Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 4737-4742

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Special Issue-7 pp. 4737-4742**
Journal homepage: http://www.ijcmas.com

Original Research Article

Impact Assessment of Front Line Demonstration on Mustard Crop

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A B S T R A C T

Krishi Vigyan Kendra, Bhadohi conducted 124 demonstrations on mustard variety - NRCHB-101, ND-8501, Pusa- Jagannath and Pusa –Vijai during two consecutive years from 2013–14 to 2014–15. The critical inputs were identified in existing production technology through meetings and discussions with farmers. Delayed sowing, use of higher seed rate resulting into dense plant population, uneven plant population, uncontrolled weeds, ignorance about fertilizers and lack of plant protection measures were the predominant identified causes of low productivity of oilseeds in district Bhadohi. In the same sequence the other parameters like technological impact, economical impact and extension gap were analyzed for Impact assessment of front line demonstration on mustard crop and feasibility of demonstrated technologies at grass root levels. The results of two years study revealed that the yield under demonstration plots was 21.50 q /ha as compared to 16.65 q /ha in traditional farmer practices plots. This additional yield of 4.85 q /ha and the increase in average mustard productivity by 29.13 per cent may contribute to present oilseed requirement on national basis. The average of technology gap, extension gap and technology index were found to be 9.27 q /ha, 3.05 q/ha and 34.63 per cent respectively. The results clearly indicate the positive effects of FLDs over the existing practices. Benefit: cost ratio was recorded to be higher under demonstrations against control treatments during the years of experimentation.

Keywords

Impact, mustard crops, front line demonstration, technology gap etc.

Introduction

The Front Line Demonstration (FLD) is an applied approach to accelerate the dissemination of proven technologies at farmers fields in a participatory mode with an objective to explore the maximum available resources of crop production and also to bridge the productivity gaps by enhancing the production in national basket. India is an important rape seed mustard growing country in the world, occupying largest area and has second position in production after China. Oil seed crops have an important position in the farming system of India. Oil seeds are rich source of fat and edible oils have various uses for human being and animals. About 90 per cent of the total edible oil produced in the country comes from two oil seed crops namely rapeseed-mustard and groundnut. The oil cakes are used as cattle feed and manures. In India, rape seed mustard is an important source of edible oil followed by ground nut (Panday *et al.*, 1999). They are cultivated in 5.791 m ha in a wide range of agro-

ecological conditions in India, resulted in the production of 7.87 m tonnes of seed mustard in 2013-2014 and our productivity is 10.9kg/ha (Anonymous 2016). In Uttar Pradesh, the total cultivated area under Rapeseed and Mustard crop, total production and yield/ha are 0.626 m ha, 0.736 mt, and 9.3 Q /ha, respectively, (Directorate of Economics and Statistics, 2016).

Series of agricultural improvement programmes have been introduced in India to increase the agricultural production and income of the farming communities. But the outcomes of these programmes are not satisfactory in terms of achieving higher agricultural production.

It is now widely accepted fact that training to farmers and farm women increases the technical knowledge regarding package of practices. KVKs are playing a vital role across the rural economy in distinguish field as animal husbandry, horticulture, plant protection and food processing.

In Bhadohi district, mustard was raised on only 189 ha with total production of 1009.26 q and productivity of 5.34 q /ha during 2014-15. Still the area and productivity of mustard in Bhadohi is far lower than the several districts of other states because the farmers are reluctant towards proper scientific management of the crop.

However, rapeseed-mustard group of crops have given the importance by the government because vast yield gap exists between potential yield and yield under real farming situation. KVK Bhadohi had done intensive efforts on training about scientific cultivation, demonstration on new variety and other interventions. The present study was conducted to impact assessment of front line demonstration on mustard crop in the operational area of the KVK.

Materials and Methods

Krishi Vigyan Kendra (KVK) conducted 124 Front Line Demonstrations on oilseed crop of mustard on farmer's field in different blocks of Bhadohi district during 2013-14 and 2014-15. For conducting FLDs, farmers were identified/ selected following the survey suggested by Choudhary (1999).The required inputs were supplied and regular visits to the demonstration fields by the KVK scientists ensured proper guidance to the farmers. Field days and group meetings were also organized to provide the opportunities for other farmers to witness the benefits of demonstrated technologies. The sowing was done during mid-October under assured irrigated conditions and harvested during first fortnight of March. Seeds were sown in rows 45 cm apart by drill or kera placed at 2-3 cm depth. However, the practices followed by farmers in general use local cultivar (varuna), seed rate @ 5 kg/ha, no seed treatment, sowing from last week of October to last week of November, in broadcasting manner, no use of fertilizer pattern to under dose application that's to use of Urea and DAP, no weed, water and plant protection measures followed.

Field days and group meetings were also organized to provide the opportunities for other farmers to witness the benefits of demonstrated technologies. The data output were collected from both FLD plots as well as control plots and cost of cultivation, net income, and benefit cost ratio were also worked out (Samui *et al.*, 2000).

The technology gap, extension gap and technological index were calculated by using following formula as given below

Technology gap = Potential yield - Demonstrated yield

Extension gap = Demonstrated yield - Yield under existing practice

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

Results and Discussion

The analysis depicted in Table 1 showed the average yield of mustard four varieties (NRCHB-101, Pusa Jagannath, ND -8501& Pusa Vijay) were 19.50, 21.50 along with 16.21 and 13.71 q/ha during 2013-14 and 2014-2015, respectively under demonstrated technology however, under farmer's practices the average yield were 16.65 and 12.71 q/ha during respective years. However, the per cent increases against local yield were 17.12 and 29.13 along with 27.53 and 3.93 during 2013-14 and 2014-2015, respectively. The result is in conformity with the finding of Tiwari and Saxena (2001) and Tiwari *et al.,* (2003). The results clearly indicated the positive effect of FLDs over the existing practices toward enhancing the yield of mustard in the study area due to use of high yielding variety, timely sowing, balance does of fertilizers along with sulphur, proper irrigation, need based plant protection etc.

Yield of the front line demonstration and potential yield of the crop was compared to estimate the yield gaps which were further categorized into technology and extension gap.The data of Table 2 depicted the technology gap in the demonstration yield against potential yield which ranged from 6.5 to 11.79 during both the year and reflects the farmer's cooperation in carrying out such demonstrations with encouraging results in subsequent years. The technology gap observed may be attributing to the dissimilarity in soil fertility status, timely sowing and weather conditions. Similar finding were recorded by Mitra and Samajdar (2010). Further, the higher extension gap was observed. The extension gap ranged from 1.0 to 4.85q /ha during the period of study that emphasizes the need to educate the farmers through various means for adoption of improved production technologies to mitigate the extension gap.

Package of practices followed by farmers under FLD and in general

Particulars	Technology Interventions	Farmer's practices
Variety	NRCHB-101,ND-8501,Pusa- Jagannath and Pusa –Vijai	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 (plant to plant) and east west direction of sowing	Broadcasting, no direction of sowing methods
Fertilizer management	120: 60: 30 (N:P:S) kg/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

Table.1 Technical Impact of mustard crop demonstrations during 2013- 2015

S. No	Crop	Variety	Technology Demonstrated	Area (ha.)	No. of Demonstration	Potential yield (q/ha)	Yield of the crop (q/ha) under Demonstration			Variety and Yield of local Check (q./ha) (Varuna)	Increase in yield (%)
							Highest	Lowest	Average		
1	2	3	4	5	6	7	8	9	10	11	12
Year (2013-2014)											
i.	Mustard	NRCHB-101	Timely sown HYV	5.31	42	28.0	20.25	14.75	19.50	16.65	17.12
		Pusa Jagannath	Timely sown HYV	2.50	20	28.0	24.85	15.65	21.50	16.65	29.13
Year (2014-2015)											
i.	Mustard	ND-8501	Timely sown HYV	2.50	20	28.0	22.50	11.35	16.21	12.71	27.53
		Pusa Vijay	Timely sown HYV	4.00	42	24.0	15.30	8.20	13.71	12.71	03.93

Table.2 Yield gap of variety wise of mustard crop during investigation year.

Years	Variety	Technology gap	Extension gap	Technology index (%)
2013-14	NRCHB- 101	8.5	2.85	30.35
	Pusa Jagannath	6.5	4.85	23.21
2014-15	ND -8501	11.79	3.5	42.11
	Pusa Vijay	10.29	1.0	42.87

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 (Variety Name)	Demonstration plot	Local Check plot	Demonstration plot	Local Check plot	
	1	2	3	4	5	6	7
Year (2013-2014)							
NRCHB -101	32600	32200	68493	58483	35893	26283	2.10
Pusa Jagannath	32600	32200	75518	58483	42918	26283	2.32
Year (2014-2015)							
ND-8501	34580	34280	61598	48298	27018	14018	1.78
Pusa vijay	34580	34280	50198	48298	15618	14018	1.45

The data of Table 3 reveals that as far as economics of mustard is concerned; gross cost, net income and benefit cost ratio were Rs. 32600/ha, Rs. 42918/ha and 2.32, respectively during 2013-14 and Rs. 34580/ha, Rs. 27018/ha and 1.78, respectively during 2014-15 under demonstration plot. However, Rs. 32200/ha gross cost, Rs. 26283/ha net return with 1.81 benefit cost ratio during 2013-14 and Rs. 3280/ha gross cost, Rs. 14018/ha net return with 1.41 benefit cost ratio observed during 2014-15 under farmer's practices. The superiority of recommended package of practices under frontline demonstration over farmers' practice was also reported by Mitra and Samajdar (2010) and Balai *et al.*, (2012).

From the findings of present study, it can be concluded that use of latest technologies of mustard cultivation can reduce the technology gap to a considerable extent resulting in to increased productivity of mustard in the district. It requires collaborative extension efforts to enhance adoption level of location and crop specific technologies among of the farmers for bridging these gaps. Therefore, extension agencies in the district need to provide

proper technical support to the farmers through various educational and extension methods for better mustard production in the district.

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