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Impact of cluster frontline demonstrations on popularization of black gram variety TBG-104 in Nellore district of Andhra Pradesh

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Abstract
Black gram is an important *rabi* pulse crop in Nellore district of Andhra Pradesh 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 902 kg/ha. The present study was carried out by Krishi Vigyan Kendra, Nellore, Andhra Pradesh 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 average yield of Blackgram (TBG-104) in CFLD under rainfed conditions ranged from 19-20q/ha whereas in FP it ranged between 12 to 13.33q/ha. The per cent increase in yield with Improved Practices (IP) over FP was recorded in the range of 66.66 to 73.68. The extension gap and technological index were ranging between 5-6 q/ha and 8.69-21.73 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: Extension gap, technology transfer, yield, cluster front line demonstrations, technology index

Introduction
India's economy has been dominated by agriculture. However, Indian agriculture fiercely depends on monsoons to yield sufficient agricultural returns. India's major food crops rice and wheat have been heavily incentivized with MSP in addition to preferential treatment of Public Distribution System to benefit the Indian poor. Hence, Indian farmers are most motivated to grow either these crops or cash crops like cotton, sugarcane etc. Pulses have been a second choice for the farmers for cultivation. Cluster front line demonstrations (CFLDs) is a novel approach to provide a direct interface between researcher and farmer for the transfer of technologies developed by them and to get direct feedback from farming community. To meet the growing demand for food grains, National Development Council (NDC) in its 53rd meeting adopted a resolution to enhance the production of rice, wheat and pulses by 10, 8 and 2 million tons respectively by 2011 with an outlay of Rs. 4,882 crore under National Policy for Farmers in the Eleventh Five Year Plan.
The proposed Centrally Sponsored Scheme 'National Food Security Mission (NFSM) is to operationalise the resolution of NDC and enhance the production of rice, wheat and pulses (Annonymous, 2011) [1]. The concept of Cluster first line demonstrations was put forth under this mission. The scheme implemented in a mission mode through a farmer centric approach. The scheme aims to target the select districts by making available the improved technologies like promotion of Integrated Nutrient Management (INM) Integrated Pest Management (IPM), promotion of micronutrients/gypsum/bio-fertilizers, promotion of sprinkler irrigation, and Extension, training and mass media campaign. These demonstrations are conducted under the close supervision of scientists of Krishi Vigyan Kendras, SAUs and their Regional Research Stations.
The major pulses producing states in India are Madhya Pradesh, Maharashtra, Rajasthan, Uttar Pradesh, Andhra Pradesh and Karnataka. These six states account for 79 percent of area and 80 percent of production of pulses in India. These pulses crops can be grown in kharif and rabi seasons in India and cultivated in marginal lands under rainfed conditions. Only 15 percent of area under pulses has assured irrigation. Among these six major pulses producing states in India, the productivity per hectare vary significantly from one state to another state. In Andhra Pradesh (13 districts) the area under pulses is 14.13 lakh hectares in 2016-17, whereas the same in 2011-12 is 13.38 lakh hectares which indicates decline in the area which is very slow or stagnated over 5 years.

Hence there is need for expansion of area and production in pulses in Andhra Pradesh. Cluster Front Line Demonstrations (CFLDs) under National Food Security Mission (NFSM) playing key role in introduction of improved varieties and production technologies in pulses.

Materials and Methods

Cluster frontline demonstrations were conducted by the Krishi Vigyan Kendra, Nellore, district of Andhrapradesh in kharif and Rabi seasons in the farmer's fields during 2015-16, 2016-17 and 2017-18with evaluation the performance of new varieties and package of practices on production and productivity of Black gram demonstrated for was identified based on Participatory Rural Appraisal (PRA) technique. Assessment of gap in adoption of recommended technology before laying out the cluster frontline demonstrations (CFLD's) through personal discussion with selected farmer's. The awareness programme (preseason training) was organized for selection of farmer's and skilled development about detailed technological intervention with improved package and practice for successful cultivation. Critical inputs for the technologies to be demonstrated (Table 1) were distributed to the farmers after the training like improved high yielding variety, recommended chemicals and literature and regular visit, monitoring and pest and disease advisory services management by the KVK scientist to the demo farmers. Finally field day was conducted involving demonstration holding farmers, other farmers in the village, Scientists from University and ATARI, officials from Department of Agriculture and local extension functionaries to demonstrate the superiority of the technology for each crop.

Crop yield was recorded from the demonstration and control plots for the crops at the time of harvest. The most feasible way by which this could be achieved is by demonstrating the recommended improved technology on the farmer's fields through front line demonstrations with the objectives to work out the input cost and monetary returns between front line demonstration and farmers methods, to identify the yield gaps between farmer's practices and front line demonstrations. The basic information were recorded from the farmer's field and analyzed to comparative performance of cluster frontline demonstrations (CFLD's) and farmer's practice. The yield data were collected from both the demonstration and farmers practice by random crop cutting method and analyzed by using simple statistical tools. The technology gap and technological index (Yadav *et al*., 2004) [14] were calculated by using following formula as given below

Extension gap = Demonstrated yield- farmer's practice yield
Technology gap= Potential yield- Demonstration yield
Additional return = Demonstration return – farmer's practice return

$$\text{Technology index} = \frac{\text{Potential yield-Demonstration yield}}{\text{Potential yield}} \times 100$$

$$\text{Percent increase yield} = \frac{\text{Demonstration yield - farmers yield}}{\text{Farmers yield}} \times 100$$

Results and Discussion

Table 1: Differences between technological intervention and farmers practices under FLD on Black gram

Particulars	Technological intervention in FLD	Farmers practices	Gap
Variety	TBG-104	Local/old varieties	Full gap
Seed rate	20 kg /ha	25 kg/ha	High seed rate
Sowing method /Spacing	30 X 10 cm, sowing with seed cum fertilizer drill	Broad casting, uneven plant population	Partial gap
Time of Sowing	October	September, November	Partial gap
Seed treatment	Seed treatment was done with 2.5 gm of Carbendizum and 5 ml of Imidacloprid per one kg to control sucking pest and diseases up to one month	Seed treatment was not done	Full gap
Fertilizer Dose	Balanced fertilization as per soil test values 20 kg of urea and 312.5 kg of SSP as basal dose/ha	Imbalance use of fertilizer 50 Kg DAP as basal	Full gap
Weed management	Pendimethalin 30% 1 to 1.5 lit per acre within 2 days of sowing. Imazythapyr 10SL 75g a.i. ha^{-1} at20-25 DAS.	Manual weeding	Full gap
Plant Protection	Neem oil @ 5ml/lit and Cholrophyriphos @2.5 ml/lit for control of sucking pest. Practiced Integrated measures to control Yellow mosaic virus like growing of maize and Jowar as border crops, removal of weeds on bunds, erecting of sticky traps and finally chemical control measures.	Injudicious use of and insecticides and fungicides based on advice of input dealers	Partial gap with high cost.

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 (20qtls/ha) in 2016-17 and lowest (18 qtls/ha) in 2015-16. The demonstration plot produced on an average of 70.157 % 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) [5] in Onion; Mishra *et al*., (2009) [9] in Potato; Kumar *et al*., (2010) [7] in Bajra; Surywanshi and Prakash (1993) [12] in Oil seeds, Dhaka *et al*., (2010) [3] in Maize and Dhaka *et al*., (2015) [4] 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) [6], Meena *et al*. (2012) [8] and Tomar *et al*. (2003) [13].

The results clearly indicate the positive effects of CFLDs over the existing practices toward enhancing the yield of blackgram in Nellore district with its positive effect on yield attributes (Table 2). Benefit-Cost ratio was recorded higher under demonstration against control in all the years of study. In a study Chakravarty *et al*., (2017) [2] 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 2.00-5.00 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) [6] and Sharma and Sharma (2004) [11] 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 TBG-104 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 Results of Cluster Front Line Demonstrations conducted during 2015-16 to 2017-18 in different villages of Nellore 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 (20 qtls/ha) in 2016-17 and lowest (18 qtls/ha) in 2015-16. The demonstration plot produced on an average of 70.157 % more yield of blackgram such fluctuation in technology index (ranging between 17-39 to 21.73%) 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 3.

Table 2: 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	30	50	20-23	18	12	66.66	5.00	6.00	21.73	2.36
2016-17	30	50	20-23	20	14	70.00	2.00	6.00	8.69	2.37
2017-18	30	50	20-23	19	14	73.68	4.00	5.00	17.39	2.39
Average	-	-	20-23	19	13.33	70.157	3.66	5.66	-	-

Table 3: Average yield parameters under demonstration package and existing farmers practice.

Yield parameters	CFLD	FP
Plant height (cm)	29.5	25.3
No of branches per plant	7	4.5
No of pod per plant	27	19
No of seeds per pod	7.2	5
100 SEED weight (g)	4.6	4.0

Conclusion

It is concluded from the above findings of CFLDs on Blackgram var. TBG-104, 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. Annonymous. Agricultural statistics at a glance. DAC Government of India, 2011, 118p.
2. 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
3. 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.
4. 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.
5. 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.
6. Katare S, Pandey SK, Mustaafa M. Yield gap analysis of Rapeseed-mustard through front line demonstrations. Agric. Update. 2011; 6:5-7.
7. 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.
8. 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.

9. 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.
10. Samui SK, Maitra S, Roy DK, Mandal AK, Saha D. Evaluation of front line demonstration on groundnut. J Indian Soc. Coastal Agri. Res. 2000; 18(2): 180-183.
11. 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.
12. Suryawanshi SD, Prakash M. Impact of viable technology of promoting oil seeds in Maharashtra. Indian J Agri. Econ. 1993; 48:102-106.
13. 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.
14. Yadav DB, Kamboj BK, Garg RB. Increasing the productivity and profitability of sunflower through frontline demonstrations in irrigated agro-ecosystem of eastern Haryana. J Agron. 2004; 20:33-35.