Enhancing the yield and economics of okra through frontline demonstrations in Samba district of Jammu and Kashmir

NEERJA SHARMA, ABHAY SINHA and SAURAV GUPTA

ICAR-Krishi Vigyan Kendra (SKUAST-Jammu)
Samba 184121 Jammu and Kashmir, India
Email for correspondence: neerja1975@gmail.com

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ABSTRACT

Frontline demonstration is one of the powerful tools for transfer of technology. After realizing the importance of frontline demonstrations, demonstrations on the production and protection technology of okra were laid out at the farmers' fields under the supervision of scientists of Krishi Vigyan Kendra, Samba, Jammu and Kashmir in different agro-climatic regions and farming situations and their impact was recorded. The study revealed that majority of the beneficiaries (87%) adopted high yielding variety resistant to yellow vein mosaic virus. The important package of practices where more increase in adoption was found was use of recommended fertilizer dose (57%), seed treatment (50%), use of high yielding improved variety (47.5%), line sowing on ridges and furrows (40%), plant protection measures to control insects pests and diseases (42%), weed management (35%) and use of proper seed rate and spacing (30%). The mean knowledge and adoption scores of beneficiaries were higher comparatively to non-beneficiaries. It was also observed that majority of beneficiaries had medium to high knowledge and adoption of production technology promoted through frontline demonstrations. This might be due to the concerted efforts made by KVK scientists in implementation of frontline demonstrations. There were significant differences observed in yield and B-C ratio of okra before the FLD and after FLD programme. The data also signified strong satisfaction of farmers about the services rendered by scientists through frontline demonstrations which ultimately lead to increase in knowledge and adoption level of beneficiaries and thus higher yield and economic net return.

Keywords: Frontline demonstration; impact; adoption; benefit-cost ratio; okra

INTRODUCTION

Indian agriculture has always acted as a catalyst for stronger and sustained economic growth of the country. India is the second largest producer of the vegetables. During 2017-18 the area under vegetables was 10.26 million hectares with a production of 184.40 million tonnes in India (Anon 2018). Mostly the vegetables are grown under irrigated conditions in normal conditions and in un-irrigated conditions during rainy season with low productivity. Many high yielding varieties have been released for cultivation but their adoption by the farmers is less. In Samba district of J&K majority of the area is under cereals. However the efforts are being made by the KVK to motivate the farmers to grow vegetables through training programmes, awareness camps and field days. In Samba district of Jammu and Kashmir, vegetables have a very low productivity which may be attributed to non-adoption of improved varieties and their package of practices. Okra is one of the most important crops available throughout the year at steady and stable market price and early crop always fetches higher price as compared to other commonly available vegetables. It is an oligo-purpose crop but is usually consumed for its green tender fruits as a vegetable in a variety of ways. Vegetable growers of Samba district cultivate okra along with other vegetable crops. Still this crop gives good returns to the farmers and has emerged as important vegetable crop due to the available irrigation in irrigated region and during monsoon in rain-fed region. Also technology development with regard to improved varieties and other inputs have played important role in raising productivity. Frontline demonstration, a concept evolved by ICAR to demonstrate the latest crop production

technologies and its management practices in the farmers' fields under different agro-climatic regions and farming situations under close supervision of the scientists work on the principle of believing through seeing and learning by doing and helps in technology integration. Realizing the importance of frontline demonstrations in transfer of okra production technologies, Krishi Vigyan Kendra, Samba, J&K conducted frontline demonstrations for three years in different locations of the district with the objective of convincing farmers and extension functionaries together about the okra crop production technologies for wider technology application. In order to further strengthen the programme, the FLDs need validation for various performance parameters in respect of yield and economics. The present investigations were planned and conducted to evaluate the frontline demonstrations in terms of extent of knowledge of farmers and adoption of recommended okra production technologies, assess the impact in terms of yield and economics along with the satisfaction of beneficiaries regarding services rendered.

MATERIAL and METHODS

The present study was conducted in Samba district of Jammu and Kashmir during 2019-2021. Total 150 farmers were included in frontline demonstrations on okra production technology. For this purpose, five Tehsils were selected purposively in which okra FLDs were laid out by KVK, Samba, Jammu and Kashmir during kharif season. For the selection of respondents, a list of farmers was prepared who laid out the FLDs. Randomly eight farmers from each Tehsil were selected making a total sample size of forty. Basic data of the beneficiaries were collected from the KVK. The data were collected by personal interview technique with the help of interview schedule developed for the study. The interview schedule was developed through discussions with experts, scientists and extension officers working in the district. Under these FLDs, an area of 4.0 ha was covered.

Knowledge was operationally defined as the technical knowhow possessed by the individual okra cultivator about okra production technology. A structured schedule was developed for measuring the knowledge of the respondents/beneficiaries about various aspects of okra cultivation as envisaged in the frontline demonstrations. Adoption was operationalized as practicing the recommended package of practices of okra cultivation by the farmers. The selected practices were administrated through structured interview schedule to the farmers for measuring the extent of adoption. For assessing the impact of frontline demonstrations, recorded data on frontline demonstrations available with KVK were collected and computed. The impact of frontline demonstrations in the present investigation was studied on the basis of percentage of increase in yield in comparison to local practices, net and gross returns obtained and benefit-cost ratio in comparison to local practice. Satisfaction of beneficiaries was taken as to react positively or negatively towards the services rendered during frontline demonstrations through various dimensions like technology demonstrated, training of participants, timeliness of services, provision of inputs, field visits, diagnosis and advisory services to field problems, organization of extension activities, performance of variety demonstrated and overall impact of frontline demonstrations. The selected respondents were interviewed personally with the help of structured interview schedule on different dimensions. Client satisfaction index of each respondent was calculated as developed by Kumaran and Vijayragavan (2005). All the data were analyzed with appropriate statistical procedures. The information on demonstrated package of practices and farmer practice followed is given in Table 1.

RESULTS and DISCUSSION

The information regarding knowledge level of respondents about okra production technology is presented in Table 2 and reflects that majority of beneficiaries (60%) possessed medium knowledge followed by high knowledge (27%) and low knowledge (20%) by three categories of respondents about improved package of practices of okra production technology. With regard to non-beneficiaries, majority of the respondents possessed medium to low knowledge (40% each) regarding okra production technology. However the mean score of beneficiaries was comparatively higher than that of mean knowledge score of non-beneficiaries. This shows positive impact of frontline demonstrations on knowledge of farmers which resulted in higher adoption of improved okra production technology. This might be due to concerted efforts made by KVK scientists in implementation of frontline demonstrations. Adoption of recommended package of practices was the ultimate outcome to be judged in terms of the impact of frontline demonstrations. The data presented in Table 3 reveal that majority

Table 1. Demonstrated package of practices and farmers' practice for okra cultivation

Component	Demonstrated practice	Farmers' practice
Improved variety resistant to yellow mosiac virus	Jammu Okra-05	Local variety
Sowing time	Second fortnight of June	July
Seed treatment	Seed treated with carbendazim	Not followed
Seed rate and spacing	15 kg/ha at 45 cm x 30 cm	20-22 kg, broadcast
Recommended fertilizer dose	25 tonnes FYM, 60 kg N + 30 kg P_2O_5 + 30 kg K_2O; 1/3rd N + full dose of P_2O_5 & K_2O applied at the time of sowing and remaining 2/3rd equally distributed at 30 and 60 DAS	Only FYM and small amount of DAP applied
Plant protection measures to control insects pests and diseases	Need-based spray application of cypermethrin 1 ml/l of water against stem borer and diamethoate 1 ml/l of water against aphids and fruit brorers	Not followed
Irrigation	Once in a week	Once/twice in a week
Weed management	Pre-emergence application of herbicide basalin	Hand weedings 3-4 times
Harvesting at proper stage	Demonstrated use of cutter for picking of fruits at proper stage	Use of local knife and at improper stage

Table 2. Extent of farmers' knowledge on okra production technology

Knowledge level	Beneficiaries (n=40)		Non-beneficiaries (n=10)	
	Frequency	Percentage	Frequency	Percentage
Low (<28)	8	20	4	40
Medium (29-33)	24	60	4	40
High (>33)	11	27	3	30

(87%) of the respondents adopted improved okra variety followed by application of recommended fertilizer dose (82%), seed treatment (80%), line sowing on ridges and furrows (80%), plant protection measures to control pests and diseases (75%), use of proper seed rate and spacing (72%) and timely irrigation (70%). Increase in adoption in the important package of practices was in the use of recommended fertilizer dose (57%), seed treatment (50%), use of high yielding variety (47.5%) plant protection measures to control insect pests and diseases (42%), line sowing on ridges and furrows (40%), weed management (35%), use of proper seed rate and spacing (30%) and sowing time of okra (30%) whereas the increase in adoption was less in case of harvesting at proper stage of maturity (22%) and timely irrigation (25%). The more adoption rate by beneficiaries could be due to more exposure of improved package practices of okra acquired through direct laying and organization of demonstrations, participation in skill training programmes and close contact with programme officials in learning and applying the skilled techniques of okra cultivation. This might be due to concerted efforts made by KVK scientists through implementation of frontline demonstrations. These findings are in close conformity with the results reported by Thakor and Patel (2006) and Singh et al (2014).

The data in Table 4 reveal that the yield of okra increased per hectare by 61.0 per cent in frontline demonstration plots. The significant yield difference may be attributed to the improved variety along with technology demonstrated through FLDs and their adoption by the frontline demonstration beneficiaries. The successful outcome of the demonstrations has shown efficacy of intervention framed and demonstrated through FLDs. Similar results were reported by Jha et al (2011) and Manjarekar et al (2015).

Economic impact: The economic impact of the demonstrated okra technology was worked out by calculating total cost, gross return, net return and B-C ratio (BCR) before and after FLDs. Total cost was calculated by total sum of expenditure of land preparation, seed, manures and fertilizers, plant protection measures, irrigation and labour components.

The data in Table 5 reveal that before FLDs, the yield of okra was 86.0 q/ha while after FLDs the yield was 139.0 q/ha. The B-C ratio for okra before

Table 3. Extent of adoption of recommended package of practices of okra crop before and after FLDs (n= 40)

Package	Adoption (before FLDs)		Adoption (after FLDs)		Increase in adoption	
	Number	Percentage	Number	Percentage	Number	Percentage
Use of high yielding improved variety	16	40	35	87	19	47.5
Sowing time of okra	15	37	27	67	12	30
Seed treatment	12	30	32	80	20	50
Use of proper seed rate and spacing	16	53	29	72	13	30
Line sowing on ridges and furrows	21	52	32	80	9	40
Recommended fertilizer dose	10	25	33	82	23	57
Plant protection measures to control insect pests and diseases	13	32	30	75	17	42
Timely irrigation	19	47	28	70	10	25
Weed management	11	44	25	62	14	35
Harvesting at proper stage	15	37	24	60	9	22

Table 4. Yield of okra before and after FLDs

Average yield of okra crop (q/ha)		Per cent increase in yield
Before FLD	After FLD	
86	139	61.0

Table 5. Profitability of okra before and after FLDs

Component	Before FLDs	After FLDs
Cost of cultivation (Rs/ha)	60,625	68,480
Yield of okra (q/ha)	86.0	139.0
Gross return (Rs/ha)	1,29,000	2,78,000
Net return (Rs/ha)	74,000	2,18,000
B-C ratio	1.34	3.63

FLD was 1.34 (calculated @ Rs 2,000 per quintal) which increased to 3.63 after FLDs. However increase in B-C after FLDs could be due to adoption of 60.0 to 87.0 per cent adoption of different package of practices. Similar results were reported by Sharma and Sharma (2004) and Patel and Patel (2014).

Satisfaction of beneficiaries regarding services rendered through frontline demonstrations

The concept of satisfaction of beneficiaries was measured as to react positively or negatively towards the services rendered through frontline demonstrations. A close observation of figures presented in Table 6 depicts that majority (60%) of the respondents expressed medium to high (27%) level of satisfaction for the extension services rendered and performance of the technology demonstrated. Relatively very few respondents (20%) expressed lower level of satisfaction. The results signify the positive response of beneficiaries towards the services rendered through FLDs. These also depict the stronger conviction and active involvement of beneficiaries in laying the demonstrations which could lead to increase in knowledge level and higher adoption. This showed the optimism and relevance of organization of frontline demonstrations.

CONCLUSION

On the set of technologies of okra crop before frontline demonstrations, the adoption was very less but after the FLD programme most of the farmers became aware about recommended production technologies of okra crop. The important package where increase in adoption was found included use of recommended fertilizer dose, timely irrigation, use of high yielding improved variety, use of proper seed rate and spacing after FLDs as compared to before FLDs. Increase in B-C ratio after FLDs could be due to adoption of 60.0 to 87.0 per cent adoption of different package of practices which showed positive impact of FLDs on adoption of demonstrated technology. The strong satisfaction of farmers about the services rendered by scientists through frontline demonstrations promoted the physical and mental active involvement

Table 6. Extent of satisfaction of beneficiaries about services rendered through organization of FLDs

Satisfaction level	Beneficiaries (n= 40)	
	Frequency	Percentage
Low (<85)	8	20
Medium (85-95)	24	60
High (>96)	11	27

of the beneficiaries which ultimately led to increase in knowledge and adoption level of beneficiaries.

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