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 *kKharif* and *rRabi*, 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 *kKharif* and *rRabi*, respectively.

Key words Keywords: 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 [1][9]. Besides, pulses possess several other qualities such as they improve improving soil fertility and physical structure, fit fitting in mixed/inter-cropping systems, crop rotations, and dry farming, and provide providing green pods for vegetables 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 tons [2] still less than the future estimated demand of 29-30 million tones tons. 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 test-based INM, and mechanized method of pulse cultivation complimented with generous governmental policies and appropriate funding support to implementing states/stake holders stakeholders [3][11].

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

In the West Godavari district, it is also one of the important pulse crops grown in uplands and tand tail end tail-end areas, but the full potential of the crop was not realized by farmers due to the 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 to meet the projected demand of 32 million tonnes tons 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 [3][11].

In India, pulses, therefore, have always received due attention s both in terms of requirement by consumers and adequate programmatic support from the government at the

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production front. Addressing this concern of significance, the Ministry of Agriculture and Farmers Welfare, Govt. of India had initiated a ~~nation-wide~~ nationwide 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~~ location-specific technologies.

The Krishi Vigyan Kendra (KVK), Undi has successfully implemented cluster frontline demonstrations on ~~balckgram~~ blackgram during the ~~seasons~~ *~~k~~Kharif* and *~~r~~Rabi seasons*, 2022-2023 in a systematic manner on farmers' fields 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~~ of assessing the performance of CFLD on b~~B~~lackgram 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~~ the *Kharif* and *Rabi seasons*, 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~~ micronutrients displayed in demonstration plots~~, while~~. In contrast, PU-31 ~~dull grained~~ dull-grained variety, high seed ~~-~~rate,~~-~~ no ~~-~~seed treatment,~~—~~and indiscriminate use~~-~~ of fertilizers and pesticides ~~was~~ were treated as farmer's practice. ~~Trainings~~ Training 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~~KVK scientists used to visit ~~to~~ the cluster frontline demonstration~~s~~ fields and farmer's field (control) ~~on regular basis~~ regularly for close supervision and data collection during the entire process of the demonstration programme. At the time of harvest, yield data were collected from both the demonstrated plots ~~as well as~~ and from the farmers' practice. The cost of cultivation and profit details of both ~~the~~ systems were collected from the farmers ~~for working~~ to work out the ~~benefit cost~~ 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 = $\frac{Potential\ yield - Demonstration\ yield}{Potential\ yield} \times 100$

Data Aanalysis

[4] contend that informed objective decisions are based on facts and numbers, real, realistic and timely information. Furthermore, according to [5], "descriptive statistics deals with describing

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a collection of data by condensing the amounts of data into simple representative numerical quantities or plots that can provide a better understanding of the collected data" (p. 272). Therefore, this study analyzed data collected with descriptive statistics such as percentages supported with tables for clarity.

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 farmers' practice i.e., 8.87 q/ha and 12.75 q/ha during *kharif* and *rabi seasons*, respectively which is depicted in Table 1. The more higher yield in the demonstration plot was might be due to the inclusion of an improved variety of seeds, seed treatment, and integrated nutrient and pest management practices. Similar to the present findings, the yield improvement through the adoption of developed technology has also been reported in earlier studies of CFLDs [1, 6, 7][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 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 was due to an increase in yield and the price of the produce was also more higher in the demonstration plot due to the 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

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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 k~~K~~harif and r~~R~~abi seasons, 2022-23. On an average, the 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 the latest production technologies with ~~high yielding~~ high-yielding variety will subsequently change this alarming trend of galloping extension gap. This finding is ~~in~~ corroborated ~~ion~~ ~~with~~ by earlier findings [9, 10, 11]~~[4,7,10]~~.

Technology index~~:~~

~~Technology~~ The 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~~ The lower value of the technology index means better performance of technological intervention. In the present study, the technology index varied from 47.60 to 29.50 ~~per cent~~ percent (Table 2). The data reveals that the demonstrated technology showed better results in the r~~R~~abi season in comparison to the k~~K~~harif. Similar results were also obtained by different investigators [12, 13]~~[6,5]~~. Large variations in the technology index might be due to variations in existing weather conditions, soil fertility status, and insect-pest ~~s~~ 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 the adoption of ~~high yielding~~ high-yielding latest varieties with an improved package of practices to increase the productivity and profitability in blackgram. The beneficiary farmers of CFLDs also play an important role as a source of information and quality seeds for wider dissemination of the ~~high yielding~~ high-yielding varieties of blackgram for other nearby farmers.

References~~:~~ The numbers are modified accordingly and changed in the paper
Review carefully the write-up of the references for consistency and completeness, and to match the Journal's requirements

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