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Impact of Front Line Demonstration on the Yield and Economics of Mustard Crop in Shajapur District of Madhya Pradesh

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A B S T R A C T

The present study was carried out at KVK Shajapur (MP) to know the yield gaps between improved package and practices (IP) under Cluster Font Line Demonstrations (CFLDs) and farmers practices (FP) of mustard. The percent increase in yield IP over FP was recorded in the range of 21 to 22. The cost benefit ratio was 3.7 and 3.8 under demonstration, while it was 3.1 to 3.4 under control plots. By conducting Cluster Front Line Demonstrations (CFLDs) of proven technologies, yield potential of mustard crop should be enhanced to a great extend with increase in the income level of farming community.

Introduction

Indian mustard (*Brassica juncea* L.) is one of the most important winter oilseed crops and India is the third largest rapeseed-mustard producer in the world after China and Canada with 11.12% of world's total production (DRMR, 2012-13). Rapeseed- Mustard is the second most important oilseed crop in India after soybean and accounts for nearly 20-22% of total oilseeds produced in the country. It is mainly grown in northern part of India, Rajasthan is the largest producing state followed by Uttar Pradesh. Mustard crop required lower water requirement (240–400 mm) for completing life cycle, therefore it is fits well for rain fed cropping system. Mustard seed contains average 34-43% oil content and contributes for 32% of total edible oil.

The Indian council of Agricultural research introduced the concept of First Line Demonstration under Oil seed technology mission during 1990-91. Later on this concept was rearranged and termed as front line demonstrations (FLD). Demonstrations were carried out under the close supervisions of agricultural scientists belonging to ICAR Institutions, national research centres, project Directorate Krishi Vigyan Kendras and State agricultural universities in order to transfer the particular technology and get feedback from the farmers with respect to its feasibility, acceptability, profitability, adoptability etc. The feedback will help the scientists to reorient their research programmes as well as refinement of the technology as per the need of the farmers. Field demonstrations are an effective way to disseminate the latest technology among the farming community (Gautam *et al.,* 2007).

Frontline demonstration may play a very important role in proper transfer of technologies and changing scientific temperament of the famers. Frontline demonstration is the new concept of field demonstration evolved by the ICAR with the inception of the technology mission on oilseed crops during mid-eighties. The main objective of frontline demonstrations is to demonstrate newly released crop production and protection technologies and its management practices in the farmers filed under different agro-climatic regions and farming situations. Ghintala *et al.,* (2018) concluded that by conducting front line demonstration (FLDs) of proven technologies, yield potential of Mustard can be increased up-to great extent and result of the study revealed that the high yielding variety of Mustard RH-749 recorded the higher yield (1450 kg/ha) as compared to local check (1220 kg/ha) traditionally grown by the farmers This will substantially increase the income as well as the livelihood of the farming community. Meena and Meena (2015) concluded that improved production technology of mustard has found more productive, economic viable and also feasible to local conditions as compared to existing farmer practices. Keeping the above point in view, the CFLDs on rapeseed-mustard using production improved technologies was conducted with the objective of showing the productive potential of the new production technologies under actual farm situation.

Materials and Methods

The study was conducted in operational area of Krishi Vigyan Kendra Shajapur (MP) to enhance mustard productivity under front line demonstrations at the farmers' field in Shajapur district during 2018-19 and 2019-20. All the participating farmers were given one day training prior to demonstration on improved production technology of mustard. A total of 25 frontline demonstrations were conducted to evaluate the impact of research emanated production technology on mustard productivity over two years during rabi 2018-19 and 2019-20. The improved package of practices i.e. row spacing, fertilizer (recommended dose of fertilizer: 80 kg N, 40 kg P2O5 and 25 kg S/ha, seed inoculated with bio-fertilizers Azotobactor and PSB culture), irrigation, weed management (fluchlorolin @ 1.0 l/ha) and plant protection measures (Quinalphos 1.5% dust 7-10 days after germination followed by one spray of diamethoate 30 EC, 875 ml/ha, seed treatment with emidaclopride 17.8 sl 5 ml/kg seed for sucking pest and apron 35 SD 6 g/kg seed for white rust including improved varieties RVM-2 and I.J-31 were followed in demonstrations. The performance of mustard grows with improved technologies were compared with the farmer's practice which included 5 kg own seed/ha without seed treatment, 100 kg N + 50 kg P_2O_5/ha. Production and economics data of front line demonstrations and farmer

practices were collected and analyzed. The selection of cultivators was done on the basis of Participator Rural Appraisal (PRA) action plan and care has been taken to layout the demonstrations on road side facilitate the demonstration of technology. Each frontline demonstration was laid out on 0.4 ha area, adjacent 0.4 ha was considered as control for comparison (farmer's practice). Majority of demonstrations were sown in the last fortnight of September.

Results and Discussion

Group demonstration organized under the oilseed rabi area of selected farmers (50) farmers and other local farmers age, education, family type, agricultural land, social participation risk potential, urban connectivity, training etc. has been included in this research (Table 1). According to the data obtained from the yield, the production obtained from the field of group demonstration farmers was higher than the local farmers and more keen on mustard crop.

The results of two years (2018-19 to 2019-20) of front line demonstrations indicated that improved varieties of mustard with full package under demonstration had excellent impact on seed yield compared to local varieties used by farmers (Table 2).

Table.1 Classification of farmers by age

S.No.	Properties	Class	Group Display Farmer (No.50)		Other Farmer (No.50)	
			Number	Percent	Number	Percent
1	Age	Young	28	14	20	10
		Adult	12	6	10	5
		Old	10	5	20	10
2	Education	Uneducated	6	3	14	7
		Primary	14	7	6	3
		Secondary	12	6	14	7
		High	18	9	14	7
3	Family type	Single	35	17.5	24	12.00
		Combined	15	7.5	26	13.00
4	Social participation	Less	13	6.5	19	9.5
		Medium	17	8.5	21	10.5
		More	20	10.00	10	5.00
5	Potential risks	Less	12	6	23	11.5
		Medium	16	8.00	13	6.00
		More	22	11.00	14	7.00
6	Urban connectivity	Less	11	5.5	24	12.00
		Medium	15	7.5	12	6.00
		More	24	12.00	13	6.5
7	Training	Less	12	6.00	11	5.5
		Medium	13	6.5	12	6.00
		More	25	12.5	27	13.5

Table.2 Yield of mustard in improved and farmers practices through frontline demonstration

Year	Variety	Area (ha)	Number of farmers	Average yield (q / ha)		Clique/Plant		% increase over FP
				FLD	FP	FLD	FP	
2018-19	R.V.M.-2	10	25	17.4	14.3	191	143	21.60
2019-20	I.J-31	10	25	19.9	16.2	213	182	22.80
Average		**10**	**25**	**18.65**	**15.25**	**202**	**162.5**	**22.2**

Table.3 Economics of improved practices under frond line demonstration at farmer's field

Year	Variety	Production Cost (Rs / ha)		Gross Income		Net Income		Profit - Cost Ratio	
		FLD	FP	FLD	FP	FLD	FP	FLD	FP
2018-19	R.V.M.-2	18000	17500	66069	54226	48069	36726	3.7	3.1
2019-20	I.J-31	18500	17300	71697	59470	53197	42170	3.8	3.4
average		**18250**	**17400**	**68883**	**56848**	**50633**	**39448**	**3.75**	**3.25**

Among mustard varieties, variety I.J-31 gave the highest (1990 kg/ha) yield in the year 2019-20 and minimum yield of 1430 kg/ha (2018-19) was recorded under farmer's practice. In comparison to farmer's practice, an average increase of 22.20 percent in seed yield was recorded during the study period due to improved package of practices Meena and Meena (2015) reported that the research emanated production technologies are capable of increasing production of mustard by 20.32 percent through frontline demonstration on farmer's field.

Economic analysis (Table 3) revealed that adoption of improved package of practices required an additional cost of Rs 850 per ha over farmer's practice. The economics of improved production practice under front line demonstrations were estimated on the basis of prevailing market rates recorded higher gross monetary return (71697 /ha) and compared to farmer practice (59470 /ha) in the year 2019-20.

The benefit cost ratios of under recommended practices were higher (3.75) than farmer's practice (3.25). This may be due to higher yields obtained under recommended practices compared to farmer's practices. Meena *et al.*, (2011) reported that 23.32 per cent increase in yield under improved technologies was observed over farmers practices, Bhatnagar (2009) reported that the research emanated production technologies were capable of enhancement of productivity of soybean by 32.26 per cent through frontline demonstration. Similarly Raghuwanshi *et al.*, 2010) and Badaya *et al.*, (2017) also observed enhancement in the productivity of oil seed crop of soybean by adoption of improved technology over farmers practices.

The study was under taken to as certain the economics of mustard production technologies. Front line demonstration (FLDs) play a very important role to disseminate recommended technologies is shows the potential of technology resulting in an increased in yield at farmers level. The results convincingly brought out that the yield of mustard can be increase with the intervention on recommended package of practices. These practices may be popularized in this area by the extension agency to bridge the higher extension gaps. It may be

concluded that improved production technology of mustard has found more productive, economic viable and also feasible to local conditions as compared to existing farmer practices.

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