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Research Paper

Improved Mustard production technology through frontline demonstrations in Rewa district of Madhya Pradesh

Smita Singh[1], Akhilesh Kumar[1], Arpita Shrivastava[2], B K Tiwari[1], K S Baghel[1] and A K Pandey[1]
[1]Krishi Vigyan Kendra, Rewa, Madhya Pradesh, India
[2]Krishi Vigyan Kendra, Katni, Madhya Pradesh, India
[1]Corresponding author-sapnapuat@gmail.com

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Abstract: Front Line Demonstration is one of the most powerful tools for transfer of technology. The present study was undertaken to find out the yield through FLDs on mustard crop. Krishi Vigyan Kendra conducted 10 demonstrations on mustard during 2018-19 in one adopted village of Rewa district. Prevailing farmers' practices were treated as control for comparison with recommended practices. The average yield of demonstrated plot was obtained 11.3 q/ha which was 36% higher compared to over control (7.2 q/ha).
Keyword: Mustard, Front line demonstration

Introduction

Indian mustard is important oilseed crop and determinant of agricultural economy of the country. However, productivity is low due to lack of awareness in farming community regarding improved package and practices of oilseed crops. Frontline demonstrations are important dissemination transfer of technology and to establish its production potentials on the farmer's fields. Rapeseed-mustard is the second most important edible oilseed crop in India, next only to groundnut and accounts for nearly 30 per cent of the total oilseed produced in the country (Shivani and Kumar, 2002) one of the largest rapeseed- mustard growing country in the world, occupying the first position in Area and second position in production after China (Thakur and Sohal., 2014). In India, oilseeds account for 3 per cent to the Gross National Product and 10 per cent to the total value of all agricultural products. India is the largest producer of oilseeds in the world and accounts for about 14 per cent of the global oilseeds area, 7 percent of the total vegetable oil production and 10 per cent of the total edible oil consumption. The total oilseed cultivated area, production and productivity of nine oilseed crops in India. Indian mustard is an important oilseed crop of Indian subcontinent contributes more than 80 per cent of the total rapeseed-mustard production in India (Meena 2014; Meena *et al*., 2015). This group of oilseed higher return with low cost of production and low

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water requirement, so it has greater potential to increase the availability of edible oil from the domestic production. In spite the high quality of oil and also its wide adapt varied agro-climatic conditions, the area, production and yield of rapeseed-mustard have been fluctuating due to various biotic and abiotic stresses together with domestic price support programme. In *Brassica* breeding programme is one of the most important objectives for improvement of seed quality. High yielding new varieties are also imperative to meet potential edible oil requirement of the country which is still increasing due to increase in population, increase in per capita consumption and slow increase in local production of oilseed crops (Shengwu *et al*., 2003). Krishi Vigyan Kendra are grass root level organization meant for application of technology through assessment, refinements and dissemination of proven technologies under different micro farming situation in the district (Das, 2007). Keeping this in view, front line demonstrations were organized in participatory mode with the objective to analyze the production by newly recommended package of practice.

Materials and Methods

The present study was carried out by the Krishi Vigyan Kendra, Rewa during rabi season from 2018-19 at the farmers fieldin one adopted village of Rewa district in Madhya Pradesh. In one village total 10 frontline demonstrations trials were conducted. Materials for the demonstrations with respect to FLDs and farmers' practices were given in Table 1. In case of farmers practice plots, existing practices being used by farmers were followed. In general, soils of the area under study were sandy loam in texture and medium to low in fertility status. The FLDs were conducted to study the yield gaps of demonstration (recommended and farmer practices).

In the present evaluation study, the data on output of mustard cultivation were collected from FLD plots, besides the data on local practices commonly adopted by the farmers of this region were also collected. In demonstration plots, a few critical inputs in the form of quality seed, balanced fertilizers, agro-chemicals etc. were provided and non-monetary inputs like timely sowing in lines and timely weeding were performed. Whereas, in farmers practice traditional practices prevailing in the area were maintained. The demonstration farmers were facilitated by KVK scientists in performing field operations like sowing, spraying, weeding, harvesting etc. during the course of training and visits. The technologies demonstrated are mentioned in Table 1 and compared with local practices.

Table 1 Technology demonstration compared with local practices

Package of practices followed by farmers under FLD and in general Particulars	**Technology Interventions**	**Farmer's practices**
Variety	NRCBH 101	Local cultivar (Varuna)
Seed rate	4 kg/ha	5 kg/ha
Seed treatment	*Carbandazim @2.5g/kg or Trichoderma* @ 8-10 gm/kg seed	No use
Time of sowing	First fortnight of October	Last week of October to last week of November
Method of sowing	40-45 cm (row to row), 15-20 cm	Broadcasting, no

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	(plant to plant) and east west direction of sowing	direction of sowing methods
Fertilizer management	120: 60: 40 (N:P:K) kg/ha with 15 kg S/ha	Use of urea 80kg/ha and DAP (100 kg/ha)
Weed management	Pre-emergence application of Pendimethalin 30 EC 3.3 l/ha followed by manual weeding at 30 days after sowing	No use
Water management	Light irrigation before flowering and after podding (If no rainfall)	No use
Plant protection	Need based application of immidachlopride @ 0.5 ml/l lt. of water for the management of aphid control	No use

Results and Discussion

Mustard Yield

The data (Table 2) indicated that the frontline demonstration has given a good impact over the farming community of Chhatarpur district as they were motivated by the new agricultural technologies applied in the demonstrations. Results of 10 frontline demonstrations indicated that the cultivation practices comprised under FLD viz., use of improved variety NRCBH 101, balanced application of fertilizers (N:P:K@120:60:40 kg/ha with 15 kg S /ha), line sowing, timely weed management and control of mustard white rust & aphid through fungicide & insecticide, produced on an average 11.3q/ha mustard yield, which was 36 % higher compared to prevailing farmers practice (7.2 q/ha). Kumar and Yadav (2007) also reported that recommended dose of phosphorus and sulphur increase the yield and quality of Indian mustard.

Cost of cultivation, Net return and BC ratio

The economics (Cost of cultivation, gross & net return) of Rapeseed-mustard under front line demonstrations were estimated and the results have been presented in Table 3. The front line demonstrations recorded higher net return (Rs. 29550/ha) with higher cost: benefit ratio (2.65) compared to farmer's practice.

Conclusion

It may be concluded that the frontline demonstrations on integrated crop management technology in mustard crop has found more productive, profitable and feasible in Rewa district of Madhya Pradesh as compared to prevailing farmers practice under real farm situations. Farmers were motivated by results of demonstrations of integrated crop management practices in mustard and they would adopt these technologies in the coming years. This will substantially increase the income as well as the livelihood of the farming community.

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Table.2 Technical Impact of mustard crop demonstrations during 2018- 2019

S. No	Crop	Variety	Technology Demonstrated	Area (ha.)	No. of Demonstration	Yield of the crop (q/ha) under Demonstration	Variety and Yield of local Check (q./ha) (Varuna)	Increase in yield (%)
1	2	3	4	5	6	7	8	9
Year (2018-2019)								
i.	Mustard	NRCBH 101	Timely sown HYV	04	10	11.3	7.2	36

Table.3 Economic Impact of Mustard crop

Variety	Average Cost of Cultivation (Rs./ha)		Average Gross Return (Rs./ha)		Average Net Return (Profit) (Rs./ha)		Benefit-Cost Ratio
	Demonstration plot	Local Check	Demonstration plot	Local Check plot	Demonstration plot	Local Check plot	
	1	2	3	4	5	6	8
Year (2018-2019)							
NRCBH 101	17910	15940	47460	30240	29550	14300	2.65