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Outcome of Fld Programme on Greengram (*Vigna radiata* L.) Production under Rainfed Conditions of Chamarajanagar District of Karnataka State

C. M. Sunil[1*], P. Mahadevu[2], G. S. Yogesh[1], Chandrakala Hanagi[1], A. B. Mohankumar[1], H. P. Rajath[1] and P. S. Abhishek[1]

[1]ICAR-Krishi Vigyan Kendra, Chamarajanagar District, UAS, GKVK, Bengaluru, Karnataka-571127, India
[2]Pulse Breeder, ZARS, V C Farm, Mandya, UAS, GKVK, Bengaluru, Karnataka-571405, India

**Corresponding author*

A B S T R A C T

Green gram (Mungbean) is an important pulse crop of India next to tur and blackgram. It plays an important role in enhancing the income of small and marginal farmers of Southern Karnataka. The production of greengram in district is very less as compared to state and national average. However, the domestic requirements are also higher, due to this greengram is being imported. With this the ICAR-Krishi Vigyan Kendra, Chamarajanagar district conducted 50 frontline demonstrations on greengram covering an area of 20 ha of farmers' fields in villages *viz.*, K. Mookalli, Sappayyanapura, Hanahalli, Kotamballi and Taggaluru during the year 2018 and 2019 to exhibit latest production technologies in comparison with farmer's practice. Demonstrated technologies comprised recommended seed rate, sowing method, nutrient management and pest and disease management and adoption of whole package of practices for the crop. The study revealed that the demonstrated technology recorded a mean yield of 545.5 kg/ha which was 182.1 % higher than obtained with farmers' practice (193.3 kg/ha). Higher Benefit: Cost ratio of 1.38 was obtained with improved technologies in comparison to farmers' practices (0.52). The frontline demonstrations conducted on green gram at the farmers' field revealed that the adoption of improved technologies significantly increased the yield as well as yield attributing characters of crop as compared to the farmers' practices. Therefore, there is a need to disseminate the improved technologies among the farmers with effective extension methods like training and demonstrations. The farmers' should be encouraged to adopt the recommended package of practices for realizing higher returns.

Keywords

Frontline demonstration, Technology gap, Extension gap, Technology index

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Introduction

Pulses are the preliminary source of dietary protein for majority of population in India. Other than this the food legumes are also used as fodder or green manure, few of them are used as silage, while others are extracted for their oil, notably soybean and groundnut (Ofuya and Akhidue, 2005). Besides being the source of protein, pulses contribute substantially to food production system by enriching the soil through biological nitrogen fixation and improving soil physical conditions. Though pulses are consumed all over the world, its consumption is higher in those parts of the world where animal proteins are scarce and expensive (Ofuya and Akhidue, 2005). Pulses are important food crops for human consumption and animal feed. Being leguminous in nature, they are considered to be important components of cropping systems because of their viability to fix atmospheric nitrogen, add substantial amounts of organic matter to the soil and produce reasonable yields with low inputs under harsh climatic and soil conditions (Rakhode *et al*., 2011).

India is the major pulse producing country in the world which shares 30-35% and 27-28% of the total area and production of pulse, respectively. Even though pulse production increased significantly during last decade growth but maintaining that trend is a challenge for researcher, extension agencies and policy makers to fulfill the domestic demand. In India, during 2017 -18 the total pulse area was 29.99 m ha with a production and productivity of 25.23 million tonnes and 841kg ha^{-1}, respectively. In Karnataka, the area, production and productivity was 3.02 m ha, 1.86 m t and 614 kg ha^{-1}, respectively (Anonymous 2018).

In Karnataka, Chamarajanagar district is known for its varied agro-climatic conditions with diversified cropping situation. Among different pulses grown in district, green gram and black gram occupies major area. The productivity of green gram of state is 247 kg ha^{-1}. Whereas the district productivity is 189 kg ha^{-1}. The major reasons for the lower productivity of green gram are erratic rainfall, cultivation of crops under poor and marginal lands, broadcasting of seeds, local varieties, non-availability of season based quality seeds resulting in increased pest and disease incidence particularly yellow mosaic virus, no seed treatment with bio-fertilizers (Rhizobium and PSB), not practicing application of micronutrients, Poor management of pests and diseases (Sengupta and Biswas, 2017).

To address these issues KVK, Chamarajanagar intervened since from 2017-18 to till date to improve the production and productivity of the crops by taking several participatory research and extension activities *viz*., Front line demonstrations (50 No's), method demonstrations (15 No's), training programmes (15 No's). With this background the present study was designed with following objectives; Introduction of new improved varieties of Greengram (KKM 3) and creating the awareness among farmers on importance of quality seed production and other production technologies.

Materials and Methods

Present study was conducted on FLD: ICM in greengram in rainfed condition in Chamarajanagar district of Karnataka state. In total 50 frontline demonstrations were conducted on farmers' field in villages of K. Mookkalli, Sappayyanapura, Hanahalli, Kotamballi and Taggaluru of Chamarajanagar district of Karnataka during pre-kharif and late kharif season of 2018 and 2019 under rainfed condition. Each demonstration was conducted on an area of 0.4 ha and 1.0 ha adjacent to the demonstration plot was kept as farmers' practices.

The package of improved technologies like line sowing, integrated nutrient management includes micro nutrient application (Zinc sulphate), seed treatment with systemic insecticides, Rhizobium and PSB and whole package were demonstrated. Greengram variety KKM-3 (Karnataka Kathalagere Moong 3) is a short duration (60-65 days) and improved green gram variety released from ARS, Kathalagere, Karnataka during 2009 having yield potential of 7.5-8 q ha^{-1} under rainfed condition with a Moderately tolerant to Yellow Mosaic Virus and Powdery Mildew disease and also for Pod borer. The technologies demonstrated under FLDs and details of farmers' practices are given in Table 1. In case of local check plots, existing practices being used by farmers were followed. In general, soils of the area under study were Shallow black soils and medium to low in fertility status. The spacing was 30 cm between rows and 10 cm between plants in the rows. Thinning (within 10-15 DAS) and weeding operations were done invariably 35-40 days after sowing to ensure recommended plant spacing (10 cm) within a row (30 cm) because excess population adversely affects growth and yield of crop.

Sowing was done during 1^{st} week of May to June 1^{st} week except Tagluru (2^{nd} week of August) with a seed rate of 15-20 kg/ha. Other management practices were applied as per the package of practices. The objective of the performance evaluation was to study the gaps between the potential yield and demonstration yield, extension gaps and the technology index. In the present study the data on output of greengram crop were collected from FLD plots, besides the data on local practices commonly adopted by the farmers of this region were also collected to estimate the technology gap, extension gap and the technology index by adopting suitable formulae (Naik *et al*., 2015 and Meena and Singh, 2017). The details of different parameters and formula adopted for analysis are as under: Extension gap = Demonstration yield - Farmers' practice yield, Technology gap = Potential yield - Demonstration yield, Technology index = Potential yield - Demonstration yield/Potential yield x 100.

Results and Discussion

The results showed that the frontline demonstrations conducted have given a positive response from the greengram growers of Chamarajanagar as they were inspired by the new agricultural technologies adopted. The plant height, number of branches per plant, number of pods per plant, seeds per pod and 100 seed weight were highest with the FLD plots as compared to farmers' practices (Table 2). Reduced per cent yellow mosaic incidence and sucking pest incidence in KKM 3 has helped in good growth and better yield parameters.

Yield of greengram has varied in different years, which might be due to the soil moisture availability & rainfall condition, climatic aberrations, disease and pest attacks as well as the change in the location of trials every year (Naik *et al*., 2015). However, the maximum grain yield was recorded with improved technologies plot (FLD) as compared to farmers' practice plots in both the years (Table 3). This was mainly attributed to good growth and yield parameters presented in table 2. The per cent increase in yield was 244.7 and 138.8 % in 2018 and 2019 respectively.

Data pertaining to technological gap, extension gap and technological index are depicted in Table 4. The technology gap, the gap in the demonstration yield over potential yield ranged from 188 to 215 kg/ha respectively. The technology gap detected may be due to heterogeneity in the soil fertility status and weather conditions as well as the soil moisture availability. Hence site-specific recommendations are necessary in bridging the gap between the yields of different technologies.

An extension gap of 355 kg/ha was recorded. Whereas, the highest extension gap of 399 kg/ha was observed during 2018-19. This emphasized the need to educate the farmers through various means for more adoption of newly improved agricultural technologies to bridge the wide extension gap. More and more use of new high yielding varieties by the farmers will subsequently change this alarming trend of galloping extension gap.

The new technologies will eventually lead the farmers to discontinue old varieties. This high extension gap in all these varieties requires urgent attention from planners, scientists, extension personnel and development departments. The technology index shows the feasibility of the evolved technology at the farmers' field. The lower the value of technology index more is the feasibility of the technology. The technology index was 26.87 percent. In Chamarajanagar district, a small chunk of farmers have access to irrigation or affordable chemical inputs, and where growth and yield reducing losses, farmers' actual yields are less than its genetic potential. Sustainable intensification strategies for Chamarajanagar region requires improved soil, water and nutrient management innovations.

Adoption of a technology purely stands on its economic feasibility and has been presented in table 5. The highest cost of cultivation was observed with demonstration plots as compared to farmers' practice (Table 5). The maximum gross returns, net returns and B:C ratio was observed with demonstration plot (Rs. 377720, Rs. 12036 and 1.46, respectively) as compared to farmers' practice (Rs.11553, Rs. -11423 and 0.52 respectively).

Table.1 Particulars showing the details of greengram grown under FLD and farmers' practice

Particulars	Farmers Practice	Technology intervention	Gap
Variety	Local	KKM 3	Full Gap
Seed rate	25-30 kg/ha	15-20 kg/ha	Partial gap
Sowing	Broadcasting/Line sowing	Line Sowing (30cm X 10cm)	Full Gap
Seed Treatment	No seed treatment	Seed treatment with systemic insecticide fb by Rhizobium and PSB @ 500 g/ha, respectively.	Full Gap
Nutrient Management	Only FYM applied and no fertilizers.	Application of FYM 3t/ha, RDF @ 25:50:25 NPK kg/ha, $ZnSO_4$ @ 10 kg/ha, Foliar application DAP @ 2 % during pre-flowering	Partial Gap
Weed Management	Hand weeding or No weed management	Weeds control by using herbicide Pendimethalin 1kg/ha in 500 liter of water as pre-emergence treatment for effective control of weeds within two days after sowing. + one intercultivation @ 35-40 DAS	Partial Gap
Plant protection	No application of Plant protection chemicals	Need based plant protection chemicals were used.	Full Gap

Table.2 Growth and yield attributing characters of Green gram variety KKM-3 in comparison with Farmers practise

Sl. No.	Year	Plant Height (cm)		No. of Branches/plant		No. of Pods/plant		Seeds/pod		100 seed weight (g)		Per cent Yellow mosaic incidence	
		IT	FP	IT	FP	IT	FP	IT	FP	IT	FP	IT	FP
1	2018-19	31.0	28.2	4.3	3.5	22.6	11.0	12.8	10.3	4.56	3.81	7.0	97.0
2	2019-20	29.9	27.9	4.2	3.0	21.6	10.2	12.9	8.10	4.43	3.95	0.0	21.3
Average		**30.5**	**28.1**	**4.25**	**3.25**	**22.10**	**10.60**	**12.85**	**9.20**	**4.50**	**3.88**	**3.50**	**59.2**

Note: IT-Improved Technologies, FP- Farmers practice

Table.3 Seed yield of greengram as affected by improved and farmer practices in farmers' fields

Sl. No.	Year	Area (ha)	No. of Farmers	Seed yield (q/ha)		Additional yield over farmers practice (kg/ha)	% increase over check
				Improved Technologies	Farmers Practices		
1	2018-19	4.0	10	5.62	1.63	3.99	244.7
2	2019-20	16.0	40	5.35	2.24	3.11	138.8
Average				**5.49**	**1.94**	**3.55**	**191.8**

Table.4 Technological gap analysis of frontline demonstrations on greengram in farmers' field

Sl. No.	Year	Area (ha)	Seed Yield (q/ha)			Technology Gap (q/ha)	Extension Gap (q/ha)	Technology Index (%)
			Potential	Demonstration	Control			
1	2018-19	4.0	750	562	163	188	399	25.06
2	2019-20	16.0	750	535	224	215	311	28.67
Average			**750**	**549**	**194**	202	355	26.87

Table.5 Economics of frontline demonstrations on greengram in farmers' field

Sl. No.	Year	Cost of Cultivation (Rs./ha)		Gross returns (Rs./ha)		Net returns (Rs./ha)		B:C Ratio	
		IT	FP	IT	FP	IT	FP	IT	FP
1	2018-19	26360	24975	38764	7313	12404	-17662	1.47	0.29
2	2019-20	25008	21975	36676	15792	11668	-5183	1.46	0.75
Average		25684	23475	37720	11553	12036	-11423	1.46	0.52

Note: IT-Improved Technologies, FP- Farmers practice

Adoption of improved production technologies along with KKM-3 new short duration variety with medium tolerance to yellow mosaic incidence and pod borer has proven best technologies in getting higher yield and given new hopes to other farmers of Chamarajanagar district and also helps in enhancing greengram production and productivity through horizontal and vertical expansion.

References

Anonymous, 2018, www.agricoop.nic.in, Department of Agriculture, Cooperation and Farmers welfare.

Meena, ML and Singh, D. 2017. Technological and extension yield gaps in greengram in Pali district of Rajasthan, India. *Legume Research*, 40(1):187-190.

Naik, A, Patil, DH, Siddappa and Teggelli, RG. 2015. Evaluation of Frontline Demonstration of Greengram (*Vigna radiata* L.) in Kalaburagi Region of Northern Karnataka. Trends in Biosciences 8(11): 2818-2820.

Ofuya , ZM and Akhidue, V. 2005. The Role of Pulses in Human Nutrition: A Review. J. Appl. Sci. Environ. Mgt., 9(3): 99-104.

Rakhode, PN, Koche, MD and Harne, AD. 2011. Management of powdery mildew of greengram. Journal of Food Legume, 24(2): 120-122.

Sengupta K and Biswas S. 2017. Pulse Production and Ecology: The Issues of Community Mobilisation in India. Agricultural Extension Journal 1(1): 31-34.

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