Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; 7(4): 940-942
Received: 15-05-2018
Accepted: 20-06-2018

Nabadeep Saikia
Subject Metter Specialist, Plant Protection, Krishi Vigyan Kendra, Assam Agricultural University, Cachar, Assam, India

Kapil Deb Nath
Subject Metter Specialist, Fisheries Science, Krishi Vigyan Kendra, Assam Agricultural University, Cachar, Assam, India

Pulakabha Chowdhury
Senior Scientist & Head, Krishi Vigyan Kendra, Assam Agricultural University, Cachar, Assam, India

Correspondence
Kapil Deb Nath
Subject Metter Specialist, Fisheries Science, Krishi Vigyan Kendra, Assam Agricultural University, Cachar, Assam, India

Impact of cluster frontline demonstrations on popularization of blackgram *var.* PU 31 in Cachar district of Barak Valley region of Assam

Nabadeep Saikia, Kapil Deb Nath and Pulakabha Chowdhury

Abstract
Black gram is an important kharif pulse crop in Cachar district of Assam but due to unavailability of improved variety and non adoption of improved cultivation practices in the district, its productivity (550 kg/ha) is far below the average national productivity (970 kg/ha) and state average of 650 kg/ha. The present study was carried out by Krishi Vigyan Kendra, Cachar, Assam to study the yield gaps between improved package of practices under cluster frontline demonstration (CFLD) and farmer's practice (FP) of Blackgram crop. The study found that the yield of Blackgram in CFLD under rainfed conditions ranged from 10.30 to 10.65q/ha whereas in FP it ranged between 4.0 to 6.9 q/ha. The per cent increase in yield with Improved Practices (IP) over FP was recorded in the range of 46.21 to 49.07. The extension gap and technological index were ranging between 4.76 -5.30 q/ha and 16.90-20.76 per cent, respectively. The trend of technology gap reflected the farmer's cooperation in carrying out demonstrations with encouraging results in subsequent years. The benefit cost ratio was 2.36-2.39 under demonstration, while it was 1.4 to 1.5 under farmer's practices. The present study resulted to convincing the farming community for higher productivity and returns.

Keywords: bush type, extension gap, technology transfer, yield, cluster front line demonstrations, technology index

Introduction
Black gram is one of the important pulse crops grown throughout India. It is consumed in the form of 'dal' (whole or split, husked and un-husked) or perched. It is used as nutritive fooder especially for milch animals. It is also green manuring crop. High values of lysine make urdbean an excellent complement to rice in terms of balanced human nutrition. In Assam, Blackgram occupies a major position in terms of area, production and productivity among the pulses. According to the annual report, 2016-17 GoI, Ministry of agriculture & Farmers Welfare (Department of Agriculture, Cooperation & Farmers Welfare) in Assam, blackgram is cultivated in 0.54 lakh hectors with an average production of 0.33 lakh tones and productivity of 624 kg/ha that constitutes 1.52% of national area and 1.59% of production of national average. Output of pulses was 17.06 MT during 2016-17. Kharif blackgram is mostly sown in August-September and harvested in November-December. The PU 31 is a bold seeded Yellow Mosaic Virus (YMV) tolerant blackgram variety with crop duration of 75-85 days depending on the environmental condition. Indian government imports large quantity of pulses to fulfill domestic requirement of pulses. In this regard, to sustain this production and consumption system, the Department of Agriculture, Cooperation and Farmers Welfare had sanctioned the project "Cluster Frontline Demonstrations on kharif pulses from 2015-16'' to ICAR-ATARI, Guwahati through National Food Security Mission. The basic strategy of the Mission is to promote and extend improved technologies, i.e., seed, micro-nutrients, soil amendments, integrated pest management, farm machinery and implements, irrigation devices along with capacity building of farmers. This project was implemented by Krishi Vigyan Kendra, Cachar of Zone-VI in Cachar district with main objective to boost the production and productivity of pulses through CFLDs with latest and specific technologies.

Materials and Method
The study was carried out during kharif season from 2015-16 to 2017-2018 (3 consecutive years) by the KVK Cachar, of Assam. The demonstrations were conducted in farmer's field of 4 different villages in the year 2015-16, 2 villages in 2016-17 and 8 villages in 2017-18 of cachar district in Barak valley agro climatic zone of Assam. During these three years of study, a total of 26, 121 and 86 numbers of beneficiaries were selected in 2015-16, 2016-17 and 2017-18 respectively for the project.

Farmers were trained to follow the package and practices for blackgram cultivation as recommended by the Assam Agricultural University and need based inputs were provided to the beneficiaries (Table 2). The farmers followed the full package of practices like soil testing, seed treatment with bio-fertilizer, fertilizer application, weed management, Integrated Pest Management (IPM) practices etc. In case of local check, the traditional practices were followed by using existing varieties. An area of 15 hectare was covered with plot size 0.5 ha under cluster front line demonstration with active participation of 30 farmers. Before conducting CFLDs, a list of farmers was prepared from group meeting and specific skill training was imparted to the selected farmers.

In general, the soil of the experimental sites were sandy loam in texture, acidic in reaction (pH 4.8-6.1), medium to very high in organic carbon (0.62-1.16%) and available nitrogen (186.6-398.8 kg N/ha), very low to medium in available phosphorus (10.2-28.4 kg P_2O_5 kg/ha) and low to medium in available potassium (107.5-214.59 kg K_2O/ha).

In demonstration plots, use of quality seeds of improved varieties (PU 31), line sowing and timely weeding, need based pesticide as well as balanced fertilizer were emphasized and comparison has been made with the existing practices. Visit of farmers and the extension functionaries was organized at demonstration plots to disseminate the message at large scale. The beneficiaries under the programme were facilitated by KVK scientists in performing field operations like sowing, spraying, weeding, harvesting etc during the course of training and visits. The traditional practices were maintained in case of local checks. The data were collected from both CFLD plots as well as control plots and finally the extension gap, technology gap, technology index along with the benefit cost ratio were worked out (Samui *et al.,* 2000) [1] as given below.

Technology gap= Potential yield - Demonstration yield
Extension gap= Demonstration yield - Farmer's yield

$$\text{Technology index} = \frac{\text{Potential yield} - \text{Demo. yield}}{\text{Potential yield}}$$

Results and Discussion

Results of Cluster Front Line Demonstrations conducted during 2015-16 to 2017-18 in different villages of Cachar district indicated that the cultivation practices comprised under CFLD *viz* use of improved variety, line sowing, balanced application of fertilizers and control of pest through insecticide at economic threshold level (table 1). It is evident from results that under the demonstrated plots, performance of blackgram (yield) was comparatively much higher than the local check. The average increase in yield comparing to local variety was recorded highest (5.3 qtls/ha) in 2016-17 and lowest (4.8 qtls/ha) in 2015-16. The demonstration plot produced on an average of 47.94 % more yield of blackgram as compared to local practices. The data of Table 3 reveals that the yield of blackgram did not fluctuate significantly over the years in demonstration plot. Similarly, yield enhancement in different crops in cluster front line demonstrations were documented by Hiremath *et al.,* (2007) [2] in Onion; Mishra *et al.,* (2009) [3] in Potato; Kumar *e. al.,* (2010) [4] in Bajra; Surywanshi and Prakash (1993) [5] in Oil seeds, Dhaka *et al.,* (2010) [6] in Maize and Dhaka *et al.,* (2015) [7] in Coriander. The increase in percent of yield was ranged from 46.21 to 49.07 during the three years of study. The results were in conformity with the findings of Katare *et al.* (2011) [8], Meena *et al.* (2012) [9] and Tomar *et al.* (2003) [10]. The results clearly indicate the positive effects of CFLDs over the existing practices toward enhancing the yield of blackgram in Barak valley zone of Assam with its positive effect on yield attributes (Table 3). Benefit-Cost ratio was recorded higher under demonstration against control in all the years of study. In a study Chakravarty *et al.,* (2017) [11] found that fish farmers of Kamrup district of Assam has better income compared to that of fishers purely from fisheries sectors. The extension gap showed an increasing trend. The extension gap ranging between 4.76-5.30 q/ha during the period of study emphasizes the need to educate the farmer through various means for adoption of improved agricultural production to reverse the trend of wide extension gap. The yield of the cluster front line demonstrations and potential yield of the crop was compared to estimate the yield gaps which were further categorized into technology index and Technology gap. The trend of technology gap (ranging between 2.7-2.2 q/ha) reflects the farmer's cooperation in carrying out such demonstrations with encouraging results in subsequent years. Similar finding was recorded by Katare *et al.* (2011) [8] and Sharma and Sharma (2004) [12] in oil seeds. From these results it is evident that the performance of the technology demonstrated was found to be better than the farmers practice under same environment conditions. The farmers were motivated by seeing the results in terms of productivity and they are now adopting the blackgram variety PU 31 with improved package and practices.

The technology index showed the feasibility of evolved technology at the farmer's fields. The lower value of technology index the more is the feasibility of technology. As such fluctuation in technology index (ranging between 20.90-16.76%) during the study period in certain region may be attributed to the dissimilarity in soil fertility status, weather conditions, non-availability of water and insect pest attack in the crop. The benefit cost ratio of cluster front line demonstrations presented in Table 3 clearly showed higher benefit cost ratio of recommended practices than control plot in all the years of study. Hence, favorable benefit cost ratios proved the economic viability of the interventions and convinced the farmers on the utility of interventions. Yield parameters enhanced by the improved package of practices over existing farmers practice are shown in table 4.

Table 1: Comparison between demonstration package and existing practices under CFLD blackgram

Particulars	**Blackgram**	
Farming situation	**Demonstration Rainfed medium land**	**Farmers Practice Rainfed medium land**
Variety	PU-31	Local
Time of sowing	Mid August to mid September	September till first week of October
Method of sowing Line	Line sowing	Broadcasting
sowing	20.25 kg/ha	24 kg/ha
Seed rate	NPK 15:35:0kg/ha/ vermicompost@30 kg/ha	FYM lower NPK dose
Fertilizer / vermin compost	With Rhizobium and captaf	Nil
Seed treatment	Need based	Nil

Plant protection	One weeding weeding15-20 days after	No weeding
Interculture	Sowing	

Table 2: Details of Need Based Input Given on CFLD of Blackgram

Year	No. of demonstrations	Variety	Technology demonstrated	Need based input
2015-16	25	PU-31	Improved variety, IPM	Improved Seed, Soil testing, Vermicompost, Rhizobium spp. Captaf, Pesticides, Bavistin, Chloropyriphos, Rogor, Group meetings and Trainings
2016-17	50	PU-31	Improved variety, IPM	Improved Seed, Soil testing, Vermicompost, Rhizobium spp. Captaf, Pesticides, Bavistin, Chloropyriphos, Rogor, Group meetings and Trainings
2017-18	50	PU-31	Improved variety, IPM	Improved Seed, Soil testing, Vermicompost, Rhizobium spp. Captaf, Pesticides, Bavistin, Chloropyriphos, Rogor, Group meetings and Trainings

Table 3: Productivity, technology gap, extension gap, technology index and benefit-cost ratio of blackgram grown under FLDs and existing package of practices.

Year	Sample Area (Ha)	Sample No. of farmers	Seed yield (Q/ha)			% increase over control	Tech. gap (Q/ha)	Extn gap (Q/ha)	Technical index (%)	B:C ratio
			Potential	CFLD	FP				CFLD	FP
2015-16	5	10	12-14	10.30	5.54	46.21	2.70	4.76	20.76	2.36
2016-17	5	10	12-14	10.80	5.50	49.07	2.20	5.30	16.90	2.37
2017-18	5	10	12-14	10.69	5.50	48.55	2.31	5.19	17.70	2.39
Average	-	-	13	10.60	5.53	47.94	2.40	5.08	-	-

Table 4: Average yield parameters under demonstration package and existing farmers practice.

Yield parameters	CFLD	FP
Plant height (cm)	33.5	27.3
No of branches per plant	7	4.5
No of pod per plant	14	8
No of seeds per pod	7.2	4
Test weight (g)	42	23

Conclusion

It is concluded from the above findings of CFLDs on Blackgram *var*. PU 31, that the technology gap can be reduced to a considerable extent by adopting scientific methods of blackgram cultivation thus leading to increase productivity of blackgram in the district. It was observed that potential yield can be achieved by imparting scientific knowledge to the farmers, providing the quality need based inputs and their proper utilization. Horizontal expansion of improved technologies may be achieved by implementation of various extension activities like training programme, field day, exposure visit *etc*. organized in CFLD programmes in the farmer's fields. Moreover, Krishi Vigyan Kendra in the district need to play the lead role in providing proper technical support to the farmers through different educational and extension activities to reduce the extension gap for better pulse production in the district.

References

1. Samui SK, Maitra S, Roy DK, Mandal AK, and Saha D. Evaluation of front line demonstration on groundnut. J Indian Soc. Coastal Agri. Res. 2000; 18(2): 180-183.
2. Hiremath SM, Nagaraju MV, Shasidhar KK. Impact of frontline demonstration on onion productivity in farmer's field. Paper Presented In: Nation Sem Appropriate Extn Strat manag Rural Resource, Univ. Agric. Sci., Dharwad, 2007, 100.
3. Mishra DK, Paliwal DK, Tailor RS, Deshwal AK. Impact of front line demonstrations on yield enhancement of potato. Indian Res. J Ext. Edu. 2009; 9(3):26-28.
4. Kumar A, Kumar R, Yadav VPS, Kumar R. Impact assessment of frontline demonstrations of Bajara in Haryana state. Indian Re. J Ext. Edu. 2010; 10(1):105-108.
5. Suryawanshi SD, Prakash M. Impact of viable technology of promoting oil seeds in Maharastra. Indian J Agri. Econ. 1993; 48:102-106.
6. Dhaka BL, Meena BS, Suwalka RL. Popularization of Improved. Maize production technology through front line demonstrations in south – eastern Rajasthan. J Agri. Sci. 2010; 1(1):39-42.
7. Dhaka BL, Poonia MK, Meena BS, Bairwa RK. Yield and economic viability of coriander under front line demonstrations in Bundi district of Rajasthan. J Hortl. Sci. 2015; 10(2):226-228.
8. Katare S, Pandey SK, Mustaafa M. Yield gap analysis of Rapeseed-mustard through front line demonstrations. Agric. Update. 2011; 6:5-7.
9. Meena BL, Meena RP, Meena RH, Balai CM. Yield gap analysis of rapeseed-mustard through front line demonstrations in agroclimatic zone IV of Rajasthan. J Oilseed Brassica. 2012; 3(1):51-55.
10. Tomer LS, Sharma BP, Joshi K. Impact of Front Line Demonstration of soybean in transfer of improved technology. J Ext. Edu. 2003; 22(1):390-420.
11. Chakravarty B, Tamuli AK, Borah S, Nath KD. Economic Analysis of Fish Farmers and Fishers in Kamrup District, Assam, India. Asian Journal of Agricultural Extension, Economics & Sociology. 2017; 20(1):1-7
12. Sharma RN, Sharma KC. Evaluation of Front Line Demonstration trials on oilseeds in Baran district of Rajasthan. Madhya J Exten. Edu. 2004; 7:72-75.