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RESEARCH ARTICLE :

Cluster front line demonstration in blackgram variety Vbn 6 at Vellore district of Tamil Nadu

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SUMMARY : The present study was conducted by KVK, Vellore during 2016 in the *Kharif* season with seventy five frontline demonstrations in Peruvalayam Village. The results of demonstrations showed that farmers could increase the blackgram 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 Blackgram variety VBN 6 recorded the higher yield (738 kg/ha) compared to the farmers' practices variety (431 kg/ha). The increase in the demonstration yield over farmer's practices was 41.5 per cent. Technology gap and the technology index values were 133 kg/ha and 15.2, respectively. The decline in overall yield and area under cultivation of blackgram in Vellore district from the year 2010 to 2015 was due to the high incidence of yellow vein mosaic (YVM) disease. The increment in yield of blackgram crop under front line demonstrations was due to spreading of improved and latest technology *viz.*, YVM resistance variety, 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 farmers' practices.

KEY WORDS :
Cluster, Front line, Demonstration, Blackgram variety Vbn 6

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BACKGROUND AND OBJECTIVES

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 (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. Pulses are water saving crops and more than 92 per cent of the area under pulses is rainfed. About 2- 3 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 (Kiresur *et al.,* 2001). 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 (Rabbinge, 1995). 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 agroclimatic regions. These demonstrations are carried out under the supervision of agricultural scientists. The newly and innovative technology having higher production potential under the specific cropping system can be popularized through FLD programme. The present study has been undertaken to evaluate the difference between demonstrated technologies *vis-a-vis* practices followed by the local farmers in blackgram crop.

RESOURCES AND METHODS

The present study was carried out at the Krishi Vigyan Kendra, Vellore during *Kharif* season in the farmers' fields of one cluster during 2016. All 25 frontline demonstrations in 10 ha area were conducted in Peruvalayam Village, Kaveripalkkam Block, Arakkonam Taluk, Vellore district. High yielding YMV resistant variety Blackgram VBN 6 was taken in the experimentation. The sowing was done in Oct-Nov at a spacing of 30 x 10 cm using 20 kg seed/ha. The fertilizers were applied as per the recommended schedule (N:P:K, 25:50;25 kg/ha). Chemicals were applied as per recommendation as and when required. Hand weeding within lines was done at 35 DAS. The crop was harvested at perfect maturity stage with suitable methods. Soil Application of Bio control agents *T.viride* and *Pseudomonas fluorescens*. Spraying of 2 % DAP @ 25th and 45th days after sowing. Optimum plant population was maintained in the demonstrations. In general, soils of the area under study were medium sandy clay with medium to low fertility status. The average rainfall of this area was 971 mm with 45 rainy days. In demonstration plots, critical inputs in the form of quality seed and treatment, bio agents and pulse wonder were provided by KVK. For the study, technology gap, extension gap and technology index were calculated as suggested by Samui *et al.* (2000).

Technology gap = Potential yield – Demonstration yield

Extension gap = Demonstration yield- Farmers' yield

$$\text{Technology index (\%)} = \frac{\text{Technology gap}}{\text{Potential yield}} \text{ x } 100$$

$$\text{Yield gap - I (\%)} = \frac{\text{Potential yield - Demo yield}}{\text{Potential yield}} \text{ x } 100$$

$$\text{Yield gap - II (\%)} = \frac{\text{Demo yield - Check yield}}{\text{Demo yield}} \text{ x } 100$$

OBSERVATIONS AND ANALYSIS

The major differences were observed between demonstration package and farmer's practices are regarding recommended varieties, seed treatment, time of sowing, fertilizer dose, method of fertilizer application and plant protection measures. Table 1 shows that under the demonstrated plot only recommended varieties and bio-agents were given to farmer by the KVK and all the other package and practices were timely performed by the farmer itself under the supervision of KVK scientist. Under farmers' practice, they generally sow seed of

Table 1 : Technologies demonstrated in cluster front line demonstration programme

Crop	Specific technology demonstrated	Recommendation/ha	Observations taken	Results	Remarks/feed-back
Black gram	High yielding variety Blackgram VBN 6	20 kg	YMV incidence	0.0 %	The field was free from YMV and highly resistant
	Mechanization sowing	Seed drill sowing	Plant population	28plants/ m^2	The labour shortage was addressed
	Spraying of 2 % DAP	2 % DAP	No. of pods yield	38 Nos of pods/plant	More flowering and more pod setting
	Application of *T.viride*	4 g/ kg of seed treatment and 2.5 kg soil application (Basal and top dressing)	Root rot incidence	0.0 %	No root rot incidence and optimum population was obtained

blackgram varieties T_9 and Vamban 5 at higher seed rate without treatment. Both these varieties grow by farmers found susceptible to yellow vein mosaic disease. As a result, the farmers selected under FLD programme on blackgram were provided with the seed of YVM resistance blackgram variety VBN 6. It is also observed that under farmer situation, normally sowing of blackgram is earlier to escape from water shortage for irrigation, thus leading to reduction in yield. Regarding the method of fertilization, under demonstration, all fertilizers were drilled at the time of sowing, whereas, under farmers' practice, broadcast method of fertilization was adopted. Similar findings have also been observed by Chandra (2010) and Raj *et al*. (2013).

The average yield of black gram (738 kg/ha) was much higher than average yield of farmers' practice (431 kg/ha).The results indicated that the frontline demonstrations gave good impact over the farming community of Vellore district as they were motivated by the new agricultural technologies applied in the FLD plots (Table 1). This finding is in corroboration with the findings of Poonia and Pithia (2011).

Technology gap :

The technology gap in the potential yield over demonstration yield was 133 kg/ha for black gram. The technological gap may be attributed to the dissimilarity in the soil fertility status and weather conditions (Mukherjee, 2003).

Extension gap :

The highest extension gap of 307 kg/ha was recorded. This emphasized the need to educate the farmers through various means for the adoption of improved agricultural production technologies. More and more use of latest production technologies with high yielding variety will subsequently change this alarming trend. The new technologies will eventually lead to discontinue the old technologies and to adopt new technologies by the farmers.

Technology index :

The technology index shows the feasibility of the evolved technology at the farmers' fields, as lower the value of technology index more is the feasibility of the technology (Jeengar *et al.,* 2006). The technology index was 15.2 per cent for black gram.

Economic return:

The input and output prices of commodities prevailed during the demonstrations were taken for calculating gross return, cost of cultivation, net return and benefit/ cost ratio. The cultivation of black gram under improved technologies gave higher net return of Rs. 43358/ha as compared to farmers' practices. The benefit/cost ratio of black gram under improved technologies was 2.83 as compared to 1.70 under farmers' practices. This may be due to higher yields obtained under improved technologies compared to local check (farmers' practice). This finding is in corroboration with the findings of Mokidue *et al.* (2011).

Reasons for low yield of black gram at farmers' fields :

Optimum sowing time was not followed due to non-availability of quality seed. More than 90 per cent of the farmers had been sowing seed as broadcast method due to which the plant population was sometimes more 2-3 times more than the recommended one. Lack of popularization of seed cum fertilizer drill for sowing and use of inadequate and imbalance doses of fertilizers especially the nitrogenous and phosphatic fertilizers by farmers could not result into potential yield. Chemical control was also quite uncommon in this region grain yield over the local check.

Conclusion:

In the frontline demonstrations there was an increase of 41.2 per cent in grain yield over the local check. Such increase was recorded with net returns increase was 49.9 per cent. As found in the results the BCR (2.83) was sufficiently high to motivate the farmers

Table 2 : Yield and net returns

Yield obtained (q/ha)						Yield increase (%)	Expenditure and returns (Rs./ha)						Net returns increase (%)
Check			Demo				Check			Demo			
Max	Min	Avg.	Max	Min	Avg.		Gross return (Rs./ha)	Net return (Rs./ha)	B:C ratio	Gross return (Rs./ha)	Net return (Rs./ha)	B:C ratio	
5.3	2.8	4.31	12.2	5.9	7.38	41.2	34488	21688	1.70	9094	43358	2.83	49.9

for adoption of the technologies. These demonstration trails also enhance the relationship and confidence between farmers and KVK scientists. The recipient farmers of FLDs also play an important role as source of information and quality seeds for wider dissemination of the improved varieties of blackgram for other nearby farmers. It is concluded that the FLD programme is a successful tool in enhancing the production and productivity of blackgram crop through changing the knowledge, attitude and skill of farmers.

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