

Enhancement of farmers profitability through front line demonstrations on *rabi* castor in Nagarkurnool districts of Southern Telanagana Zone

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(Received 20 May, 2022; Accepted 29 July, 2022)

ABSTRACT

Castor is a one of the major oilseed crop in rainfed conditions but due to gray mold disease, farmers are shifted to other crops. To promote castor in *rabi* season front line demonstrations were conducted at different locations like Kummera, Gummakonda, Nandivaddeman villages of Nagarkurnool district by AICRP on castor, RARS, Palem to promote castor in *rabi* season with integrated crop management practices. The increase in mean seed yield 18 % with increasing higher seed yield of every individual year of 2018 to 2020 and additional net returns Rs. 22001 ha⁻¹ were recorded with improved production technologies compared to farmers practice.

Key words : Castor, Telanagana, Farmers income

Introduction

Castor is an important industrial non-edible oilseed crop. Castor seed contain 45-47 % non-edible oil, which is used as domestic, medicinal and industrial purposes. Castor oil is used as a lubricant in all moving parts of the machinery and particularly high speed engines and aero planes. Hydrogenated castor oil is used in polishes, varnishes, transparent paper, linoleum, plasticizers, ointments, waxes, printing ink, cosmetics, hairdressing, soaps etc. In dyeing industries and disinfectants, it is used for the preparation of Turkey red". Castor oil received from small seeded variety is of very good quality and specially used as a medicine, while oil received from bold seeded variety is used for lightening and lubrication (Kumar Naik *et al.*, 2015).

Castor is major important oil seed crop in Telangana. It is mainly grown in Mahabubnagar, Nagarkurnool, Wanaparthy, Narayanapet,

Nalgonda, and Ranga Reddy. Most of the farmers grow castor crop as a rainfed crop, but now a days due to aberrant weather conditions like heavy rainfall within short intervals at the time of flowering to capsule formation stage leads to favourable conditions for gray mold disease and frequent dry spells during crop growth period leads to reduced crop yields and in severe conditions crop may be failed. To overcome these problems farmers were educated to grow the castor crop in *rabi* season by first week of October to last week of October. Improved crop management practices resulted in higher productivity and market price compared to rainfed conditions. But the awareness among the farmers is very less. Hence focused efforts are required to transfer the technology for adoption of scientific interventions in castor farming in the farmers' fields to realize immediate gains by the individual farmers and in turn towards increasing the oilseeds production (Anonymous, 2014).

Materials and Methods

Front Line Demonstrations were conducted in farmer's fields to transfer technology from Researcher to the farmers by bringing awareness about improved technologies *viz.*, time of sowing, method of sowing, spacing, weed management, fertilizer management, irrigation scheduling, integrated pest and disease management and promotion of new hybrids.

As a part of FLDs, the scientists of AICRP on castor at Regional Agricultural Research Station (RARS), Palem, have demonstrated the castor cultivation during *rabi* season by improved production technologies *viz.*, adoption of high yielding cultivars (ICH-66, PCH-111 and DCH-519), integrated crop management integrated management of pest & diseases etc., in three locations like Kummera, Gummakonda, Nandivaddeman villages of Nagarkurnool district, Southern Telanagana Zone.

Results and Discussion

RARS (PJ TSAU), Palem has developed several crop production and protection technologies besides releasing high yielding and wilt resistant hybrids and production and supply of good quality seed. Hence to promote *rabi* castor cultivation among the farmers FLDs were conducted during *rabi* 2018-19 (25 acres), 2019-20 (25 acres), and 2020-21 (35 acres). During the demonstrations several improved management practices as listed below were suggested to farmers to attain maximum yield.

- Selection of good quality and higher productivity of varieties/hybrids like ICH-66, PCH-111, DCH 519.
- Taking up sowings during first fortnight of October to obtain higher yields. Nearly 80-100 mm rainfall is generally received during October month and the same will be useful for

proper germination and establishment of the crop. This saves the cost of 2-3 irrigations. Delay in sowing from October 1st to November 15th results in decline in seed yield of castor by 21 to 44%. The delayed sowings leads to coincidence of flowering & spike formation stages to high temperature which results in occurrence of more number of male flowers on the raceme and in turn leads to poor yield.

- Soil drenching with carbendazim @ 3g/l near the base of the disease affected and surrounding plants is recommended for effective management of *Fusarium* wilt in Castor.
- Castor crop sown on row to row spacing 90 cm and plant to plant spacing 30 cm.
- In case of traditional method of sowing on the ridges and furrows crop should be irrigated at 10-15 days interval up to December, from January to harvesting of the crop (March to April) irrigate the crop at 7-10 interval in the furrow and weed management done before 45 DAS by intercultivation using cattle pair or mini tractor.
- Application of N-P-K fertilizers at 80-40-30 kg ha⁻¹ in the form of urea, single super phosphate and murate of potash, respectively will result in higher yields. Urea should be applied in split doses at the time of sowing, 30 Days After Sowing (DAS) and 60 DAS of the crop, where as single super phosphate and murate of potash should be applied as a basal dose at the time of sowing.
- In case of *rabi* castor grown under drip irrigation, 40 kg P₂O₅ and 30 kg K₂O ha⁻¹ through SSP and MOP should be applied as basal by pocketing method at 15-20 DAS. On the otherhand, N has to applied in the form of urea through fertigation by following fertigation schedule. 20-50-30-20 kg N ha⁻¹ has to be scheduled through fertigation during vegetative stage (0-

Table 1. Abstract of results of Castor FLD Rabi 2020-21 RARS, Palem

Year	Technology Demonstrated		Mean seed yield		Increase in seed yield (%)	Cost of cultivation (Rs./ha)		Gross returns (Rs./ha)		Net returns (Rs./ha)		Additional net returns (Rs ha ⁻¹)	B: C ratio	
	IT/(ICM)	FP	IT	FP		IT	FP	IT	FP	IT	FP		IT	FP
2018	PCH 111	GCH 22	2133	1680	20.9	42884	41741	97471	73205	54587	31465	23123	2.31	1.78
2019	DCH 519	GCH 4	2079	1671	19	43147	43116	94846	68584	51591	25474	26118	2.21	1.60
2020	ICH 66	GCH 4	2015	1696	15	42516	42322	107891	90936	65376	48615	16761	2.54	2.16
Mean	2076	1682	18	42849	42393	100069	77575	57185	35185	22001	2.35	1.85		

Note: IT- Improved practice (Integrated crop management with castor hybrid from Palem/IIOR)

Table 2. List of Field days and training programme organized to popularize *rabi* castor in STZ

S. No.	Year	Field days	No. of farmers attended
1.	2018	<i>Rabi</i> castor management at kummera	81
2.	2019	Field day on <i>Rabi</i> castor (ICH 66) at Nandivaddeman	75
3.	2020	“Enhancing the productivity of <i>Rabi</i> Castor’ on at Gummkonda village, Thimmajipet mandal, Nagarkurnool district	63
S. No.	Year	Training programmes	No. of farmers attended
1.	2018	Best management practices for <i>rabi</i> castor	80
2.	2019	Yield maximization through best management practices in castor to farmers	100
3.	2020	Improved production Technologies for Castor for input dealers and AOs and AEOs at Farmers	120

45 DAS), primary spike development (46-90 DAS), secondary spike development (65-120 DAS) and tertiary spike development (85-150 DAS) stages, respectively.

- In *rabi* season incidence of sucking pests & capsule borer is the major problem, it can be controlled by spraying of profenophos @ 2 ml/l or acetameprid 0.4 g/l.

FP- Farmers practice (low crop management with private hybrids)

Integrated crop management with castor hybrids from Palem/IIOR (Table 1) gave an average of 18% higher seed yield advantage over farmers practice. Further, improved package resulted in Rs. 22001 / ha higher additional net returns and better B:C ratio 2.35 as compared to farmers practice 1.85.

A well managed *rabi* crop yields 23-25 q/ha. Adoption of drip irrigation and fertigation can increase the seed yield upto 35-38 q/ha. Full package of practices including improved variety/hybrid, thinning, timely weed control, proper nutrition, need based irrigation and plant health management will certainly improve the yields.

An amount of Rs. 25,000 to 30,000 ha⁻¹ is generally incurred for raising castor crop during *rabi* season. Based on the market rate prevailed in the last several years *i.e.*, Rs. 4200 to 6200 q⁻¹ it is estimated that, an amount of Rs. 55,000 to 57,500 ha⁻¹ can be obtained as net returns.

Benefits of *rabi* castor cultivation

- No incidence of gray mold in *rabi* season.
- No wild boar and monkey menace on castor.
- Availability of high yielding and wilt resistant hybrids (PCH-111, DCH -519, DCH- 177 and ICH-66).

Strategies to increase the castor production

- *Rabi* castor has to be sown during first fortnight of October for higher yields.
- Maintain optimum plant population.
- Providing drip facility and subsidy for the same by the government to popularize of *rabi* castor under drip irrigation.
- Development and popularization of Integrate pest and disease management technology.
- Production and supply of quality seed in large quantities.
- Development of low cost sustainable crop production technologies suitable for small and marginal farmers.

Constraints in increasing castor area and production

- Fluctuating market price from year to year and no minimum support price for castor.
- Competition for water among paddy, groundnut, maize and castor crops in *rabi* season.
- Cultivation by resource-poor farmers under low input management.
- Poor soil fertility with low water holding capacity.

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