

Effect of Spacing on Yield and Yield Components of Castor (*Ricinus communis* Linn)

N. SUNDARESAN¹, S. PALANISAMY², M. STEPHEN DORAI RAJ³ and K. NAVAKOTI⁴

A spacing trial was conducted at the Castor Research Station, Salem under rainfed conditions for two consecutive years with the short duration variety SA. 1. The yield increase was significantly high in the intra row spacing of 60cm when compared to 75cm and 90cm. The production of primary branches, secondary branches, number of branch racemes, length of raceme and number of capsules per plant increased with increase in intra row spacing.

The effect of plant population on yield is considerable and hence the optimum population for a particular region, variety and type of cultivation must be accurately determined for maximum yield and efficient utilization of the land. Seshadri and Varisai Muhammad (1953) have reported in TMV. 2 castor that wider spacings increased stem thickness, branching, length of fruit cluster and ultimately the yield, but reduced the plant height, number of nodes on the main stem and duration. They have recommended a spacing of 90cm x 90cm. Recent investigations have however, established the beneficial effects of closer spacings (Zimmerman, 1958 and Ivanov *et al*, 1966). A recommendation of 60cm x 30cm spacing under scanty rainfall conditions has been made by Weiss (1966).

Since the earlier work has been confined to long duration varieties the present study was undertaken to determine the optimum spacing for the short duration variety SA. 1 which matures in 130 to 150 days and also to study

the effect of spacing on yield and yield components. With this in view a spacing trial was conducted for two years at the Castor Research Station, Salem.

MATERIALS AND METHODS

The trial was conducted under rainfed condition in a randomised block design replicated four times. Five intra-row spacings were adopted keeping the inter-row spacing constant at 90cm. The plot size was 21.74 sq. m nett and the manurial dose adopted was 40kg N, 40kg P and P 20kg K per hectare over a basal application of farmyard manure at five tonnes per hectare.

RESULTS AND DISCUSSION

The duration of the crop tends to increase significantly as the spacing between the plants is reduced in both the years of the trial (Table). In lower spacing this increase in duration is found to be mainly due to the delayed emergence of the first inflorescence.

1-4 : Castor Research Station, Salem.

TABLE. Spacing Effect on Yield and Yield Components of SA. 1 Castor

Treatments	Duration in days		No of Primary branches		No of secondary branches		No of branch racemes		Length of inflorescence		Total No. of capsules per plant		Yield in kg/ha												
	I Yr	II Yr	I Yr	II Yr	I Yr	II Yr	I Yr	II Yr	I Yr	II Yr	I Yr	II Yr	I Yr	II Yr											
90cm x 90cm	173	128	3.5	3.5	3.5	3.5	4.5	2.5	2.5	3.5	5.8	4.0	4.9	65.5	58.8	62.2	163	168	166	1330	1029	1180			
90cm x 75cm	175	129	3.3	3.5	3.4	3.5	3.5	2.5	2.5	3.0	4.5	3.7	4.1	66.0	57.8	61.9	163	157	160	1327	1108	1218			
90cm x 60cm	179	131	2.5	3.5	3.0	3.0	3.0	1.5	2.3	4.0	3.5	3.8	3.8	61.3	60.8	61.1	127	167	147	1501	1211	1355			
90cm x 45cm	176	134	2.0	2.75	2.4	2.3	2.3	0.7	1.5	3.2	2.8	3.0	3.0	55.8	49.8	52.8	108	129	119	1430	1177	1304			
90cm x 30cm	178	135	2.0	2.5	2.3	1.0	1.0	1.2	1.1	2.5	2.5	2.5	2.5	51.3	46.0	48.7	74	99	87	1492	1200	1346			
F test	*	*	**	**	N.S	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	N.S.	**	**	**
S. E.	1.18	1.50	0.57	0.21	0.28	0.20	0.35	0.31	0.19	0.27	0.25	0.21	2.19	1.78	1.14	5.99	7.25	5.37	83.60	24.50	42.78				
C. D.	3.64	4.60	1.74	0.66	—	0.62	1.07	0.97	0.58	0.83	0.76	0.66	6.74	5.48	3.52	18.47	22.34	16.55	—	81.60	131.90				

* Significant at 5% level ** Significant at 1% level

This is in conformity with the findings of Seshadri and Varisai Muhammad (1953). The extended duration of the crop in the first year might have been attributed to the prolongation of the crop growth due to unusual heavy rains spread over a considerable period. There was gradual increase in the number of primary and secondary branches as the spacing between the plants increased. While the increase was significant in the first year in both the characters, in the second year there was a slight deviation. In the pooled analysis however, the increases are significant in both cases.

Number of racemes produced from the branches increased significantly in both the years. Increase in length of raceme was marked in the lower three spacings in both the years. The production of capsules also increased gradually from the lower spacings to higher spacings. However, when yield is considered, this short duration castor gave significantly superior yield in the lower plant spacing of 60cm, 45cm and 30cm thus, proving that short duration

types perform well in closer spacings (Kulkarni, 1966).

The authors are thankful to the Indian Council of Agricultural Research, New Delhi under whose financial assistance the studies were undertaken.

REFERENCES

- IVANOV, V. K., S. A. KIREEVA, A. P. MOROZ and U. N. SALATENKO, 1966. Castor beans on irrigated land in the South Ukraine steppe. *Vest. Sel Khoz., Nauki, Mark. No. 2* : 29-34.
- KULKARNI, L. G. 1966. Dwarf castors that are great in performance. *Indian Fmg. 16* : 18-19.
- SESHADRI, C. R. and S. VARISAI MUHAMMAD, 1953. Effect of spacing on some important characters of the castor plant. *Proc. of the third Scientific Workers Conference, Agricultural College and Research Institute, Coimbatore.* p. 102-6.
- WEISS, E. A. 1966. Dwarf castor - a promising crop for East Africa. *World Crops, 18* : 43-50
- ZIMMERMAN, L. H. 1958. Castor beans - A new oil crop for mechanised production. *Adv. Agron., 10* : 257-88.