The Journal of Rural and Agricultural Research Vol. 21 No. 2, 42-45 (2021)
Received July 2021; Acceptance October 2021

Impact of CFLD on Production and productivity blackgram (Urd)

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Abstract

Pulses are rich source of protein and can play vital role in fulfilling the rquirement of swiftly increasing population. India is the world's first largest producer (25%) and consumer (27%) of pulses and importer (14%) of pulses in the world. It was for the first time since plan intervention on pulses that nation inscribed a success by achieving higher production at 23.13 Mt and 25.23 Mt during 2016-17 and 2017-18. Major increment was recorded in kharif production i.e. 62 per cent mainly due to lion share contributed by urd (82 per cent) followed by tur (52 per cent) and mung (34 per cent). Over all maxium number of farmers fall in category of poor level kowledge, while very fiew with high knowledge level. The average yield recommended practice (CFLD) was obtained 13.66 q/ha as compared to farmers' practice 7.03 q/ha, which was 94.44 per cent higher than farmers' practice. Technology gap is the gap in the demonstration yield over potential yield was found 0.34 q/ha while extension gap was recorded 6.64 q/ha. Technology index I (1.43-3.43). The two years average yield of CFLD demonstration technology I was found 2.43 per cent. Technology Index II of CFLD black gram was found higher (48.57) over farmers' practice. Cultivation of black gram under improved technologies gave higher net return 41400 & 47120 Rs/ha compared to 13050 & 16040 Rs/ha under farmers' practice in the corresponding years. The average benefit cost ratio of CFLD demo was 2.65, and that of farmers' practice 1.66.

Key Word: Black gram, production, productivity and area

Introduction

India foodgrain production to hit a record high 291.95 million tonnes in 2019-20. Total pulse production during 2019-20 is estimated at 23.02 million tonnes which is higher by 2.76 million tonnes than the Five Year average production of 20.26 million tonnes. Pulses account for 20 per cent of the area under foodgrain and cntributed around 7-10 per cent of the total foodgrains production in country. Madhya Pradesh, Maharasthra, Rajasthan, Uttar Pradesh and Karnataka are the top five pulses producing stastes and productivity of pulses is 764 kg/ha. Pulses are rich source of protein and can play vital role in fulfilling the rquirement of swiftly increasing population. India is the world's first largest producer (25%) and consumer (27%) of pulses and importer (14%) of pulses in the world. Globally, different pulses are cultivated in 83.3 million hactares in 171 countries with the production of 81.8 million tonnes. India is world's largest producer, accounting for 34% of area and 24% of production. The total consumption of various pulses and pulse products in India about 21 - 22 million tonnes. The most imported pulses are pegionpea, chickpea, blackgram, lentil and greengram, along with it being the largest importer of pulses, it is also largest producer of the same. Almost 24 per cent of total GDP in terms of Global output is been contributed by pulses in the country. India imported pulses worth over 110 billion Indian rupees in financial year 2021, an increse from the previous financial year.

Almost pulses are mainly being grown on marginal and sub-marginal land under rainfed conditions with low input usage and less than 15% of area under pulses is irrigated, exposing its production to weather-related yield risks.

Blackgram (Urd), the third important crop grop, was cultivated over an area of 5.44 million ha (Kharif + Rabi) and recod a production of 3.56 Mt at a

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productivity level of 655 kg/ha. this was the highest ever area, production and productivity in this crop. Major contributing state have been MP, Rajasthan, AP, UP, Tamilnadu, Mahrastra Jharkhand and Gujrat.

It was for the first time since plan intervention on pulses that nation inscribed a success by achieving higher production at 23.13 Mt and 25.23 Mt during 2016-17 and 2017-18.

Major increment was recorded in kharif production i.e. 62 per cent mainly due to lion share contributed by urd (82 per cent) followed by tur (52 per cent) and mung (34 per cent).

The mandate, of the Krishi Vigyan Kendra (KVKs) are application of technology through assessment, refinement and demonstration of proven technologies under different 'micro farming' situations in a district (Das, 2007). The production and productivity of Blackgram (Urd) is not adequate in the district due to use of poor quality seed, poor production technology, attack of yellow mosaic virus (YMV), and incidence of insect- pests. Therefore, it is necessary to demonstrate production and protection technologies to the farmers which are not adopted by them. Taking into the concentration cluster front line demonstrations were conducted on Kharif black gram (Urd) (var. PU 31). The major objectives of the study was to demonstrate the performance of recommended high yielding black gram variety with full recommended package of practices and to compare the yield levels of Farmers' practice.

Methodology

The present study was coduct with aim to assess the impact of cluster front line demonstration on production of blackgram. The cluster front line demonstration of kharif on blackgram for the year 2016 and 2017. Guide line of Cluster Frontline Demonstration to KVK by ICAR-ATARI, Kanpur Zone III. According CFLDs under blackgram (Urdbeen) laid out in ten villages. The knowledge level of the farmers in these villages was also evaluated by random sample of 30 farmers each village. Thereby sample included 300 numbers of farmers in the study. The farmers were asked to reply questions about the improved agro techniques including the high yielding varieties of blackgram. The score so obtained under various questions were summed-up. On the basis of the total score obtained, respondents were categoriezed on to three classes i.e. low, medium and high level of knowledge.

The soil sample were taken and analysis before sowing of CFLDs demonstrations.The soil of CFLDs fields were found sandy loam to clay loams having 0.3 to 0.6 per cent available organic carbon, 240 to 290 kg/ha nitrogen, 29 to 47 kg/ha available P_2O_5 and 60 to 120 kg/ha available potassium with pH range from 6.5 to 7.9. CFLDs on Blackgram were cultivated during kharif season and sown first fortnight of August. Black gram crop was sown in line and fertilize with a common dose of N:P:K:S @ 20:60:40:25 kg/ha. Full Nitrogen, Phosphorus, Potash and Sulpher applied at the time of sowing. Nitrogen was use as starter dose of crop. Seed Treatment done by using carbandazim @ 2g/kg seed 2 to 3 days beforeof sowing. Soil treatment of CFLDs demonstration fields were taken by using trichoderma @ 5 kg/ha and plant protaction measures adopted during crop period.

Participating farmers were provide with all advance technical know how about advanced cultivation of blackgram crop.Scientist of KVK also visited regularly to the demonstrations fields and continously guided the farmers. The variety PU 31 was utilized for collaction of feedback information for more improvements in technology transfer programme. field days and group meeting were also organised at demonstration site to provide the opportunities for other farmers to witness benefits of demonstration technologies. The dataon Blackgram productivity (q/ha) were collacted from the demonstration and control plot (Farmers Practice) for further analysis. The critical inputs were duly supplied to the farmers by KVK. Data were collacted fro the field of CFLDs farmers and analysed to compare the yield of farmers' field and CFLDs fields. The technology gap, extension gap and technlogy index I and technology index II were were estimated by using formulae provided by Samue *et.al.* 2000.

Technology gap = Potential Yield – Demonstration Yield

Extension gap = Demonstration Yield – Farmers Practice Yield (control)

Technology index I

$$= \frac{\text{Potential Yield-Demonstration Yield}}{\text{Potantial Yield}} \times 100$$

Technology index II

$$= \frac{\text{Demonstration Yield – Check Yield}}{\text{Demonstration Yield}} \times 100$$

Results and Discussion

Knowledge Level of Advanced Agronomic Practices of Blackgram (Urd)

To know the need of the technological intervantion the knowledge level of the farmers in ten villages were estimete from 300 farmers from 30 farmers each village. Over all maxium number of farmers fall in category of poor level kowledge, while very fiew with high knowledge level (Tabl 1). thus the need was felt to introduce latest varieties and nutrient management in CFLDs programme in 06 villages. CFLDs are good extension tool to demonstrtion the impact of new agro techniques to the farmers.

Table 1: Overall knowledge level of farmers in respect of cultivation of Black gram (Urd) N= 300

Category of Knowledge level	Score Range	No. of Farmers	% of respondent
Low	30-35	146	49
Medium	36-54	108	36
High	55-75	46	15

Yield and Technological index I & II :

Implementation of improved production technology remarkably increased the yield (94.44) over farmers practice during both years of CFLD demonstration. The average yield recommended practice (CFLD) was obtained 13.66 q/ha as compared to farmers' practice 7.03 q/ha, which was 94.44 per cent higher (Table 2). Yield obtained under CFLD demonstration at par than potential yield of variety. It may be due to cumulative effect of several biotic and a biotic factors in micro climatic condition and good management of agronomic practices.

Yield enhancement under recommended practice might be due to balance nutrition as per soil test value, integrated approach, involving fertilizers and bio fertilizers which play a vital role in making availability of plant nutrients. Similar results were Singh et.al. (2019), Tomar et.al. (2003).

Technology gap is the gap in the demonstration yield over potential yield was found 0.34 q/ha while extension gap was recorded 6.64 q/ha. The technology gap was found very less that's mean the application of technological intervention and climatic condition are good for the variety. But to minimize the extension it is need to educate the farmers through various means for more adoption of improved high yielding variety and recommended practices to bridge the wide extension gap. This extension gap requires urgent attention from planners, scientists, extension personnel, development department and NGOs working in the agricultural fields.

Technology index shows the feasibility of the evolved technology at the farmer's field. The lower the value of technology more is the feasibility of the technology. The Data showed in table 3 that adopting advance production technology under CFLD demonstration produce at par than the potential yield of variety and it reflected technology index I (1.43 - 3.43). The two years average yield of CFLD demonstration technology I was found 2.43 per cent. Technology Index II of CFLD blackgram was found higher (48.57) over farmers' practice.

Data presented in table 3 revealed that demonstration technology had impact over farmers' practice. It might be due to cumulative effect on average yield of district, technology index I and technology index II due to good management of CFLD and technology spread among the farmers of district. The average yield increased in CFLD demonstration field due to technology intervention may happen in other similar situation the results agreement with Singh, *et.al.* (2019), Roy *et.al.* (2006) and Tomar *et.al.* (2003)

Economical Assessment

Input & output prices of commodities prevailed during each year of demonstration were taken for calculating cost of cultivation, net return and benefit

Table 2: Performance of technological intervention (CFLD) on Yield (q/ha)

Year	Yield Potential (q/ha)	Yield obtained (q/ha)						Yield increase (%)	Technology gap	Extension gap
		Check			Demo					
		Maximum	Minimum	Average	Maximum	Minimum	Average			
2016	14.00	8.50	6.50	6.95	15.10	12.20	13.52	94.52	0.48	6.57
2017	14.00	8.90	7.20	7.10	15.30	12.30	13.80	94.36	0.20	6.70
Average	14.00	8.70	6.85	7.03	15.20	12.25	13.66	94.44	0.34	6.64

Table 3: Performance of technological intervention (CFLD) on technology index I & II

Year	Area (ha)	Demo (No)	Variety Check	Variety Demo	National av. yield (q/ha)	State av. yield (q/ha)	District av. yield (q/ha)	Potential yield of demo variety	Technology Index I	Technology Index II
2016	10	25	Shekhar	PU 31	6.55	3.20	10.70	14.00	3.43	48.59
2017	10	25	Shekhar	PU 31	6.55	3.20	10.70	14.00	1.43	48.55
Average	10	25	-	-	6.55	3.20	10.70	14.00	2.43	48.57

Table 4: Economical comparison between CFLD demo and farmers' practice

Year	Sale Price (Rs/q)	Expenditure and return (Rs/ha) Check Gross Cost (Rs/ha)	Check Gross Income (Rs/ha)	Check Net Return (Rs/ha)	Check B:C ratio	Demo Gross Cost (Rs/ha)	Demo Gross Income (Rs/ha)	Demo Net Return (Rs/ha)	Demo B:C ratio	Net income increase (%)
2016	5000	21700	34750	13050	1.61	26200	67600	41400	2.58	217.0
2017	5400	22300	38340	16040	1.71	27400	74520	47120	2.71	194.0
Average	5200	22000	36545	14545	1.66	26800	71060	44260	2.65	205.5

cost ratio (table 4). The investment on production by adopting improved technologies (cost of cultivation) were 26200 to 27400 Rs/ha with a mean value of 26800 Rs/ha against farmers' practice where the variation in cost of production were 21700 to 22300 Rs/ha with an average of 22000 Rs/ha. Cultivation of blackgram under improved technologies gave higher net return 41400 & 47120 Rs/ha compared to 13050 & 16040 Rs/ha under farmers' practice in the corresponding years. The average benefit cost ratio of CFLD demo was 2.65, and that of farmers' practice 1.66. The average net return increase 205.5 per cent higher than that of farmers' practice. This may be due to higher yields obtained under CFLD technology compares to farmers' practice. The result suggested economics viability and agronomic feasibility of technology for blackgram cultivation as reported Singh *et.al.* (2019), Deshmukh *et.al.* (2005) and Pathak (2005)

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