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Yield Gap Analysis and Economics of Okra Cultivation through Front Line Demonstration in Seoni District of Madhya Pradesh

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Abstract

Okra (Abelmoschus esculentus L Monech) is one of the major vegetable crops of India, which plays a major role in supplementing the income of small and marginal farmers of Seoni district of Madhya Pradesh. The front line demonstrations were conducted on farmers field of Seoni district of Madhya Pradesh from 2012-13 to 2014-15 (three consecutive years) at two adopted villages under real farming situations. Prevailing farmer's practices were treated as control for comparison with recommended practice. The result of Front Line Demonstration conducted by Krishi Vigyan Kendra, Seoni in okra crop shows a greater impact on farmers face due to significant increase in yield over local check. The extension gap ranged between 26.15 to 40.88 q/ha whereas the trend of technology gap ranged between 12.63 to 20.22 q/ha, the benefit cost ratio was recorded to be higher 2.24 to 2.34 under demonstration, while it was 1.53 to 1.71 under control plots. The results of improved technological intervention brought out that the yield of Okra could be increased by 31.26% to 53.44%, if proper package and practices are followed.

Key words: Okra, front Line Demonstration, yield, economics, technology and extension gap

Introduction

Realizing the importance of dissemination of technological information in the changing scenario of food and nutritional security, Indian Council of Agricultural Research made an institutional innovation in the form of KVK. It was also envisaged that technology assessed by the KVK will be act as model for the line departments and act as a catalyst to improve the existing systems for better delivery mechanism. The KVK organize front line demonstrations which aim at demonstrating the production potentialities of newly released and pre-released production technologies of cereals, pulses and vegetables on farmer's fields. These are called front line demonstrations. Available agricultural technology does not serve its purpose till it reaches and adopted by its ultimate users, the farmers. Technology transfer refers to the spread of new ideas from originating sources to ultimate users. Vegetables are important food and highly beneficial for the maintenance of health and prevention of diseases. They play a major role in providing food, health and nutritional security. Considering the recommendations of ICMR for nutrient requirement, vegetables form an important component of a balanced diet, which remains a distant dream for many Indians. Indians are predominantly vegetarian and depend on vegetables and fruits for bulk of their nutrients and minerals requirement. Currently, India is producing 15% of world vegetable and ranks 2nd in vegetable production after China. But, the productivity is just 17.4 tons per ha which is less than the world average of 18.8 tons per ha. One of the reasons for this low productivity is low access of Indian farmers to the modern technologies. In India, okra is produced on an area of 532.7 thousand hectare with a production of 6346.4 thousand MT which contributes to 3.9 % of total vegetable production (NHB, 2015). In India it is extensively grown throughout the country as warm season vegetable crop for its immature green tender fruits. In Seoni district of Madhya Pradesh the poor productivity is mostly due to use of old varieties, imbalanced use of fertilizers and indiscriminate use of plant protection measures for control of Jassids, OLCV disease. There is ample scope for further improvement of production and productivity of Okra for raising the income level of the farming community of the district. Further; the resource poor farmers are very reluctant towards proper scientific management of the crop. But still a good area (1862 ha) is under cultivation of Okra with the available low cost technologies therefore it is

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possible to bridge the yield gap and increase the existing production level up to certain extent.

Materials and Methods

The study was carried out by JNKVV, Krishi Vigyan Kendra Seoni, (M.P.) during Kharif season from 2012-13 to 2014-15 (three consecutive years) at the farmers field of two adopted villages namely Kalbodi and Khapa of Seoni district. During these three years of study, an area of 10.5 ha was covered under front line demonstration with active participation of 30 farmers. Before conducting FLDs a list of farmers was prepared from group meetings and specific skill training was imparted to the selected farmers regarding different aspects of cultivation .The difference between the demonstration package and existing farmer's practices are mentioned in Table 1.

In demonstration plots, use of quality seeds of improved variety Kashi Kranti sowing in ridges and timely application of weedicide as well as balanced fertilization were emphasized. The traditional practices were maintained in case of local checks. The data on output were collected from FLD plots as well as control plots and finally the extension gap, technology gap, technology index, economics of demonstration along with the benefit cost ratio were worked out. The demonstrated trials were regularly monitored and necessary data related to new varieties were collected. In addition to this, data on traditional practices followed by the farmers were also collected. Technology gap, extension gap and technology index were worked out as per formula suggested by Samui *et al.* (2000) and Dayanand *et al.* (2012) as given below:

Technology gap =

Potential yield (P1) - Demonstration yield (D1);

Extension gap =

Demonstration yield (D1) - Farmers yield (F1)

$$\text{Technology index} = \frac{\text{(PI - DI)}}{\text{PI}} \times 100$$

Results and Discussion

A perusal of data (Table 2) indicates that the yield of okra increased successively over the years in demonstration plots. The green fruit yield ranged from 109.78 to 117.37 q/ha in the three consecutive years (Table 2). The increase in percentage of yield ranged "between" 31.26 to 53.44 during three years of the study. The result speaks of the positive effects of FLD over the existing practices towards enhancing the yield of Okra in Seoni district of Madhya Pradesh with its positive effect on yield attributes. The extension gap ranging between 26.15 to 40.88 q/ha during the period of study emphasizes the need to educate the farmers

Table 1: Level of use and gap in adoption of Okra technologies in study area

Crop operations	Improved package of practices	Farmers practices	Gap
Variety	Kashi Kranti	Local	Full gap
Soil testing	Have been done in all locations	Not in practice	Full gap
Seed rate	8-10 Kg /ha	15-20 Kg /ha	Partial gap
Seed priming	Seed priming was performed for better germination. Seeds were soaked during night for 8-10 hours with natural water, drained out excess water and dried in shade before sowing.	Not in practice	Full gap
Seed treatment	Seed was treated with Captan @ 2-3g /kg seeds or carbendazim @ 1 g /kg seed and with Imidacloprid @ 2.0 g /Kg seed	Not in practice	Full gap
Sowing method	Line sowing in Ridges Distance Row to Row 60 cm & Plant to Plant 30 cm	Flat bed sowing Row to Row 30 cm & Plant to Plant 30 cm	Partial gap
Sowing time	June	May	Partial gap
Fertilizer dose	Fertilizer @ 120 kg N, 60 Kg, P2 O5 and 60 Kg K_2O	Nil/without recommendation	Partial gap
Weed management	Pendimethaline 38.7 % @ 1.75 litre/ ha was applied immediately after sowing.	Hand weeding/rarely used	Partial gap
WSF Spray	Foliar spray of 2% N:P:K 19:19:19 just before flowering and repeated after 20-25 days	No application	Full gap
Plant protection	Need based in case of severe infestations Imidacloprid 17.8% SL or dimethoate and other systemic chemicals	No application of chemicals/ rarely used and without knowledge	Partial gap

Table 2: Productivity, Technology gap, Extension gap and Technology index in Okra (cv Kashi Kranti) Under FLDs

Year	Area (ha)	No. of farmers	Green fruit yield (q/ha)			(%) increase over control	Technology gap (q/ha)	Extension gap (q/ha)	Technology index (%)
			Potential	Demonstration	Control				
2012-13	2.0	10	130.00	112.42	78.91	42.46	17.58	33.51	13.52
2013-14	2.0	10	130.00	109.78	83.63	31.26	20.22	26.15	15.55
2014-15	2.5	10	130.00	117.37	76.49	53.44	12.63	40.88	9.71

Table 3: Economics of Front line demonstration of Okra

Year	Yield (q/ha)		Cost of Cultivation (Rs/ha)		Gross Return (Rs/ha)		Net Return (Rs/ha)		Benefit Cost ratio	
	Demonstration	Control	Demonstration	Control	Demonstration	Control	Demonstration	Control	Demonstration	Control
2012-13	112.42	78.91	49452	46589	112420	78910	62968	32321	2.27	1.69
2013-14	109.78	83.63	51478	48900	120758	83630	69280	34730	2.34	1.71
2014-15	117.37	76.49	52300	49990	117370	76490	65070	26500	2.24	1.53

through various means for the adoption of improved agricultural production to reverse the trend of wide extension gap.

The trend of technology gap ranging between 12.63 to 20.22 q/ha reflected the farmers cooperation in carrying out such demonstration with encouraging results in subsequent years. The technology gap observed may be attributed to the dissimilarity in soil fertility status and weather condition.

The technology index showed the feasibility of the evolved technology at the farmer's field. The lower the value of technology index, the more is the feasibility of the technology. As such, the reduction in technology index from 13.52% during 2012-13 to 9.71% during 2014-15 exhibited the feasibility of the demonstrated technology in this region.

Economic indicators i.e., cost of cultivation ,gross return ,net returns and B:C ratio of Front Line Demonstration are presented in (Table 3). The data revealed that, the net return from the demonstration were substantially higher than control plots. B:C ratio was recorded to be higher under demonstration against control during all the years of study.

Scientific method of Okra cultivation can reduce the technology gap to a considerable extent thus leading to increased productivity of Okra in the district which in turn will improve the economic condition of the growers. Moreover, extension agencies in the district need to provide proper technical support to the farmers through different educational and extension methods to reduce the extension gap for better Okra production in the district. It was concluded from the study that with the introduction of improved variety there was a positive impact on the farmer's economy by using the improved Okra variety and scientific package of practices, farmers can increase okra yield and get more profit, by which they can improve their socio-economic condition. The results of improved technological intervention brought out that the increase in yield of okra could be increased by 31.26% to 53.44%. Improved package of practices can decrease the technology gap by which productivity of the crop can be increased. To achieve this target, extension agencies of the concern area have to provide appropriate technical support time to time to the farmers.

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