



Effect of High Yielding Variety and Improved Practices on Yield of Sesamum in Onattukara Tracts of Alappuzha District

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ABSTRACT

Field demonstrations were conducted during 2018-19 and 2019-20 in Onattukara region of Alappuzha district to establish the advantage of cultivating a high yielding variety with recommended crop management practices on enhancing the net income from sesamum cultivation. High Yielding Variety Thilarani was cultivated at twenty farmer partners' field in a total area of 12 hectares in Vallikunnam and Chettikulangara panchayaths during the summer season (January to April) during both years. Scientific crop management along with critical irrigations were given at 2-4 leaf stage, branching, flowering and pod formation stages. Observations were recorded on plant height, number of branches, number of capsules per plant, 1000 seeds weight and yield. While plant height (142.7 cm), number of branches (6.6), number of capsules per plant (43.4) were significantly higher in the HYV compared to the farmers' variety, capsule length (2.4), number of seeds per capsule (53), and 1000 seed weight (3.1 g) were on par. Seed yield of high yielding variety (424 kg/ha) was significantly higher compared to the traditional variety (334 kg/ha). Higher average net returns (Rs.47702/ha) as well as benefit cost ratio (1.8) were achieved by the cultivation of HYV with scientific management practices compared to the farmers' practice (Rs.26104/ha and 1.4)

Key Words: Demonstration, Onattukara, Sesamum, Thilarani, Yield.

INTRODUCTION

Sesamum (*Sesamum indicum* L.) is the oldest indigenous oilseed crop cultivated in India. Sesamum is having the highest oil content (46- 64%) and dietary energy (6355 kcal/ kg). Its oil unlike other fats is highly stable and does not develop rancidity leading to loss of flavor and vitamin. India is the largest producer and exporter of sesame in the world (Puspha and Senthilkumar, 2003). India ranks first in the world with 19.50 lakh ha sown area and 8.50 lakh tones production. It is mainly cultivated in the states of Gujarat, Madhya Pradesh, Rajasthan, Uttar Pradesh, Orissa, Maharashtra, Tamil Nadu, Andhra Pradesh, and West Bengal. In Kerala it is cultivated on an area of 239 ha with a production of 90 t (FIB, 2020) of which 59 per cent of the area is covered in Onattukara tracts comprising of 39 panchayaths of Alappuzha and Kollam districts. It

is grown as a catch crop in harvested paddy fields by utilising the residual soil moisture and nutrients. Naturally this results in lower yield of the crop owing to inadequate supply of nutrients, poor production practices, and poor native fertility. The main reasons for low productivity of sesamum are its rain fed cultivation in marginal and sub marginal lands under poor management and unavailability of high yielding varieties. An improved varieties and scientific cultivation technologies are capable for increasing the productivity level of sesamum (Yadav *et al*, 2020).

Against this background, with the objective of obtaining higher yield and income from sesame cultivation, demonstrations were conducted during the summer seasons of 2019 and 2020 in Onattukara region of Alappuzha district with high yielding varieties and improved production technologies.

Thilarani, a high yielding sesamum variety released by Onattukara Regional Agricultural Research Station under Kerala Agricultural University was selected for the demonstration. This is a short duration variety and suitable for cultivation in the rice fallows with duration of 80 days. The seeds are brownish black and yields up to 580 kg/ha.

MATERIALS AND METHODS

Demonstrations were conducted on twenty farmer's field each during 2018-19 and 2019-20 in Vallikunnam and Chettikulangara panchayaths of Onattukara region. Onattukara sandy plains, which are designated as Agro Ecological Unit - III of the state has tropical humid monsoon type climate with annual mean temperature of 27.6°C and a mean annual rainfall of 2492 cm. The soils are sandy, very deep and well drained with shallow water table. Seeds of the high yielding sesame variety Thilarani, were sown during January after the harvest of the second crop of paddy (September to December) crop. After ploughing the field to a fine tilth the seeds were broadcasted @ 5kg/ha. Package of practice recommendations (KAU, 2016) were followed for the demonstration plots. Recommended dose of chemical fertilizers (30:15:30 kg NPK/ha) were applied in two splits. Full dose of P and K and half dose of N were applied as basal and the remaining N was applied as foliar spray at 30 days after sowing. One hand weeding was done at 25 DAS and the optimum plant populations were maintained by thinning off the plants. Irrigation using portable sprinkler was given at critical stages of plant growth viz., 2-4 leaf stage, branching, flowering and pod formation stages. The crop was harvested after 15 days of yellowing of leaves and when the capsules started collapsing. Adjacent plots to the demonstration plots were selected as control for the farmers' practice.

Observations were recorded on plant height, number of branches, number of capsules per plant, 1000 seeds weight, and yield. The data collected were analysed by t test using the WASP 1 programme available on ICAR-CCARI-Goa website. Cost of

cultivation, net income and benefit cost ratio of the demonstrations were worked out and compared with that of the traditional practices to assess the benefits of the intervention.

RESULTS AND DISCUSSION

The data on yield attributing characters like plant height, number of capsules per plant, number of seeds per capsule, test weight (1000 seeds weight) and yield are presented in table 1. Results showed that the average height of Thilarani plants was significantly higher in both the years (142.7 cm) as compared to traditional varieties (116 cm). Similarly, the number of capsules per branch (43.4) and number of seeds per capsule (53) also were significantly higher compared to the local varieties. Capsule length, seed per capsule and 1000 seed weight were also higher in the HYV even though statistically on par with the farmers' variety. Seed yield of 438 and 410 kg/ha were recorded in Thilarani in 2018-19 and 2019-20, respectively which was 24 and 29 per cent higher than that of the local variety (337 and 330kg/ha). Saravanakumar (2018) reported that the performance of newly introduced variety along with improved practices was found better than the local check in black gram under same conditions. The adoption of improved varieties, crop management practices, and irrigation at critical stages resulted in increase in yield in the demonstrations. Naik *et al* (2016) also reported that scientific technologies for production of Sesamum have given very good result in comparison to local check. Theggali *et al* (2018) also reported that the adoption of improved varieties of sesame crop was helpful in replacement of local varieties for higher productivity. Similar findings were reported by Kumar *et al* (2018) on significant yield improvement in sesamum due to introduction of new variety in cluster mode which facilitated better crop management.

ECONOMIC ANALYSIS

Economic advantages of the management of Thilarani variety over local variety were calculated

Table 1. Comparative growth and yield parameters of sesamum in the technology demonstration

	Plant height (cm)			No. of branches			No. of capsules/ branch			capsule length (cm)			Seeds per capsule			Test weight (g)			Yield (kg/ha)		
	2018- 2019	2019- 2020	Av.	2018- 2019	2019- 2020	Av.	2018- 2019	2019- 2020	Av.	2018- 2019	2019- 2020	Av.	2018- 2019	2019- 2020	Av.	2018- 2019	2019- 2020	Av.	2018- 2019	2019- 2020	Av.
Demonstration Package	152	133.4	142.7	7.9	5.4	6.6	40.1	46.8	43.4	2.2	2.6	2.4	54	52	53	3.31	2.81	3.1	438	410	424
Farmers' practice	112.6	119.5	116	6.5	4.2	5.3	25.8	24.4	25.1	2.3	4.2	3.2	48	47	47.5	3.18	2.72	2.95	337	330	333.5
t value (5%)	2.9*	7.5*		2.7*	2.0*		8.3*	5.2*		NS	NS		NS	NS		NS	NS		4.7*	6.2*	

*Significant at 5%

Table 2. Economics of sesamum cultivation with high yielding variety and scientific management practices (Rs./ha)

	Gross Cost			Gross Income			Net income			BC ratio		
	18-19	19-20	Av.	18-19	19-20	Av.	18-19	19-20	Av.	18-19	19-20	Av.
Demonstration package	61500	55095	58298	102500	109500	106000	41000	54405	47702	1.6	2.0	1.8
Farmers' practice	57550	57178	57364	82500	84437	83468	24950	27259	26104	1.4	1.5	1.45

based on the prevailing market prices, wages and other input costs, for both the years. The cost of production of sesame under the demonstrations varied from Rs. 61,500/ha to Rs 55,095/ha with an average of Rs.58,298/ha (Table 2). The result confirmed the similar findings of front line demonstrations on oilseed crops by Singh *et al* (2018). This was higher when compared to the farmers practice naturally due to the adoption of better management practices. But net returns and benefit cost ratio were higher in the demonstration plots (Rs.47,702/ha and 1.8) compared to the local check (Rs. 26,104/ha and 1.4). Rao and Ramana (2017) reported similar results in adoption of improved varieties and production techniques in sesame under rain fed conditions in Andhra Pradesh. Meena *et al* (2018) concluded that the small and marginal farmers associated with sesamum cultivation could substantially increase the income as well as the livelihood security by the use of new production technologies.

CONCLUSION

The results of the front line demonstrations showed that the high yielding sesamum varieties with improved production techniques substantially increased the yield and economic benefits of sesame cultivation in Onattukara tracts of Kerala. There is a need to increase the adoption and spread of improved technologies by the extension agencies to improve the area expansion and production potential of sesame.

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