002	2003	2002	2003	2002	2003	2002	2003	2002	2003	2002	2003	2002	2003
<i>Date of sowing</i>																
1 June	5.19	5.16	59.2	84.8	15.4	16.8	31.8	31.9	20.58	20.71	12.4	16.9	6,301	12,420	1.63	2.21
20 June	4.79	4.66	63.0	79.8	14.3	16.2	31.1	31.3	20.15	20.49	13.2	17.1	7,285	12,545	1.73	2.22
10 July	3.99	4.30	47.3	73.6	12.3	15.4	32.4	32.4	19.85	20.03	11.2	10.7	4,849	4,645	1.48	1.45
CD (P=0.05)	0.32	0.21	5.2	6.1	1.3	0.9	NS	NS	0.53	0.56	1.1	1.0				
<i>Variety</i>																
'DH 1'	4.58	4.70	64.5	85.6	12.8	16.6	31.6	31.8	20.01	20.33	13.3	15.5	7,369	10,570	1.74	2.03
'Ses ND 3'	4.73	4.72	48.9	72.8	15.3	15.6	31.8	31.9	20.37	20.49	11.2	14.4	4,933	9,170	1.49	1.89
CD (P=0.05)	NS	NS	4.3	4.9	1.0	0.7	NS	NS	NS	NS	0.9	0.8				
<i>Row spacing (cm)</i>																
30	4.59	4.71	52.3	68.6	12.8	13.9	30.5	30.6	20.32	20.37	11.2	13.3	4,744	7,702	1.47	1.74
45	4.59	4.74	51.6	81.6	14.0	16.4	32.0	32.4	20.07	20.41	12.6	15.6	6,685	10,782	1.67	2.05
60	4.79	4.68	65.6	86.9	15.2	18.1	32.7	32.6	20.18	20.46	12.9	15.8	7,006	11,140	1.70	2.10
CD (P=0.05)	NS	NS	8.6	5.0	1.0	1.0	1.6	1.6	NS	NS	1.0	0.8				

both the years showed that 20 June sowing gave 5.94 and 108.86% higher net income than 1 June and 10 July sowings respectively.

### Genotype

Genotype 'DH 1' produced significantly more number of pods (24.7%) and branches/plant (12.7%) compared with 'Ses ND 3'. The increased number of pods increased the yield of the former by 13.4% over the latter. Vendan and Rajeshwari (2000) also reported genotypic difference in seed yield of *dhaincha*. However, pod length, grains/pod, 1,000-grain weight and plant height were not altered in 'DH 1', resulting in 27.2% higher net income than in 'Ses ND 3'.

### Row spacing

The highest yield of *dhaincha* was recorded when planted at 60 cm row spacing, but it was almost similar to the yield obtained at 45 cm. Both these spacings registered significantly more yield than closer spacing of 30 cm during both the years. Averaged data showed that 60 cm row spacing gave 1.3 and 17.61% higher yield than that of 45 and 30 cm. Significantly more number of pods and branches/plant were recorded at 60 cm row spacing than at 30 and 45 cm. However, the difference between 30 and 45 cm was also significant. Both the wider row spacings produced significantly more number of grains/plant compared with closer spacing of 30 cm during both the years, except in 2002 where 45 cm as well as 30 cm spacing produced almost similar number of grains.

Pod length, boldness and plant height did not respond to row spacing. Low yield at 30 cm spacing could primarily be due to production of less number of branches and poor pod bearing, because of severe competition among the plants, resulting in mutual shading and leading to abortion of the reproductive structures (Ranglakshmi and Purushothaman (1999). But greater number of pods and branches in wider row spacing was the result of competition free environment for their development under these spacings compared with that under closer spacing. Vendan and Rajeshwari (2000) and Parlawar *et al.* (2003) also reported higher yield of *dhaincha* with low seed rate and wider row spacing. Moreover, planting of crop at 60 cm row spacing resulted in 45.79 and 3.89% higher net income compared with that at 30 and 45 cm row spacings respectively.

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