

Response of castor genotypes to different sowing dates under rainfed conditions of Karnataka

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Abstract: Experiments were carried out to evaluate the response of two castor hybrids viz. DCH-32 and GCH-4 and two castor varieties viz. 48-1 and DCS-9 to four different sowing dates during 1998, 1999 and 2000 under rainfed conditions of northern Karnataka. GCH-4 hybrid recorded the highest yield (2988 kg ha⁻¹) over three years under July 1st fortnight sowing. But, under delayed sowing DCH-32 recorded slightly higher yield over check GCH-4 mainly due to early maturity nature. July first fortnight was found to be ideal for sowing of castor to get higher yields in northern dry zone of Karnataka.

Key words : *Castor, Genotypes, Date of sowing, Rainfed and Yield.*

Introduction

Castor is one of the important oilseed crop having high plasticity suiting to wide range of soil environments and capacity to adjust its growth according to moisture availability conditions of the soil. Once, the soil moisture increase after prolonged drought, castor rejuvenates quickly and puts up its growth at faster rate as compared to other oilseed crops. The chances of multiple harvests of beans is more and it may bring assured income to the farmers even under remnant moisture conditions. In the last 3-4 years, sunflower crop faced problems due to necrosis and abiotic stresses in northern dry zone of Karnataka and the yields were poor. Hence, there is a need to popularize contingent oilseed crop such as castor in this zone. Though castor is a known crop to this area, it needs to be exploited better, both agronomically and genetically, for its suitability for intercropping, high yielding nature and high oil content. Hence, a study was undertaken to standardize the date of sowing of castor and suitability of castor genotypes to this region. Such works conducted by scientists elsewhere have brought out the best season for castor crop to be sown in their respective regions for realizing higher yield (Dhoble *et al.* 1987 (15th June - Maharashtra); Sukhadia *et al.* 1992 (May-Gujarat); Sawarkar and Thakur, 1999 (30th June - Madhya Pradesh).

Materials and Methods

Experiments were conducted at Regional Research Station, Bijapur during 1998-99, 1999-

2000 and 2000-2001 under rainfed condition following split-plot design with dates of sowing as main plot treatments and genotypes as sub-plot treatments. The sub-plot treatments were found castor genotypes including two hybrids viz. GCH-4 (a national check) and DCH-32 (a recently released hybrid from DOR, Hyderabad) and two varieties viz. 48-1 (a high yielding variety) and DCS-9 (a national check variety). Four dates of sowing were considered as main treatments. First date of sowing commenced with onset of monsoon and subsequent sowing dates coincided with occurrence of sufficient rainfall at Bijapur, with an approximate interval of fifteen days. Each year the castor genotypes were sown in four different dates of sowing (during 1998-99-11.07.1998, 22.07.1998, 07.08.1998, 29.08.1998; 1999-2000-13.07.1999, 04.08.1999, 18.08.1999, 10.09.1999 and 2000-01-14.07.2000, 08.08.2000, 23.08.2000, 19.09.2000). The seeds were manually dibbled by following the spacing of 90 cm between the rows and 45 cm within the row. Other practices were followed as per the recommended package of practices under Northern dry zone of Karnataka. The observations were recorded for the characters viz. days to 50% flowering, plant height, number of nodes per plant, number of effective spikes per plant, hundred seed weight and also total bean yield harvested from 2-3 pickings. The estimation of oil percentage was done by NMR method.

Table 1. Effect of sowing dates and castor genotypes on ancillary characters and oil percentage

Treatment	Days to 50% flowering				Plant height (cm)				No. of modes per plant			
	1998	1999	2000	Mean	1998	1999	2000	Mean	1998	1999	2000	Mean
<i>Sowing date</i>												
1 st date	54.50	55.67	57.58	55.98	65.56	101.25	75.23	80.68	12.35	7.88	12.80	14.34
2 nd date	59.00	53.83	61.58	58.13	62.38	111.16	69.83	81.12	11.48	5.00	12.70	13.06
3 rd date	63.75	59.75	68.33	63.94	57.98	99.43	75.23	77.54	12.18	3.43	13.55	13.05
4 th date	88.00	72.75	73.92	78.22	37.43	72.90	41.92	50.75	10.40	1.03	8.75	10.06
CD (P=0.05)	1.19	1.11	4.53		11.86	14.25	21.32		1.68	0.86	1.70	
<i>Variety</i>												
48-1	70.50	63.50	72.75	68.91	66.50	106.50	78.40	83.80	13.13	4.32	13.22	13.55
DCS-9	66.50	60.33	65.25	64.02	48.13	94.73	59.62	67.59	10.85	4.55	11.85	12.41
GCH-4	68.25	62.67	65.83	65.83	65.58	58.42	95.62	67.37	73.80	11.73	3.52	12.65
DCH-32	60.00	55.50	57.58	57.69	50.32	87.90	56.83	65.01	10.70	4.97	10.08	11.91
CD (P=0.05)	1.43	0.83	3.79		7.56	6.46	5.17		1.30	0.81	0.91	

Table 1. contd...

Treatment	No. of effective spikes plant ⁻¹				Hundred seed weight (g)				Oil %			
	1998	1999	2000	Mean	1999	2000	Mean		1999	2000	Mean	
<i>Sowing date</i>												
1 st date	5.40	11.33	5.10	7.27	24.59	25.52	25.05		47.00	45.19	46.09	
2 nd date	4.11	11.30	2.87	6.09	25.53	23.79	24.65		46.46	45.17	45.81	
3 rd date	3.62	11.03	2.20	5.61	24.91	21.30	23.10		45.77	44.97	45.37	
4 th date	1.23	8.82	1.43	3.82	23.20	22.47	22.83		43.31	39.33	41.42	
CD (P=0.05)	1.83	0.87	0.56		2.46	1.79			1.46	2.89		
<i>Variety</i>												
48-1	3.88	12.08	2.73	6.23	25.10	22.59	23.84		42.99	41.02	42.00	
DCS-9	3.10	10.73	3.03	5.62	23.31	22.02	22.66		44.83	43.65	44.24	
GCH-4	3.97	10.25	3.12	5.78	25.90	25.33	25.61		47.25	45.85	46.55	
DCH-32	3.42	9.42	2.72	5.18	23.93	23.15	23.54		47.38	44.32	45.85	
CD (P=0.05)	0.69	0.78	0.41		1.30	1.32			2.97	2.14		

Marginal reduction in oil content was observed as sowing was delayed (Table 1). This is in contrast to findings of Sarma (1985), wherein a reverse trend was observed.

Response of cultivars to varied dates of sowing

When the performance of four genotypes over four different sowing dates and over three years was considered, GCH-4 has recorded the highest yield (2988 kg ha⁻¹), 48-1 (2097 kg ha⁻¹) and DCS-9 (1736 kg ha⁻¹). But, from second sowing date onwards, (i.e. August, September sowings) DCH-32 recorded slightly higher yield over check GCH-4 (Table 2). This can be attributed to shorter plant height (65.01 cm), less number of nodes per plant (11.91), early and uniform maturity of spikes (58 days to 50% flowering) nature of DCH-32 (Table 2). This is coupled with compact spike and erect plant type which fits the genotype well to all the situations and especially, it completes its life cycle before acute drought commences under late sowing situations. The study has also brought out that hybrids (GCH-4, DCH-32) are superior over the varieties (48-1, DCS-9) for all the sown situations at Bijapur due to expression of high heterosis for yield. However, when the performance of varieties was taken alone, 48-1 was high yielding over DCS-9 in all the sown situations. In general, the bean yield was better in 1999 in all the genotypes as compared to other years probably due to high remnant moisture in soil with favourable weather conditions existed in season. In overall GCH-4 hybrid had possessed high oil content (46.55%) as compared to DCH-32 (45.85%), DCS-9 (44.24%) and 48-1 (42.00%).

Further, it may be concluded that July first fortnight is the best season for sowing of castor crop in order to harvest maximum bean yield. GCH-4, a national check hybrid is high yielder under July first fortnight sown situation and for late sown situations the hybrid DCH-32 and the variety 48-1 are more suitable.

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