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IMPACT ASSESSMENT OF FRONT LINE DEMONSTRATIONS ON BLACK GRAM: AN EXPERIENCE FROM PRATAPGARH TRIBAL DISTRICT OF RAJASTHAN, INDIA

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Abstract

Krishi Vigyan Kendra Pratapgarh conducted Cluster Front Line Demonstration on black gram variety PU-31 at farmer field in the eight adopted villages of Pratagarh district from 2012 to 2017. Total 308 front line demonstrations were conducted in 125 hectare area with active involvement of farmers and scientific staff of KVK. According to analysis of data the highest yield was obtained in demonstrated plots with an average of 7.78 q/ha as compared to local check with an average of 6.14 q/ha. An average extension gap between demonstrated practices and farmers practices was recorded 1.63 q/ha. The net return (26769 Rs/ha) was obtained in the demonstration plots and 19222 Rs/ha was in local check plots. Benefit cost ratio was recorded higher in front line demonstrations (2.36) as compared to local check (1.96) during the period of study.

Key words: Front Line Demonstration, Technology Gap, Technology Index.

Introduction

Black gram (*Vigna mungo*) is a widely grown legume, belongs to the family Fabaceae and assumes considerable importance from the point of food and nutritional security in the world. It is a short duration crop and thrives better in all seasons either as sole or as intercrop. India is the world's largest producer as well as consumer of black gram. It produces about 1.5-1.9 MT of black gram annually from about 3.5 m ha area, with an average productivity of 600 kg/ha. Black gram output accounts for about 10 per cent of India's total pulse production. It is therefore, necessary to assess the technological gap in production and also to know the problems and constraints in adopting modern black gram production technologies Islam *et al.,* (2011). Krishi Vigyan Kendra an innovative science based institution plays an important role in bringing the research scientist face to face with farmers. The main aim of Krishi Vigyan Kendra is to reduce the time lag between generations of technology at the research institution and its transfer to the farmers for increasing productivity and income from the agriculture and allied sectors on sustained basis. KVKs are grass root level organizations meant for application of technology through assessment, refinement and demonstration of proven produce technologies under different micro farming situations in a district (Das, 2007). The main objective of front line demonstration was to show the worth or value of the technology. The present investigation was undertaken for "Impact Assessment of Front Line Demonstrations on Black gram: An Experience from Pratapgarh Tribal District of Rajasthan, India".

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Materials and Methods

The present study was carried out by Krishi Vigyan Kendra, Pratapgarh for six consecutive years from 2012 to 2017. Three hundred and eight farmers from eight adopted villages were selected under Cluster front line demonstration. The soil of FLD's field was clay to clay-loam and the PH of soil is near about 7.0-7.5. The improved technologies such as improved varieties, seed treatment, weed management, plant protection measures were maintained during period of study. Seed treatment was done with *Trichoderma, Rhizobium* and PSB. The seed rate of black gram was kept 15 kg/ha in demonstration plots. The sowing was done during first week of July to second week of July. The spacing between row and plant was kept 30 × 10 cm for the cluster front line demonstration. The fertilizers doses were also given as basal dose. One hand/ mechanical weeding with in rows were done at 30-35 days after sowing. The

Table 1: Technology demonstrated under CFLD's and farmers' practices.

S. No.	Particulars	Demonstrations	Farmers practice
1	Farming Situation	Rainfed	Rainfed
2	Variety	PU-31	T-9, Local
3	Time of sowing	1 July-15 July	1 July-25 July
4	Method of sowing	Line sowing	Line sowing
5	Seed Treatment	*Trichoderma, Rhizobium* & PSB	No Seed treatment
6	Seed rate	15 kg/ha	20-25 kg/ha
7	Fertilizer dose	N:P (15:40)	Nil
8	Plant Protection	Quinalfos for pod borere Profenofos for caterpillars and Imidachloprid for white fly	Not specific
9	Weed Management	Quizolfop 50 gm ai/ ha	Manual weeding

data were collected through personal contact with farmers at farmer's field and after that, tabulated and analyzed to find out the findings and conclusion. The statistical tool like percentage used in this study for analyzed data. The extension gap, technology gap and the technology index were work out with the help of formulas given by Samui *et al.,* (2000) as mentioned below:

1. Extension gap = Demonstration yield - farmers' yield (control)

2. Technology gap = Potential yield - demonstration yield

3. Technology index = (Technology gap / Potential Yield) × 100

Results and Discussion

The findings of the present research study as well as relevant discussion have been conferred under following points:

Yield performance

The seed yield of CFLD's plots was higher as compared to local check because of good variety, seed treatment, weed management and plant protection measures followed in CFLD's plots (Table 1). The table 2 depicted that the average seed yield was 7.78 q/ha which was higher as compared to local plots (6.14 q/ha). The increased % yield was 27.23 in CFLD's over local check. During 2014, the yield in demonstration plots was increased upto 41.82% over farmers practice. However, the obtained seed yield in CFLD's was low as compared to potential yield of the variety PU-31 due to weather conditions like drought/excessive rainfall at the time of flowering and pod formation stage of the crop. The similar results were also observed by Dubey *et al.,* (2010) and Poonia and Pithia, (2010). Yield of the front line demonstration trials and potential yield of the crop was compared to estimate the yield gaps which were further categorized into technology and extension gaps (Hiremath and Nagaraju, 2009).

Extension gap

An average extension gap between demonstrated practices and farmers practices was recorded 1.63 q/ha (Table 2). This Extension gap should be assigned to adoption of improved transfer technology in demonstrations practices which outcome in higher grain yield than the traditional farmer practices. The similarly observations were also obtained in Black gram crop by Bairwa *et al.,* (2013) and also Hiremath and Nagaraju, (2010).

Yield gap and technology index

Yield of the demonstration plots and potential yield of the crop was compared to estimate the yield gaps, which were further categorized in to technology and extension gaps. The average technology gap in the black gram was 4.23 q/ha (Table 2). The observed technology gap may be attributed dissimilarity in soil fertility status, rainfall distribution, disease and pest attacks as well as the change in the locations of demonstration plots every year. Further, the maximum extension gap of 2.3 q/ha was recorded in black gram (PU-31) demonstrations during kharif 2014. The table 2, also revealed that the average technology index was 35.21 percent. The technology index shows the feasibility of the variety at the farmer's field. The lower value of technology index more is the feasibility of technology. This indicates that a gap existed between technology evolved and technology adoption at farmer's field.

The similar results were also observed by Thakral and Bhatnagar, (2002), Bairwa *et al.,* (2013), Hiremath

Table 2: Productivity, extension gap, technology gap and technology index of black gram as grown under CFLD's and existing package of practices.

Year	Yield (q/ha)		Increase in yield (%)	Extension gap (q/ha)	Technology gap (q/ha)	Technology Index (%)
	Demo	Farmer				
2012	7.5	6.2	20.97	1.3	4.5	37.50
2013	9.1	7.6	19.74	1.5	2.9	24.17
2014	7.8	5.5	41.82	2.3	4.2	35.00
2015	6.6	5.1	29.41	1.5	5.4	45.00
2016	7.75	6.25	24.00	1.5	4.25	35.42
2017	7.9	6.2	27.42	1.7	4.1	34.17
Average	7.78	6.14	27.23	1.63	4.23	35.21

Table 3: Gross Return, Net Return, Gross cost Cultivation and BC Ratio of black gram as grown under FLDS and existing package of practices.

Year	Cost of cultivation (Rs)		Gross Return (Rs)		Net Return (Rs)		B:C Ratio	
	Demo	Farmer	Demo	Farmer	Demo	Farmer	Demo	Farmer
2012	12750	11850	30000	23560	17250	11710	1.35	0.99
2013	16700	16550	31605	22800	14905	6250	1.89	1.38
2014	14600	12100	33774	24750	19174	12650	1.31	1.05
2015	14700	13350	72600	61200	57900	47850	3.94	3.58
2016	13480	13100	46500	37500	33020	24400	3.45	2.86
2017	14825	13580	33191	26051	18366	12471	2.24	1.92
Average	14509	13422	41278	32644	26769	19222	2.36	1.96

and Nagaraju, (2010) and Dhaka *et al.,* (2010). Hence, it can be concluded from the table 2 that increased yield was due to adoption of improved varieties and conducting demonstration of proven technologies yield potentials of crop can be increased to greater extent.

Economic returns

Average cost of cultivation was higher in demonstration practice (14509 Rs/ha) as compared to farmers practice (13422 Rs/ha). Use of pricy seeds for crop sowing, seed treatment, recommended dose of chemical fertilizers, weed management, proper pest management etc., all of these were the main reasons for high cost of cultivation in demonstration plots than local check. The figures showed in table 3 clearly explicated the implication of front line demonstration at farmer's field during the period of study in which higher average net returns (26769 Rs/ha) was obtained under demonstration plots as compared to farmer practices (19222 Rs/ha). Average Benefit cost ratio was also recorded under front line demonstrations (2.36) as compared to farmer practices (1.96) during the period of study. The similarly findings was also obtained by Bairwa *et al.,* (2013). The above results showed that the integration of improved technology along with active participation of farmer has a positive effect on increase the Grain yield and Economic return of black gram.

Conclusion

There is a need of suitable technology for enhancing the productivity of black gram crop and it is also a need to conduct such demonstrations which may lead to the improvement and empowerment of farmers. High benefit: cost ratio also advocated the economic viability of the demonstration and motivated the farmers towards adoption of interventions demonstrated. Hence, by conducting front line demonstrations of proven technologies, yield potential of black gram crop can be increased to great extent. This will subsequently increase the income as well as the livelihood of the farming community.

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