Asian Journal of Agricultural Extension, Economics & Sociology

40(7): 75-78, 2022; Article no.AJAEES.85354
ISSN: 2320-7027

Impact Assessment of Front-Line Demonstration (FLDs) on the Yield of Greengram

S. M. Umale [a€], U. U. Rajput [b#] and S. A. Borde [a*¥]

[a] *KVK, Warwat Bakal Road, Jalgaon (Jamod), Dist. Buldana-443402 (Maharashtra), India.*
[b] *Central Demonstration Farm, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, India.*

Authors' contributions

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

Article Information

DOI: 10.9734/AJAEES/2022/v40i730919

Open Peer Review History:
This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: https://www.sdiarticle5.com/review-history/85354

Original Research Article

Received 24 January 2022
Accepted 02 April 2022
Published 15 April 2022

ABSTRACT

The green gram cluster frontline demonstrations were conducted by Krishi Vigyan Kendra, Jalgaon Jamod during 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 culture, PSB bio-fertilizers and crop protection management approaches were exhibited in farmers' fields. The results showed that the highest grain yield was obtained in the demonstration plot with an average of 6.15 q/ha compared to 4.66 q/ha in the farmers' practice. A higher average net return (Rs.19,712/ha) was obtained in the demonstration plots compared to the 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 the increase in net return over farmer practice was 49 %. This is due to both improved technology and improved varieties. The level of return was significantly low for local practices due to a 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.

[¥] *SMS (Ext. Educ.);*
[#] *Agriculture Assistant;*
[€] *SMS (Agronomy);*
**Corresponding author: E-mail: bordeshyamsundar78@gmail.com;*

Keywords: Greengram; FLD; technology and extension gap; technology index and economic return.

1. INTRODUCTION

'Green gram (*Vigna radiata L*) is the third most 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' [1]. Its seeds are transferred 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 for pulses to reach at 39 million tonnes by 2050, which will require pulses production to grow at an annual rate of 2.2%' [2]. To meet the rising demand, the country must both produce enough pulses and competitiveness 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 have been organized in the Buldana district of Maharashtra to transfer the farm technology developed to enhance productivity and profitability. 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 to introduce and disseminate improved varieties of green gram (BM-2003-2).

2. MATERIALS 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 in 12 villages of two blocks of Sagrampur Tahsil, Buldana dist, Maharashtra for cultivating green gram (*Vigna radiata L*) through recommended practice packages; whereas in control plots, crops were grown according to 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 the crop cutting method followed by face-to-face interviews. Farmers were educated on preferred technology for a demonstration before the key decision was taken. Improved quality seeds of green gram (BM-2003-2), seed treatment, appropriate fertilizer dose, use of Rhizobium and PSB bio-fertilizers and crop protection management techniques were demonstrated in the farmers' fields through front-line demonstrations at various locations. 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

3. RESULTS AND DISCUSSION

Technologies implemented in the Front-Line Demonstration cluster and practices adopted by farmers are presented in Table 1.

3.1 Grain Yield

Grains of green gram under improved practices and general farming practices are presented in 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% in farmers' practices. The findings support those of Singh et.al. [3], Kaur et al. [4], Lalit et al. [5] and Kumar & Kispotta [6], who all observed an increase in green gram grain yield in front line demonstration plots.

3.2 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 to exploit the yield potential of certain cultivars on demonstration plots.

3.3 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 the technology index, the more the feasibility is proven where as poor field establishment in the 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. [5] and Singh et al. [7].

3.4 Economic and Front-Line Demonstration

Gross return and net return costs of cultivation depicted in Table 3 and show that cultivation costs range from Rs. 13,466 to Rs 20,742 / ha with average Rs. 17,753 per hectare under FLDs, but farmer conditions with an average of Rs 16,292 per hectare. During 2016-17, the maximum net return of Rs 25,823 per hectare was achieved under the 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. [8] and Kumar et al. [9] research.

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 1.25 kg /10 kg seed	No seed treatment
5	Time of Sowing	Last week of June to First fortnight of July	As per monsoon
6	Fertilizer dose	Urea 62.50 kg, SSP 250 kg and Zink sulfate 10 kg (based on 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 spraying 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 (q/ha)	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**

4. 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. This suggests for the need for appropriate dissemination of site-specific technologies embedded in high yielding varieties to increase productivity and profitability of rainfed agriculture to improve the agriculture of Maharashtra.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Meena OP, Sharma KC, Meena RH, Mitharwal BS. Technology transfer through FLDs on mung bean in semi-arid rgion of Rajasthan. Rajasthan J Ext Edu. 2012;20:182-186.
2. IIPR. Vision. Indian Institute of Pulses Research Kanpur, Uttar Pradesh, India. 2015;2050:1-50.
3. Singh G, Sharma K, Dhaliwal NS, Singh J. Boosting moong productivity through front line demonstration. Rajasthan J. Extn. Edu. 2012;20:32-34.
4. Kaur P, Kaur A, Kaur B, Singh K. Performance of front line demonstration on summer moong in Jalandhar district. J. Krishi Vigyan. 2014;3(1):58-61.
5. Lalit M, Patil DJ, Modi HM, Vasava, Gomkale SR. Evaluation of Front line demonstration programme on green gram variety Meha (IPM 99 – 125) in Bharuch district of Gujarat. J. Agric. & Vet. Sci. 2015;8(9):01-03.
6. Kumar S, Kispotta W. Impact of front line demonstration on summer moong through improved technology in Bhadohi district of Uttar Pradesh, India. Plant Archives. 2017;17(1):423-426.
7. Singh D, Singh KB, Gill NS, Grewal IS. Impact analysis of front line demonstration on pulses in Punjab. Internat. J. Farm Sci. 2017;7(1):190-194.
8. Raj AD, Yadav V, Rathod JH. Impact of front line demonstrations on the yield of pulses. Interernat. J. Sci. & Res. Public. 2013;3(9):1-4.
9. Kumar P, Singh K, Kaur P. Economic impact of frontline demonstration on pulses in Punjab a step towards diversification. Indian J. Econo. & Develop. 2015;11(1): 111-116.

Peer-review history:
The peer review history for this paper can be accessed here:
https://www.sdiarticle5.com/review-history/85354