



Performance of High Yielding Castor Hybrids as Pure Crop Suitable for Namakkal District of Tamil Nadu

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ABSTRACT

Three castor (*Ricinus communis* L.) hybrids were evaluated by Krishi Vigyan Kendra, Namakkal to assess the suitable hybrid as a pure crop in terms of yield, acceptability and adoption potential during *Kharif* 2018 in Namakkal district. Three castor hybrids were YRCH 1, DCH 519 and DCH 177, which were sown by following all recommended package of practices followed as per TNAU recommendation. The study revealed that DCH 519 recorded more number of effective spikes per plant (38.20), number of capsules per spike (57.4), very less incidence of leaf hopper (2.20 %), lesser incidence of botrytis (2.6 %), higher seed yield (1311.6 kg/ha) as compared to YRCH 1 and DCH 177 hybrids. The least seed yield (1037 kg/ha) and higher incidence of leaf hopper (13.6 %) and botrytis (7.8 %) were observed in DCH 177 hybrid. Gross and net returns were Rs. 65580/- and Rs. 42010/ha, respectively by cultivating DCH 519 as against Rs. 64850/- and Rs. 41230/ha in the YRCH 1 hybrid. Farmers were satisfied with DCH 519 and YRCH 1 hybrids, as crop did not suffer from botrytis disease. Castor DCH 519 and YRCH 1 hybrids would be a better option for pure crop in *kharif* season in north western zone of Tamil Nadu.

Key Words: Castor, Economic, Seed yield, Spike.

INTRODUCTION

Castor (*Ricinus communis* L.) is the most important non edible industrial oilseed crop grown across the world in tropical, sub-tropical and warm temperate region. Castor oil has multifarious applications in production of wide industrial products ranging from medicines, aviation fuels, fuel additives, biopolymers and bio-diesel (Prasad, 2012). India is the world's largest producer of castor contributing to around 85 per cent of world's total production and dominating the global trade with a share of more than 9 percent from the country. India produces around 10 lakh tones of castor seed and around 5.5 lakh tones of castor oil. Also it meets more than 80 per cent of the demand of castor oil, thereby enjoying a dominant position in the world castor scenario (Anon, 2015).

In Tamil Nadu, castor was grown as a low input dry land crop in an area of 15,000 ha. Mostly used as a border or inter crops, where its drought - hardy nature helps to provide as cash for farming community and castor leaves provided for excellent green fodder for small ruminants. Castor growing areas in Namakkal district on 1300 ha was mostly under rainfed condition and irrigated condition. Major limitation other than irrigation is varietal preferences. As farmers were growing different local varieties in intercrop, border crop and some parts as pure crop under rainfed condition and obtained very poor yield and less farm income. Hence, the study was undertaken with the objectives to evaluate the high yielding castor hybrids as pure crop in terms of yield, acceptability and adoption potential during *Kharif* season through on farm

Table 1. Characteristics of castor hybrids selected for experiment.

Name of the castor hybrid	Characters / traits of the hybrid
YRCH 1	Early duration of 150-160 d (15 days earlier than TMVCH 1 and 30 days earlier than GCH 4), Average yield 1861 kg/ha under rainfed ecosystem, 49% oil content, Suitable for rainfed and areas, Less time lag between any two order of spike, hence more number of spike is produced in short period, Compact plant type suitable for intercropping system, resistant to jassids, moderately tolerant to capsule borer and leaf hopper and developed by TNAU, Coimbatore. (TNAU, 2009)
DCH 519	105-110 d to maturity, tolerant to drought, resistant to fusarium wilt and leaf hopper, higher yield (2130 kg/ha), 50% Oil content and developed by IIOR, Hyderabad (ICAR-IIOR, 2006)
DCH 177	90-100 d to maturity, resistant to fusarium wilt and white fly, dwarf nature, higher seed yield (1550 – 2130 kg/ha), 49 % oil content and developed by IIOR, Hyderabad (ICAR-IIOR, 1999).

trials and work out farmers' preferences for castor cultivation in Namakkal district.

MATERIALS AND METHODS

On-farm trial with farmers' participatory mode was conducted during *kharif* 2018 by involving five farmers from Unjanai and Kokkalai villages of Namakkal district. Sowing was performed under rainfed condition, depending on the onset of monsoon and completed between 10 and 20 June in both the villages. The plot size was 20 m × 20 m with plant spacing of 150 x 120 cm. Three high yielding castor hybrids *viz.* YRCH 1, DCH 519 and DCH 177 in the trial were taken for study. The soil of the experimental field was red sandy loam with non-calcareous and available nutrient status of the experimental site was low in N and P (255 and 5.40 kg/ha) and high in K (376 kg/ha). The germination percentage of seed was more than 92 per cent and the required plant population was maintained with gap filling done within 10 days after sowing. Farm yard manure @ 12.5 t/ha was applied commonly to all the treatments. A fertilizer schedule of 60:30:30 kg N, P₂O₅ and K₂O/ha were kept constant for all the treatments and were applied along the planting rows as urea, DAP and Muriate of Potash and covered with soil. All other plant protection measures were adopted as per the technical programme. The data on germination percent, plant height, days to 50 percent flowering, number of effective spikes per

plant, spike length, number of capsules per spike, 100 seed weight, leaf hopper and botrytis incidence, seed yield, gross return and net return of all the hybrids were recorded.

RESULTS AND DISCUSSION

The study revealed that castor hybrid DCH 519 recorded higher seed yield (1311.6 kg/ha), yield attributes like plant height (194.4 cm), number of effective spikes per plant (38.20), spike length (44.4 cm), number of capsules per spike (57.4), 100 seed weight (25.02 g) were increased with DCH 519 hybrid which was observed to be on par with YRCH 1 hybrid (Table 2 & 3). Castor hybrids DCH 519 and YRCH 1 recorded 26.48 and 25.07 percent higher seed yield than DCH 177 hybrid, respectively. With respect to pest and disease, less leaf hopper incidence (2.2 and 3.2 %) and less botrytis disease incidence (2.8 and 3.1 %) were observed in DCH 519 and YRCH 1, respectively. The lowest seed yield, lower yield attributes, higher incidence of leaf hopper and botrytis disease were observed in DCH 177 hybrid. A reduction in leaf hopper and botrytis disease incidence was observed in DCH 519 and YRCH 1 compared to DCH-177 hybrid. No difference was observed among the castor hybrids with respect to days to fifty percent flowering because this parameter is mainly governed by the genetic makeup of the hybrids. With respect to economics, higher gross return of Rs. 65580/ha and

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Table 2. Growth and yield attributing characters of different castor hybrids.

Name of the castor hybrids	Plant height (cm)	Days to 50% flowering	Number of effective spikes per plant	Spike length (cm)	No. of capsules / spike	Leaf hopper incidence (%)	Botrytis disease incidence (%)	100 seed weight (g)
YRCH 1	136.2	70	43.8	38.4	53.4	3.2	2.7	24.32
DCH 519	194.4	72	38.2	44.4	57.4	2.2	2.6	25.02
DCH 177	173.1	77	37.4	35.8	46.2	13.6	7.8	24.00

Table 3. Seed yield and economics of different castor hybrids.

Name of the castor hybrids	Seed yield (kg/ha)	Gross returns (Rs./ha)	Net returns (Rs./ha)	BCR
YRCH 1	1297.0	64850	41230	2.74
DCH 519	1311.6	65580	42010	2.78
DCH 177	1037.0	51850	28220	2.19

net return of Rs. 42010/ha with BCR of 2.78 was realized with DCH 519 hybrid which was observed to be at par with YRCH 1 hybrid.

The probable reason was lesser incidence of leaf hopper and botrytis disease coupled with higher number of effective spikes per plant, more spike length, higher number of capsules per spike, more 100 seed weight resulting higher seed yield influenced by genotype, environmental and management factors (Zuchi *et al*, 2010 and Vallejos *et al*, 2011). The better yield attributing characters was mainly due to sufficient space between rows which encouraged to produce more vigorous plants and also lesser interplant competition for space, light, nutrient and moisture and resulted in more source to sink movement and partitioning efficiency. The similar finding was reported by Kathirvelan (2017). A detailed score card was provided to the farmers of these two villages, as a effect, DCH 519 and YRCH 1 recorded as most preferred castor hybrid as compared to DCH 177 in both the villages.

CONCLUSION

Castor hybrids DCH 519 and YRCH 1 recorded more number of effective spikes per plant, more spike length, higher number of capsules per spike,

more 100 seed weight, lesser incidence of leaf hopper and botrytis disease, higher seed yield, good withstand under rainfed condition and performed very well compared to DCH 177 hybrid. Farmers were satisfied with DCH 519 and YRCH 1 castor hybrids, as the crop did not suffer much pest and disease incidence leads to less number of pesticide sprays. From this study, it could be concluded that Castor hybrids DCH 519 and YRCH 1 had recorded higher yield attributing characters and seed yield with higher monetary returns and it could be better option for rainfed cultivation during *khari*f season in north western zone of Tamil Nadu.

REFERENCES

- Anonymous (2015). Castor seed crop survey, Directorate of Oilseeds Research, Hyderabad. Pp 41-44.
- Prasad R B N (2012). *Lipids - a magic source of food, fuel and fabulous chemicals*. In: Prasad, R. B. N., *et al*. (Eds.), refresher course on Conventional, Chromatographic and spectral analysis of Oils and Fats : pp 5 - 20.
- Kathirvelan P (2017). Optimizing plant density for promising castor hybrid DCH 519. *Int J Curr Microbiol App Sci* **6** (11): 3694-3697.
- Vallejos M, Rondanini D, Wassner D.F (2011). Water relationships of castor bean (*Ricinus communis* L.) seeds related to final seed dry weight and physiological maturity. *European J Agron* **35**: 93 - 101.

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Zuchi J, Zanuncio J C, Bevilaqua G A P, Peske S T and Silva S D A (2010). Castor yield components according to floral order and sowing season in the Rio Grande do Sul State. *Rev Ciên Agron* 41: 380–386.

Received on 31/03/2020

Accepted on 15/05/2020