J Krishi Vigyan 2022, 10 (2) : 263-267 DOI : 10.5958/2349-4433.2022.00043.5

Performance of Cowpea Variety DC-15 at Farmers' Field

Dinesh Kumar S P, Sudha S and Kammar M R

ICAR- Krishi Vigyan Kendra,
Near Railway Station, Badami Road, Bagalkot – 587 101 (Karnataka)

ABSTRACT

The study on the impact of frontline demonstration of cowpea variety DC-15 on yield and economics was conducted for two years, during 2017-18 and 2018-19 by ICAR-Krishi Vigyan Kendra, Bagalkote (Karnataka) with an objective to assess the yield level of cowpea variety (DC-15) with an improved package of practices over old local variety and its economic impact. Improved practice recorded significantly higher grain yield of cowpea (18.11 q/ha) over farmers' practice (12.62 q/ha) and there was a 43.43per cent increase in the yield. Similar trend was also noticed in the growth and yield parameters of cowpea. The improved technology in cowpea realized an additional income of Rs. 21,727/ha over farmers' practice due to created greater awareness and convinced the other farmers to adopt the improved package of practices for cowpea.

Keywords: Cowpea, Demonstration, Economics, Extension, Technology, Yield.

INTRODUCTION

Pulses are considered as main source of protein used as food, feed, forage, fodder, vegetable and various dishes prepared from its grains (Kumar and Narain, 2005). Cowpea (*Vigna unguiculata* (L) Walp) crop suits for both arid and semi-arid regions and adapts to high rainfall regions, soil types and agro-climatic zones. In Karnataka, cowpea is grown in an area of 0.62 lakh hectares with a production of 0.21 lakh tonnes. In Bagalkote, the crop is grown in an area of 385 ha with a production of 59 t with a productivity 161 kg/ha as compared to the state productivity of 362 kg/ha. The farmers of the Bagalkote district grow cowpea for grain purposes and to improve the soil fertility by covering the entire soil surface with this crop and reduces weed infestation.

Farmers having irrigation facilities sow cowpea in December after the harvest of pegion pea. As the farmers using a local or old variety of cowpea, the flowering coincides with the summer months when there is attack of Cowpea Mosaic Virus infestation which results in low yield of cowpea. To conserve soil moisture during summer and to increase soil fertility with additional income and reduce the disease infestation new cowpea variety DC-15 was introduced in the farmers' field. Cowpea variety DC-15 was released in the year 2017 for cultivation in Karnataka, Andhra Pradesh, Tamilnadu, and Kerala. This variety matures at 75-80 days after sowing (DAS), which has wide adaptability from deep black to red loamy soil and is tolerant to aphids, pod borer, moderately resistant to dry root rot and Cowpea Mosaic Virus. Hence, a study on performance of cowpea variety DC-15 on yield and economics under demonstration was conducted.

MATERIALS AND METHODS

The pre-seasonal group meeting was conducted and interacted with the farmers before conducting the study in the Bagalkote district of Karnataka. The study was conducted in three villages with 10 farmers and in 8 villages with 10 farmers during 2017-18 and 2018-19, respectively having irrigation facility by adopting purposive sampling method. During the initial year, 2017-18 information on existing cultivation practices by the farmers' was collected. The information comprises of the variety

Corresponding Author's Email: dineshspuasd@gmail.com

Table 1. Comparison of improved practice and farmers practice under frontline demonstration in cowpea.

Sr. No.	Particular	Frontline demonstration	Farmers' Practice	Gap
1	Variety	DC-15	Local/ C-152	Full gap
2	Seed rate (kg/ha)	25	40-50	Partial gap
3	Seed treatment	*Rhizobium*	No	Full gap
4	Sowing method	Seed cum fertilizer drill	Seed drill	Partial gap
5	Spacing	45 cm x 10 cm row spacing	45 cm x 10 cm row spacing	No gap
6	Depth of sowing	5 cm	Deep sowing	Full gap
7	Sowing date	June –July January - February	December-January	Partial gap
8	Fertilizer application	12.5:25:12.5 kg NPK/ha at the time of sowing	125 kg DAP/ha	Partial gap
9	Weed control	Pre-emergent application of Pendimethalin 30 EC@ 3.25 l/ha and one inter-cultivation	Two inter-cultivation and hand weeding	Partial gap
10	Number of irrigation	5	7	Partial gap
11	Plant protection	Based on recommended dose (as per package of practice)	Overdose and non-recommended brands of pesticides	Partial gap

cultivated, yield, profit, and problems faced by the farmers. Based on the information collected, technological gaps were identified and a suitable package of practice which was developed by University of Agricultural Sciences, Dharwad was introduced (Table 1) at Kaladgi and Nayanegili villages of Bagalkote taluka during 2017-18 and Neeralkeri, Ilal, Kajjidoni, Murnal, Mullur villages of Bagalkote taluka, Aihole and Belgal villages of Hungund taluka and Rabakavi village of Bilagi during 2018-19. Other varieties of cowpea grown by participating farmer or adjoining farmer served as control (farmers' practice) for the study.

The data on the cost of cultivation, yield was collected from each selected framer. For calculation of economics, the price of the product has been collected from Agricultural Produce Marker Committee (APMC), Bagalkote. From the collected data yield, cost of cultivation, gross returns, net profit, and B:C ratio was worked out. To know the overall impact of two years of assessment, the data were analyzed using Randomized Complete Block Design (RCBD). The extension gap, technology gap, and technology index were estimated (Samui *et al,* 2000).

RESULTS AND DISCUSSION

Growth and yield parameters

The two years pooled data of cowpea recorded significantly higher plant height in improved practice (104.0 cm) with cowpea variety (DC-15) as compared to farmers' practice (83.2 cm) (Table 2). A similar trend was also noticed in yield parameters such as the number of pods per plant (65.6 v/s 57.1), the number of seeds per pod (12.9 v/s 12.5), pod length (16.3 v/s and 14.7 cm) and 100 seed weight (4.07 g v/s 3.72 g). The higher yield parameters obtained in the improved practice may be due to the higher growth of the plant that the cultivars possess certain inherent potential and

Table 2. Growth, yield parameters and economics of cowpea as influenced by improved and farmers practice under the frontline demonstration.

Parameter	Treatment	2017-18	2018-19	Pooled
Plant height (cm)	IP-Improved Practice	106.2	101.8	104.0
	FP-Farmers Practice	86.2	80.2	83.2
S.Em±		1.57	2.55	1.56
CD(0.05)		5.02	8.17	4.98
No of Pods per plant	IP-Improved Practice	66.2	64.9	65.6
	FP-Farmers Practice	58.4	55.7	57.1
S.Em±		1.47	1.69	1.14
CD(0.05)		4.72	5.40	3.65
No of seeds per pod	IP-Improved Practice	14.2	12.1	13.2
	FP-Farmers Practice	3.6	10.8	12.2
S.Em±		0.49	0.21	0.30
CD(0.05)		NS	0.68	0.95
Pod Length (cm)	IP-Improved Practice	16.9	15.8	16.3
	FP-Farmers Practice	15.6	13.8	14.7
S.Em±		0.36	0.52	0.30
CD(0.05)		1.16	1.65	0.95
100 Seed Weight (g)	IP-Improved Practice	4.25	3.89	4.07
	FP-Farmers Practice	3.80	3.64	3.72
S.Em±		0.09	0.06	0.07
CD(0.05)		0.28	0.20	0.23
Grain yield (q/ha)	IP-Improved Practice	18.75	17.47	18.11
	FP-Farmers Practice	13.00	12.25	12.62
S.Em±		0.40	0.30	0.26
CD(0.05)		1.27	0.97	0.82
Cost of Cultivation (Rs./ha)	IP-Improved Practice	31210	33849	32530
	FP-Farmers Practice	31050	33689	32370
S.Em±		-	-	-
CD(0.05)		-	-	-
Gross Return (Rs./ha)	IP-Improved Practice	71250	73353	72302
	FP-Farmers Practice	49400	51429	50415
S.Em±		1045.5	757.6	707.0
CD(0.05)		3344.4	2423.5	2261.8
Net return (Rs./ha)	IP-Improved Practice	40040	39504	39772
	FP-Farmers Practice	18350	17740	18045
S.Em±		1045.5	757.6	707.0
CD(0.05)		3344.4	2423.5	2261.8
Additional Income (Rs./ha)		21690	21764	21727

B:C ratio	IP-Improved Practice	2.28	2.17	2.22
	FP-Farmers Practice	1.59	1.53	1.56
S.Em±		0.03	0.02	0.02
CD(0.05)		0.11	0.07	0.07

Table 3. Grain yield, extension gap, technology gap, and technology index of cowpea as influenced by improved and farmers practice under the frontline demonstration.

Year	Grain yield (q/ha)		Per cent increase in yield	Potential yield (q/ha)	Extension gap (q/ha)	Technology gap (q/ha)	Technology index (%)
	IP	FP					
2017-18	18.75	13.00	44.23	20.00	5.75	1.25	6.25
2018-19	17.47	12.25	42.63	20.00	5.22	2.54	12.68
Mean	18.11	12.62	43.43	20.00	5.49	1.89	9.46

Note: IP-Improved Practice, FP-Farmers' Practice

their interaction with soil and climatic conditions (Shourov and Prakshipta, 2021).

Grain yield

Among the pooled data on grain yield (Table 2), significantly higher grain yield was recorded in improved practice (18.11 q/ha) with cowpea variety (DC-15) as compared to farmers practice (12.62 q/ha). In both years, a similar trend was noticed in grain yield. The increase in the grain yield of the cowpea variety (DC-15) with improved practice was 43.43 per cent over the farmer's practice. Adoption of seed treatment with *Rhizobium* and plant protection practices at right time resulted in higher yields. These results were in line with the finding of Singh (2002).

Extension gap

The difference between improved practice and farmer's practices was worked out as an extension gap, which ranges from 5.22 to 5.75 q/ha with an average of 5.49 q/ha during the assessment period (Table 3). This wider and alarming trend of galloping extension gap needs to be addressed by educating the farmers through various extension activities for the adoption of new and high-yielding varieties of cowpea which are suitable for the summer season. These results were in line with the findings of Singh *et al* (2019).

Technology gap

To know the technology gap, the yield difference between potential and demonstration yield of cowpea variety DC-15 was worked out, which ranges from 1.25 to 2.54 q/ha with an average of 1.89 q/ha (Table 3). The variation in the yield may be due to the weather and fertility status of the area. These results were similar to the findings of Hiremath and Nagaraju (2009).

Technology index

The technology index will explain the feasibility of improved technology at the farmers' fields by comparing the potential yield of the variety with improved technology (Table 3). The higher feasibility of improved technology was indicated by lower values of the technology index. The lower technology index (6.25 %) was observed in 2017-18, followed by 2018-19 (12.68 %). During 2017-18 lower technology index appeared, this may be due to cowpea variety DC-15 performed well with improved technology in an area of higher

soil fertility which was coupled with the good weather conditions. These results were similar to the findings of Hiremath and Nagaraju (2009) and Anuratha *et al* (2020).

Economics

The economics measure the profitability of a system. The farmer adopts such practice that gives more profit. The pooled data on economics were worked out for each demonstrating year for both improved and farmers practice (Table 2). Over the years, economic analysis of improved practice with cowpea variety (DC-15) recorded significantly higher gross return (Rs. 72302/ha), net return (Rs. 39772/ha), and B:C ratio (2.22) as compared to farmers practice (Rs. 50415/ha, Rs. 18045/ha and 1.56, respectively). The adoption of a cowpea variety (DC 15) with improved practice realized an additional income of Rs. 21727/ha. These findings were similar to the findings of Vinay *et al* (2020). Under local agro-ecological situations, the results of the demonstrations revealed that the higher profitability and economic viability of cowpea variety (DC-15) with an improved package of practice.

CONCLUSION

It can be concluded that adopting a cowpea variety (DC 15) with improved practices increased the yield to the tune of 43.43 percent over the farmer practice with an additional income of Rs. 21727/ha, which motivated the other farmers to adopt the improved technology. Thus, the frontline demonstration is an effective and feasible tool for increasing the area, production, and productivity of cowpea in the study area.

REFERENCES

Anuratha A, Ramasubramanian M and Chandirakala R (2020). Assessment of greengram varieties for better yield in Nagapattinam District of Tamil Nadu. *J Krishi Vigyan* **9**(1): 12-15.

Hiremath S M and Nagaraju M V (2009). Evaluation of frontline demonstration trials on onion in Haveri district of Karnataka. *Karnataka J Agri Sci* **22** (5):1092-1093.

Kumar D and Narain P (2005). Production technology for cowpea, AICRP on Arid legumes, CAZRI, Jodhpur, Rajasthan. pp 1-36.

Samui S K, Maitra S, Roy D K, Mandal A K, Saha D (2000). Evaluation on front line demonstration on groundnut. *J Indian Soc Coastal Agri Res* **18**(2):180-183.

Shourov D and Prakshipta B (2021). Improved management practices of Garden pea (*Pisum sativum* L.) produced higher yield in Karbi Anglong District of Assam. *J Krishi Vigyan* **10**(1): 123-132.

Singh A K, Singh R P, Singh R K and Upadhyay (2019). Frontline demonstration: An effective tool for increasing productivity of pulses in Gorakhpur district of Uttar Pradesh. *J Pharm and Phyto* **8**(2): 1882-1884.

Singh P K (2002). Impact of participation in planning on adoption of new technology through FLD. *Manage Ext Res Rev* pp 45-48.

Vinay G and Prabhatsinh J (2020). Impact of demonstration on productivity and profitability of greengram in Gandhinagar district of Gujarat. *J Krishi Vigyan* **8**(2): 174-177.

Received on 16/8/2021 *Accepted on 24/1/2022*