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Economics and yield analysis of front line demonstrations on sesame (Sesamum indicum L.)

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Abstract

Front line demonstration is the long-term extension scientific activity conducted by Agriculture scientists on systematic manner in farmers' field to extent of adoption of improved new agriculture technology is a crucial aspects under innovation diffusion process and the most important for enhancing agriculture production at a faster rate. FLD is one of the most powerful tools for assessment and transfer of technology for enhancing agriculture production. The major critical inputs were identified in production technology through meetings and discussions with farmers, use of higher seed rate resulting into dense plant population, uneven plant population, ignorance about fertilizers were the predominant identified causes of low productivity of Sesame in Agra district. The present study was to determine the Economics and yield analysis of front line demonstrations on sesame (Sesamum indicum L.). The Krishi Vigyan Kendra, Bichpuri, Agra had conducted the frontline demonstrations (FLDs) on sesame during 2016-17 and 2017-18. The results clearly indicate the positive effects of FLDs over the farmer practices. The improved new agriculture technology (FLDs) recorded additional yield and more income over the farmer practices, grain yield of sesame increased by 104% and 61% (2016-17 and 2018-19) over farmer practices. Adoption of improved package of practices under FLDs in sesame cultivation recorded higher B:C ratio (2.37:1) and (3.27:1) as compared to farmers practices (1.49:1) and (2.50:1) in 2016-17 and 2017-18. FLDs provided was net returns in first year Rs 22420 and farmer practices Rs6240 and second year FLDs was provided Rs 35714 and farmer practices Rs 1920. Improved technology (FLDs) produced higher yield of 4.00 q/ha and 6.43 q/ha compared to farmer practices.

Key words: Economics, Yield, Front Line Demonstrations, Sesame

Introduction

Sesame (*Sesamum indicum* L.) is very important and one of the most ancient oilseed crops in the tropic, sesame (Sesamum indicum L.) is an important edible oilseed crop in India. Oilseeds are important constituent in human dietary system next to carbohydrate and protein, (Pal and Gangwar, 2004). Among the oilseeds crops, sesame has the highest oil content of 46-64% (Goel and Sanjayakumar, 1994). It is recognized by various names like gingely, til, simsim, gergelim and biniseed etc. About 70 per cent of the sesame produced in the country is used for oil extraction. Its oil content generally varies from 46 to 52 per cent which is highly resistant to oxidative rancidity, its highly nutritious and edible seeds (Iwo et al., 2002).The protein content is around 25%, it is high-quality protein. Sesame oil is also referred to as "poor man s substitute for ghee". Sesame is called as „Queen of oilseeds. Oil are important constituent in human dietary system next to carbohydrates and proteins (Shelke et al.,2010)

Farmers in sesame growing areas are resource poor and heavily depend on rain-fed crop production systems and natural soil fertility for crop production (Ibeawuchi et al., 2009).

The easiest way to boost the productivity is through balanced fertilization to the undernourished crop (Chaudhary et al., 2002). The main role of phosphorus is for root and fruit production, and

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potassium is for hardiness, disease resistance, drought tolerance, and general durability.

Front Line Demonstration is most effective tool for transfer of Cost effective technologies among the farmers (Srinivas et al., 2015 and Jeendar et al., 2006). Therefore, front line demonstration were conducted during kharif seasons of the year 2016-17 and 2017-18 on selected farmer field of the operation area of Krishi Vigyan Kendra Bichpuri, Agra with the objectives of exhibiting the performance of balanced fertilizer application and seed rate of sesame crop.

Materials and Methods

Front line demonstration is one of the most powerful tools for transfer of new technology. The present study was find out the, Economics and yield analysis of front line demonstrations on sesame (Sesamum indicum L.) on farmers field in Agra. These trials was conducted during 2016-17 and 2017-18 in Kharif season at Krishi Vigyan Kendra Bichpuri , Agra (U.P). The soil of the farmers field were sandy-loam in texture and medium phosphorus , low organic carbon and nitrogen .

The Technology used for Front line demonstration they were recommended dose of fertilizer. Farmers provide by Krishi Vigyan Kendra phosphorus sources of di ammonium phosphate , potash sources of murat of potash, sulphur source of elemental sulphur, zinc sources of zinc sulphat at 33 percent and new varieties of sesame recommended for the area and non monetary in put like timely sowing, seed rate, plant spacing, weeding, thinning, harvesting, threshing ,chemical use , etc practices were taken cane through farmers training, field visit, etc and production data of sesame were observation separate farmer after threshing.

Treatments:

Farmer Practices (T-1) : No use of fertilizer .

Recommended under FLDs (T-2) : 30 kg/ha Phosphorus, 30 kg /ha Potash, Zinc(33%) 12.5 kg and Sulphur 40 kg /ha with seed 4 kg/ha .

Economics of the treatments

Economics of the treatments Recommendation and adoption of any practice by cultivators depends upon its economics. Therefore, it becomes essential to work out economics of the treatments tested for judging the best treatment under study, for getting higher net profit per hectare.

Cost of cultivation (Rs./ha)

For different treatments total cost was calculated on the basis of prevailing market rates of fertilizer, field preparation, sowing of seeds, labour charges, cultural and intercultural operations as well as expenditure an herbicides, harvesting and threshing of the crop produce etc.

Gross return (Rs. /ha)

For different treatments gross returns were calculated on the basis of prevailing market rate of produce.

Net return (Rs. /ha)

It was calculated treatment wise. The cost of cultivation per hectare was subtracted from the gross income for computing net returns of each treatment.

Net profit (Rs./ha) = Gross return (Rs./ha) - Cost of cultivation (Rs./ha)

The BCR formula was calculated in given below.

$$BCR = \frac{\text{Gross return}}{\text{Gross cost}}$$

Results and Discussion

(i) Grain Yield

The data that is proved form the average yield in Table 1 reveal that application of balanced fertilizer technology result in substantially higher sesame seed yield that compare to farmer's practices during the year 2016- 17 and 2017-18. The average seed yield of sesame first year was 4.08 q/ha and next year average seed yield of sesame was 6.43 q/ha under demonstration technology. The average seed yield of farmer's practices in first year 2.0 q/ha and in second year 4.0 q/ha.

Demonstration technology seed yield of sesame 2.08 q/ha first year and second year yield of sesame 2.43 q/ha was more in the comparison to farmer's practices. The higher seed yield of sesame under Demonstration in comparison to farmer's practices could be ascribed mainly to the use of balanced

Table 1: Grain yield of farmer practices and demonstration

Treatments	Grain yield (q/ha) 2016-17	2017-18	No. of Farmer
Farmer practices (T-1)	2.0	4.0	08
Recommended technology under FLD (T-2)	4.08	6.43	08

Table 2: Economics of yield on farmer practices and demonstration

Treatmets	Gross Cost (ha^{-1})		Gross return (ha^{-1})		Net return (ha^{-1})		B:C Ratio	
	2016-17	2017-18	2016-17	2017-18	2016-17	2017-18	2016-17	2017-18
Farmer practices (T-1)	12760	12800	19000	32000	6240	19200	1.49:1	2.50:1
Recommended technology under FLD (T-2)	16340	15760	38760	51440	22440	35714	2.37:1	3.27:1

fertilizer dose. The similar results of yield enhancement in front line demonstrations have been documented by Jeendar et al. (2006), Singh et al., (2016) and Tomar *et a*l (2003). The results clearly indicate the positive effects of FLDs over the existing practices towards enhancing the productivity of sesame in district of Agra.

Despite the lower yield levels in village Nagala Vishnu, the newer technologies for production of sesame have given a very good result in comparison to farmer's practices. There is a need to adopt FLDs technology that enhancing sesame production.

(ii) Economics

Economics indication i.e. gross cost of cultivation gross returns, net returns and Benefit Cost ratio of front line demonstration are presented in Table 2 clearly shows that year 2016-17 and 2017-18 gross cost of cultivation for sesame under front line demonstration practices first year Rs 16340 and second year Rs 15760 compare to farmer practices cost of cultivation first year Rs 12760 and second year Rs 12800. The date clearly revealed that demonstrated technology provided substantially higher return than local check (farmer practices) i.e. during 2016-17 and 2017-18 . Front line demonstration technology show clear of income Rs 22440 and Rs 35714 compare to farmer practices Rs 6240 and Rs 19200, respectively both the year. Show clear Front Line Demonstration technologies were more Profitability compared to farmer practices.

Economics analysis of the yield performance revealed the B:C ratio of demonstration higher were 2.37:1 and 3.27:1 compare to 1.49:1 and 2.50:1 farmers practices (Traditional) of year 2016-17 and 2017 -18, respectively .

Benefit: Cost ratio was recorded to be higher under demonstration against control during both the years of study.

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