Popularization of blackgram (*Vigna mungo* L) under rainfed condition in Sivaganga district, Tamil Nadu

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ABSTRACT

The present study was conducted in Sivaganga district of Tamil Nadu during the year 2016-17 through cluster frontline demonstrations (CFLDs) under National Food Security Mission (NFSM) scheme. The CFLDs were carried out in two clusters comprising 50 farmers with total area of 20 ha in two selected villages in the district. The results revealed that the treatment cluster demonstration with improved variety of blackgram VBN (Bg) 6 + seed treatment (*Trichoderma viridi* 5 g/kg + *Rhizobium* sp 25 g/kg + PSB 25 g/kg) + pheromone traps 3/acre + neem oil spray) recorded highest yield 9.22 q/ha as against 6.55 q/ha in control plots with usual farmers' practice. The demonstration with improved variety recorded higher average gross return (Rs 49,851), net return (Rs 34,586) with higher benefit-cost ratio (2.30) as compared to farmers' practice. Thus the pulses production could be enhanced by encouraging the farmers through adoption of integrated crop management which was followed in the CFLDs.

Keywords: CFLD; blackgram; grain yield; IPM

INTRODUCTION

Pulses are important source of protein in India. India is the largest producer having 25 per cent of world's production and consumer of 27 per cent of total pulses of the world. The domestic production is less than the estimated demand of 23-24 million tonnes. In India the share of pulses to gross cropped area and in total foodgrains basket is about 12 and 6-7 per cent respectively. India's outstanding contribution towards total global acreage of pulses is 35 per cent (Tiwari and Shivhare 2016).

Blackgram is one of the most important pulse crops and occupies a major position among pulses in Tamil Nadu. In Tamil Nadu blackgram is cultivated in 3.65 lakh hectare with the production of 3.10 lakh tonne and with an average productivity of 851 kg/ha (www.tnstat.com).

In Sivaganga district of Tamil Nadu, blackgram is the predominant pulse crop normally grown and cultivated under rainfed condition in rabi season and the farmers are cultivating the older variety, VBN (Bg) 2 which is susceptible to yellow mosaic virus. Hence in the CFLD a short duration variety of blackgram VBN (Bg) 6 having crop duration of 65-75 days was introduced to withstand prolonged dry spells, drought and to test the performance of this variety compared to VBN (Bg) 2 being practiced by the farmers.

MATERIAL and METHODS

The present study was conducted as CFLD during rabi season of 2016-17 in Kandipatty and Ammayenthal villages of Kalayarkovil and Thirupattur blocks of Sivaganga district, Tamil Nadu. It was carried out in 20 hectare area comprising 50 small and marginal farmers. In the selected two villages, the farmers were made aware about the utility of pulse crops and the varietal characters of blackgram, VBN (Bg) 6 (Table 1) through trainings, seminars and lectures with the whole package of practices recommended by the Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu (Table 2). The soil in the demonstration area was red soil with pH 7.6 and EC 0.75 dS/m having 0.32 per cent organic carbon, 243 kg/ha available N, 11.5 kg/ha available P and 127 kg/ha available K. The experiment

consisted of the treatnments T_1: Farmers' practice and T_2: Syncronized matured, YMV resistant variety VBN (Bg) 6 + seed treatment (*Trichoderma viridi* 4 g/kg + *Rhizobium* sp 25 g/kg + PSB 25 g/kg) + plant protection (pheromone traps 5/acre + neem oil spray). Additionally in the demonstration plots basal application of recommended dose of fertilizers (RDF 12.5:25:12.5 NPK kg/ha) and application of foliar spray of TNAU Pulse Wonder 5 kg/ha in 500 litres of water once at flowering and another at 15 days thereafter was administered.

The participating farmers had also sown the existing old variety VBN (Bg) 2 which made it easy to make comparison between demonstration and control. For the plots under demonstration, KVK provided critical inputs and all other inputs were applied by the farmers themselves as per the advice of the KVK scientists. In control plots farmers sowed VBN (Bg) 2 at their own level as they had been practicing earlier.

RESULTS and DISCUSSION

The details of yield parameters of CFLDs are presented in Table 3. The blackgram yield varied between 9.22 to 6.75 q/ha and average yield was found to be 7.80 q/ha under the demonstration plots whereas in the farmers' practice (control) the average yield

Table 1. Varietal characters of blackgram demonstrated under CFLDs

Variety	Vamban (Bg) 6
Parentage	VBN 1/VBG-04-006
Duration	65-70 days
Year of release	TNAU, 2017
Season	December - January/January - February
Yield	741 kg/ha; Maximum 1,515 kg/ha
Special characters	High yielding variety, semi-erect and tall plant type, average protein 21.6%, arsbinose content 5.7%, moderately resistant to yellow mosaic virus, leaf crinkle virus and powdery mildew disease

Table 2. Details of critical inputs provided under CFLDs of blackgram

Cluster	Number of farmers	Area (ha)	Technology demonstrated	Critical inputs
Kandupatty (Cluster I)	25	10	VBN (Bg) 6; short duration, synchronized matured and yellow mosaic resistant variety; seed treatment with biocontrol agents; sticky traps biofertilizers, pheremone traps, foliar spray of neem oil	Seeds (VBN 6); *Trichoderma viride* 4 g/kg seed, *Pseudomonas fluorescens* 10 g/kg seed, *Rhizobium* culture, TNAU Pulse Wonder, pheremone traps and neem oil
Ammayenthal (Cluster II)	25	10		

Table 3. Yield parameters of CFLDs conducted during 2016-17

Parameter	Demonstration	Control (farmers' practice)
Grain yield (q/ha)	Maximum: 9.22 Minimum: 6.75 Average: 7.80	Maximum: 6.55 Minimum: 4.05 Average: 5.30
Yellow mosaic virus (YMV) incidence (%)	0.5	27.0
100-grain weight (g)	3.8-4.0 g	2.7-3.5
Duration (days)	65-70	75-80
Gross cost (Rs/ha)	15,265	14,876
Gross return (Rs/ha)	49,851	34,882
Net return (Rs/ha)	34,586	20,006
Benefit-cost ratio (BCR)	2.30	1.40

obtained was 5.30 q/ha with 16.1 per cent increase in yield observed in demonstration plots over farmers' practice. In the demonstration plots reduced incidence of YMV (0.5%), higher 100-grain weight (4.0 g) and short duration of 65-70 days were recorded. The demonstration plots showed reduced flower shedding of 8.5 per cent and increased pod setting of 12 per cent. The cost of cultivation by applying improved practices was Rs 15,265/ha as against farmers' practice where it was Rs 14,876/ha. Cultivation of blackgram under demonstration practices gave higher net return of Rs 34,586/ha as compared to Rs 20,006/ha under farmers' practice. The additional net income was Rs 14,580/ha over farmers' practice. The average benefit-cost ratio of demonstration plots was 2.30 and that of farmers' practice was 1.40. The higher yield and better returns recorded in the demonstration plots could be attributed to the application of seed treatment, use of recommended fertilizers, foliar spray, timely weed and water management and integrated pest management practices compared to farmers' practice.

Thus the CFLDs of latest variety VBN (Bg) 6 with improved technological packages were effective in improving the grain yield and net income of the farmers.

Farmers' perception on technology demonstrated

The results of farmers' perception on the new blackgram VBN 6 variety are depicted in Table 4. The farmers had high perception towards the technology demonstration under CFLDs. Ninety six per cent of the farmers perceived the technology demonstration to be cost effective, profitable and acceptable while 88 per cent farmers perceived it to be high in problem solving and compatibility. Preference, practicability, accessibility, understandability and sustainability were perceived to be high by 84, 82, 78, 76 and 72 per cent farmers respectively.

Table 4. Farmers' perception of the CFLDs on blackgram

Technology attribute	Farmers' perception (n= 50)		
	High (%)	Moderate (%)	Low (%)
Problem solving	88	12	0
Understandability	76	16	8
Practicability	82	14	4
Cost effectiveness	96	4	0
Profitability	96	4	0
Sustainability	72	20	8
Compatibility	88	10	2
Accessibility	78	16	6
Acceptability	96	4	0
Preference	84	16	0

Multiple responses

The findings indicate that in overall the farmers perceived the technology demonstrated under CFLDs as high in problem solving and of moderate understandability, practicability, cost effectiveness, profitability and sustainability. Vijaya Lakshmi et al (2017) observed that frontline demonstration is an effective tool for increasing the production and productivity of pulses and changing the knowledge, attitude and skill of farmers. Frontline demonstration over the farmers' practice created greater awareness and motivated the other farmers to adopt the improved package of practices of pulses. The latest technologies will eventually lead the farmers to discontinue the traditional technology and to adopt new technology.

CONCLUSION

The demonstrations on improved blackgram variety resulted in increased grain yield, net returns and higher BCR. The FLDs showcased a significant positive result on increasing the productivity potential and profitability through the latest technology under real farming situation. Horizontal spread of improved technologies may be achieved by the successful implementation of frontline demonstrations and various extensions activities like training programmes and field

days organized in cluster frontline demonstration programmes in the farmers' fields. For wider dissemination of technologies recommended by state agricultural universities and other research institutes, more number of FLDs should be conducted. Cluster front line demonstration builds the link and self-reliance between farmers and scientists. The farmers also play an important role as source of information and quality seeds for wider dissemination of the high yielding varieties of pulses for nearby farmers.

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