J Krishi Vigyan 2020, 8 (2) : 178-181 DOI : 10.5958/2349-4433.2020.00037.9

Impact of Frontline Demonstrations on Yield, Economics and Adoption of Marigold Cultivation

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ABSTRACT

The Krishi Vigyan Kendra, Jammu conducted the frontline demonstrations on marigold crop during years 2014 to 2019 in three blocks of district Jammu in the Union territory of Jammu and Kashmir with the objective to determine the impact on yield, adoption and economic impact of marigold cultivation. One hundred and forty beneficiary farmers were selected as the sample for the present study. The farmer practice was considered as local check in demonstration cluster. These check plots were maintained by the farmers according to their own traditional cultivation practices. The KVK provided critical inputs such as seed of improved varieties *viz.* Pusa Basanti and Pusa Narangi and required agro chemicals to the farmers under demonstration plots. The findings showed an increase in the average yield of demonstration plot (100.0 q/ha) over the control local check (80.0 q/ha) of marigold crop . There was a positive impact on the yield of marigold crop, replacement of local varieties with improved varieties such as Pusa Basanti and Pusa Narangi and adoption of production technologies of marigold crop. The adoption of improved technology under FLDs resulted in higher gross returns (Rs 1,41,333/ha), net return (Rs 1,07,500/ha) and benefit:cost ratio (4.32:1) as compared to farmer's practice.

Key Words: Adoption, Cultivation, Demonstrations, Economics, Marigold, Yield.

INTRODUCTION

Frontline demonstrations (FLDs) a flagship programme on farmer's field is one of the mandates of krishi vigyan kendra. Therefore, KVK emphasized the frontline demonstration as an educational activity in a systematic manner at farmers' fields to show the worth of new technology/enterprise. Union territory of Jammu and Kashmir is endowed with diverse agroclimate suitable for growing different types of crops and Jammu district being a place of temples offers a huge demand for marigold flowers. Floriculture especially marigold cultivation can be a major thrust area for diversification. The commercial cultivation of marigold can be a good source of income and employment to marginal as well as large farmers as this crop fetches more price per unit area as compared to cereals. The farmers of Jammu were growing traditional crops and getting a meager income from the agriculture. To motivate the farmers towards diversification and bring floriculture as a subsidiary source of income in addition to their already adopted farming, FLD's on marigold were conducted by KVK Jammu during the years 2014 to 2019. About 65.52 ha of land (2016-17) was under floriculture in district Jammu which included major share of marigold cultivation (Anon, 2016). Hence, the study was undertaken to assess the impact of frontline demonstrations on yield and adoption of marigold crop, to know the varietal replacement and its economic impact.

MATERIALS AND METHODS

The study was conducted in Nagrota, Bhalwal and R S Pura blocks of district Jammu in the Union territory of Jammu and Kashmir. Krishi Vigyan Kendra Jammu conducted the FLDs on floriculture

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cropsduring2014to2019inKarotana,Badyal,Salher, Raipur sazda, Jandial and Kattal Battal villages of Jammu district on 7.00 ha area. Therefore, the present investigation was carried out in six adopted villages purposively. The FLDs were conducted on farmers'fields according to package of practices recommended by Sher-e-kashmir University of Agricultural Sciences and Technology-Jammu. The farmer's practice was considered as local check in demonstration cluster. These check plots were maintained by the farmers according to their own traditional cultivation practices. The KVK provided critical inputs such as seed of improved varieties *viz.* Pusa Basanti and Pusa Narangi and required agro chemicals to the farmers under demonstration plots. The demonstrations were laid out under the close supervision of KVK scientists. Total 140 farmers were selected for the organization of FLDs on marigold crop in the above mentioned villages. The average yield data of demonstration plots as well as control plots were collected after harvesting to assess the impact of FLDs intervention on the yield of marigold crop. The personal interview was conducted with the beneficiary farmers in the year 2019 by using structured and pre-tested interview schedule to elicit the information from beneficiary farmers about adoption, varietal replacement and horizontal spread of marigold crop technologies in adopted villages. The following formulae were used to assess the impact of FLDs on the different parameters of marigold crop.

Impact on yield (% change) = Yield of demonstration plot –Yield of control plot x 100 Yield of control plot

Impact on adoption (% change) = No. of adopters after FLD.- No. of adopters before FLD x 100 No. of adopters before FLD

RESULTS AND DISCUSSION

Impact on crop yield

It was evident (Table 1) that the average flower yields of demonstration plots of marigold varieties Pusa Narangi and Pusa Basanti for the years 2014-15, 2016-17, 2018- 2019 were 85, 105, 110 q/ha. However, the average flower yields of control plot/ local check were 70, 85 and 85 q/ha in the years 2014-15, 2016-17, 2018- 2019,respectively. This showed that there was a positive increase in the mean yield of marigold demonstration plots over the farmer' practice by 21.42, 23.52 and 29.41 per cent during the years 2014-15, 2016-17, 2018-2019, respectively. The main reasons of the low yield of control plots in adopted villages were the use of poor quality seeds, traditional varieties and traditional cultivation methods with poor nutrient and weed management practices. However, KVK scientists used improved varieties of seed, adopted scientific cultivation practices like timely sowing, pinching, recommended spacing, balanced use of manure and fertilizers with time to time weed management and integrated disease management for the demonstration plots which recorded 24.78

Table 1. Impact of Frontline demonstrations on marigold crop yield.

Year	Variety	Number of farmers	Demonstrated area (ha)	Average yield (q/ha)		Impact (% Change)
				Check Plot (q/ ha)	Demonstration Plot (q/ha)	
2014-15	Pusa Narangi	40	1.0	70	85	+21.42
2016- 17	Pusa Narangi	50	3.0	85	105	+23.52
2018-19	Pusa Narangi and Pusa Basanti	50	3.0	85	110	+29.41
	Total	140	7.0	80	100	24.78

per cent higher mean yield over that of control plots. Similar results were obtained by Khadekar *et al* (2017) in chick pea FLD's and Patil *et al.* (2018) in oilseed crops. There was a positive impact on flower yield by use of improved varieties and scientific package of practices. Tiwari *et al* (2015) indicated that the existing local cultivar Saathi of marigold was out performed by the variety Pusa narangi in all the crop growth parameters in malwa region of Madhya Pradesh. The improved variety was significantly taller than the local by more than 31 cm.

Impact on economics

The inputs and outputs prices of commodities prevailed during the study of demonstration were taken for calculating net return and benefit: cost ratio (Table 2).

The data indicated that cultivation of marigold under improved technologies gave higher net return of Rs. 110000/-, 103500/- and 109000/- ha in the years 2014-15, 2016-17 and 2018-19, respectively as compared to farmer's practices. Similar findings were reported by Khadekar *et al* (2017) in chickpea cluster FLDs. The benefit cost ratio of marigold cultivation under improved cultivation practices were 4.92:1, 4.63:1 and 3.42:1 where as they were 3.23:1, 3.33:1 and 2.97:1 in farmer's practices during 2014-15, 2016-17 and 2018-19 respectively. This may be due to higher yield obtained under improved technologies compared to local check (farmer's practice). This finding was in corroboration with the findings of Bhowate and Olambe (2017) for wheat.

Impact on adoption

The data (Table 3) revealed that a number of adopters for land preparation and application of FYM to marigold were 75 per cent before demonstrations, which increased to 96.42 per cent after frontline demonstrations in adopted villages. A similar trend was also observed in the case of use of improved varieties and sowing time and spacing as the percentage of adopters increased from 24.28 to 92.85 per cent and 41.42 to 98.57 per cent. The number of adopters for application of fertilizers and weed management were increased during pre and post-demonstrations period from 27.85 to 90.0 per cent and from 15.71 to 62.85 per cent, respectively. The FLDs intervention made highly positive impact on adoption of technologies as majority of the participant farmers in FLD program had full adoption of improved practices *viz.,* land preparation, use of high yielding varieties, sowing time, spacing application of manures and fertilizer, weed management operations and integrated disease management.

CONCLUSION

The frontline demonstrations (FLDs) organized by the KVK Jammu enhanced the production of marigold crop. The FLDs made a positive and significant impact on yield of marigold by 24.78 per cent. The FLDs showed a great impact on the use

Table 2. Impact of Frontline demonstrations on economics of marigold cultivation.

Year	Cost of cultivation (Rs /ha)		Gross income (Rs /ha)		Net income (Rs/ha)		B:C Ratio	
	Demo plot	Check plot	Demo plot	Check plot	Demo plot	Check plot	Demo plot	Check plot
2014-15	28000	26000	138000	84000	110000	58000	4.92:1	3.23:1
2016-17	28500	25500	132000	85000	103500	59500	4.63:1	3.33:1
2018-19	45000	40000	154000	119000	109000	79000	3.42: 1	2.97:1
Mean	33833	30500	141333	96000	107500	65500	4.32:1	3.17:1

Table 3. Impact of frontline demonstrations on adoption of marigold production technologies.

Sr. No.	Technology	Number of Adopters (N=140)		Change in no. of adopters	Impact (% change)
		Before demonstration	After demonstration		
1.	Land preparation and use of FYM	105 (75)	135 (96.42)	+30	+28.57
2	Improved varieties (Pusa Narangi, Pusa Basanti)	34 (24.28)	130 (92.85)	+96	+282.35
3	Sowing time and spacing	58 (41.42)	138 (98.57)	+94	+162.06
4	Fertilizer management NPK	39 (27.85)	126 (90.0)	+87	+223.07
5	Weed management and IDM	22 (15.71)	88 (62.85)	+66	+300.0
6	Pinching off operation 30 -40 DAT	34 (24.28)	140 (100.0)	+106	+311.76

of improved varieties, intercultural operation *viz.,* pinching off and adoption of other recommended practices of the crop. The local varieties of marigold crop were replaced by improved cultivars like Pusa Narangi and Pusa Basanti on a large scale in demonstration cluster. Therefore, it can be concluded that FLDs had positive impact in enhancing the marigold crop productivity and adoption of floriculture as an enterprise. Therefore, it is recommended that frontline demonstrations (FLDs) may be organized on large scale by adopting cluster approach for harnessing the productivity potential of a crop and to ensure rapid spread of flagship technologies. Most of the low yielding local Varieties were replaced due to FLDs in adopted villages. This varietal replacement strategy through FLDs may help to increase the crops productivity at micro and macro level.

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Received on 13/02/2020 *Accepted on 15/04/2020*