Original Research Article

Impact Assessment of Front Line Demonstration (FLDs) on Yield of Green gram

ABSTRACT

The green gram cluster frontline demonstration was conducted by Krishi Vigyan Kendra, Jalgaon Jamod 2016-17, 2017-18 and 2018-19 in kharif season and covered 30 ha of land with 75 demonstrations in total 15 villages in 2 clusters of Buldana District of Maharashtra. In front-line demonstrations, improved quality seed variety, seed treatment, recommended fertilizers doses, Rhizobium, PSB bio-fertilizers and crop protection management approches were exhibited in farmers' field. The result showed that the highest grain yield was obtained in the proven plot with an average of 6.15 q/ha compared to 4.66 q/ha in farmers' practice. A higher average net return (Rs.19,712/ha) was obtained in the demonstration plots compared to practice farmers' plot(Rs.13,250/ha).The average B:C ratio was 2.10 in demonstrated plot compared to 1.80 in farmers plot. The average increase in demonstration yield over farmers practice was 32 percent and increase in net return over farmer practice was 49 percent. This is due to both improved technology and improved varieties. The level of return was significantly low for local practices due to significant difference in the extent of adoption of recommended practices versus the level of risk in terms of cost-benefit, skill and knowledge of the practices involved. Productivity was better than local practices demonstrated.

KEYWORDS: Greengram, FLD, Technology and Extension gap, Technology Index and Economic return

INTRODUCTION

'Green gram (*Vigna radiata L*) is the third important pulse crop in India. Green gram has strong root system and capacity to fix the atmospheric nitrogen into the soil and improves soil health and contributes significantly to enhancing the yield of subsequent crops' (Meena et al, 2012).

Front Line demonstration (FLD) is an important method to fully transfer the latest practice pack to farmers. In addition, these demonstrations are carefully designed when arrangements are made for rapid dissemination of the demonstrated technology to the farming community through the organization of other supportive outreach activities, such as field days and farmer conventions. Among the grain legumes, green gram is one of the most important crops in India. Its seeds are transfer more nutritious, more digestible and non-flatulent than other legumes grown in the country. 'The Indian Institute of Pulses Research, Kanpur, has projected the country's demand of pulses at 39 million tonnes by 2050, which will require pulses production to grow at an annual rate of 2.2%' (IIPR, 2015). To meet the rising demand, the country must both produce enough pulses and competitiveness in order to defend domestic production. To achieve this, more efficient crop production technologies, as well as favorable policies and market support, must be developed and implemented to encourage farmers to commit more acreage to legumes. In light of the foregoing, an extensive intervention, including cluster front-line demonstrations has been implemented in the Buldana district of Maharashtra to transfer the farm technology developed by FLDs' in legumes with the goal of enhancing productivity and to reduce profitability in the extension gaps arise. The yield gaps of technological extension in legumes in this comprehensive study are also presented in this paper appropriate extension strategy for effective technology transfer to target farmers in Buldana district introduce and dissemination of improved varieties of green gram (BM-2003-2).

MATERIAL AND METHODS

. Krishi Vigyan Kendra, Jalgaon (Ja.) Dist. Buldana, Maharashtra, in 2016-17, 2017-18 and 2018-19 conducted a Cluster Frontline Demonstration (CFLD) on improved production technologies for harvesting in 12 villages of two block of Sagrampur Tahsil, Buldana dist, Maharashtra green gram (*Vigna radiata L*) through in demo plots recommended practice packages were adopted while in control plot crops were grown according agricultural practice generally adopted by individual farmers. Soils of the CFLD plots were poor in N and moderate in P and K availability. The primary data on grain yield farmers' practices were collected from beneficiary farmers through crop cutting method followed by face-to-face interviews. Farmers were educated on preferred technology for demonstration before the key decision was taken. Improved quality seeds of green gram (BM-2003-2), seed treatment, and appropriate fertilizer dose, use of Rhizobium, PSB bio-fertilizers and crop protection management techniques were demonstrated in the farmers' field through front-line demonstration at various locations in terms of demonstration quality. The usual practices were maintained for the on-site inspections. All major farm operations were conducted under the supervision of KVK scientists through regular visits. The yield increase in demonstrations over farmers' practice was calculated by using the following formula:

Extension Gap (q/ha) = Demonstration Yield – Check Yield

Technology Gap (q/ha) = Potential Yield – Demonstration Yield

Technology Index (%) = Technology Gap / Potential Yield X 100

RESULTS AND DISCUSSION

Technologies implemented in the Front Line Demonstration cluster and practices adopted by farmers are presented in Table 1 and show that farmers did not adopt recommended practices in green gram.

Grain Yield

Grains of green gram under improved practices and general farming practices are presented in the Table 2 and Table 3, which clearly show that the use of high-yielding variety helps to increase the productivity of green gram under rainfed conditions. The average grain yield of green gram under improved practices ranged from 4.31 to 8.80 q/ha which is 23.47 to 29.07 percent higher than farmers' practices. In frontline demonstration plots, there was an average yield increase of 26.58 % farmers' practices. The findings support those of Singh et.al. (2012), Kaur et al. (2014), Lalit et al (2015) and Kumar & Kispotta (2017), who all observed an increase in green gram grain yield in front line demonstration plots.

Technology gap

The average green gram technology gap ranged from 1.20 to 5.69 q/ha. The average technology gap of 3.85 q/ha for green gram was reported in the present study. The larger technological gap can be mainly attributed to the uneven distribution of rainfall, differences in soil fertility and peripheral cultivation and locally specific crop management problems faced in order to exploit the yield potential of certain cultivars on demonstration plots.

Extension gap & Technology index

The extension gap varied from 0.82 q/ha to 2.44 q/ha during the study period. The average extension gap was 1.49 q/ha the technology index varied from 12.00 to 56.90 showing the feasibility of the farmer field's developed technology. The lower value of technology index, the more the feasibility is proven where as Poor field establishment in early vegetative stage due to water stress in rainfed agriculture with uneven distribution of rainfall, long dry period and increasing pressure from diseases and insect pests are the possible reason for poor yields causing higher technology index. Similar results were also reported by was also reported by Lalit et al. (2015) and Singh et al. (2017)

Economic and Front-Line Demonstration

Gross return and net return costs of cultivation shown in Table 3 and B:C ratio yield showed that cultivation costs range from Rs. 13,466 to Rs 20,742 / ha with average Rs. 17,753 per hectare under FLDs but under farmer conditions with a average of Rs 16,292 per hectare. During 2016-17, the maximum net return of Rs 25,823 per hectare was achieved under frontline demonstration. The suggested practices had a greater average benefit-cost-ratio (2.10) than a general farmer practice (1.80) was obtained. The findings are consistent with Raj et al (2013) and Kumar et al (2015) research.

CONCLUSION

Green gram grain yield was higher under improved techniques than under farmer practices, increasing yield per unit area while also increasing farmers' income. However, due to technology and extension gaps there is a large gap in potential yields, demonstration yields and farmers' plot yields among both crops suggesting need for appropriate dissemination of site-specific technologies embedded in high yielding varieties to increase productivity and profitability of rainfed agriculture to improve agriculture of Maharashtra.

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Table 1 : Difference between technological intervention & farmers practices for Green gram

Sr. No.	Particular	Front-line demonstration practices	Farmers practices
1	Soil testing	Soil tested	Not adopted
2	Variety	BM-2003-2	Local variety
3	Seed rate	10 kg	12 kg
4	Seed treatment	seed treatment with Rhizobium culture @ 250 ml/10 kg seed + PSB @ 250 ml/10 kg seed and Tricoderma 1.25kg /10 kg seed	No seed treatment
5	Time of Sowing	Last week of June to First fortnight of July	As per mansoon
6	Fertilizer dose	Urea 62.50 kg, SSP 250 kg and Zink sulphate 10 kg (on the basis of soil testing report) per ha in demo plot	Irrational use of nitrogenous fertilizers and graded fertilizer
7	Method of fertilizer application	Fertilizer drilled at the time of sowing	Broadcasting
8	Management of insect-pests	Insecticide spaying based on need at the economic threshold level (ETL)	Excess doses/ unrecommended brand of insecticide

Table 2 : Grain yield and gap analysis of front line demonstration on Green gram

Year	Area (ha)	No. of farmers	Yield q/ha			% increase over farmer practices	Technology gap (q/ha)	Extension Gap	Technology Index
			Potential	FLD plots	Farmer practices				
2016-2017	10	25	10	8.80	6.36	27.20	1.20	2.44	12.00
2017-2018	10	25	10	4.31	3.49	23.47	5.69	0.82	56.90
2018-2019	10	25	10	5.35	4.14	29.07	4.65	1.21	46.50
			Mean	**6.15**	**4.66**	**26.58**	**3.85**	**1.49**	**38.47**

Table : 3 Economics analysis of demonstrated plots and farmers practices of Green gram

Year	Av. Cost of Inputs (Rs/ha)		Av. Gross return (Rs/ha)		Average net return (Rs/ha)		B;C ratio	
	Demo. Plots	**farmers practices**	**Demo. Plots**	**farmers practices**	**Demo. Plots**	**farmers practices**	**Demo. Plots**	**farmers practices**
2016-2017	20742	18885	46566	36609	25823	17725	2.24	1.94
2017-2018	13466	12869	27512	22326	14041	9457	2.05	1.73
2018-2019	19051	17122	38324	29682	19272	12569	2.01	1.73
Mean	**17753**	**16292**	**37467**	**29539**	**19712**	**13250**	**2.10**	**1.80**