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Impact of Frontline Demonstration of Red Gram Production Technology on Partner Farmers of Tumakuru District in Karnataka

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Abstract

The study was carried out in Tumakuru district of Karnataka state during 2020-21 to analyse the impact of front line demonstrations (FLDs) of Red gram production technologies on the partner farmers. Forty farmers who have availed the benefits from the FLD formed the sample of the study. The results revealed that more than three fourth of the farmers (80.00%) had medium to high level knowledge on recommended Red gram production technologies. Observations also found that less than half of the farmers (42.50%) and (40.00%) belonged to medium and high adoption level categories, respectively. Cent per cent of partner farmers adopted recommended method of sowing, field preparation and nipping. Whereas, great majority (95.00%) of the farmers adopted recommended improved seed variety and FYM/ acre, spacing and time of sowing (92.50%). Further adoption of soil testing (42.50%), post-harvest practices (60.00%), proper irrigation management (65.00%) and application of bio fertilizers (65.00%) were found to have increased at lower rate. FLD on Red gram enhanced the average yield of the farmers from 4.06 qtl to 5.18 qtl. Non-availability of labour, lack of irrigation facilities, high cost of fertilizers, Non-availability of agricultural inputs in time and lack of marketing facilities were the major constraints faced by the partner farmer in adoption of recommended red gram production technologies.

Keywords : Front line demonstrations, Adoption, Knowledge, Partner farmers

Front-line Demonstration is the concept of field demonstration evolved by the Indian Council of Agricultural Research (ICAR) with the inception of the Technology Mission on Oilseed (TMO) Crops during mid-eighties. The field demonstrations conducted under the close supervision of scientists of the National Agriculture Research System (NARS) are called FLDs. As the technologies are demonstrated for the first time by the scientists themselves before it is being fed into the main extension system of the State Department of Agriculture. The main objective of FLD is to demonstrate newly released crop production and protection technologies and its management practices in the farmers' field under different agro-climatic regions and farming situations. While demonstrating the technologies in the farmers' field, the scientists are required to study the factors contributing for higher crop production, field constrains of production and thereby generate production data and feedback information. FLDs are conducted in a block of two or four hectares land in order to have better impact of the demonstrated technologies on the farmers and field level extension functionaries. Front Line Demonstrations are meant not only to educate farmers on the efficacy of new technologies but also help the field extension functionaries to gain confidence in suggested technologies. The success of frontline demonstration depends on how well they are being established and used for educational purposes.

Red gram, (*Cajanus cajan*) is the second most important pulse crops in India after Chickpea. It has multiple uses and occupies an important place in the prevailing farming systems in the country. It plays an important role in sustainable agriculture by enriching the soil nutrients through Biological Nitrogen Fixation. Because of its deep root system it can be grown under rainfed condition. Karnataka is the second largest producer of Red gram in the country (8.9 lakh hectares) with 5.3 lakh tones of production (2010-11) with an average productivity of 625 kg per

hectare. In Southern Karnataka, Tumakuru district is famous for Red gram cultivation occupying an area of 9,819 hectare with 4,868 tonnes of production and 354 kg/ha of average productivity which is much lower than the state and national average of productivity. Though Red gram is widely grown in Tumakuru district, various factors influences potential yield of the crop such as, faulty sowing practices, lack of knowledge about high yielding and diseases resistant varieties, (Fusarium wilt and sterility mosaic diseases are severe in the district) lack of awareness about seed treatment (with biofertilizers *viz.,* Rhizobium and Phosphorous Solubilizing Bacteria and bio-agent *Trichoderma viridae),* improper management of pod borer, (*Helicoverpa),* lack of knowledge about timely intercultural operations and lack of plant protection practices with this background, KVK Konehalli, Tumakuru has been conducting FLDs on Red gram to show the worthiness of high yielding and wilt resistant BRG 5 variety in conjunction with package of practices. While a large number of studies have been made to discuss the yield potentialities and procedures for conducting these demonstration limited studies have been conducted to assess the impact of FLD on adoption behaviour of farmers. Thus, the present study is an attempt to evaluate the impact of FLD on knowledge and adoption behaviour of Red gram partner farmers

Objectives

- To assess the impact of Red gram FLD on knowledge and adoption level of partner farmers
- To enlist the constraints faced by partner farmers in using technologies and seek their suggestions for further improvement of Front Line Demonstrations

METHODOLOGY

Study Area

The study was carried out in Tumakuru district of Karnataka. As it has two Krishi Vigyan Kendras one at Konehalli, Tiptur taluk and another at Hirehalli, Tumakur taluk. Hence, Tumakuru district was purposively selected for the study. Further, KVK Konehalli was selected for the study as it has conducted more number of FLDs on Red gram crop over the past years.

Selection of Respondents

The list of FLD Red gram partner farmers and their villeges were obtained from the records of KVK, Konehalli. Three villeges were purposefully selected based on the presence of majority of FLD Red gram growing farmers *viz.,* Gunnagere, Chikkahonavalli and Belavatta. A total of 40 partner farmers who have availed the benefits under FLD and were voluntarily willing to provide the required information were randomly selected for the study.

Research Design

Ex-post-facto research design was adopted for the study

Impact of FLDs on Red Gram Partner Farmers

Impact is operationalised in the context of the study as the extent of intended outcome on Knowledge and Adoption of the improved red gram cultivation practices as well as the Yield of Red gram crop by the partner farmers under the FLD.

Change in Adoption Level

It is operationally defined as the extent of adoption of recommended red gram production technologies and practices by Red gram growers on their farm after conducting of FLDs

The improved farming practice listed by using the Package of Practice given by UAS-B on Red gram production and the responses were collected from the respondents at three point continuum *viz.,* fully adopted, partially adopted and not adopted for both before and after the conducting of FLD. Scoring for these responses were 2, 1 and 0, respectively. The aggregate score of each respondent was obtained by adding the respective score for each item.

Thus after computing the adoption score, the respondents were grouped in to low, medium and high

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category by taking mean and standard deviation as a measure of check.

Category	Criteria	Score	
		Before	After
Low	< (mean-1/2SD)	15.26	31.00
Medium	(mean ±1/2SD)	15.26 - 17.1	31.10 - 33.91
High	> (mean+1/2SD)	17.10	33.90422

	Mean	SD
Before	17.10	3.671093
After	32.45	2.908432

TABLE 1

Overall knowledge level among partner farmers as a result of conducting FLD on Red gram

n = 40

Categories	Number of Respondents				Chi square value
	Before FLD		After FLD		
	No.	%	No.	%	
Low	12	30.00	8	20.00	7.73*
Medium	19	47.50	11	27.50	
High	9	22.50	21	52.50	
Total	40	100.00	40	100.00	

* Significance at 5% level of probability

Analysis of the Data

The collected data was analysed using Mean, Frequency, Percentage and Chi-square tests to meaningfully interpret the data.

RESULTS AND DISCUSSION

Overall Knowledge among Partner farmers as a Result of Conducting FLD on Red gram

Table 1 reveals the overall knowledge level of partner farmers before and after the introduction of FLD.

It was observed that before FLD on Red gram, nearly to half (47.50 %) of the farmers perceived medium level of knowledge on Red gram production technologies followed by low (30.00%) and high (22.50%) level of knowledge category. Whereas, after FLD, more than half (52.50%) of the farmers belonged to high knowledge level followed by medium (27.50%) and low (20.00%) knowledge level categories. Further, knowledge level was found to be significant (7.73) at 5 per cent level of significance.

The possible reason for increase in knowledge level after conduction of FLD might be due to active involvement of farmers in training related to Red gram production technologies conducted by KVK scientists, participation in discussion and demonstration. Farmers gained high knowledge regarding production practices after participation in FLD. The findings have similarity with the findings of Jyothi & Anand (2013), Ankitha Pandey *et al.* (2017) and Sidhu (2019).

Overall Adoption Level among Partner Farmers as a Result of Conducting FLD on Red Gram

It was observed in Table 2 that before FLD, little more than half (52.50%) of the respondents belonged to medium adoption category of Red gram production technologies followed by low (30.00%) and high (17.50%) categories. Whereas, after FLD, less than half (42.50%) of them belonged to medium adoption level category followed by high (40.00%) and low (17.50%) adoption categories. Further, adoption level was found to be significant (5.26) at 5 per cent level of significance.

Before FLD, they were using private and local varieties due to lack of knowledge and non-availability of improved seeds. However, after participation in the capacity building programmes and with constant guidance of scientists, they were able to adopt recommended technologies like BRG 5 seed varieties and its seed treatment, recommended spacing, nutrient management, Pest control measures (pod borer and webbing caterpillar) and motivational factors (provision of critical inputs) might have influenced the farmers to adopt appropriate technologies. The findings have found similar with the findings of Dinesh Dour *et al.* (2015) and Naina Virang *et al. (*2016)

TABLE 2

Overall adoption among partner farmers as a result of conducting FLD on Red gram

n = 40

Categories	Number of Respondents				Chi square value
	Before		After		
	No.	%	No.	%	
Low	12	30..00	07	17.50	
Medium	21	52.50	17	42.50	5.26*
High	07	17.50	16	40.00	
Total	40	100.00	40	100.00	

* Significance at 5% level of probability

Impact of Front Line Demonstrations (FLDs) on Adoption of Specific Red Gram Production Technologies

Impact of Front Line Demonstrations (FLDs) on adoption of specific Red gram production practices by the farmers is presented in Table 3. It was found that, the adoption of recommended variety of Red gram was less before demonstration which increased by 533.33 per cent after demonstration. This was followed by seed treatment with Trichoderma which was increased significantly by 371.42 per cent. Post-harvest practices and use of micro nutrients increased by 300 per cent and 250 per cent,

TABLE 3

Impact of front line demonstrations (FLDs) on adoption of specific Red gram production technologies

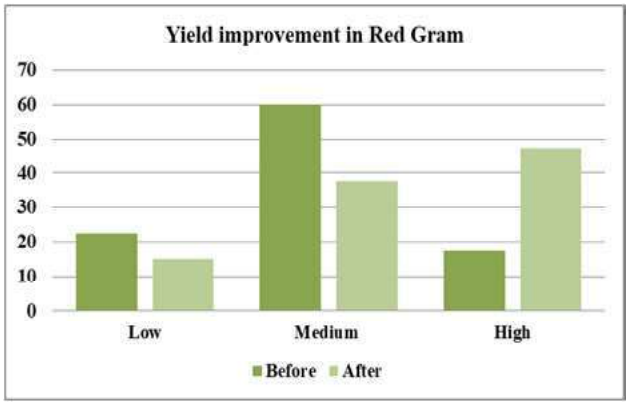
Specific Red Gram production practices	Partner farmers				Change in No. of adopters (No.)	Impact change (%)
	Before FLD		After FLD			
	No.	%	No.	%		
Soil testing	06	15.00	17	42.50	11	183.33
Land preparation (1 deep ploughing, 2 light ploughing followed by harrowing)	33	82.50	40	100.00	7	21.21
Improved Red gram variety (BRG-5)	06	15.00	38	95.00	32	533.33
Seed treatment (Trichoderma)	07	17.50	33	82.50	26	371.42
Seed rate (5-6 Kg/Acre) 100.00		15	37.50	30	75.00	15
Spacing adopted (2-3 ft. x 0.5ft.)	27	67.50	37	92.50	10	37.03
Time of sowing (May-June/July)	29	72.50	37	92.50	8	27.58
Method of sowing	26	65.00	40	100.00	14	53.84
FYM/acre (3 tonnes/acre)	27	67.50	38	95.00	11	40.74
NPK/acre (10:20:10 kg/acre)	16	40.00	33	82.50	17	106.25
Micro nutrients (Zinc 6Kg, Sulphur 8Kg, pulse magic)	08	20.00	28	70.00	20	250.00
Bio fertilizer (Rhizobium 200g, PSB-200g)	08	20.00	26	65.00	18	225.00
Weed management	17	42.50	33	82.50	16	94.11
Nipping	28	70.00	40	100.00	12	42.85
Irrigation management (2 protective irr.)	11	27.50	26	65.00	15	136.36
Plant protection	14	35.00	32	80.00	18	128.57
Proper method of harvesting and threshing	28	70.00	35	87.50	7	25.00
Post-harvest practices	06	15.00	24	60.00	18	300.00
Overall impact		148.70				

Multiple responses recorded

respectively. Using of bio fertilizers, soil testing, irrigation management and plant protection measures were increased by 225.00, 183.33, 136.36 and 128.57 per cent, respectively due to intervention of FLD. In addition, the per cent of adoption of recommended technologies such as, application of NPK, recommended seed rate, weed management, method of sowing, practicing nipping, FYM application, crop spacing, time of sowing, proper method of harvesting and method of field preparation increased significantly. The overall adoption level of Red gram production technologies increased by 148.70 per cent due to FLDs organized by KVK, Konehalli, Tumakuru. Similar findings were also reported by Chapke (2012), Mahadik & Tripathi (2016), Mahale *et al.* (2016) and Bhagavan Singh & Sharma (2018).

Yield Improvement among Partner Farmers as a Result of Conducting FLD on Red gram

The result of Yield Improvement among Partner farmers as a result of conducting FLD on Red gram is presented in the Fig. 1**.** Before conduction of FLD majority (60.00%) of the Red gram partner farmers belonged to medium level of yield category followed by low (22.50%) and high (17.50%) categories. Whereas, after conduction of FLD, it was observed that 47.50 per cent of the respondents belonged to high yield level categories and 37.50 and 15.00 per cent of farmers belonged to medium and low categories of yield improvement, respectively and it



Fig, 1. Yield Improvement among Partner farmers as a result of conducting FLD on Red gram

was found to be significant (8.22) at 5 per cent level of significance. The possible reason is that adoption of improved technologies like use of improved variety seeds, seed treatment, recommended spacing, pest and disease management and timely operations under the guidance of scientists, resulted in enhancement of productivity in Red gram in terms of grain. The similar results were also reported by Mutturaj (2017) and Padmavathi *et al.* (2018)

Constraints Perceived by Partner Farmers in Adoption of Recommended Red gram Production Technologies

Non availability of labour (Rank I), lack of irrigation facilities (Rank II), high cost of fertilizers (Rank III), non-availability of agricultural inputs in time (Rank IV), lack of marketing facilities (Rank V), lack of timely information (Rank VI), lower price of produce at the time of harvesting (Rank VII), lack of subsidies (Rank VIII), high cost of plant protection chemicals and equipments (Rank IX) and non-availability of quality seed material (Rank X) are the major problems faced by the red gram growing partner farmers for effective implementation of FLD in order of importance (Table 4). Similar problems were reported by Yashashwini (2013) and Mutturaj (2017).

Suggestions as Perceived by Red gram Partrner Farmers for Effective Implementation of FLD

Table 5 reveals the suggestions of Red gram partner farmers for effective implementation of FLDs. The suggestions are : Developing labour saving technologies (Rank I), Training on new technologies (Rank II), Providing agricultural inputs at reasonable price (Rank III), Proper irrigation facilities (Rank IV), Continuous supply of power (Rank V), Providing appropriate marketing facilities (Rank V), Provision for skill improvement training (Rank VII), Provision of Minimum Support Price (Rank VII). Providing timely information (Rank IX), Credit should be available easily and timely (Rank X) and providing quality seed material at right time (Rank XI). To enhance the productivity of Red gram, the above mentioned activities are crucial and

TABLE 4

Constraints perceived by Red gram growers in adoption of recommended Red gram production technologies

Constraints	frequency	Per cent	Rank
Non-availability of labour	32	80.00	I
Lack of irrigation facilities	31	77.50	II
High cost of fertilizers	28	70.00	III
Non availability of agricultural inputs in time	27	67.50	IV
Lack of marketing facilities	26	65.00	V
Lack of timely information	25	62.50	VI
Lower price of produce at the time of harvesting	24	60.00	VII
Lack of subsidies	23	57.50	VIII
High cost of plant protection chemicals and equipments	19	47.50	IX
Non availability of quality seed material	18	45.00	X
Lack of storage facilities	17	42.50	XI
Plant protection operation is difficult	15	37.50	XII
Credit not available easily	13	32.50	XIII
Non availability of bio fertilizers	7	17.50	XIV
Non-availability of plant protection chemicals and equipments	5	12.50	XV
Lack of transportation facilities	5	12.50	XV

Multiple responses recorded

TABLE 5

Suggestions as perceived by Red gram partrner farmers for effective implementation of FLD

Constraints	frequency	Per cent	Rank
Developing labour saving technologies	34	85.00	I
Training on new technologies	31	77.50	II
Providing agricultural inputs at reasonable price	29	72.5	III
Proper irrigation facilities	28	70.00	IV
Continuous supply of power	27	67.50	V
Providing appropriate marketing facilities	27	67.5	V
Provision of Minimum Support Price	26	65.00	VII
Provision for skill improvement training	26	65.00	VII
Providing timely information	25	62.5	IX
Credit should be available easily and timely	23	57.50	X
Providing quality seed material at right time	21	52.50	XI

Multiple responses recorded

demand driven. Hence, extension professionals those involved in organizing demonstrations should take at most care and make necessary arrangements for supplying critical inputs, skill teaching, training on latest technologies and making necessary arrangements to provide quality seed materials at reasonable rate and timely availability of fertilizers, bio fertilizers and plant protection chemicals and technical guidance on production technologies should be given to the farmers to enhance the productivity. The findings have similarity with the findings of Yashashwini (2013) and Mutturaj (2017).

It was observed that Front Line Demonstrations were effective in enhancing the rate of adoption of production technologies recommended in POP. Most of the farmers perceived high level of knowledge (52.50%) about recommended production practices of Red gram after conducting the FLDs on farmers field. The adoption of important practices such as improved Red gram variety, seed treatment, post-harvest practices, application of micro nutrients and plant protection measures were also increased after FLD as compared to before FLD. FLD on Red gram has enhanced the yield after the conduction of demonstrations. Hence, Front Line Demonstrations may serve as a powerful tool to convince the farmers as the usefulness of production practices of red gram. There by the production and productivity of the Red gram may be increased substantially by supplying quality seeds, bio-fertilizers and pesticides in time by the scientists and extension workers will help the farming community to adopt the practices effectively in field situation and reap the good harvest of the crop.

REFERENCES

ANKITA PANDEY, NISHITH GUPTA, AKANCHHA PANDEY AND SARITA SINGH, 2017, Impact of vocational training on value addition in knowledge and adoption of rural women. *Int. J. Pure App. Biosci*., **5** (1) : 129 - 134.

BHAGWAN SINGH AND SHARMA, A. K., 2018, Impact of front line demonstrations on yield, knowledge adoption and horizontal spread of cumin crop in arid zone. *International J. Seed Spices,* **8** (2) : 32 - 35.

CHAPKE, R. R., 2012, Impact of frontline demonstrations on jute (*Corchorus olitoriu*s). *J. Human Ecology*, **38** (1) : 37 - 41.

DINESH DOUR, SANDHYA CHOUDHARY AND SWARNAKAR, V. K., 2015, Impact of frontline demonstration (Fld's) on adoption behavior of soybean growers under the KVK in Ujjain district of MP. *Journal of Agriculture and Veterinary Science*, **8** (1) : 40 - 43.

JYOTHI, M. S. AND ANAND, T. N., 2013, Knowledge and adoption of rtecommended technologies in groundnut cultivation among FLD and non FLD farmers. *Mysore J. Agric. Sci.,* **47** (1) : 171 - 175.

MAHADIK, R. P. AND TALATHI, M. S., 2016, Impact of frontline demonstrations (FLDs) organized by Krishi Vigyan Kendra, Roha. *Ind. J. Ext. Edu. & R. D.,* **2** : 162 - 165.

MAHALE, MAHESH, PATIL, SANDEEP AND CHAVAN, A., 2016, Impact of FLD intervention on yield adoption and horizontal spread of oilseed crops in Konkan. *Indian J. Extension Education,* **52** (3 & 4) : 79 - 83.

MUTTURAJ KADALGI, 2017, Impact analysis of front line demonstrations of Krishi Vigyan Kendra on beneficiary farmers in Belagavi district of Karnataka. *M.Sc. (Agri.) Thesis* (unpub.), Univ. Agric. Sci., GKVK, Bangalore.

NAINA VIRANG, RAGHVENDRA PATHAK, SANDHYA CHOUDHARY AND SWARNAKAR, V. K., 2016, Study on knowledge and adoption behavior of soybean growers under Atma Program in Dewas district of M.P. India. *Journal of Research in Agriculture and Animal Science*, **3** (12) : 01 - 05

PADMAVATHI, M., SRINIVASAPPA, K. N., MANJUNATH, B. AND VASANTHI, B. G., 2018, Impact of frontline demonstrations on yield and economics of Pigeon Pea in Bengaluru Rural district of Karnataka. *Mysore J. Agric. Sci.,* **52** (3) : 621 - 625.

SIDHU, P. S. AND DHILON, G. S., 2019, The knowledge and adoption level of farmers about recommended cultivation practices for chickpea. *Agriculture update*, **14** (1) : pp : 58 - 61.

YASHASHWINI, M. A., 2013, Effectiveness of front line demonstrations of Krishi Vigyana Kendra on FLD Farmers of Mandya district. *M.Sc. (Agri.) Thesis*, Univ. Agri. Sci., Bangalore.

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