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Impact of Front Line Demonstration on Yield and Economics of Okra [*Abelmoschus esculentus* (L.)] in Banswara District of Rajasthan

Bheroo Singh Bhati[1*], Rajendra Singh Rathore[2] and Lekhu Kumar[1]

[1]Krishi Vigyan Kendra, Banswara, MPUAT, Udaipur, India.
[2]Agricultural Research Station, SKRAU, Bikaner, India.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

The present study was undertaken to find the yield gap through FLDs on okra crop. The Krishi Vigyan Kendra, Banswara conducted Frontline demonstration on 10 farmers for each year since 2016, 2017 and 2018 in different locations of Banswara district. Frontline demonstrations were conducted on okra by the active participation of the farmers with the objective of improved technologies of okra production potential. Use of hybrid variety, balanced use of fertilizer on the basis soil testing report and integrated pest and disease management etc are the main technologies to be tested in this demonstration. Okra is a major vegetable crop of Rajasthan, but the productivity of okra is very low in this district due to lack of knowledge and partial adoption of recommended package of practice by okra cultivators. Results showed that average yield obtained were 142.6, 134.2 and 137.7 q/ha under improved system, whereas, in local variety 80.3, 81.7 and 87.3 q/ha yield was recorded during 2016, 2017 and 2018, respectively. The per cent increase in yield with high yielding over local variety was 57.73 to 77.58 per cent. The extension gap recorded was 62.3, 52.5 and 50.4 per cent during 2016, 2017 and 2018, respectively. Besides this, the demonstrated plots gave higher gross return, net return with higher benefit cost ratio when compared to farmer's practice.

*Corresponding author: E-mail: bhati.bsbikaner@gmail.com;

Keywords: B:C ratio; extension gap; FLD, technology gap; technology index; Yield.

1. INTRODUCTION

Okra [*Abelmoschus esculentus* (L.) Moench] is an annual vegetable crop belongs to family Malvaceae. The centre of origin is tropical and sub-tropical region of the world. It is known as 'Gumbo' in USA, 'Ladys Finger' in England, whereas 'Bhindi' in India. Okra occupies a place of prominence amongst summer vegetables in India. Total area under okra cultivation in India was estimated to be 509000 ha with an annual production of 6094000 Metric Tonnes [1]. The area under okra cultivation in Rajasthan was 4.15 thousand ha with production of 21.39 thousand MT [1]. Its adaptability to a wide range of growing condition makes it popular among vegetable growers. It is widely grown for its immature tender fruits which are used as vegetable. It is used in curries, cooked into soups, canned green or dried for off season uses. The root and stem of okra plants are used for cleaning the cane juice in the manufacture of Jaggery and Sugar. Its fruits also have good nutritional and medicinal values as the fruit contain 6.4 g carbohydrates, 2.2 g protein 0.2 g fat, 66 mg calcium, 500 mg phosphorus, 15 mg iron and 13 mg vitamin-C per 100 g edible portion. Similarly, okra fruit is excellent source of iodine which is necessary for the resistance against throat disease like goiter. It is good for the people suffering from heart weakness. Ripen seeds are roasted ground and used as substitute for coffee in turkey. Matured fruits and stem contain crude fibre which is used in paper industry. Okra thrives in all kinds of soils, but it grows best in a friable well manured soil [2]. KVKs are grass root level organizations meant for application of technology through assessment, refinement and demonstration of proven technologies under different 'micro farming' situations in a district [3]. Front line demonstration (FLD) is a long term educational activity conducted in a systematic manner in farmers fields to worth of a new practice/technology. Farmers in India are still producing crops based on the knowledge transmitted to them by their fore fathers leading to a grossly unscientific agronomic, nutrient management and pest management practices. As a result of these, they often fail to achieve the desired potential yield of various crops and new varieties. To improve yield levels and make awareness to the okra growers, front line demonstrations (FLD) were conducted. In the present study, performance of okra variety Shakti against local check was evaluated in front line demonstrations conducted at farmers field during Summer seasons 2016 to 2018.

2. MATERIALS AND METHODS

The present study was carried out by Krishi Vigyan Kendra, Banswara on okra for three consecutive years *viz*. 2016, 2017 and 2018 during summer season. Total 30 demonstrations in a 6 ha area were conducted on farmer's field and each frontline demonstration was laid out on 0.2 ha area while adjacent 0.2 ha was considered as control for comparison (farmer's practice). Planting was done during 1st fortnight of February. FLD's were conducted to study the gap between potential yield (150 q/ha), demonstration yield, extension gap and technology index. The data on output of improved and local okra plots were recorded. The farmers were guided by KVK scientists in respect of package of practices to be followed during the crop season. Technology gap, extension gap and technology index were calculated using following formula as suggested by Samui et al. [4].

$$Per\ cent\ increase\ yield\ = \frac{Demonstration\ yield - farmers\ yield}{Farmers\ yield} X\ 100$$

Technology gap= Potential yield - Demonstration yield

Extension gap =Demonstration yield- Yield under existing Farmers practice

$$Technology\ index\ (\%) = \frac{Potential\ yield - Demonstration\ yield}{Potential\ yield} X\ 100$$

3. RESULTS AND DISCUSSION

The data with respect to yield and economic returns are presented in Table 2, whereas the data pertaining to extension gap, technology gap and technology index are presented in Table 3.

3.1 Yield

The results revealed that due to front line demonstration on okra, yield ranged from 134.2 to 142.6 q ha^{-1} in demonstration plots and from 80.3 to 87.3 q ha^{-1} in farmer's practice plot in three years of demonstration (Table 2). An average yield of 138.17 q ha^{-1} was obtained under demonstration plots as compared to 83.10 q ha^{-1} in farmer's practices plots during the three years. This results clearly indicated that the higher average yield in demonstration plots over the years compare to farmers practice may be due to knowledge and adoption of full package of practices i.e. use of recommended dose of fertilizers and timely application of plant protection chemicals. Similar results were also reported by Kalalbandi et al. [5] in chilli crop as well as by Dhemre and Desale [6] in okra crop. The increment in yield ranged between 57.73 to 77.58 per cent and the three years average increase in yield of okra was 66.52 per cent. The above findings are in similarity with the findings of Balai et al. [7], Shelke et al. [8], Adhikari and Piya [9] and Singh et al. [10] in vegetable crops. However variations in the yield of okra in different years might be due to the variations in environmental factors like soil fertility, moisture availability, rainfall, etc, and the change in the location of demonstrations every year.

3.2 Economic Returns

The input and output prices of commodities prevailed during the study of demonstrations were taken for calculating cost of cultivation, gross return, net return and benefit: cost ratio and the data is presented in Table 2. The cultivation of okra under improved technologies gave higher net return of Rs. 157,500.00 ha^{-1}, Rs. 135500.00 ha^{-1} and Rs. 153290.00 ha^{-1} during the years 2016, 2017 and 2018, respectively with an average net return of Rs. 148763.33 ha^{-1} which was higher as compared to farmer's practices (Rs. 81203.33 ha^{-1}). The benefit cost ratio of okra ranged from 2.90 to 3.79 in demonstration plots and from 2.13 to 2.59 in farmer's practice plots during three years of demonstration with an average of 3.25 in demonstration and 2.43 under farmer's practices. This may be due to higher yield obtained under improved technologies as compared to local check (farmers practice). This finding is similar with the findings of Singh et al. [10] in solanaceous vegetables and Shalini et al. [11] in tomato.

3.3 Extension Gap

Extension gap of 62.30, 52.50 and 50.40 q ha^{-1} was observed during the years 2016, 2017 and 2018, respectively (Table 3). On an average extension gap under three year FLD programme was 55.07 q ha^{-1}. This emphasized the need to educate the farmers through various techniques for the adoption of improved agricultural production technologies to reverse this trend of extension gap. More and more use of latest production technologies with high yielding variety will subsequently change this alarming trend of galloping extension gap. These findings are similar to Teggelli et al. [12] in pigeon pea.

3.4 Technology Gap

The technology gap, that is the differences between potential yield and yield of demonstration plots was 7.40, 15.80 and 12.30 q ha^{-1} during the years 2016, 2017 and 2018, respectively (Table 3). On an average technology gap under three year FLD programme was 11.83 q ha^{-1}. This may be due to the variations in soil fertility, managerial skills of individual farmer's and climatic conditions of the area. Hence, location specific recommendations are necessary to bridge this gap. These findings are similar to Singh et al. [10] in solanaceous vegetables.

Table 1. Details of Farming situation during three years of FLDs

Crop	Season	No. of Demo	Area (ha)	Farming Situation	Soil type	Sowing date	Date of Picking
Okra	Summer 2016	10	2.0	Irrigated	Medium brown loamy Soil	2nd Week of Feb. 2016	2nd Week of April to 2nd week of July, 2016
Okra	Summer 2017	10	2.0	Irrigated	Medium brown loamy Soil	3rd Week of Feb. 2017	3rd week of April to 4th week of July, 2017
Okra	Summer 2018	10	2.0	Irrigated	Medium brown loamy Soil	2nd Week of Feb. 2018	3rd week of April to 4th week of July, 2018

Table 2. Yield and Economic Impact of FLDs

Year	No. of Demo	Area (ha)	Demo yield (q/ha)			Local check yield (q/ha)	% increase in yield	Economics of demostration (Rs/ha)				Economics of Local check (Rs/ha)			
			Highest	Lowest	Average			Gross cost	Gross return	Net return	B:C Ratio	Gross cost	Gross return	Net return	B:C Ratio
2016	10	2.0	197.2	92.8	142.6	80.3	77.58	56400	213900	157500	3.79	42800	120450	77650	2.13
2017	10	2.0	198.6	94.3	134.2	81.7	64.26	65800	201300	135500	3.06	47600	122550	74950	2.57
2018	10	2.0	193.2	89.4	137.7	87.3	57.73	80800	234090	153290	2.90	57400	148410	91010	2.59
Average	-	-	196.33	92.17	138.17	83.10	66.52	67666.67	216430.00	148763.33	3.25	49266.67	130470.00	81203.33	2.43

Table 3. Extension gap, technology gap and technology index in okra production under FLDs

Year	Potential Yield	Average Demo Yield (q/ha)	Farmer Practice Yield (q/ha)	Extension gap (q/ha)	Technology gap (q/ha)	Technology index (%)
2016	150	142.6	80.3	62.30	7.40	4.93
2017	150	134.2	81.7	52.50	15.80	10.53
2018	150	137.7	87.3	50.40	12.30	8.20
Average	150	138.17	83.10	55.07	11.83	7.89

3.5 Technology Index

The technology index shows the feasibility of the demonstrated technology at the farmer's field. The technology index varied from 4.93 to 10.53 (Table 3). On an average technology index of 7.89 % was observed during the three years of FLD programme, which shows the effectiveness of technical interventions. The lower the value of technology index more is the feasibility of the particular technology. It means the technology is suitable for Banswara district of Rajasthan.

4. CONCLUSION

The FLD produced a significant positive result and provided an opportunity to demonstrate the productivity potential and profitability of the latest technology (intervention) under the real farming situation. By conducting demonstrations of improved scientific technologies, yield potential of okra can be increased to a great extent. This will substantially increase the income as well as the livelihood of the farming community. There is a need to adopt multi-pronged strategy that involves enhancing okra production through improved technologies in Banswara district of Rajasthan state.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Anonymous. Horticulture Statistics Division, Department of Agriculture, Cooperation & Farmers Welfare, Horticultural Statistics at a Glance. 2018; 196.
2. Yawalkar, KS and Ram, HH. Fruit Vegetables. In: Vegetable crops of India Eds, Nagpur: Agri-Horticultural Publishing House. 2004;99–112.
3. Das, P. Proceedings of the Meeting of DDG(AE), ICAR, with Officials of StateDepartments, ICAR Institutes andAgricultural Universities, NRC Mithun,Jharmapani; Zonal Coordinating Unit, Zone-III, Barapani, Meghalaya, India. Quoted by V.Venkatasubramanian, Sanjeev MV, Singha AK. in Concepts, Approaches andMethodologies for Technology Applicationand Transfer- a resource book for KVKs Iind Edition. 2007;6.
4. Samui SK, Mitra S, Roy DK, Mandal AK, Saha D. Evaluation of front line demonstration on groundnut. Indian Society of Coastal Agricultural Research. 2000;18(2):180–183.
5. Kalalbandi, BM, Dudhate, DG and More, SS. Impact of front line demonstration on chilli (*Capsicum annum L*.) production technology in Parbhani district of Maharashtra state. Crop Protection. 2006; 3(1):157–158.
6. Dhemre, JK and Desale, SB. Impact of front line demonstration on production technology of okra cv. "Phule Utkarsha" in Dhule district of Maharashtra. Asian Scientific. 2010;5(1):29–31.
7. Balai, CM, Jalwania, R, Verma, LN, Bairwa, RK and Regar, PC. Economic impact of front line demonstrations on vegetables in tribal belt of Rajasthan. Current Agriculture Research Journal. .2013;1(2):69–77.
8. Shelke, AA, Wadatkar, SB and Beldar, RM. Effect of Different Levels of Fertilizer on Growth and Yield of Okra. International Journal of Current Microbiology and Applied Sciences. 2019;8(12) :1363-1367.
9. Adhikari, A and Piya, A. Effect of Different Sources of Nutrient on Growth and Yield of Okra (Abelmoschus esculentus L. Monech). International Journal of Environmental & Agriculture Research. 2020;6(1):45-50.
10. Singh R, Soni, RL, Singh V, Bugalia HL. Dissemination of improved production technologies of solanaceous vegetables in Banswara district of Rajasthan through Frontline demonstrations. Rajasthan Society of Extension Education. 2011;19:97–100.
11. Shalini, M, Devaraja and Gowda, M. Impact of front line demonstrations on yield and economics of tomato in Chikkaballapur district of Karnataka. International Journal of Applied and Pure Science and Agriculture. 2016;2(7):4–8.
12. Teggelli, RG, Patil, DH, Naik, A, Zaheer Ahamed, B and Patil, MC. Impact of frontline demonstration on the yield

and economics of pigeon pea in Kalaburgi district of Karnataka state. International Journal of Science and Nature. 2015; 6(2):224–227.

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