Impact of CFLD's on productivity and profitability of Blackgram in farmers, fields of West Godavari district

ABSTRACT: The Krishi Vigyan Kendra, UNDI, West Godavari district has conducted 100 Cluster Frontline Demonstrations (CFLD) on blackgram with variety TBG-104 in 40 ha area during seasons *Kharif* and *Rabi*, 2022- 2023. CFLD is the most appropriate method for showcasing the output potential of recently released technology in large scale on farmers' fields. The results indicated that higher yield i.e., 10.48 q/ha and 14.10 q/ha was realized with TBG-104 variety, which was 18.08 and 10.58% more compared to farmers practice variety PU-31 with 8.87 q/ha and 12.75 q/ha during *kharif* and *rabi*, respectively. The net returns of Rs. 30,058, Rs. 51, 890/- per ha and B:C ratio of 1.91, 2.14 were also higher with demonstration plot compared to farmers practice plot (Rs. 20,250, Rs. 41,855 per ha and 1.61,1.90) during *Kharif* and *Rabi*, respectively.

Key words: Productivity, Profitability, Blackgram, Extension gap, Technology gap

Introduction: Pulses are the important sources of proteins, vitamins and minerals and are popularly known as "Poor man's meat" and "rich man's vegetable", which contribute significantly to the nutritional security of the country [9]. Besides, pulses possess several other qualities such as they improve soil fertility and physical structure, fit in mixed/inter-cropping system, crop rotations and dry farming and provide green pods for vegetable and nutritious fodder for cattle as well.

India is the largest producer and consumer of urdbean. The blackgram production of India was 2.78 million tonnes [2] still less than the future estimated demand of 29-30 million tones. The targeted production and productivity is possible by way of harnessing this yield gap by growing pulses in new niches, precision farming, quality inputs, soil test based INM and mechanized method of pulse cultivation complimented with generous governmental policies and appropriate funding support to implementing states/stake holders [11].

Blackgram production contributes to 11 percent of India's total pulses production (25.46 million tonnes in 2020-21). Among the major producing states, productivity was highest in Andhra Pradesh (915 kg/ha).

In West Godavari district, it is also one of the important pulse crop grown in uplands and tand tail end areas, but the full potential of the crop was not realized by farmers due to low adoption of new technologies. So, there is a need to improve the production potential of blackgram.

According to the Vision-2030 document prepared by the ICAR-Indian Institute of Pulses Research (IIPR), Kanpur, a growth rate of 4.2% has to be ensured in order to meet the projected demand of 32 million tonnes of pulses by 2030. This will, however, require a paradigm shift in research, technology generation and dissemination, popularization of improved crop management practices and commercialization along with capacity building of the stakeholders in frontier areas of research [11].

In India, pulses, therefore, have always received due attentions both in terms of requirement by consumers and adequate programmatic support from the government at the production front. Addressing this concern of significance, the Ministry of Agriculture and

Farmers Welfare, Govt. of India had initiated a nation-wide cluster frontline demonstration (CFLD) programme on pulses under National Food Security Mission-Pulses (NFSM-Pulses) since 2015-16. 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. The ICAR through its Krishi Vigyan Kendras (KVKs) across the country has been implementing this CFLD programme on different pulse crops to boost the production and productivity of pulses with improved varieties and location specific technologies.

The Krishi Vigyan Kendra (KVK), Undi has successfully implemented cluster frontline demonstrations on balckgram during seasons *Kharif* and *Rabi*, 2022-2023 in a systematic manner on farmers' field under the close supervision of their scientists to show the worth of new/ proven varieties with technological packages in their respective districts for enhancing production and productivity of blackgram. With this background, the present investigation was undertaken with the specific objectives to assess the performance of CFLD on Blackgram in terms of grain yield, extension gap, technological gap and economic gains by the farmers.

Materials and Methods: The study was carried out by conducting 100 Cluster Frontline Demonstrations (CFLD) on blackgram with variety TBG-104 in 40 ha area in farmers fields of Buttayagudem, Gurrapugudem, Singarajupalem and Pedapadu villages of West Godavari district, Andhra Pradesh during seasons *Kharif* and *Rabi*, 2022- 2023.. The TBG-104 (high yielding, shiny seeded, resistant to Yellow Mosaic Virus) variety with integrated crop management practices like seed treatment, pre-emergence application of pendimethalin, post-emergence application of Imazethapyr, erection of yellow sticky traps and blue sticky traps, recommended dose of fertilizer application and spraying of micro nutrients displayed in demonstration plots, while PU-31 dull grained variety, high seed rate, no seed treatment, indiscriminate use of fertilizers and pesticides was treated as farmer's practice. Trainings to farmers, Field days and group meetings were also organized to provide the opportunities for other farmers to witness the benefits of demonstrated technologies. The KVKs Scientists used to visit to the cluster frontline demonstrations fields and farmer's field (control) on regular basis for close supervision and data collection during the entire process of demonstration programme. At the time of harvest, yield data were collected from both the demonstrated plots as well as from the farmers' practice. The cost of cultivation and profit details of both the systems were collected from the farmers for working out the benefit cost ratio. The economic parameters were calculated based on the prevailing market prices of inputs and minimum support prices of outputs.

Extension Gap = Demonstrated yield-Farmers' practice yield

Technology Gap= Potential yield- Demonstration yield

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

Results:

Grain yield: Results of the study revealed that transmission of developed technology under CFLD in blackgram resulted in higher grain yield i.e., 10.48 q/ha and 14.10 q/ha was realized which was 18.08 and 10.58% more compared to farmers practice i.e., 8.87 q/ha and 12.75 q/ha during *kharif* and *rabi*, respectively which is depicted in Table 1. The more yield in demonstration plot was might be due to inclusion of improved variety of seed, seed treatment and integrated nutrient and pest management practices. Similar to present findings, the yield improvement through adoption of developed technology has also been reported in earlier studies of CFLD's [1, 3, 9].

Net returns and B:C ratio: The net returns of Rs. 30,058, Rs. 51, 890/- per ha and B:C ratio of 1.91, 2.14 were also higher with demonstration plot compared to farmers practice plot (Rs. 20,250, Rs. 41,855 per ha and 1.61,1.90) during *Kharif* and *Rabi*, respectively. The increase in net returns and B:C ratio were due to increase in yield and price of the produce was also more in demonstration plot due to shiny nature of the seed as the PU 31 is dull in nature.

Table 1: Effect of Cluster Frontline Demonstrations on Yield and Economics of Blackgram

S. No.	Particulars	Kharif, 2022		Rabi, 2022-23	
		Demo plot	Farmers practice	Demo plot	Farmers practice
1	Average yield (q/ha)	10.48	8.87	14.10	12.75
2	Increased yield (%)	18.08	-	10.58	-
5	Net returns (Rs./ha)	30058	20250	51,890	41,855
6	B: C ratio	1.91	1.61	2.14	1.90

Table 2: Impact of technological intervention on gap analysis in blackgram.

Season	Yield (q/ha)			Technology gap (%)	Extension gap (%)	Technology Index (%)
	Potential	CFLD	Farmers practice			
Kharif	20	10.48	8.87	9.52	1.61	47.6
Rabi	20	14.10	12.75	5.90	1.35	29.5
Average	20	12.29	10.81	7.71	1.48	38.5

Technology Gap: An average technology gap of 7.71 q/ha (Table 2) was calculated during the demonstration period. The data reflects that there is further potential for increasing yield by implementation of better technological interventions reducing the technological gap and ultimately lowering down technology index. The technological gap may be attributed to the dissimilarity in the soil fertility status and weather conditions [8].

Extension Gap: An extension gap of 1.61 and 1.35 q/ha (Table 2) was recorded during Kharif and Rabi seasons, 2022-23.On an average, extension gap observed during both the seasons was 1.48 q/ha which is a wide gap. This emphasized the need to educate the farmers through various means for the adoption of improved agricultural production 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. This finding is in corroboration with earlier findings {4,7,10].

Technology index: Technology index is another important tool for judging the adoption and impact of different technologies. It is derived as the ratio between technology gap and potential yield in terms of percentage. Lower value of technology index means better performance of technological intervention. In the present study, technology index varied from 47.60 to 29.50 per cent (Table 2). The data reveals that the demonstrated technology showed better results in Rabi season in comparison to the Kharif. Similar results were also obtained by different investigators [6,5]. Large variation in technology index might be due to variation in existing weather condition, soil fertility status and insect-pests infestation.

Conclusion: The outcome showed that cluster frontline demonstrations created greater awareness and made a positive impact on the local farming community as they were motivated by adoption of high yielding latest varieties with improved package of practices increase the productivity and profitability in blackgram. The beneficiary farmers of CFLDs also play an important role as source of information and quality seeds for wider dissemination of the high yielding varieties of blackgram for other nearby farmers.

References:

1. Abraham S, Chourasia M, Arya M, Sahu E, Jamrey P. and Mishra T. Agricultural Acience Digest. 2024
2. Agricultural Statistics Division, DES, MoAF&W, 2022.
3. Devi MG, KUMAR CA, KISHORE KR. CFLD: An Effective Approach to Improve Production Potential of Groundnut in Guntur District of Andhra Pradesh. Journal of Eco-Friendly Agriculture. 2023;18(2): 258–262.
4. Hiremath SM. and Nagaraju MV. Evaluation of on-farm front line demonstrations on the yield of chilli. Karnataka Journal of Agricultural Sciences. 2010; 23: 341-342.
5. Jha AK, Chatterjee K, Mehta BK, Kumari M. Effect of technological intervention of cluster frontline demonstration (CFLDs) on productivity and profitability of black gram (Vigna mungo L.) in Sahibganj district of Jharkhand. International Journal of Chemical Studies. 2020; 8: 2124-2127.
6. Kumar A, Kumar R, Yadav VPS, Kumar R. Impact assessment of frontline demonstration of bajra in Haryana state. Indian Research Journal of Extension Education. 2010; 10: 105-108.
7. Meena RK, Singh B, Shinde KP, Meena RK. Cluster front line demonstrations of green gram under national food security mission in Sriganganagar district: An evaluation of production and productivity of green gram. International Journal of Current Microbiology and Applied Sciences. 2020; 9: 984-990.
8. Mukherjee N. Participatory Learning and Action Concept, Publishing Company, New Delhi. 2003; 63-65.
9. Singha AK, Deka Bidyut C, Parisa Divya, Nongrum C and Singha Amrita. Journal of Pharmacognosy and Phytochemistry 2020; 9(3): 606-610.
10. Singh M, Dwivedi AP, Yadav KS. Gaps in pulses production in Vindhya plateau agroclimatic zone of Madhya Pradesh: an assessment through frontier technology. Indian Journal of Extension Education. 2019; 55: 39-42.
11. Tiwari AK, Shivhare AK. Pulses in India Retrospect & Prospects, Status Paper, Directorate of Pulses Development, Vindhyachal Bhavan, Bhopal, 2017.