

Original Research Article

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Demonstration of Hybrid Castor with Onion as Intercrop under Drip Fertigation System

K. Thirukumaran* and K. Kavitha

ICAR-Krishi Vigyan Kendra, Thirupathisaram, Kanyakumari District 629 901, India

*Corresponding author

ABSTRACT

To popularize *rabi* castor cultivation with onion intercrop in drip fertigation in Salem and Namakkal district demonstration were conducted under farmers participatory approach. The castor with onion intercropping through drip fertigation was introduced in different blocks in Namakkal and Salem districts in an area of 18 ha with total beneficiaries of 43. On observing the yield and economics, the results revealed that the average castor yield of 4 tonnes/ha and onion intercrop yield of 5 tonnes/ha was recorded in the farmer's field and the higher gross return of Rs.2,05,295/ha and net return of Rs.1,54,685/ha and B:C ratio of 3.06 was received with castor + onion intercrop. Introduction of onion as intercrop has given double the return then what they are getting previously other cropping systems with normal irrigation system.

Keywords

Castor, Onion,
Drip irrigation,
Intercrops

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Introduction

Castor (*Ricinus communis L.*) belonging to family Euphorbiaceae is one of the ancient oilseed crops of the world. Castor oil is an important industrial oil. In India, Castor crop is grown in an area of 1000 lakh ha, with a production of 1689 lakh tones and productivity of 1689 kg/ha (Anonymous, 2015). Gujarat, Andhra Pradesh and Rajasthan are the major castor producing states. India is the largest producer of castor

in the world earning nearly Rs.3000 crores of foreign exchange annually through export. Tamil Nadu is an important castor growing state in India, with an area of 13,900 hectare.

Major castor producing districts are Salem, Namakkal, Erode, Dharmapuri and Perambalur. Castor is mostly raised as rainfed crop or intercrop with groundnut in Tamil Nadu and hence the maximum potential yield is not being harnessed. Castor as wider spaced crop is ideal for intercropping system.

Initially the growth of castor is slower, that period can be effectively harnessed for growing short duration intercrops. Onion is an ideal intercrop for castor; it is short duration and less demanding in terms of water and other inputs.

Castor is drought tolerant crop (Kirloskar, 2007) and water requirement is low (500 mm) when compared to other crops such as maize (800 mm) and cotton (900 mm) which are the major contingent crops (Kaore, 2012). It is suitable for both *kharif* and *rabi* season. It grows well for all type of well-drained soil and is good contingent crop for weather aberrations such as delayed monsoon or monsoon failure. In the Salem, Namakkal and Erode districts of Tamil Nadu, ground water is over exploited in majority of the blocks. In these three districts the small and marginal farmers constitute 89 per cent of total farmers. Castor is less demanding in terms of land, labour and other inputs, hence it is well suited for the resource poor, small and marginal farmers of these districts. The productivity is low (400 kg/ha), when compared to national average of 1392 kg/ha. The productivity is low mainly because the castor is cultivated as inter / mixed crop in rainfed eco system. Availability of new productive hybrids such as YRCH 1 and DCH 519 offers a great scope for increasing productivity. There is large gap between realizable potential yield and present productivity in castor. .

In Tamil Nadu important castor growing districts are Salem, Namakkal and Erode. The castor productivity is low mainly because of low spread of hybrid castor as pure crop, *Botrytis* gery rot in *kharif* planted crop, Use of low productive traditional land races and local varieties by the farmers, Cultivation as mixed and border crop, Cultivation under rainfed ecosystem in marginal and low fertile soils, Not selecting ideal season (*rabi*) for cultivation and lack of awareness on

agronomic practices fertilizer application, irrigation etc., Irrigation application can be reduced by 50 to 80 per cent with drip irrigation compared to sub surface irrigation and overhead irrigation (Locascio *et al.*, 1989). Under optimum irrigation level, a seed yield of 3780 kg ha⁻¹ was obtained with the hybrid GCH5 (Raj *et al.*, 2010).

A castor field produced 1774 kg/ ha of seed without irrigation, 2199 kg/ ha with a supplementary irrigation at the end of the growing season and 4252 kg/ ha with supplementary irrigation before and after the rainy season (Souza *et al.*, 2007). Through drip fertigation under *rabi* season, cultivation of castor can increase productivity can to 3500 kg/ha which is well above the nation average (1209 kg/ha). Hence drip irrigation system offers a great scope to cultivate castor in these areas. In addition to drip fertigation, onion as intercrop in castor will give additional net income. To popularize *rabi* castor cultivation with onion intercrop under drip fertigation, demonstration were conducted in Salem and Namakkal under farmers participatory approach.

Materials and Methods

Farmers having drip system was selected for raising castor with onion intercrop through drip fertigation system during *rabi* season in consultation. Training on crop production technology of Onion and castor were provided to farmers at village level. Technology of castor + onion intercropping under drip fertigation in *rabi* season, were covered in all trainings.

Improved Castor Hybrid YRCH 1 with Onion CO5 as inter crop was demonstrated under drip fertigation. A total of ten demonstrations per block were conducted by selecting the farmers who is already having the drip fertigation system in their fields. Field days

were conducted in the farmers holdings to disseminate the technology of raising castor + onion intercrop under drip fertigation. Totally ten field days were conducted at the rate of one field day per block.

Results and Discussion

The castor with onion intercropping through drip fertigation was newly introduced in different blocks in Namakkal and Salem districts in an area of 18 ha with total beneficiaries of 43. On observing the yield and economics, the results revealed that the average yield of 4 tons/ha was recorded in the farmers field and the higher gross return of Rs.196530/ha and net return of Rs.145920/ha

and B:C ration of 2.89 (Table 1). The results are similar to the finding of Padmaiah *et al.*, 2012 and Kumar Naik *et al.*, (2015). Results are similar to the finding of Babu GS, 2014 that intercropping of onion in the wider spaced rabi castor was found to be more remunerative and beneficial with better growth and yield of both the crops. The effect of drip fertigation on growth and yield of castor + onion intercropping system was reported earlier by Pushpanathan *et al.*, (2017). Introduction of Onion as a new crop under intercropping system double the return then what they are getting previously. In future the area under this crop may be increased due to impact of the area and the returns realized.

Table.1 Economic Impact of Demonstrations on castor with onion intercrop under drip fertigation

S.No	Block	COC	Yield (kg/ha)		Gross Income/ha	Net income/ha	BCR	BCR Farmers practice
			Castor	Onion				
1.	Namagiripetti	50610	3895	5276	199631	149021	2.95	1.98
2.	Rasipuram	50610	3788	5382	197153	146543	2.90	1.83
3.	Elachipalayam	50610	3737	5389	195445	144834	2.86	1.92
4.	Trichendodu	50610	3680	5026	189096	138486	2.74	1.79
5.	Edapadi	50610	3786	5511	198643	148033	2.93	1.99
6.	Valapdi	50610	3742	5467	196574	145964	2.89	1.94
7.	Mecheri	50610	3879	5401	200116	149506	2.95	1.88
8.	Omalur	50610	3715	5508	196105	145495	2.88	1.67
9.	Pudhuchatram	50610	3759	5352	195772	145162	2.87	1.90
10.	Sankagri	50610	3761	5428	196764	146154	2.89	1.86
Average			3774	5374	196530	145920	2.89	1.87

Outcome

The area and productivity of hybrid castor has been increased.

Hybrid castor cultivation was popularized among the farmers against local variety / races.

Castor hybrid area was increased to a tune of 20 % in the current year itself that too as pure crop cultivation.

By introduction of drip fertigation technology, the yield was increased by 1500 kg/acre as against 1000 kg/ac in normal irrigated cultivation.

Introduction of onion intercrop in castor realized an additional income of Rs.20,000/- per acre.

Farmers realized a net income of Rs. 50,000 per acre in drip fertigation for castor – onion intercropping technology against Rs. 25,000 – 30,000 / acre in castor pure crop alone. By cultivation of local variety / races the farmer will get only Rs.10,000.

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