

A Study on Diffusion of Farm Technology under First Line Demonstration Programme in Raichur District

A. BHEEMAPPA

Department of Agricultural Extension Education
College of Agriculture, Dharwad-580 005

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Abstract : The results of the study carried out in Raichur district during 1994-95 indicated that in the distribution of farmers possessing knowledge of recommended practices considerable increase was noticed in fertilizer use among all the crops, followed by improved implements among Groundnut (400%) and Sunflower (178.6%), the proper method of seed treatment among Redgram (300%) and Bengalgram (109.1%) farmers. In the adoption of recommended practices, the use of micronutrients among farmers of Groundnut and Sunflower crops, Rhizobium seed treatment among Redgram and Greengram farmers and fertilizer use among Bengalgram crop farmers, the programme has contributed to highest increase after the implementation. Whereas, in the use of herbicides among all the crop farmers, improved implements among Redgram farmers and Micronutrients application among farmers of greengram and bengalgram crop, the programme did not show any impact. Not convinced of treatment results in chemical and Rhizobium seed treatment and micronutrient use, in-effectiveness of recommended pesticides and non-availability of inputs were the first ranked reasons for adopting the recommended practices. The technology for increasing yield in Groundnut, evaluation of hybrids of various companies and suitable cropping pattern in Sunflower, modification in spacing in Redgram, developing of varieties resistant to powdery mildew in Greengram, and fertilizer recommendation for tank bed areas in Bengal gram crop were the major feedback for future research.

Introduction

Demonstration is method of motivating farmers for adopting new practices by showing its superior results in farmers' natural setting. They can also show the causes for convincing farmers who have not learnt to think abstractly.

Looking at the success of the various earlier transfer of technology projects of the ICAR in conducting useful and scientific demonstrations, the Ministry of Agriculture, Government of India started the First-line Demonstration (FLD) project on pulses and oilseeds during 1990-91 with all available recent technologies through intensified training programmes and effective monitoring (Bheemappa, 1995). In this direction, the Extension Education Unit, Raichur under the overall supervision of ICAR (TOT), Zone-VIII Bangalore started implementing this programme from 1991 (*Rabi*), in Raichur

district covering major crops like Groundnut, Sunflower, Redgram, Greengram and Bengalgram. So to assess the impact of this programme it is worthwhile to evaluate the achievements of this programme and hence the present study was taken up to assess the comparative knowledge and adoption level of recommended crop production practices among the beneficiaries of FLD programme, to identify the reasons for the non-adoption / discontinuation of recommended package and to identify the felt research needs of FLD beneficiaries for future research.

Material and Methods

This study was taken up in Raichur district in 1994-95 covering the beneficiaries of First-line demonstration programme which were implemented during 1991-92 to 1993-94 periods. The population consisting of 226 farmers who were involved in this programme

were interviewed personally with the help of well designed interview schedule. Constraintwise total scores were worked out and mean score was computed and finally rank positions were assigned (Mundhva and Patel, 1991).

Results and Discussion

A perusal of data on the distribution of farmers on their knowledge of recommended practices before and after the FLD programme implementation as presented in table 1, brings to light that the maximum per cent increase was noticed in fertilizer use among all the five crops under study. The knowledge of improved implements among farmers of Groundnut (400%) and Sunflower (178.6%), seed treatment among Redgram (300%) and Bengalgram (109.1%) farmers and among Greengram farmers (400%) it was the micronutrient use were found to be the next ranked practices.

In the knowledge of recommended spacing only 25 per cent increase of farmers in Redgram crop was observed since majority of them felt that the present research recommendation not profitable to their existing soil and climate and management levels. A similar situation was observed in practices like seed rate and spacing among Groundnut and greengram farmers.

And on the overall the maximum per cent increase of farmers was noticed in Groundnut crop (105.4%) followed by Redgram and Greengram (100% each), Sunflower (96.0%) and Bengalgram (92.3%) crops.

The data on the comparative adoption as presented in the table 2, highlights that among Groundnut and Sunflower crops the

high per cent increase of farmers has been noticed in adoption of micronutrients followed by fertilizer use (496.9%) and spacing (168.4%).

Among Redgram farmers the practice of Rhizobium treatment has shown the highest increase (500%) followed by chemical seed treatment (400%) and fertilizer use (200%). Whereas, in the adoption of spacing, seed rate, pesticides application procedure, improved implements and micronutrients use the programme did not make any significant influence which was mainly due to the ineffectiveness of recommended practices to the existing soil type, crop growth, management level and also the non-availability of quality pesticides.

The highest per cent increase of farmers in adoption of fertilizer among Greengram (220%) and Bengalgram (200%) farmers has been observed followed by the recommended seed treatment to the extent of 66.7 per cent and 166.7 per cent respectively.

In herbicides use among farmers of all the five crops, the programme has not shown the impact in adoption, the similar situation was also observed with the adoption of micronutrients use and improved implements among Redgram, Greengram and Bengalgram crops and also in application of pesticides among Redgram crop farmers.

And in the overall adoption of recommended practices the highest per cent increase of adoption observed in Sunflower crop (107.7%), followed by Redgram, Bengalgram and Greengram (50.0%) crops among the farmers after the implementation of programme.

Table 1. Distribution of beneficiaries of FLD processing knowledge of recommended cultivation practices

Item	Per cent of farmers possessing correct knowledge									
	Groundnut (n=95)		Sunflower (n=64)		Redgram (n=12)		Greengram (n=25)		Bengalgram (n=30)	
	After	Before	After	Before	After	Before	After	Before	After	Before
1. Variety	89.5 (102.5)	44.2	100.0 (73.0)	57.8	100.0 (50.0)	66.7	100.0 (19.0)	84.0	100.0 (7.1)	93.3
2. Seed rate	100.0 (11.7)	89.5	95.3 (19.6)	79.7	83.3 (66.6)	50.0	84.0 (61.5)	52.0	96.6 (38.1)	70.0
3. Spacing	94.7 (11.0)	85.3	85.9 (161.9)	32.8	83.3 (25.0)	66.7	100.0 (31.6)	76.0	100.0 (100.0)	50.0
4. Seed treatment	84.2 (122.2)	37.9	82.8 (152.4)	32.8	66.7 (300.0)	16.7	84.0 (40.0)	60.0	76.7 (109.0)	36.7
5. Rhizobium treatment	83.2 (182.0)	29.5	- -	-	91.7 (120.0)	41.7	60.0 (275.0)	16.0	63.3 (90.1)	33.3
6. Fertilizer use	74.7 (445.0)	13.7	89.1 (307.0)	21.9	83.3 (398.8)	16.7	100.0 (525.0)	16.0	100.0 (900.0)	10.0
7. Gypsum appln.	83.2 (276.4)	22.1	- -	-	- -	-	- -	-	- -	-
8. Micronutrient use.	40.0 (281.0)	10.5	85.9 (161.9)	32.8	41.7 (150.0)	16.7	60.0 (400.0)	12.0	63.3 (90.1)	33.3
9. Pests & diseases control:										
a) Selection of pesticide	75.8 (16.1)	65.3	93.8 (46.3)	64.1	75.0 (200.0)	25.0	76.0 (46.1)	52.0	93.3 (55.5)	60.0
b) Appln. of pesticide	86.3 (134.5)	36.8	84.4 (116.0)	39.1	66.7 (300.0)	16.7	68.0 (70.0)	40.0	86.7 (62.5)	53.3
10. Herbicides use	57.9 (244.6)	16.8	42.2 (145.3)	17.2	41.7 (150.00)	16.7	60.0 (275.0)	16.0	63.3 (90.1)	33.3
11. Improved implements	63.0 (401.5)	12.6	60.9 (178.6)	21.9	41.7 (15.0)	16.7	76.0 (58.3)	48.0	40.0 (50.0)	26.7

Figures in the parentheses indicate percentage of increase.

Table 2. Distribution of beneficiaries of FLD in the adoption of recommended crop production practices

Item	Per cent of farmers adopting the recommended practices									
	Groundnut (n=95)		Sunflower (n=64)		Redgram (n=12)		Greengram (n=25)		Bengalgram (n=30)	
	After	Before	After	Before	After	Before	After	Before	After	Before
1. Variety	57.9 (96.3)	29.5	85.9 (71.8)	50.0	83.3 (66.6)	50.0	60.0 (66.7)	36.0	73.3 (37.5)	53.3
2. Seed rate	80.0 (55.0)	51.6	79.7 (82.4)	43.7	00.0 (00.0)	00.0	28.0 (16.7)	24.0	66.7 (33.4)	50.0
3. Spacing	80.0 (16.9)	68.4	79.7 (168.4)	30.0	00.0 (00.0)	00.0	28.0 (16.7)	24.0	66.7 (122.3)	30.0
4. Seed treatment	43.1 (95.0)	22.1	40.6 (113.7)	19.0	41.7 (402.4)	08.3	20.0 (66.7)	12.0	7 (166.7)	10.0
5. Rhizobium treatment	36.8 (52.1)	24.2	-	-	50.0 (502.4)	08.3	00.0 (00.0)	00.0	13.3 (99.4)	06.7
6. Fertilizer use	78.9 (476.0)	13.7	29.7 (111.0)	14.0	25.0 (201.2)	08.3	64.0 (220.0)	20.0	90.0 (200.0)	30.0
7. Gypsum appln.	38.9 (1312)	16.8	-	-	-	-	-	-	-	-
8. Micronutrient use.	15.8 (650.0)	02.1	20.3 (1169.0)	01.6	00.0 (00.0)	00.0	00.0 (00.0)	00.0	00.0 (00.0)	00.0
9. Pests & diseases control:										
a) Selection of pesticide	47.4 (12.5)	42.1	54.7 (94.6)	28.1	25.0 (201.2)	08.3	48.0 (50.0)	32.0	60.0 (100.0)	30.0
b) Appln. of pesticide	15.8 (15.3)	13.7	12.5 (60.2)	17.8	00.0 (00.0)	00.0	12.0 (50.0)	08.0	23.3 (75.2)	13.3
10. Herbicides use	00.0 (00.0)	00.0	00.0 (00.0)	00.0	00.0 (00.0)	00.0	00.0 (00.0)	00.0	00.0 (00.0)	00.0
11. Improved implements	09.5 (350.9)	02.1	20.3 (1169.0)	01.6	00.0 (00.0)	00.0	00.0 (00.0)	00.0	00.0 (00.0)	00.0

Figures in the parentheses indicate percentage of increase.

Table 3. Reasons for the non adoption/discontinuation of recommended crop production practices

Reason/Constraint	Ranked reasons among the farmers									
	Groundnut (n=95)		Sunflower (n=64)		Redgram (n=12)		Greengram (n=25)		Bengalgram (n=30)	
	Mean Score	rank	Mean Score	rank	Mean Score	rank	Mean Score	rank	Mean Score	rank
1. Improved Variety										
a) Non-availability of suitable HYVs	2.6	I	1.9	II	3.0	I	1.2	V	2.4	I
b) Non-availability of seeds at right time	2.3	II	1.5	III	2.1	II	1.5	IV	1.6	II
c) Non-suitability of recommended variety/hybrid	1.7	IV	0.0	-	0.0	-	1.7	III	-	-
d) Less market price	1.9	III	0.0	-	0.0	-	2.6	I	-	-
e) Low yielding capacity	0.0	-	2.8	I	0.0	-	1.9	II	-	-
2. Seed rate and spacing										
a) Unsuitable recommendation	1.5	II	1.7	II	3.1	I	2.8	I	1.3	II
b) Non-availability of required spaced seed drill	2.6	I	2.7	I	0.0	-	1.6	II	2.6	I
3. Chemical seed treatment										
a) Not convinced of the treatment results	1.8	I	1.9	I	2.3	I	2.4	I	2.6	I
b) Non-availability of chemical	1.2	III	1.3	III	1.4	II	1.9	II	1.5	II
c) Not interested	1.5	II	1.8	II	1.1	III	1.4	III	1.3	III
4. Rhizobium treatment										
a) Not convinced of the treatment results	2.2	I	-	-	2.0	I	2.7	I	2.1	I
b) Non-availability of culture	2.1	II	-	-	1.7	II	2.1	II	1.9	II
c) Not interested	1.7	III	-	-	1.3	III	1.8	III	1.3	III
5. Fertilizer use										
a) In-sufficient qty. to get higher yields	2.6	I	2.5	I	2.8	I	0.0	-	0.0	-
b) Existing soil fertility is enough	0.0	-	0.0	-	0.0	-	1.8	I	2.3	II
c) More cost involved	1.3	III	1.5	III	1.1	III	0.0	-	0.0	-
d) Non-availability of research data for tank bed cultivation	0.0	-	0.0	-	0.0	-	0.0	-	3.0	I
e) Non-availability at required time	1.8	II	2.1	II	1.9	II	0.0	-	0.0	-

Table 3. (Contd.....)

Reason/Constraint	Ranked reasons among the farmers									
	Groundnut (n=95)		Sunflower (n=64)		Redgram (n=12)		Greengram (n=25)		Bengalgram (n=30)	
	Mean Score	rank	Mean Score	rank	Mean Score	rank	Mean Score	rank	Mean Score	rank
6. Gypsum application										
a) Not convinced of results	2.2	II	-	-	-	-	-	-	-	-
b) Non-availability at required time	2.6	I	-	-	-	-	-	-	-	-
c) Felt not necessary	1.8	III	-	-	-	-	-	-	-	-
7. Micronutrient use										
a) Lack of knowledge	2.3	II	1.7	II	1.9	II	2.2	II	1.9	II
b) Not convinced of result	2.8	I	2.4	I	2.6	I	2.6	I	2.3	I
c) Felt not necessary	1.6	III	1.2	III	1.7	III	1.9	III	1.9	II
8. Pests and Diseases control										
a) Selection of pesticides										
i) Ineffectiveness of rec. pesticides	2.7	I	2.4	I	2.6	I	1.9	I	1.7	I
ii) Lack of knowledge	1.6	II	1.8	II	1.9	II	1.4	II	1.3	II
b) Application of pesticides										
i) Lack of knowledge	1.5	III	1.2	III	1.4	III	1.2	III	1.6	III
ii) Ineffectiveness of recommended pesticides	2.8	II	2.6	II	2.4	II	1.8	II	2.1	II
iii) Not confident in recommended dosage of pesticides	3.2	I	3.4	I	3.3	I	2.1	I	2.6	I
9. Herbicides use										
a) Lack of knowledge	2.3	III	2.5	II	1.9	II	2.3	II	1.8	II
b) Harmful effect of residue	3.3	I	2.9	I	2.7	I	3.1	I	2.2	I
c) More cost involved	2.7	II	1.6	III	1.5	III	1.7	III	1.4	III
10. Improved implements										
a) Heavy price of implements	2.9	II	1.8	II	1.6	II	1.9	II	1.8	II
b) Non-availability of suitable implements	3.4	I	2.1	I	2.7	I	3.1	I	2.7	I

In the analysis of identified reasons for the nonadoption of recommended practices as presented in the table 3, it has been brought out that in adoption of HYVs the first ranked problem was the non-availability of seeds as pointed out by the farmers of Groundnut, Redgram and Bengalgram farmers, whereas, among Sunflower and Greengram farmers the factors like low yield levels of recommended varieties and the less market price for the produce, respectively.

The ineffectiveness of recommended pesticides and also lack of confidence in recommended dosage of pesticides were the highly pointed out problems in selection and application of recommended pesticides and it was the problem of harmful effect of herbicides' residue as the first ranked reason for discontinuation had been noticed among the farmers of all the crops demonstrated under FLD programme.

And in adopting the improved farm implements the non-availability of suitable farm implements followed by its heavy price were the major reasons quoted among all the beneficiaries.

The enlisting of identified feedback from the beneficiaries of FLD programme as presented in table 4, brings to focus that among Groundnut farmers it was the need for technology to check decline in yield levels (78.9%), followed by the suitable harvester (63.1%) and multiple resistant varieties for pest and diseases (55.8%) were the major feedback for research.

Among Sunflower farmers the need for evaluating the hybrids of various private companies for their proper recommendation was the highly felt research need (90.6%), followed by priorities of developing HYVs from the University (71.9%), the suitable date of

sowing in *Kharif* to overcome decline in yield levels (60.9%), the suitable cropping pattern (56.3), and resistant varieties to *Alternaria* disease (48.4%).

In Redgram crop all the farmers have expressed the research need for modification in the spacing and also effective and economical plant protection measures, whereas, 83.3 per cent highlighted the need for evolving white seeded variety having the resistance to wilt.

Among Greengram farmers the need for developing varieties having resistance to powdery mildew was the highly felt research need (80.0%), followed by the need for developing bold and shining seeded varieties (64.0%), and non-shattering varieties (56.0%). The non-availability of research data for application of fertilizer in tank bed area cultivation and developing of wilt resistant and short duration varieties were the major feedback from 53.3 and 33.3 per cent farmers of Bengalgram crop, respectively for future research.

The results of the impact study on the diffusion of technology under FLD programme enlighten that there is greater need for popularising the low-cost recommended practices like seed treatment, spacing, micronutrients use through effective field demonstrations. And at the same time the documentation of feedback for future research alarm the research system to streamline the research activities to review the present recommendations like fertilizer application, spacing, plant protection measures, herbicides and farm implements which should be followed by effective early demonstrations in order to convince the extension workers and farmers of their adaptability to the diverse conditions so that effective and efficient extension system can exist and continue.

Table 4 Feedback from the beneficiaries of FLD for future research

Crop	Felt research need	Per cent of farmers expressing the need
Groundnut		
	1. Improved technology to check the decline in yield levels	78.9
	2. Suitable harvester	63.1
	3. Development of multiple resistant varieties to budnecrosis, leafminer, leafspot	55.8
	4. Control measures to check podrot	48.4
	5. Short duration and suitable early sowing varieties for Tungabhadra project areas for <i>Rabi</i> season	36.8
Sunflower		
	1. Evaluation of hybrids developed from various private agencies and their recommendation	90.6
	2. Developing of HYVs (from the university)	71.9
	3. Suitable date of sowing in <i>Kharif</i>	60.9
	4. Suitable sunflower based cropping pattern	56.3
	5. Varieties/hybrids resistant to <i>Alternaria</i> disease	48.4
Redgram		
	1. Modification in the spacing recommendation	100.0
	2. Developing of wilt resistant and white seeded varieties	83.3
	3. Effective and economical plant protection measures	100.0
Greengram		
	1. Developing of varieties resistant to powdery mildew	80.0
	2. Developing of bold and shining seeded varieties	64.0
	3. Developing of non-shattering poded varieties	56.0
Bengalgram		
	1. Fertilizer recommendation for tank bed area cultivation	53.3
	2. Developing of wilt resistant and short duration varieties	33.3

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