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Impact of Demonstrations on Productivity and Profitability of Greengram in Gandhinagar district of Gujarat

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ABSTRACT

The present study was conducted by KVK during 2017 to 2019 in the summer seasons with 172 demonstrations across 13 villages of Gandhinagar district of Gujarat. The improved technologies consisted use of disease resistant variety, seed treatment with bio-fertilizers, integrated nutrient and weed management, pest and disease management. The results revealed that the highest seed yield was obtained in demonstrated plot with an average of 963.3kg/ha as compared to 733.3kg/ha. Higher net return (Rs 29056/ha) was obtained in the demonstration plots compared to farmers' practice plot (Rs 20766 /ha). The increase in the demonstration yield over farmer's practices was 31.3 per cent. The average extension gap was 230kg/ha and average technology gap 536.6kg/ha was recorded.

Key Words: Bio fertilizer, Greengram, Productivity, Profitability.

INTRODUCTION

Pulses play vital role in nutritional security and are a major source of vegetable proteins in our country. India is the world's largest producer of pulses, it imports a large quantity of pulses to meet the growing domestic needs. Thus, India is the largest importer, producer and consumer of pulses. Pulses contribute 11per cent 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. Over a period of time, a number of improved pulses varieties and production technologies have been developed, but full potential of these varieties as well as technologies could not be exploited due to low rate of adoption and low yields. Thus, factors limiting the productivity cannot be overlooked. Research and extension programme need to be diverted to produce value additive pulses. It may emphasize on quality attributes, adoption and popularization of new agro technology, evolving better varieties for stress conditions and improving present yield potential. The aim of these demonstrations in general was to raise production through transfer of farm technology. The efforts were taken with planning, execution and follow up action of the pulses production technology through front line demonstrations (Sumathi, 2012).

The productivity of pulses in India (694 kg/ha) is lower than most of the major pulse producing countries. In Gujarat, *kharif* and summer green gram was cultivated in an area of 2.65 Lakh ha with production 1.20 Lakh tones and productivity of 455 kg/ha during the year 2011-12 (DOA, 2011-12). The main objective of front line demonstrations is to demonstrate newly released crop production technologies and its management practices in the farmers' field under different farming situations and at different agro climatic regions. The present study has been undertaken to evaluate the difference between demonstrated technologies vis-a-vis practices followed by the local farmers in green gram crop.

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Table 1. Differences between farmers' practices and technological intervention for green gram crop.

Sr. No.	Practice	Demonstrated practice	Farmers' practice	Critical inputs
1	Farming situation	Irrigated	Irrigated	
2	Field preparation	2 ploughings	Single plough	-
3	Method of sowing	Line sowing behind the plough	Broad casting	-
4	Time of sowing	First fort night of march	15th Feb to 5th March	-
5	Variety	GAM-5	K-851 & local seeds	Seeds of variety GAM-5
6	Seed treatment	Seed treatment with *Rhizobium*, PSB and Imidacloprid	No seed treatment	PSB, *Rhizobium* and Imidacloprid
7	Seed rate & spacing	16 kg / ha and 45 x 10 cm	24 kg/ha Broad cast	16kg
8	Manures and Fertilizers	Urea @ 43 kg/ha and SSP@ 222 kg/ha Sulphur 20kg/ha	Irrational use of nitrogenous fertilizers and less use of phosphate fertilizers.	20kg sulphur
9	Weed management	One interculture and manual weeding	No weeding/ manually	
10	Plant Protection	Neem oil @ 5ml/l and for control of sucking pest.	Injudicious use of and insecticides and fungicides.	Neem oil

MATERIALS AND METHODS

The present study was carried out by the Krishi Vigyan Kendra during summer season from 2017 to 2019 at the farmers' fields of different 13 villages of Gandhinagar district of Gujarat. In total 172 Cluster frontline demonstrations in 80ha area in different villages were conducted. A group of co-operative farmers were identified based on their participation and feedback received during the preliminary survey and interactive meeting. All 172 demonstrations on 80 ha area were conducted by the active participation of farmers with the objective to demonstrate the improved technologies of pulses production potential in different villages.

Assessment of gap in adoption of recommended technology before laying out the cluster frontline demonstrations (CFLD's) through personal discussion with selected farmers. The awareness programme was organized for selection of farmers and skilled development about detailed technological intervention with improved package and practice for successful cultivation. Critical inputs for the technologies were demonstrated (Table 1) after imparting the training like improved high yielding variety, recommended chemicals and literature and regular visit, monitoring and pest and disease advisory services management by the KVK scientist. The satisfaction level of participating as well as neighboring farmers' for the performance of improved variety demonstrated was also assessed. The economic-parameters (Gross return, net return and B:C ratio) were worked out on the basis of prevailing market prices of inputs and minimum support prices of outputs. The data output were collected from both FLD as well as control plot and finally the extension gap, technological gap, technological index along with the benefit-cost ratio were calculated (Samui *et al*,2000). The data were collected through personal contact with farmers at farmer's field. 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) .

RESULTS AND DISCUSSION

The improved package of practices was more important with technological intervention for

Table 2. Grain yield and gap analysis of cluster frontline demonstrations on Green Gram.

Year	Number of Demonstrations	Average yield Kg/ ha		% Increase in Recommended Practice (RP)	Extension gap (kg/ ha)	Technology gap (kg/ ha)	Technology Index
		Recommended practice	Farmers practice				
2017	68	980	750	30.6	230	520	34.6
2018	60	960	720	33.3	240	540	36
2019	44	950	730	30.1	220	550	36.6

productivity and profitability of pulses. It was also observed that farmer's use injudicious and un-recommended insecticides. Similar observations were reported by Singh *et al* (2011). The seed yield of demonstration plots was higher as compared to farmers practice due to high yielding YMV resistance variety and other integrated crop management practices. A comparison of yield performance between demonstrated practices and local checks was shown in Table 2.

The data revealed that average grain yield of demonstrated field's was higher from farmer's practice in all three years. The results revealed that average grain yield of Greengram under cluster frontline demonstrations were 980, 960 and 950kg/ ha as compared to 750, 720 and 730 kg/ha recorded in farmer's practice and average yield increase of 30.6,33.3 and 30.1 per cent, respectively. Similar yield enhancement in different crops in front line demonstration has been documented by Poonia and Pithia (2011), Patel *et al* (2013) and Raj *et al* (2013). Yield of the front line demonstration trials and potential yield of the crop was compared to estimate the yield gaps which was further categorized into technology and extension gaps (Hiremath and Nagaraju, 2009).

Extension gap

The extension gap is the difference or gap between demonstration yield and farmers' practices (control). The extension gap was 230, 240 and 220 kg/ ha, respectively for three years. The average extension gap between demonstration practices and farmers practices was recorded 230kg/ha (Table 2). This extension gap should be assigned to adoption of improved transfer technology in demonstrations practices resulted in higher seed yield than traditional farmer practices.

Technology gap

The technology gap is the difference or gap between the demonstration yield and potential yield. It was found 537kg/ha (Table 2). The technology gap observed may be attributed to dissimilarity in the soil fertility status and weather conditions. Hence, location specific recommendation appears to be necessary to bridge the gap between the yields. These findings were similar to the findings of Patel *et al* (2013).

Technology index

The Technology index shows the feasibility of the technology at the farmer's field. The results revealed that the technology index value was 35.7

Table.3 Economics of front line demonstration.

Year	Total returns (Rs./ha)		Gross cost (Rs./ha)		Net return (Rs./ha)		Additional return (Rs./ ha)	B:C ratio	
	RP	FP	RP	FP	RP	FP		RP	FP
2017	39200	27400	19050	27400	20150	18150	2000	2.06:1	1.51:1
2018	48000	36000	18750	17200	29250	18800	10450	2.57:1	2.09:1
2019	57000	43800	19300	18450	37770	25350	12420	2.951	2.37:1
Average	**48061**	**35733**	**19033**	**21016**	**29056**	**20766**	**8290**	**2.53:1**	**1.99:1**

per cent. This indicates that a gap existed between technology evolved and technology adoption at farmer's field. The similar results were also observed by Gangadevi *et al*(2017), Kumar *et al* (2014), Thakral and Bhatnagar (2002), Bairwa *et al* (2013), Hiremath and Nagaraju, (2010) and Dhaka *et al* (2010). The results of economic analysis of green gram production revealed that average cost of cultivation increased in demonstration practice (21016 Rs/ha) as compared to Farmers practice plot check (19033 Rs/ha). It was observed that front line demonstrations recorded higher gross returns (Rs 48061/ha) and net returns (Rs 29056/ha). The benefit cost ratio of demonstration plot (2.53) was also more than the farmers' practice (1.99). Average net return increased by Rs 8290/-ha.

CONCLUSION

The findings of the study revealed that wide gap exist in demonstration yield and farmers' practice in green gram cultivation due to technology and extension gap in Gandhinagar district of Gujarat. The per cent increment in yield of green gram to the extent of 31.3 under demonstrations over the farmers' practice created greater awareness and motivated the other farmers to adopt the improved package of practices of green gram.

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