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IMPACT ASSESSMENT OF CLUSTER FRONT LINE DEMONSTRATION ON PIGEONPEA CROP IN SULTANPUR DISTRICT OF UTTAR PRADESH

Agricultural Science

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ABSTRACT

Krishi Vigyan Kendra, Sultanpur conducted 135 demonstrations on Pigeon pea variety NDA-2 during two consecutive years from 2016–17 to 2017–18. The critical inputs were identified in existing production technology through meetings and discussions with farmers & on the basis of soil sampling. Delayed sowing & use of higher seed rate resulting into dense plant population, uneven plant population, uncontrolled weeds, ignorance about fertilizers and lack of plant protection measures were the predominant identified causes of low productivity of Pulses in district Sultanpur. In the same sequence the other parameters like technological impact, economical impact and extension gap were analyzed for Impact assessment of front line demonstration on Pigeon pea crop and feasibility of demonstrated technologies at grass root levels. The results of two consecutive years study revealed that the yield under demonstration plots was 19.5q /ha as compared to 13.77q /ha in traditional farmer practices plots. The average of technology gap, extension gap and technology index were found to 8.5, 6.06 and 30.36 per cent respectively. The results clearly indicate the positive effects of FLDs over the existing practices. Benefit cost ratio was recorded to be higher under demonstrations against control treatments during the years of experimentation.

KEYWORDS

Impact, Pigeon pea, Cluster front line demonstration, technology gap

INTRODUCTION

Pigeon pea [Cajanus cajan (L.) Millsp.] is an important legume crop of rain fed agriculture in the semiarid tropics. It is one of the major pulses grown in the semi-arid tropics between 30°N and 30°S, covering about 50 countries in Asia, Africa and the Americas. Historically India is the largest producer, consumer and importer of pulses. Pulses are a good and chief source of protein for a majority of the population in India. Protein malnutrition is prevalent among men, women and children in India. Pulses contribute 11% of the total intake of proteins in India (Reddy, 2010). In India, frequency of pulses consumption is much higher than any other source of protein, which indicates the importance of pulses in their daily food habits. Keeping the cheapest source of protein, it is important to increase pulses production to increase balanced diet among the socially and economically backward classes. India accounts for 33% of the world area and 22% of the world production of pulses. About 90% of the global pigeon pea, 65% of chickpea and 37% of lentil area falls in India, corresponding to 93%, 68% and 32% of the global production, respectively (FAOSTAT, 2011). Although it is the world's largest pulses producer, India is importing 3-4 million tons (MT) of pulses every year to meet its domestic demand. Pulses are grown across the country with the highest share coming from Madhya Pradesh (24%), Uttar Pradesh (16%) and Gujarat (23 %). Even though pulses production increased significantly during the last decade but continuing the faster growth is a bigger challenge for researchers, extension agencies and policy makers to fulfill the domestic demand of its in India. The productivity of pulses in India (694 kg/ha) is lower than most of the major pulse producing countries.

The Cluster Front Line Demonstration (CFLD) is an applied approach to accelerate the dissemination of proven & tested technologies at farmer's fields in a participatory mode with an objective to explore the maximum available resources of crop production and also to bridge the productivity gaps by enhancing the production. In Sultanpur district, Pigeon pea was raised on 5,565 ha with total production of 2,605 q and productivity of 4.82 q /ha during 2016-17. Still the area and productivity of Pigeon pea in Sultanpur is far lower than the several districts of other states because the farmers are reluctant towards proper scientific management of the crop.

However, Pigeon pea crops have given the importance by the government because vast yield gap exists between potential yield and yield under real farming situation. KVK Sultanpur had done intensive efforts on training about scientific cultivation, demonstration on new variety and other interventions. The present study was conducted to impact assessment of front line demonstration on Pigeon pea crop in the operational area of the KVK.

Material and Methods: Krishi Vigyan Kendra (KVK) conducted 135 Front Line Demonstrations on oilseed crop of Pigeon pea on farmer's field in different blocks of Sultanpur district during 2016-17 and 2017-18. For conducting FLDs, farmers were identified/ selected following the survey suggested by Choudhary (1999).The required inputs were supplied and regular visits to the demonstration fields by the KVK scientists ensured proper guidance to the farmers. Field days and group meetings were also organized to provide the opportunities for other farmers to witness the benefits of demonstrated technologies. The sowing was done during last week of june under assured irrigated conditions and harvested during April.. However, the practices followed by farmers in general use local cultivar (Bahar), seed rate @ 20 kg/ha, no seed treatment, sowing from last week of July, in broadcasting manner, no use of fertilizer , no weed, water and plant protection measures followed. The data output were collected from both CFLD plots as well as control plots and finally the extension gap, technology gap, technology index along with the benefits cost ratio were work out (Samui et al., 2000) as given below:

Technology gap = Potential yield -Demonstration yield

Extension gap = Demonstrated yield - Yield under existing practice

$$\text{Technology index} = \frac{\text{Potential yield - Demonstrated yield}}{\text{Potential yield}} \times 100$$

RESULTS AND DISCUSSION

The analysis depicted in Table 2 showed the average yield of Pigeon pea varieties (NDA-2) were 19.2, 19.05 & 20.25 q/ha during 2016-17 and 2017-2018, respectively under demonstrated technology however, under farmer's practices the average yield were 14.2, 12.6 & 14.5 q/ha during respective years. However, the per cent increases against local yield were 35.21 & 38.8, 39.6 during 2016-17 and 2017-2018, respectively. The result is in conformity with the finding of Tiwari and Saxena (2001) and Tiwari et al., (2003). The results clearly indicated the positive effect of FLDs over the existing practices toward enhancing the yield of Pigeon pea in the study area due to use of high yielding variety, timely sowing, balance does of fertilizers along with sulphur, proper irrigation, need based plant protection etc.

Yield of the front line demonstration and potential yield of the crop was compared to estimate the yield gaps which were further categorized into technology and extension gap. The technology gap observed may be attributing to the dissimilarity in soil fertility status, timely sowing and weather conditions. Similar finding were recorded by Mitra and Samajdar (2010). Further, the higher extension gap was observed. The extension gap ranged from 5.0 to 6.45 q /ha during the

period of study that emphasizes the need to educate the farmers through various means for adoption of improved production technologies to mitigate the extension gap.

Table.1 Package of practices followed by farmers under FLD and in general

Particulars	Technology Interventions	Farmer's practices
Variety	NDA-2	Local cultivar (Bahar)
Seed rate	16 kg/ha	20 kg/ha
Seed treatment	PSB + Rhizobium 200gm/10 Kg seed & Trichoderma 5gm/Kg seed	No use
Time of sowing	Last week of June	Last week of July
Method of sowing	Line sowing	Broadcasting
Fertilizer management	Liquid Fertlizer NPK (18:18:18)	No use
Weed management	Pre-emergence application of Pendimethalin 30 EC 3.3 l/ha	No use
Plant protectio	Need based application of Imidachlorprid @ 0.5 ml/l lt. of water for the management of aphid control	No use

Table.2 Technical Impact of Pigeon pea crop demonstrations during 2016- 2018

No	Crop	Variety	Technology Demonstrated	Area (ha.)	No. of Demonstration	Potential yield (q/ha)	Yield of the crop (q/ha) under Demonstration			Variety and Yield of local Check (q./ha) (Bahar)	Increase in yield (%)
							Highest	Lowest	Average		
Year (2016-2017)											
1	Pigeon pea	NDA-2	HYV seed, weed management, nutrient management & P.P	10	55	28	19.8	18.6	19.2	14.2	35.21
Year (2017-2018)											
2	Pigeon pea	NDA-2	HYV seed, weed management, nutrient management & P.P	10	20	28	21.5	16.6	19.05	12.6	38.8
3	Pigeon pea	NDA-2	HYV seed, weed management, nutrient management & P.P	20	60	28	21.5	19.0	20.25	14.5	39.6

Table.3 Economic Impact of Pigeon pea crop

Variety	Average Cost of Cultivation (Rs./ha)		Average Gross Return (Rs./ha)		Average Net Return (Profit) (Rs./ha)		Benefit - Cost Ratio
	Demonstration plot	Local Check plot	Demonstration plot	Local Check plot	Demonstration plot	Local Check plot	
NDA -2	19,750	18,200	96,000	71,000	76,250	52,800	4.86
NDA -2	22,500	20,800	1,06,275	68,670	83,775	48,170	4.6
NDA -2	22,500	20,800	1,10,363	79,025	87,863	58,225	4.8

The data of Table 3 reveals that as far as economics of Pigeon pea is concerned; gross cost, net income and benefit cost ratio were Rs. 19,750/ha, Rs. 76,250/ha and 4.86, respectively during 2016-17 and Rs. 22,500/ha, Rs. 1,06,275 & 1,10,363/ha and 4.8 & 4.6, respectively during 2017-18 under demonstration plot. However, Rs. 19,750/ha gross cost, Rs. 76,250/ha net return with 4.86 benefit cost ratio during 2016-17 and Rs. 22,500/ha gross cost, Rs. 83,775 & 87,863/ha net return with 4.6 & 4.8 benefit cost ratio observed during 2017-18 under farmer's practices. The superiority of recommended package of practices under frontline demonstration over farmers' practice was also reported by Mitra and Samajdar (2010) and Balai et al., (2012).

Extension gap

On an average extension gap under two year Demonstration programme was 5, 6.45 & 5.75 q/ha. This emphasized the need to educate the farmers through various techniques for the adoption of improved agricultural production technologies to reverse this trend of wide extension gap.

Technology gap

The technology gap, the differences between potential yield and yield of demonstration plots was 8.8, 8.95 & 7.75 q /ha. This may be due to the soil fertility, managerial skills of individual farmer's and climatic condition of the area. Hence, location specific recommendations are necessary to bridge this gap.

Technology Index

The technology index shows the feasibility of the demonstrated technology at the farmer's field. The technology index was 31.43, 31.96 & 27.68 which shows the effectiveness of technical interventions. This accelerates the adoption of demonstrated technical interventions to increase the yield performance of Pigeon pea.

CONCLUSION:

From the findings of present study, it can be concluded that use of latest technologies of Pigeon pea cultivation can reduce the technology gap to a considerable extent resulting in to increased productivity of Pigeon pea in the district. It requires collaborative extension efforts to enhance adoption level of location and crop specific technologies among of the farmers for bridging these gaps. Therefore, extension agencies in the district need to provide proper technical support to the farmers through various educational and extension methods for better Pigeon pea production in the district

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