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Performance of Greengram (*Vigna radiata* L.) Under Integrated Crop Management in North Eastern Dry Zone of Karnataka

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ABSTRACT

The present study was conducted by ICAR- KVK, Raddewadagi UAS, Raichur scientists during Kharif 2016 season with 50 frontline demonstrations in Jewargi and Chittapur taluka of Kalaburagi district, Karnataka state. The results of demonstrations showed that farmers could increase the greengram productivity notably by switching over to improved variety and adoption of improved production technology. From the front line demonstrations, it was observed that the improved greengram variety BGS-9 along with integrated management practices recorded higher yield (804 kg/ha) compared to the farmer's practices variety (634 kg/ha). The increase in the demonstration yield over farmer's practices was 26.81 per cent. Technology gap and the technology index values were 196 kg/ha and 170, respectively. The decline in overall yield and area under cultivation of greengram in Kalaburagi district was due to the high incidence of yellow vein mosaic (YVM) disease. The increment in yield of greengram crop under front line demonstrations was due to spreading of improved and latest technology viz., YVM management practices, seed treatment with bio-agents, recommended seed rate, proper dose of fertilizers and plant protection measure. In spite of increase in yield, technological gap, extension gap and technology index existed. The improved technology gave higher gross return, net return with higher benefit/cost ratio than farmer's practices.
Key words: *Greengram, FLD, Farmer practice, Production, Productivity*

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INTRODUCTION

Pulses have great importance in Indian agriculture as they are rich source of protein (17 to 25 %) as compared to that of cereals (6 to 10 %), their ability to fix atmospheric nitrogen and improve the soil fertility. Among pulses, black gram is one of the most important crop. Protein malnutrition is prevalent among men, women and children in India. Pulses contribute 11 per cent of the total intake of proteins in India [14]. 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. Pulses are water saving crops and more than 92 per cent of the area under pulses is rainfed. About 23 million tons of pulses need to be imported every year to meet the domestic demand. The yield (around 780 kg/hectare) of pulses is less than the global average. Adoption levels for several components of the improved technology of the crop were low emphasizing the need for better dissemination [7]. Several biotic, abiotic and socio-economic constraints inhibit exploitation of the yield potential of black gram and these are needed to be addressed. Crop growth and yield are limited through poor plant nutrition and uncertain water availability during the growth cycle. Inappropriate management may further reduce the fertility of soil [12].

The extent of adoption of improved agricultural technologies is a crucial aspect under innovation diffusion process and the most important for enhancing agricultural production at a faster rate. Large number of technologies evolved in the field of agriculture is not being accepted and adopted to its fullest extent by the farmers. The gap between recommendations made by the scientists and actual use by farmers is frequently encountered. With the start of technology mission on oilseeds, frontline demonstration on oilseed crops using new crop production technology was started with the objectives of showing the production potential of the new technologies under real farm situation over the locally cultivated oilseed crops. The main objective of ICM is to demonstrate the crop production technologies and management practices in the farmers' fields under different agro-climatic regions and farming situations. The ICAR- KVK has followed the concept of ICM in true spirit and conducted large number of demonstrations in different villages of Kalaburagi district under NFSM programme. The present study has been undertaken to evaluate the difference between demonstrated technologies *vis-a-vis* practices followed by the local farmers in greengram crop.

MATERIAL AND METHODS

The study was conducted at ICAR- KVK, Raddewadagi in Kalaburagi district in Karnataka state in farmers fields during Kharif 2016 with objective to popularize improved technologies for productivity enhancement of greengram through ICM. Fifty ICM were conducted in farmer's field. To diffuse greengram productivity enhancement technologies on campus and off campus trainings were conducted. Then improved practices were demonstrated with the following technologies

1. Improved variety- BGS-9
2. Seed treatment with PSB (500 g), *Rhizobium* (500 g) and *Trichoderma* (5 g per kg of seeds)
3. Balanced nutrient application (FYM 5 t/ha, 12.5 kg N and 25 kg P_2O_5)
4. Integrated pest management (Timely spray of insecticides)

In check plot, farmers were applied in their regular practices (local variety, 10 Kg N and 20-25 kg P_2O_5). The greengram crop was sown during Kharif 2017 in an adequate soil moisture condition. The crop was harvested at maturity stage. For the study, technology gap, extension gap and technology index were calculated as suggested by Samui *et al.,* [15].

Technology gap= Potential yield – Demonstration yield

Extension gap = Demonstration yield – Farmers yield

Technology index (%) = (Potential yield – Demonstration yield /Potential yield) * 100

RESULTS AND DISCUSSION

The data were subjected to analyze, technology gap, extension gap and technology index was calculated as per the formula and economic analysis was done as per procedure and data were presented in the table 1 and 2.

From the front line demonstrations, it was observed that the improved greengram variety BGS-9 along with integrated management practices recorded higher yield (804 kg/ha) compared to the farmers' practices variety (634 kg/ha). The increase in the demonstration yield over farmer's practices was 26.81 per cent. The results indicated that the ICM demonstrations gave good impact over the farming community of Kalaburagi district as they were motivated by the new agricultural technologies applied in the ICM plots (Table 1). This finding is in corroboration with the findings of Veeramani *et al.* [16], Raj *et al*. [13], Poonia and Pithia [11] and Chandra [5]. The higher yield of greengram in ICM was mainly attributed to the adoption of improved technologies. Greengram variety BGS-9 is potential yielder than local control and having moderate resistance to pests. Seed treatment with bio-inputs enabled to mobalise nutrients from native soil nutrients. Seed treatment with *Trichoderma* helped the crop to resist against diseases. The technology gap in the demonstration yield over potential yield was 196 kg per ha. The technological gap may be attributed to the dissimilarity in the soil fertility status and weather conditions Mukherjee [10]. The extension gap of 170 kg per ha was noticed. This emphasized the need to educate the farmers through various means for the adoption of improved agricultural technologies to reverse this trend of wide extension gap. More and more use of latest production technologies with high yielding variety will subsequently change this alarming trend of galloping extension gap. The new technologies will eventually lead to the farmers to discontinue the old technology and to adopt new technology. The technology index shows the feasibility of the evolved technology at the farmer's fields and lower value of technology index more is the feasibility of the technology Jeengar *et al.* [6]. In this demonstration noticed 19.60 per cent technologies index, which indicates proper adoption of improved technologies. Similar results were also recorded by Lalit *et al.* [8] in greengram, Bar and Das [3] in tur, Anuja *et al.* [1] in different oilseeds crops, Balai *et al.* [2] in rapeseed mustard and Berjesha *et al.* [4] in Brassica.

Table 1: Grain yield of greengram, technology gap, extension gap and Technology index as influenced by improved practices

Farmer No. (50)	Yield (Kg/ha.)		% increase in yield over FP	Technology gap (Kg/ha.)	Extension gap (Kg/ha.)	Technology index (%)
	ICM Demo plot	FP				
Average	804	634	26.81	196	170	19.60

Table 2: Economic analysis of greengram cultivation

Sl. No.	Net Return (Rs/ha.)		B:C ratio	
	ICM Demo	FP	ICM Demo	FP
Average	35740	24240	3.86	2.76

The inputs and outputs prices of commodities prevailed during the study demonstrations were taken for calculating gross return, cost of cultivation, net return and benefit cost ratio (Table 2). The cultivation of greengram with improved technologies gave higher net return of Rs 35740 /ha as compared to farmer's practices. The benefit cost ratio of greengram in ICM was 3.86. This may be due to attributed higher yields obtained under improved technologies compared to local check. This finding is in corroboration with the findings of Mokidue *et al.* [9].

CONCLUSION

The study has shown that the ICM programme was found useful in enhancing the knowledge and adoption level of farmers in various aspects of greengram production technologies. ICM practices created great awareness and motivated the other farmers to adopt appropriate greengram production technologies. The area of high yielding variety of greengram has increased which will spread in taluks including the adjoining area. The selection of critical input and participatory approach in planning and conducting the demonstration definitely help in the transfer of technology to the farmers.

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