

## Original Research Article

### **Impact Assessment of ~~Front-Line~~Front-Line Demonstration (FLDs) on Yield-The yield of Green gram**

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#### **ABSTRACT**

The green gram cluster frontline demonstration was conducted by Krishi Vigyan Kendra, Jalgaon Jamod 2016-17, 2017-18, and 2018-19 in kharif-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 approaches were exhibited in farmers' fields. 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 the practice farmers' plot (Rs.13,250/ha). The average B:C ratio was 2.10 in demonstrated plot compared to 1.80 in the farmer's plot. The average increase in demonstration yield over farmers' practice was 32 percent and the 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 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. Productivity was better than local practices demonstrated.

**KEYWORDS:** Green gram, FLD, Technology and Extension gap, Technology Index and Economic return

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#### **INTRODUCTION**

'Green gram (*Vigna radiata* L) is the third important pulse crop in India. Green gram has a 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~~<sup>red</sup> 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 to enhance~~ productivity and ~~to reduce~~<sup>reducing</sup> 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<sup>s</sup> 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 ~~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, ~~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~~ 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 % in 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 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. (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 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 (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 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.

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## REFERENCES

- 115 IIPR.2015 Vision. Indian Institute of Pulses Research Kanpur, Uttar Pradesh, India;2050:1-50.
- 116 Jeengar KL, Panwar P, Pareek OP. 2006. Front line demonstration on maize in bhilwara District  
117 of Rajasthan, *Current Agriculture* **30** (1/2):115-116.
- 118 Kaur, P., Kaur, A., Kaur, B. and Singh, K. 2014. Performance of front line demonstration on  
119 summer moong in Jalandhar district. *J. Krishi Vigyan*, **3** (1): 58-61.
- 120 Kumar, P., Singh, K. and Kaur, P. 2015. Economic impact of frontline demonstration on pulses  
121 in Punjab a step towards diversification. *Indian J. Econo. & Develop.*, **11** (1): 111-116.
- 122 Kumar, S. and Kispotta, W. 2017. Impact of front line demonstration on summer moong through  
123 improved technology in Bhadohi district of Uttar Pradesh, India. *Plant Archives*, **17** (1):  
124 423-426.
- 125 Kumar S, Mahajan V, Sharma PK, Prakash S. 2019. Impact of front line demonstrations on the  
126 production and productivity of moong (*Vigna radiata* L), mash (*Vigna mungo* L),  
127 rajmash (*Phaseolus vulgaris* L), lentil (*Lens culinaris* L) and chickpea (*Cicer aeritinum*  
128 L) under rainfed ecology in mid hills of J & K, India. *Legume Research* **42** (1) :127-133.
- 129 Lalit, M., Patil, D.J., Modi, H.M., Vasava and Gomkale, S.R. 2015. Evaluation of Front line  
130 demonstration programme on green gram variety Meha (IPM 99 – 125) in Bharuch  
131 district of Gujarat. *J. Agric. & Vet. Sci*, **8** (9): 01-03.
- 132 Meena O P, Sharma K C, Meena R H and Mitharwal B S 2012. Technology transfer through  
133 FLDs on mung bean in semi-arid region of Rajasthan. *Rajasthan J Ext Edu* **20**:182-186.
- 134 Raj, A.D., Yadav, V. and Rathod, J.H. (2013). Impact of front line demonstrations on the yield of  
135 pulses. *Interernat. J. Sci. & Res. Public.*, **3** (9): 1-4.
- 136 Sangeetha, R., Ashok, K.R. and Priyanka, P.A. 2020. Scenario of Major Pulse Production in  
137 Tamil Nadu: A Growth Decomposition Approach. *Eco. Affairs*, **65**(2): 301-307.
- 138 Singh, D., Singh, K.B., Gill, N.S. and Grewal, I.S. 2017. Impact analysis of front line  
139 demonstration on pulses in Punjab. *Internat. J. Farm Sci.* , **7** (1):190-194.
- 140 Singh, G., Sharma, K., Dhaliwal, N.S. and Singh, J. 2012. Boosting moong productivity through  
141 front line demonstration. *Rajasthan J. Extn. Edu.*, **20**: 32-34.

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143 | **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 <del>monsoon</del> <u>monsoon</u>
6	Fertilizer dose	Urea 62.50 kg, SSP 250 kg, and Zink <del>sulphate-sulfate</del> 10 kg ( <del>on the basis of</del> <u>based on</u> 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 <del>spraying</del> 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 the 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	

151 | **Table : 3 Economics analysis of demonstrated plots and farmers' practices of Green gram**  
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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
<b>Mean</b>	<b>17753</b>	<b>16292</b>	<b>37467</b>	<b>29539</b>	<b>19712</b>	<b>13250</b>	<b>2.10</b>	<b>1.80</b>

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