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Performance of Castor *(Ricinus communis)* Genotypes Under Various Sowing Times and Row Spacings in Summer Season

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ABSTRACT

A field experiment was conducted during the summer season of 1995 and 1996 at Junagadh to find out optimum time of sowing and row spacing for castor *(Ricinus communis* L.) genotypes. Sowing on 15 January favoured most of the yield attributes (capsules/main spike, seed weight/ main spike, spikes/ plant, capsules/ plant, test weight and seed weight/ plant) and resultantly seed yield. The level of spacing did not affect growth and yield attributes, however, there was a significant increase in branches/ plant, spikes / plant, capsules / plant, seed weight/ plant and seed yield with wider row spacing (90 cm). The variety GCH 4 recorded the highest seed yield with improved growth and yield attributes.

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INTRODUCTION

Castor (*Ricinus communis* L.) is generally grown in rainy (kharif) season. There is also a greater scope of growing castor in summer season (Saran and Giri, 1987). The crop matures within 100 to 135 days in summer as compared to 210 to 240 days in *kharif* season, therefore, it is possible to take other crop in kharif season. Moreover, summer crop is less infested by insect-pests as compared to kharif crop, hence total monetary returns could substantially increased. Looking to the predominancy of kharif groundnut in the south Saurashtra region of Gujarat, the present experiment was undertaken to evaluate the performance of castor genotypes under various sowing times and row spacings in summer season.

MATERIALS AND METHODS

The field experiment was conducted during the summer season of 1995 and 1996 at the Instructional Farm, Department of Agronomy, Gujarat Agricultural University, Junagadh on clayey soil (vertisol). It had pH 7.9, E.C. 0.3 dS/m, organic carbon 0.66-0.75 %, available nitrogen 251.5-260.7 kg/ ha, phosphorus 20.9-27.5 kg/ha and potassium 216.4-237.7 kg/ha. The experiment was laid out in split plot design with 4 replications, having 3 times of sowing (15 January, 30 January and 15 February) in main plots and 2 row spacings (60 and 90 cm) and 3 genotypes (GAUC 1, GC 2 and GCH 4) in sub-plots. The crop was sown at 60 cm x 60 cm and 90 cm x 60 cm with seed rate of 15 and 10 kg/ha, respectively and fertilized with 75 kg N + 50 kg P_2O_5/ha. A whole dose of P and half dose of N in the form of diammonium phosphate and urea were applied at the time of sowing and remaining half dose of N as urea was top-gressed in two equal splits at 45 and 65 days of sowing.

TABLE 1

Effect of time of sowing and row spacing on growth and yield attributes of castor genotypes (pooled mean).

Treatments	*Plant height (cm)*	*Branches/ plant*	*Length of main spike (cm)*	*Capsules/ main spike*	*Seed weight/ main spike (g)*	*Spikes/ plant*	*Capsules/ plant*	*Seed weight/ plant (g)*	*100 seed weight (g)*
Time of sowing									
15 January	136.9	3.6	43.5	78	54.9	3.8	158	108.3	29.6
30 January	140.2	3.8	46.3	73	49.6	3.9	132	86.2	29.1
15 February	136.7	3.9	46.0	66	44.8	3.6	117	70.8	27.8
CD (P=0.05)	NS	0.1	1.7	6	3.0	0.3	9	5.2	0.7
Row sowing (cm)									
60	137.2	3.5	45.4	73	50.3	3.6	130	85.1	28.7
90	138.7	4.0	45.1	72	49.2	4.0	141	91.8	29.0
CD (P=0.05)	NS	0.2	NS	NS	NS	0.2	5	2.5	NS
Genotype									
GAUC 1	139.7	2.8	47.4	85	52.0	2.8	136	82.2	26.4
GC 2	144.9	3.5	39.5	44	33.9	4.0	112	71.3	28.4
GCH 4	129.3	5.0	48.9	84	63.7	4.5	158	111.8	31.8
CD (P=0.05)	4.9	0.2	2.4	3	1.9	0.2	6.	3.0	1.3

TABLE 2

Yield and oil content of castor genotypes as influenced by time sowing and row spacing.

Treatments	*Seed yield (q/ha)*			*Stalk yield (q/ha)*			*Oil content*		
	1995	*1996*	*Pooled*	*1995*	*1996*	*Pooled*	*1995*	*1996*	*Pooled*
Time of sowing									
15 January	16.87	16.24	16.56	21.00	17.24	19.12	48.44	48.45	48.45
30 January	15.46	15.92	15.69	23.14	19.21	21.17	48.38	48.32	48.35
15 February	10.83	11.64	11.23	18.51	18.94	18.73	48.37	48.33	48.35
CE (P=0.05)	1.06	2.36	1.15	1.92	NS	1.59	NS	NS	NS
Row sowing (cm)									
60	14.10	14.31	14.20	21.32	19.53	20.43	48.39	48.29	48.39
90	14.68	14.88	14.78	20.44	17.40	18.92	48.40	48.35	48.38
CD (P=0.05)	NS	NS	0.54	NS	1.55	0.92	NS	NS	NS
Genotype									
GAUC 1	13.62	14.20	13.91	21.31	17.20	19.25	47.92	47.96	47.94
GC 2	11.97	13.54	12.75	20.44	19.23	19.83	48.29	48.33	48.31
GCH 4	17.57	16.62	16.81	20.91	18.96	19.93	48.98	48.81	48.89
CD (P=0.05)	0.78	1.11	0.67	NS	NS	NS	NS	NS	NS

RESULTS AND DISCUSSION

Dates of sowing had a significant effect on all the growth and yield attributes except plant height. Sowing on 15 January recorded significantly the highest number of capsules / main spike, seed weight / main spike, capsules / plant, seed weight / plant and test weight, though 15 January and 30 January sowings were at par regarding capsules / main spike, spikes / plant and test weight (Table -1). Significantly the highest number of branches / plant was observed under 15 February sowing date. The climatic condition prevailed in early sowing might have provided sufficient period for flowering and development of seed leading to higher production of photosynthates before the critical heat period. Seed yield also followed the same trend as observed with yield attributes. Significantly the highest seed yield was recorded with 15 January sowing but it was at par with 30 January sowing during 1996 and pooled results. There was a sharp decline in seed yield in the sowing thereafter (Table-2).

Sowing on 30 January recorded significantly the highest stalk yield during 1995 and pooled results, however, times of sowing did not affect the stalk yield in 1996 and oil content in both the years as well as in pooled results. The results are in close confirmity with the findings of Saran and Giri (1987).

Row spacings

Spacing did not affect significantly the plant height, length of main spike, capsules / main spike, seed weight / main spike and test weight, however, number of branches / plant, spikes / plant, capsules / plant and seed weight / plant were significantly higher under 90 cm than under 60 cm spacing (Table-1). Though spacing did not influence the seed yield during both the years, significantly higher seed yield of 14.78 q/ha was recorded under wider row spacing than narrow spacing in pooled results (Table-2). While, narrow spacing produced significantly higher stalk yield than wider spacing in 1996 and pooled results. Oil content of seed was not influenced by spacing. This indicates that wider spacing favoured individual plant performance and better for the summer crop than narrow spacing. Thadoda (1993) also suggested 90 cm x 60 cm spacing for *kharif* castor.

Genotypes

Genotypes GC 2 recorded significantly the tallest plants, while genotypes GAUC 1 and GCH 4 registered significantly higher length of main spike and capsules / main spike over GC 2. Significantly the highest number of branches / plant, seed weight / main spike, spikes / plant, capsules / plant, seed weight / plant and test weight were observed in variety GCH 4 (Table-1). The differences in growth and yield attributes were due to genetic characters of genotypes. Castor hybrid 'GCH 4' also recorded significantly the highest seed yield during both the years and pooled results (Table-2). Genotypes did not differentiate stalk yield and oil content in both the years and pooled results. Better performance of variety GCH 4 was also noticed at Palem, Andhra Pradesh (Anon.; 1995).

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