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Frontline demonstration as an effective mean for increasing yield of oilseed crops

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Abstract

The present study was carried out during *kharif* and *rabi* season in 08 villages of Sheopur district of Madhya Pradesh during 2014-15. A total 24 frontline demonstration covering an area of 10 ha were conducted on oilseed crops, out of which 12 demonstration were on soybean and 12 on mustard. Under frontline demonstration, improved variety, seed treatment, balanced fertilization, integrated pest management etc. were included as improved technologies. The results of these demonstrations revealed that the soybean and mustard under improved technologies yielded 23.84 and 20.81 percent higher than farmer's practices. The average yield of oilseed under demonstration [soybean (1496kg/ha) and mustard (1857kg/ha)] were much higher than yield under farmer's practices [soybean (1208kg/ha) and mustard (1537 kg/ha)]. The improved technology gave higher gross return, net return with higher benefit cost ratio. In spite of increasing in yield technology gap, extension gap and technology index existed.

Keywords: Frontline demonstration, oilseeds, technology gap, extension gap, technology index, yield

Introduction

Frontline demonstration is one of the most powerful tools for transfer of technology because farmers in general, are driven by the perception that "Seeing is believing". The main objective of frontline demonstration is to demonstrate newly released crop production and protection technologies and its management practices in the farmer's field. While demonstrating the technologies in the farmer's field, the scientists are required to study the factor contributing higher crop production; field constraints of production and there by generate production data and feedback information.

The country witnessed yellow revolution through a phenomenal increased in production and productivity from 2.68 MT and 650 kg/ha in 1985-86 to 6.96 MT and 1022 kg/ha in 1996-97, respectively. In spite of these achievements, there exists a gap between production potential and actual realization (Shekhawat, *et al.*, 2012) ^[4]. Soybean and mustard are the most important popular sources of vegetable oil in India. The technologies developed through research activities are demonstrated under actual field conditions of the farmer's through frontline demonstration. Realizing the importance of frontline demonstration in transfer of technologies, Krishi Vigyan Kendra, Sheopur have regularly been conducting FLDs on oilseed at farmers' field in different villages of Sheopur district of Madhya Pradesh with the objective of convincing farmers and extension functionaries together about the production potentialities of the oilseed technologies for further wide scale diffusion. Keeping in view of an effective extension approach of FLDs for dissemination of oilseed technology, present study was undertaken with the objective of increasing oilseeds production.

Materials and Methods

The study was conducted in Sheopur district of Madhya Pradesh in *kharif* and *rabi* season during 2014-15. Initially participatory Rural Appraisal (PRA) was done to identify causes of low yield of oilseeds; For the purpose of the study 08 villages namely Galmanya, Ajapura, Lalitpura, Soikalan, Bardha, Panwada, Occhapura and Partwara of Sheopur district, where FLDs were conducted during 2014-15 were selected. A total no. of 24 frontline demonstrations in 10 ha area were conducted in selected villages on oilseed crops, out of which 12 demonstration were on soybean and 12 on mustard. In general, the soils of area under study were medium black with medium to low fertility status. The average rainfall of the area was 822mm.

In demonstration plots, improved technologies included use of quality seeds of improved varieties (soybean JS 93-05 mustard RVM-2) seed treatment with fungicide, balanced nutrient application and integrated pest management etc. were followed.

The sowing of soybean was done during July and mustard during October at 45x 10 cm spacing. The seed rate of soybean and mustard were 75kg/ha and 5kg/ha, respectively. The both crop were fertilized with recommended dose of fertilizer. IPM practices were followed as per crop. The traditional practices were maintained in case of local cheek (farmer's practices). In demonstration plots, critical inputs in the form of quality seed and agrochemicals were provided by Krishi Vigyan Kendra. The out put were collected from both FLDs plots as well as farmer's practices and finally the technology gap, extension gap, technology index along with the benefit cost ratio were calculated (Samui. *et al.*, 2000) [2] as given below:-

Technology gap = Potential yield- demonstration yield

Extension gap = Demonstration yield – farmer yield

$$\text{Technology index (\%)} = \frac{\text{Potential yield} - \text{demonstration yield}}{\text{Potential yield}} \times 100$$

Results and Discussion

Yield

The average yield of oilseed [soybean (1496kg/ha) and mustard (1857kg/ha)] were much higher than average yield under farmer practices [soybean (1208kg/ha) and mustard (1537kg/ha)](table 1). A yield increase of 23.84% in soybean and 20.81% in mustard were recorded which is mainly because of application of improved technologies of oilseed production. The results are similar with the findings of Singh *et al.* (2007) [5] and Sharma *et al.* (2011) [3]. The data indicated that the positive effect of frontline demonstration over the existing practices towards increasing the yield of oilseeds in Sheopur district of Madhya Pradesh.

Technology gap

The technological gap i.e. the difference between potential yield and yield achieved under demonstration plot were 204kg/ha and 143kg/ha in soybean and mustard, respectively (table 1). Technology gap imply researchable issue for realization of potential yield, it may be attributed to the dissimilarity in the soil fertility status and weather conditions.

Extension gap

The extensions gap of 288 and 320 kg/ha were recorded in soybean and mustard, respectively (table 1). For bridging this gap, it is need to educate the farmers through various means for the adoption of improved agricultural production technologies. More and more use of latest production technologies with high yielding variety will subsequently change alarming trend of extension gap.

Technology index

The technological index revealed the feasibility of the demonstration technology. Lower value of technology index indicates more feasibility of the technology. The technology index 12 percent for soybean and 7.15% for mustard were recorded (tabal 1).

Economics

The input and output prices of commodities prevailed during the study of demonstrations were taken for calculating gross return, cost of cultivation, net return and benefit: cost ratio (table 2). As far as economics of soybean and mustard was concerned, it was noted that by spending 1 rupee we earn a benefit of up to 2.59 in soybean and 3.49 in mustard under improved technologies. The cultivation of soybean and mustard under improved technologies gave higher net return of Rs. 32653/ha and Rs. 45722/ha as compared to farmer's practices Rs. 23729/ha and 35707/ha, respectively. This may be due to higher yields obtained under improved technologies compared to farmer's practices. Results are similar with the findings of Bhatt (2013) [1].

Conclusion

The frontline demonstration plays a very important role to disseminated recommended technologies because it shows the potential of technologies resulting in an increase in yield at farmer level. Under demonstrations some specific technologies like seed treatment, spacing, improved varieties, balance use of fertilizers and plant protection measures were under taken in a proper way. These technologies were found to be the main reason for increase in the yield and thus it can be said that FLDs were the most successful tools for transfer of technology.

Table 1: Yield, technology gap, extension gap and technology index in oilseeds under FLDs

Name of oilseeds	Area (ha)	No. of farmers	Yield (kg/ha)			%Change were farmer practices	Technology gap (kg/ha)	Extension gap (kg/ha)	Technology index (%)
			Potential	Improved technologies	Farmer practices				
Soybean	5.00	12	1700	1496	1208	23.84	204	288	12
Mustard	5.00	12	2000	1857	1537	20.81	143	320	7.15

Table 2: Gross return, Cost of cultivation, Net return and B:C ratio under demonstration and farmer's practices

Name of oilseeds	Gross return (Rs/ha)		Cost of cultivation (Rs/ha)		Net return		B:C Ratio	
	Improved technology	Farmer's practices	Improved technology	Farmer's practices	Improved technology	Farmer's practices	Improved technology	Farmer's practices
Soybean	53108	42882	20455	19155	32653	2379	2.59	2.23
Mustard	64066	5306	18344	17319	45722	35707	3.49	3.06

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