The Journal of Rural and Agricultural Research Vol. 20 No. 2, 41-43 (2020)
Received August 2020; Acceptance October 2020

Role of cluster frontline demonstrations in enhancement of sesame productivity

SUMITRA DEVI BAMBORIYA* AND GOPICHAND SINGH
Krishi Vigyan Kendra, Maulasar, Nagaur-II, District, Nagaur, Rajasthan-341506, India
**Email:* sumisaani@gmail.com

Abstract

The cluster frontline demonstrations (CFLDs) on sesame were conducted by Krishi Vigyan Kendra, Maulasar, Nagaur-II during kharif season 2018-19 to 2019-20. All 125 demonstrations on sesame crop were carried out in area of 50 ha by the active participation of farmers with the objective to demonstrate the improved technologies of oilseeds production potential. The improved technologies consisting use of improved variety, seed treatment, mechanized sowing, integrated nutrient & weed management, pest and disease management. The improved technology recorded higher yield, net returns and BC ratio in the value of 4.57qt ha^{-1}, Rs.117 ha^{-1} and 1.68 as compared to farmer's local practice (3.53 qha^{-1}, Rs. 8400 ha^{-1} and 1.33, respectively).

Key words: *C*luster front line demonstration, sesame, technology gap, extension gap and technology index

Introduction

Sesame (*Sesamum indicum* L.) is one of the important oilseed crop in Indian agriculture. Sesame seeds are rich source of food, nutrition, edible oil and bio-medicine and due to presence of potent antioxidants, they are called as "the seeds of immortality". Its oil has excellent nutritional, medicinal, cosmetic and cooking qualities for which it is known as the "queen of oils". It is cultivated on a large area in the states of Maharashtra, Uttar Pradesh, Rajasthan, Orissa, Andhra Pradesh, Madhya Pradesh, Tamil Nadu, West Bengal, Gujarat, Karnataka, Kerala, Bihar, Assam. By virtue of its early maturing, sesame fits well into a number of multiple cropping systems either as a catch crop or a sequence crop in *rabi* and pre-*kharif* seasons. India ranks first in area, production and export of sesame in the world. But the productivity of sesame in general is much lower than its potential yield. Lower productivity is due to use of sub-optimal rate of fertilizer, poor management and cultivation of sesame in marginal and sub-marginal lands. This indicates the scope and need to increase the productivity of sesame. Sesame is an important source of high-quality oil and protein. The oil has excellent stability due to the presence of natural antioxidants such as sesamolin and sesamin (Bedigian *et al*., 1985). The Queen of the oilseed crops by virtue of the excellent quality of the oil, flavour, taste and softness. Sesame is usually rich in oil (50%), protein (18-20%), moisture (5%), carbohydrate (16%) and fibre (5%). Accordingly Mahrous *et al*. (2015) in arid and semi-arid conditions, sesame is one of the most commonly ancient oil crop cultivated for grain, oil and bio-energy production in subtropical and tropical regions.

Materials and Methods

The present study was carried out in the Nagaur district is located on the North-western part of Rajasthan state and lies at 27°20'N latitude and 73°74' E longitude with an altitude of 302 m above the mean sea level (MSL). Cluster frontline demonstrations were conducted during *kharif*, 2018-19 and 2019-20 with evaluation the performance of RT-351, variety of sesame in Maulasar & Nawan block of the district. In this study, 125 farmers were selected from aforesaid blocks during consecutive years under cluster frontline demonstration of sesame. All the technological intervention was taken as per prescribed package and practices for improved variety of sesame crop (Table 1). The grain yield, gap analysis, cost of cultivation, net return and additional returns parameters were recorded (Table 2 and 3). Assessment of gap in adoption of recommended technology before laying out the cluster frontline demonstrations (CFLD's) through personal discussion with selected farmers. The training was organized for selection of farmer's and skilled development about detailed technological intervention with improved package and practice for successful sesame cultivation. Scientists visited regularly cluster frontline demonstration fields and farmer's fields also. The feedback information from the farmer's was also recorded for further improvement in research and extension programmes. The extension activities i.e. training, scientist's visits and field days were organized at the cluster frontline demonstrations sites. The basic information were recorded from the farmer's field and analyzed to comparative performance of cluster frontline demonstrations and farmer's practice. Different parameters were calculated to find out technology gaps (Yadav *et al.,* 2004).

Extension gap = Demonstrated yield - farmer's practice yield

Technology gap= Potential yield - Demonstration yield

Additional return= Demonstration return- farmer's practice return

$$\text{Technology index} = \frac{\text{Potential yield-Demonstration yield}}{\text{Potential yield}} \times 100$$

check yield of 3.53 q/ha and the percentage increase in the demonstration yield over local check was 29.5 per cent. Similarly, yield enhancement in different crops in front line demonstrations were documented by Deshmukh *et al.*, (2014) and Meena *et al.,* (2018).

Extension gap, Technology gap and Technology index

This emphasized the need to educate the farmers through various means for the adoption of improved agricultural production technologies to reverse this trend of wide extension gap. More and more use of latest production technologies with high yielding variety will subsequently change this alarming trend of galloping extension gap. The new technologies will eventually lead to discontinue the old technologies and to adopt new technologies by the farmers. The extension gap 1.05 and 1.03 q ha^{-1} was recorded (Table 2) during 2018-19 and 2019-20, respectively.

Technology gap may be attributed to dissimilarities in soil fertility, salinity and to erratic rainfall and other vagaries of weather in the demonstration area. Hence, location specific recommendations may

Table 1: Detail of package and practices for sesame cultivation

S. No.	Technological intervention	Farmer's practice	Recommended Practice (CFLD's)
1.	Variety	Local	RT-351, RT-127
2.	Seed rate ($kgha^{-1}$)	4-5	3-4
3.	Seed treatment	Carbendazim 50 WP @ 2g kg^{-1}	Carbendazim 50 WP @ 2g kg^{-1} seed, Imidacloprid 70 WS @ 5g kg^{-1} seed and Azospirillum & PSB culture 5-10 ml kg^{-1} seed
4.	Soil treatment	No Application	Quinalphos 25 kg ha^{-1}
5.	Spacing	Un uniform plant population	30 x 10 cm
6.	Time of Sowing	1-30 July	1July- 15 July
7.	Nutrient management	Imbalance use of fertilizers and 50 kg DAP at sowing	Balance fertilization:-10-15 kg N, 30-40 kg P_2O_5 & 40 kg S/ha at sowing time.
8.	Weed management	Hand weeding	Pendimethalin 500g a.i. ha^{-1} at 1-2 DAS
9.	Plant protection measures	Use of monocrotophos 1 litre/ha	Spray of Imidacloprid @ 0.5ml/litre of water for sucking pest and spray of Streptocyclin 1g/10 litre of water for bacterial blight control

Results and Discussion

The major differences were observed between demonstration package and farmer's practices are regarding recommended varieties, seed treatment, time of sowing, fertilizer dose, method of fertilizer application and plant protection measures.

Grain Yield

The demonstrations were recorded higher average pod yield 4.57 q/ha compared to average local

become necessary to narrow down the gap. The technology gap 1.40 and 1.47 q ha^{-1} was recorded (Table 2) during 2018-19 and 2019-20, respectively.

Technology index shows the feasibility of the variety/technology at the farmer's field. The lower the value of technology index (23 %) more is the feasibility of the particular technology (Table 2). The results of the present study are in consonance with the finding

Table 2: Yield performance, technology gap, extension gap and technology Index of sesame under Farmers' Practice and Cluster Front Line Demonstration

CFLD conducted year	Crop	Variety	No. of Demons -trations	CFLD Area (ha)	Yield (q/ha) Potential of variety	Yield (q/ha) Demonstr- ated plot	Yield (q/ha) Local Check plot	% increased yield over	Technology gap (q/ha)	Extension gap (q/ha)	Technology Index (%)
2018-19	Sesame	RT-351	50	20	6.00	4.60	3.55	29.58	1.40	1.05	23.33
2019-20	Sesame	RT-351	75	30	6.00	4.53	3.50	29.43	1.47	1.03	24.50
Average					6.00	4.57	3.53	29.50	1.44	1.04	23.92

Table 3: Economics of sesame under Cluster frontline demonstrations

Conducted year	Cost of cultivation (Rs/ha)		Gross return (Rs/ha)		Return (Rs/ha)		B:C Ratio	
	Demonstrated plot	Local Check plot	Demonstrated plot	Local Check plot	Demonstrated plot	Local Check plot	Demonstrated plot	Local Check plot
2018-19	17300	16500	28745	21246	11445	4746	1.66	1.28
2019-20	17353	16500	29373	22698	12019	12054	1.69	1.37
Average	17327	16500	29059	21972	11732	8400	1.68	1.33

Meena *et al.,* (2018).

Economic analysis

The Net returns and B:C ratio of demonstration plot was Rs. 11732 ha^{-1} & 1.68 and for control Rs. 8400 ha^{-1} and 1.33, respectively (Table 2). This improvement in yield might be due to the application of seed treatment, use of bio fertilizers, timely sowing, application of recommended dose of fertilizers, proper and timely weed management and integrated pest management practices. The results indicated that the cluster frontline demonstrations gave good impact over the farmers practice. With incremental benefit cost ratio 3.50 suggesting it's higher profitability and economic viability of the demonstration. The result confirmed the similar findings of front line demonstrations on oilseed crops by Lathwal (2010) and Singh *et al*., (2012).

References

Crop-wise Fourth Advance Estimates of Area, Production and Yield of various principal crops during 2018-19. Commissionerate of agriculture, Rajasthan-Jaipur, 2018-19.

Yadav, D.B., Kamboj, B.K. and Garg, R.B. (2004). Increasing the productivity and profitability of sunflower through front line demonstrations in irrigated agro-ecosystem of eastern *Haryana. Journal of Agronomy,* **20**:33-35.

Meena, R., Singh, B., Meena, K.C., Meena, R.K., Singh, B. and Gurjar, P. (2018). Performance of Front Line Demonstrations on Sesame (*Sesamum indicum* L.) in Karauli District of Rajasthan, India . *International Journal of Current Microbiology and Applied Sciences* **7**(3): 1507-1511.

Singh Jagmohan, Dhillon B.S., Asthaand Parvinder Singh (2012). Front line demonstration – An effective tool for increasing the productivity of summer moong in Amritsar district of Punjab. *Asian Journal of Soil Science*, **7**(2): 315-318.

Lathwal, O.P. (2010). Evaluation of frontline demonstrations on black gram in irrigated agro ecosystem. *Annals of Agril. Res.* **31**(1&2): 24-27.

Deshmukh, G., Patel, H. B. and Patel, M. R. (2014). Frontline demonstration influences on knowledge and adoption of mustard growers. *Gujarat Journal of Extension Education*, **25**(1): 27-30.

Bedigian, D., Seigler, D.S. and Harlan, J.R. (1985). "Sesamin, sesamolin and the origin of sesame," *Biochemical Systematics and Ecology*, **13**(2): 133–139.

Mahrous, N.M., Abu-Hagaza, N.M., Abotaleb, H.H. and Fakhry, S.M.K. (2015). Enhancement of growth and yield productivity of sesame plants by application of some biological treatments, *American-Eurasian Journal of Agricultural and Environmental Sciences*, **15**: 903–912.