



RESEARCH PAPER

Yield enhancement of sesame through cluster front line demonstration in Jaipur district of Rajasthan

B.L.Yadav*, Irfan Khan and S.S. Rathore

Krishi Vigyan Kendra, Chomu (Tankarda) Jaipur-1, Jaipur (Rajasthan) India

(Email: babuagron86@gmail.com)

Abstract : Cluster front line demonstration (CFLDs) on sesame crop was conducted by Krishi Vigyan Kendra, Chomu (Tankarda) district- Jaipur (Rajasthan) during *Kharif* 2018 and 2019, respectively. Total number of demonstrations was conducted 105 with area of 42 ha in Jaipur district. The improved technology consist of improved variety, seed treatment, weed management, nutrient management and plant protection measures. The results was found that the maximum average yield was recorded 6.38q/ha in demonstration plot and minimum yield was recorded 4.61 q/ha in farmers practices. The highest average net return (Rs.23,484/ha) was recorded in the demonstration plot as compared to farmers' practice (control plot) (Rs.14,812/ha). The maximum B:C ratio was recorded 2.38 in demonstrated plot and lower B:C ratio was found 2.03 in farmer practices.

Key Words : CFLDs, Sesame, Variety, Yield, Benefit cost ratio

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INTRODUCTION

Sesame (*Sesamum indicum* L.) is one of the important edible oilseeds cultivated in India. India is the major producer of this crop in the world. This crop has earned a poetic label "Queen of Oilseeds" due to its high quality poly-unsaturated stable fatty acids. Sesame oil is really the poor man's substitute for *Ghee*. India ranks first in both area and production, but lowest, its productivity in the world level (Bhaduria *et al.*, 2012) due to its cultivation in marginal and sub-marginal soils and rainfed farming situation with poor agronomic management practices.

Sesame is grown as a *Kharif* season crop under rainfed conditions in Rajasthan, Madhya Pradesh, Uttar Pradesh, Andhra Pradesh, Gujarat, Maharashtra, Orissa, Karnataka and Tamil Nadu. Sesame is also cultivated as a summer crop under irrigated condition. This current study was conducted to determine farmer awareness of sesame cultivation, the extent of adoption of better methods and the yield gap in sesame production technology. Krishi Vigyan Kendra is a grass-roots organization dedicated to the use of technology by assessing, refining and disseminating proven technologies in various microfarming situations throughout the district (Das *et al.*, 2007).

*Author for correspondence:

MATERIAL AND METHODS

The present investigation of cluster frontline demonstrations (CFLDs) on sesame was conducted by Krishi Vigyan Kendra, Chomu (Tankarda) Jaipur-1 during *Kharif* 2018 and 2019 at villages namely Mumarkya, Udaipuria, Thali, Trilokpura, Bhadipura and Hingoniain Jaipur district of Rajasthan state. The demonstration was conducted in an area of 10 ha in *Kharif* 2018 and 32 ha in *Kharif* 2019 with six locations against local variety in two years and each demonstration size was 0.4 ha. Total number of demonstrations 105 with area of 42 ha (2018 to 2019) were conducted with active participation of farmers to demonstrate the improved technologies of sesame in different villages, so that to sustain production potentials and expand the area under the crop in the district. Present study with respect to CFLDs and farmers' practices (FP) are given in Table 1. The soils in selected villages were sandy loam in texture. Farmers were trained to follow the package of practices for sesame cultivation as recommended by III A Zone of Rajasthan and need based critical inputs provided to the farmers for increasing productivity of sesame crop (Table 1).

The assessment of gap in adoption of recommended technology before conducting cluster frontline demonstrations by group meeting and discussion with farmers in village. The training was organized to selected farmers for conducting cluster frontline demonstrations of sesame crop. Technological intervention like improved technology for sesame production. KVK Scientists visited regular cluster frontline demonstration fields and farmer's fields sowing to harvesting of crop. The feedback collected from the farmers for further improvement in

research. The extension activities like that Scientists visits time to time at CFLDs fields and field days were organized in the good stage of crops. Different parameters as suggested by Yadav *et al.* (2004) was used for gap analysis, and calculating the economics. The details of different parameters and formula adopted for analysis are as under :

Extension gap = Demonstration yield - Farmers' practice yield
Technology gap = Potential yield - Demonstration yield

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

RESULTS AND DISCUSSION

The experimental findings obtained from the present study have been discussed in following heads :

Seed yield :

The yield of sesame under cluster frontline demonstrations (CFLDs) from 6.18 to 6.58q/ha (Table 2) during *Kharif* (2018 to 2019), respectively and maximum yield recorded 6.58 q/ha in 2018. Yield was recorded in farmer practices range between 4.45 to 4.77q/ha during *Kharif* 2018 to 2019. Two years of cluster frontline demonstrations yield increase per cent was 37.95 and 38.88%, respectively as compared to farmer practices. The integrated crop management practices result exhibited that the yield increase 38.42 per cent in two years over the farmer practices. Yield of sesame was differed with different integrated crop management technologies, which might have been due to improved variety, line sowing method, nutrient management, weed management, insect and disease management. The highest yield observed in ICM this

Table 1 : Technological gap analysis for sesame

Sr. No.	Technology	Existing farmers' practices	Recommended practices
1.	Variety	Local own available seed	RT-346 and RT 351
2.	Seed rate	Seed rate : 5-6 kg/ha	Seed rate : 2.5 kg/ha.
3.	Seed treatment	No seed treatment	Seed treatment with Thiram @ 2-3 gm/kg seed
4.	Bio - fertilizers	No use of PSB culture	PSB culture @ 10 ml/kg seed
5.	Nutrient management	Imbalance use of fertilizers N:P:S (30:15:00 kg/ha)	Recommended N:P:S (20:25:40 kg/ha) as basal dose
6.	Weed management	one hand weeding	Pendimethalin 0.5 kg a.i. per ha at 1-2 DAS and one hand weeding at 30 DAS
7.	Plant protection	Inadequate use of plant protection measures	*Use of Imidacloprid 17.8 SL @ 0.4 ml/lit of water for sucking pest (40-45) DAS * Spray of Kasugamycin 3% SL @ 0.3ml/lit of water for Phyllody management (55-60) DAS

may be due to adoption of proper and complete agronomic management practices. These results are similar findings of Meena *et al.* (2018) and Bamboriya and Singh (2020).

Extension gap:

The study of (Table 2) found that an extension gap of 1.73 to 1.81 q/ha was obtained between demonstrated technology and farmers' practice and average extension gap of 1.77q/ha in the two year of demonstrations. The highest extension gap was found 1.81 q/ha during *Kharif* 2018 and the lowest extension gap was found 1.73 q/ha during *Kharif* 2019. The adoption of improved variety, improved technologies, seed treatment, weed management and plant protection measures in demonstrations get resulted in higher yield as compared to farmers' practices.

Technology gap:

The technology gap was found 2.42 and 2.82q/ha during 2018 and 2019, respectively and average technology gap of two years was recorded 2.62q/ha. Technology gap may be attributed to dissimilarities in soil fertility, erratic rainfall and other variation of weather in the demonstration sites. The difference in technology gap in different years was due to better performance of improved varieties along with different type of interventions and suitable of demonstrated technologies during the two years in different locations of Jaipur district.

Technology index:

Technology index indicated that the suitability of the

variety and recommended technologies at farmers' field. The lowest value of the technology index performed the suitability of the technology. This study found that the technology index was range from 26.89 to 31.33 percent during *Kharif* 2018 to 2019, respectively. The average technology index was found 29.11 per cent in two years of demonstration.

Economics :

The results of economics (Table 3) were found better in CFLDs of two years during *Kharif* 2018 to 2019. Economic indicators of cluster front line demonstrations, such as gross returns, net returns and BC ratio. The data clearly showed that the net returns from suggested practices were maximum than the control plot, *i.e.* farmers practiced in all demonstrations from *Kharif*-2018 to *Kharif*-2019. The maximum mean value of two years of gross returns of Rs. 40598/ha, net return Rs.23484 and B:C ratio 2.38 was recorded in cluster front line demonstrations as compared to farmer practice.

Yield enhanced might be due to the adoption of improved variety, seed treatment, use of bio fertilizers, line sowing, nutrient management, weed management and integrated pest and disease management. The result indicates that the cluster frontline demonstration has a good impact over the farmers practice. The similar findings by Lathwal (2010). Singh *et al.* (2012) and Bamboriya and Singh (2020).

Conclusion:

Based on the two years results of cluster front line

Table 2 : Seed yield of sesame crop under cluster frontline demonstrations (CFLD) and farmer practice (FP)

Year	Area (ha.)	No. of Demo.	Variety	Yield (q/ha)			Percent increase over farmers practices	Technology gap (q/ ha)	Extension gap (q/ ha)	Technology index (%)
				Potential	Demo.	Farmer practices				
2018	10	25	RT-351	9.0	6.58	4.77	37.95	2.42	1.81	26.89
2019	32	80	RT-351	9.0	6.18	4.45	38.88	2.82	1.73	31.33
Total	42	105	-	-	-	-	-	-	-	-
Average	-	-	-	9.00	6.38	4.61	38.42	2.62	1.77	29.11

Demo.- Demonstration, CFLD – Cluster frontline demonstration

Table 3 : Economics of sesame crop under CFLD and farmer practice (FP)

Year	Cost of cultivation (Rs./ha)		Gross return (Rs./ha)		Net return (Rs./ha)		B:C ratio	
	Demo.	Farmer practices	Demo.	Farmer practices	Demo.	Farmer practices	Demo.	Farmer practices
2018	16462	13812	41118	29808	24656	15996	2.50	2.16
2019	17765	15230	40077	28858	22312	13628	2.26	1.89
Average	17114	14521	40598	29333	23484	14812	2.38	2.03

demonstration on sesame crop, the adoption of integrated crop management practices along with improved variety RT-351 performed better than farmer practices in all the demonstrations. So that, it is need to disseminate the improved variety with recommended technologies in the farmers field with extension methods such as training, field visits and field day.

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