



Role of technology adoption on marigold production through front line demonstration

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ABSTRACT

Marigold is one of the important commercial crop among floriculture supplementing the regular income to small and marginal farmers of the Kathua district of J&K state. Jammu being a city of temples consumption of flowers is more, but as compared to consumption production is very less. However, the major constraints of marigold cultivation are low productivity due to the lack of good quality seed, non adoption of recommended package of practices and lack of awareness regarding the economics of the crop as compared to cereals. To solve this problem, front line demonstration were conducted at the farming situation of Kathua district with the participation of farmers after the baseline survey. The cultivation practices in this FLD (use of improved variety, proper nursery techniques, balance dose of fertilizers, important inter-culture operations and plant protection measures) increased the yield by 53.78 percent on an average over the farmer practice. The highest extension gap was 72.75q/ha while the technology index, which is inversely correlated to the feasibility of the improved technology in the farmers field was 24.3 percent. The adoption of improved technology under FLDs resulted in higher gross returns (Rs 728000/ha), net return (Rs 643517/ha) and benefit:cost ratio(1:7.61) as compared to farmer practice.

KEYWORDS Marigold, frontline demonstration, yield, technology gap, extension gap, technology index

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INTRODUCTION

Floriculture has been a major thrust area for diversification of horticulture. Growing of flowers and ornamental crops is rapidly expanding enterprise. The floriculture continues to generate employment opportunities to people in rural area. An area under flower cultivation can support a family consisting of 5-6 members. Flowers are the beauty in human life. Marigold flower cultivation is getting popular among the farmers. It is an important and popular flower and ranks third in number after roses and chrysanthemum. The commercial cultivation of marigold is a source of income and employment to marginal as well as large farmers and this crop fetch more price per unit area as compared to cereals. Marigold is used for making garlands, garden disc play, loose flower and perfume industries. Marigold is one such potential flower crop for natural colour extraction.

The state J&K is blessed with some world famous religious shrines and huge amount of flowers are needed for worship. But most of the produce comes from out of the state for worship. In spite of the increasing demand for the crop the production is low to fulfil the domestic demand. Main reason for low production and less adoption of marigold in their farming system is lack of awareness regarding scientific package of practice and its economic importance [4]. The improved technologies developed by research institutes were also found to be financially attractive. Yet adoption levels for several components of the improved technology were low emphasizing the need for better dissemination. Several biotic, abiotic and socio-economic constraints inhibit the exploitation of the yield potential. Demonstration is one of the most powerful extension tools in communication of new ideas, methods and techniques in agricultural development. It helps to convince the farmers faster than any other method through the process of observing, hearing, learning by doing and experiencing things. The main objective of the front line demonstration is to demonstrate the newly released crop production and protection technologies and its management practices at the farmer's field under different agro-climatic regions and farming situations.

The improved cultivation practices followed in the national demonstrations have already shown high yield potentials [1].

Kathua district has very less area under marigold cultivation due to paddy –wheat farming system. The low productivity of marigold poses a threat to economic security of the small and marginal farmers. Keeping the above points in views, the front line demonstration on marigold was initiated with the objective of the improved production technologies under real farm situations over locally cultivated marigold crop.

MATERIALS AND METHODS

The present study was carried out by Krishi Vigyan Kendra Kathua during 2015-16 to 2016-17 in the farmers field of kathua district. Kathua district is the gate way of Jammu& Kashmir is located in the extreme south. The district comprises of three agriculture subdivision namely Bhillawar, Bahsoli and Hiranagar, Forty front line demonstrations in 2 ha area in four villages of above mentioned subdivision were conducted. Nursery of marigold was raised in first week of September. Planting of seedling was done after twenty five days of nursery raising with the spacing of 45x45 cm along-with seedling dip in Trichoderma to avoid the problem of wilting in demonstration plot, while check plots traditional method was followed. Manure and fertilizers were given as per improved package of practice as basal dose as well as in top dressing. All the intercultural operations were adopted according to package of practice. Materials for the present study with respect to FLD's and farmer practice were given in the table A. In case of local check existing practices were used. Data on output of marigold cultivation from FLD plots as well as local practices adopted by the farmers were collected. In demonstration plots critical inputs like seed/seedlings, agrochemicals and technical guidance regarding transplanting, seedling treatment, pinching, weeding, earthing-up, plant protection measures and harvesting were also provided to beneficiaries, where as traditional practices were opted in local checks. Trainings, field days and regular monitoring were also conducted. Study of the technology gap, extension gap and technology index were calculated as suggested by [12].

Technology gap = Potential yield –demonstration yield

Extension gap = demonstration yield-Farmer yield

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

Table A: Particulars showing the details of marigold cultivation under frontline demonstration and existing farmer practices			
S.NO.	Operation	Existing practices	Improved practices demonstrated
1	Variety	Local seed	Pusa Narangi variety of marigold
2	Seed treatment	No seed treatment	Seed treated with Trichoderma@5gm/kg of seed
3	Raising of seedlings	Broadcasting of seed in flat bed	Seed sown in line and in raised bed Seedling dip in Trichoderma for 20 minutes before transplanting
4	Fertilizer application	Broadcasting the urea	FYM- T/ha N:P:K@ 120:100:100 Kg/ha
5	Diseases and Pest management	Do not follow	Adoption of plant protection measures as per package of practice
6	Quality improvement	Do not follow	Adoption of improved practices like grading etc.

RESULTS AND DISCUSSIONS

The objective wise facts and findings derived after analysis of the data have been presented under the following heads :

Yield and yield parameters:

A comparison of yield parameter and productivity levels between levels between improved practices in demonstration plots and farmer practices is shown in table 1. Yield and yield attributing parameters viz., number of flowers, size of flowers, number of branches and yield per plant were recorded highest in demonstration plots as compared to farmers traditional practices. On an average 206.2 qt/ha yield was recorded in demonstration plot as compared to the farmers practices (135.6qt/ha) during 2013-14 and there was 52.06 % increase in yield over farmer practices. Singh *et al.* [13] also reported the increase in yield in Rajasthan condition through FLDs on improved production technology. Similarly, yield enhancement in different crops in front line demonstration has amply documented by [2, 6, 11, 12, 7, 14]. The resulted that the front line demonstration have given a good impact over the farming community of

Kathua district as they were motivated by the new agricultural technologies applied in the FLD plots. This findings is in corroboration with the findings of [10].

Technology gap :

Data indicated in table1 revealed that the technology gap in the demonstration yield was 68.8qt/ha and 65.2qt/ha for 2013-14 and 2014-15 respectively over the potential yield, 275 qt/ha for marigold. The technological gap may be attributed to the dissimilarity in the soil fertility status and weather conditions by [9]. Hence, variety wise location specific recommendation appear to be necessary to minimize the technology gap for yield levels in different situations

Extension gap:

The highest extension gap of 70.6qt/ha and 74.9 qt/ha (Table1) was recorded during the period of study respectively. This emphasized the need to educate the farmers through various means for the adoption of improved agricultural production technologies to reverse this adoption of wide extension gap. More and more use of latest production technologies with high yielding varieties will subsequently change this alarming trend of galloping extension gap. The new technologies will eventually lead the farmers to discontinue the old technologies and to adopt new technology. This finding is in corroboration with the finding of [3].

Technology index

The technology index shows the feasibility of the evolved technology at the farmer's fields. The lower the value of technology index more is the feasibility of the technology [5].the technology index were 25.01% and 23.7% during both the year of study

Economic return

The input and output prices of the commodities prevailed during the demonstration were taken for calculating cost of cultivation, gross returns, net returns and benefit: cost ratio (table2). With the adoption of improved technology under FLDs, higher gross return(Rs 734300/ha),net return(Rs649,314/ha) and B:C ratio (1:7.64) was recorded as compared to farmer practices having the gross return of (Rs339000/ha),net return(Rs 259775/ha) and B:C ratio of (1:3.27). This may be attributed due to higher yields obtained under improved technologies compared to farmers traditional practice. These results are in close conformity with the findings of [3, 8].

Table1: Productivity, technology gap and technology index of marigold under FLDs and existing practices								
Year	Area (ha)	No. of FLDs	Yield (q/ha)		% increase over farmer practice	Technology gap (qt/ha)	Extension gap (qt/ha)	Technology index(%)
2013-14	2	40	206.2	135.6	52.1	68.8	70.6	25.01
2014-15	2	40	209.8	134.9	55.5	65.2	74.9	23.7

Table2: Cost of cultivation(Rs/ha), gross return(Rs/ha), net return(Rs/ha)and B:Cratio as effected by improved and local practices									
Year	Cost of cultivation(Rs/ha)		Gross Return(Rs/ha)		Net Return(Rs/ha)		B:C ratio		
	FLD	Farmer practice	FLD	Farmer practice	FLD	Farmer practice	FLD	Farmer practice	
2013-14	83980	79225	721700	339000	637720	259775	7.59	3.27	
2014-15	84986	80346	734300	337250	649314	256904	7.64	3.19	

Reasons for low yield of marigold at farmer's fields:

Optimum sowing time was not followed due to non- availability of quality seed. Moreover, farmers raise the nursery in traditional way by broadcasting the seed in flat bed. Use of inadequate and imbalance dose of fertilizers especially the recommended dose of nitrogenous, phosphoric and potash by the farmers could not results into potential yield. Lack of knowledge regarding weedicide, plant protection measures, other cultural operations and post harvest management techniques are also factors responsible for lower yield.

Specific constraints with marginal /small farmers:

Traditional implements and tools are still in practice due to small holdings which have poor working efficiency. The lack of simple modern tools for small holdings also hinders the adoption of improved technology. Small and marginal farmers have less capability to take risk and do not dare to invest in the costly input due to high risk and poor purchase capacity of small farmers. Thus the adoption of well proven technology is considered due to small size of holding and poor farm resources.

CONCLUSION

Frontline demonstration is the most suitable method for assessing the performance of the improved technology as it directly involves the scientists in conducting the demonstration at the farmer's field which enables them to have first knowledge related to the technology. Technological and extension gap extended can be bridged by improved package of practices with emphasis on improved production technology including all cultural operations. Replacement of local variety with the improved variety of marigold would increase the production and net income of the farmers also. Hence the concept of FLD may be applied at more farmer's field for speedy and wider dissemination of the recommended practice which will subsequently improve the livelihood of the farming community.

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