SOCIETY OF EXTENSION EDUCATION

RESEARCH ARTICLE

Knowledge Level of Farmers Regarding Demonstrated Groundnut Production Technologies

Sanskaran Swami[1] and R.K. Verma[2]

1. PG. Scholar,
2. Professor,
Department of Agricultural Extension & Communication, SKRAU, Bikaner, Rajasthan, India
Corresponding author e-mail: sanskaranswami@gmail.com

ABSTRACT

Krishi Vigyan Kendras (KVK) Bikaner continuously conducting the Cluster Front Line Demonstrations (CFLD) on groundnut since last five years (2016-2020) to enhance the rate of adoption of groundnut production technologies. An effort has been made to know the impact of CFLD on groundnut growing farmers in terms of knowledge level and association of socio-economic profile of farmers with knowledge level. The Study was carried out in two tehsils Kolayat and Bikaner of Bikaner district of Rajasthan State. The proportionate random sampling method was used to select 160 respondents i.e., 80 beneficiary and 80 non-beneficiary respondents. The results of this study were concluded that majority of the respondents had medium level of knowledge about CFLD in the study area. They had highest knowledge about the aspect of "harvesting" and least about "time of sowing". There was significant association found between education, mass media exposure and extension agency contact, information seeking behaviour and information sharing behaviour with the knowledge level of the respondents.
Key words*: Adoption; Knowledge; Production Technologies; Groundnut; CFLD.*

In India, the cultivation of oilseed is considered important next to cereals. Gujarat, Rajasthan, Tamil Nadu, and Andhra Pradesh are the leading producers of groundnuts in India. Among them, Rajasthan occupied the second place in groundnut production after Gujarat (Directorate of Economics & Statistics, Govt. of India,). The growth in the domestic production of oilseeds has not been able to keep pace with the growth in demand in the state. Low and unstable yields of most oilseed crops and uncertainty in returns to investment, lack of knowledge and skills of production technologies which result from the continuing cultivation of oilseeds in rainfed, high-risk production environments, are the factors leading to this situation of wide demand-supply gap. Hence, to increase the production and productivity of oilseed crops in the country, the Ministry of Agriculture and Farmers' Welfare, Government of India sanctioned a project on "Cluster Frontline Demonstrations (CFLDs) of Oilseeds in 2015-16" under the National Mission on Oilseeds and Oil Palm (NMOOP) implemented through eleven ICAR-Agricultural Technology Application Research Institutes (ATARI) all over India. The objective of conducting CFLDs was to show the production potential of notified oilseed varieties and technologies generated by ICAR and State Agricultural Universities (SAUs) in oilseeds for higher production, better productivity and profitability for farmers. The project was implemented through ICAR-ATARI by Krishi Vigyan Kendras (KVKs). The present study, therefore, was designed to assess the impact of *Cluster front line demonstrations on knowledge* of beneficiary farmers and their relationship with selected profile characteristics.

METHODOLOGY

The present study was conducted in Bikaner district of Rajasthan selected purposely as Bikaner district has highest production of groundnut among all districts of state. KVK Bikaner is purposely selected for the study. Bikaner district comprises eight *tehsils* comes under KVK, Bikaner. Out of these four *tehsils*, two *tehsils* Bikaner and Kolayat is selected purposely for the present study as highest number of cluster front

line demonstrations were conducted by KVK Bikaner during 2016-2020. For selection of respondents, the proportionate random sampling method was used to select the respondents. The respondents who were having registration and got training in KVK for CFLD of groundnut called as beneficiary farmers. Thus total 160 respondents i.e., 80 Beneficiary and 80 Non-Beneficiary included for the present investigation. The personal interview method was adopted for the collection of desired data. The analysis of the data was done with the help of different statistical tools like frequency distribution, percentage, mean, standard deviation; mean percent score, correlation coefficient (r), rank correlation, 'z' test, t-test as well as multiple linear regressions.

RESULTS AND DISCUSSION

Knowledge level of the beneficiary farmers regarding groundnut production technologies demonstrated under CFLD : In the present investigation, knowledge was operationalized as the amount of information gained and retained by the respondents regarding groundnut production technologies demonstrated under CFLD. The knowledge level of all respondents regarding groundnut production technologies demonstrated under CFLD assessed with the help of knowledge test. Based on the knowledge scores obtained by the respondents, mean value and standard deviation were computed. The respondents were classified into three categories on the basis of mean value (48.16) and standard deviation (06.58). The data related to the knowledge level of all respondents i.e. beneficiary and non-beneficiary farmers indicate that the farmers' knowledge concerning groundnut production technologies demonstrated under CFLD had a wide dispersion. The data pertaining to the knowledge level of the respondents about groundnut production technologies demonstrated under CFLD are presented in Table 1.

The data presented in Table 1 reveals that a huge majority i.e. 71.25 per cent beneficiary respondents had medium level of knowledge followed by high 23.75 per cent and low 05.00 per cent level of knowledge, respectively. In case of non-beneficiary respondents, majority of the farmers 65.00 per cent possessed medium level of knowledge followed by low 28.75 per cent and high 06.25 per cent level of knowledge. The data presented in Table 1 also indicates that 68.13 per cent of the overall respondents had medium level of knowledge followed by low 16.87 per cent and high

Table 1. Distribution of respondents according to knowledge level about CFLD

Categories with score	Respondents					
	Beneficiary (n=80)		Non-bene-ficiary (n=80)		Overall (N=160)	
	No.	%	No.	%	No.	%
Low (<41.58)	04	05.00	23	28.75	27	16.87
Medium (41.58 to 54.74)	57	71.25	52	65.00	109	68.13
High (>54.74)	19	23.75	05	06.25	24	15.00

Mean: 48.16; S.D.: 6.58

15.00 per cent level of knowledge. Comparative view of data pertaining to these three categories of farmers clearly bring to light that there was high level of knowledge among beneficiary respondents, it means that there had been upward movement in the knowledge level of the farmers after receiving the benefits of CFLD. The findings are supported by the findings of *Choudhary and Yadav (2012)* who reported that majority of the respondents possessed medium level of knowledge about improved mungbean production technologies and also by the findings of *Pokar et. al. (2014)*, *Rathod and Gaikwad (2016)*, *Kale et. al (2017)* and *Rajashekar et. al. (2017)* who reported that majority of the respondents possessed medium level of knowledge about groundnut production technologies.

Further, the different aspect-wise knowledge level of all respondents was also measured separately. The relative importance of all the ten aspects of knowledge about groundnut production technologies demonstrated under CFLD was highlighted by ranking them on the basis of Mean Percent Score (MPS) of knowledge level. The data presented in Table 2 shows that beneficiary farmers possessed highest knowledge about harvesting (100 MPS) as this aspect was ranked first. the second rank was assigned to improved varieties (99.06 MPS) followed by seed treatment (84.82 MPS), irrigation management (80.78), selection of land, soil (54.31) which were accorded ranked third, fourth, fifth, sixth, seventh, eighth, ninth and tenth, respectively.

The data in Table 2 also indicates that the non-beneficiary farmers had very good amount of knowledge in two aspects i.e., harvesting and improved varieties with 100 and 93.43 MPS. The non-beneficiary farmers possessed comparatively less knowledge of irrigation management, selection of land, soil testing and field preparation, seed treatment, plant protection measures, seed rate and spacing, nutrient management

Table 2. Aspect-wise knowledge level of respondents about CFLD

Knowledge Aspects	Respondents					
	Beneficiary (n=80)		Non-beneficiary (n=80)		Overall (N =160)	
	MPS	Rank	MPS	Rank	MPS	Rank
Selection of land, soil testing and field preparation	78.75	V	75	IV	76.87	IV
Improved varieties	99.06	II	93.43	II	96.52	II
Time of sowing	54.21	X	51.09	IX	52.65	X
Seed rate and spacing	68.33	VII	58.95	VII	63.64	VII
Seed Treatment	84.82	III	66.96	V	75.89	V
Nutrient Management	63.86	IX	55.56	VIII	59.71	VIII
Irrigation management	80.78	IV	77.65	III	79.21	III
Weed Management	65.12	VIII	49.75	X	57.43	IX
Plant protection measures	71.42	VI	63.21	VI	67.32	VI
Harvesting	100	I	100	I	100	I
Pooled	76.63		69.16		72.90	

r_s = 0.92, t = 6.64**

r_s = rank correlation; MPS = Mean Percent Score; ** Significant at 0.01 level of probability

and time of sowing with 77.65, 75.00, 66.96, 63.21, 58.95, 55.56 and 51.09 MPS, respectively. The non-beneficiary farmers possessed least knowledge regarding weed management with 49.75 MPS   If we look at Table 2 irrespective of beneficiary and non-beneficiary respondents, data clearly reveals that overall respondents had very good amount of knowledge about harvesting and improved varieties with 100 and 96.52 MPS followed by irrigation management, selection of land, soil testing and field preparation, seed treatment, plant protection measures, seed rate and spacing and nutrient management, with 79.21, 76.87, 75.89, 67.32, 63.64 and 59.71 MPS, respectively. Respondents possessed least knowledge regarding weed management and time of sowing with 57.43 and 52.65 MPS, respectively.

An effort was also made to determine the relationship between the ranks assigned by beneficiary and non-beneficiary respondents by applying rank correlation test. The value of rank correlation (r_s) was 0.92 which shows positive correlation. The significance of r_s was tested by 't' test and it was observed that calculated 't' value (6.64) was higher than its tabulated value. This shows positive and significant at one per cent level of significance which leads to conclusion that there was a similarity in the rank assignment pattern of knowledge possessed by beneficiary and non-beneficiary respondents about groundnut production technologies demonstrated under CFLD, though there

was difference in magnitude of Mean Per cent Score of beneficiary and non-beneficiary farmers. The results are in line with the findings of *Kumawat et. al. (2018)* who concluded that the farmers had good knowledge about high yielding varieties, seed rate and spacing, harvesting and time of sowing regarding mustard production technology.

The data related to knowledge level of both beneficiary and non-beneficiary respondents incorporated in the Table 3 depicts that calculated 'Z' value was higher than the tabulated value in nine aspects of CFLD i.e., selection of land, soil testing and field preparation, improved varieties, time of sowing, seed rate and spacing, seed treatment, nutrient management, weed management, plant protection and harvesting measures significant at 0.01 level of probability. This shows that in all the nine aspects of CFLD the beneficiary and non-beneficiary respondents had wide difference in their knowledge level. Table 3 also reveals that calculated 'Z' value was lower than the tabulated value in one aspect of CFLD i.e. irrigation management. It showed non-significant difference in the knowledge level of beneficiary and non-beneficiary farmers. It means that beneficiary farmers possessed more knowledge as compared to the non-beneficiary respondents in the above mentioned nine aspects as well as the overall knowledge of beneficiary and non-beneficiary farmers regarding CFLD. The higher knowledge level of groundnut production technologies

Table 3. Aspect-wise comparison of knowledge level of respondents about CFLD

Knowledge Aspects	Respondents				'Z' Value
	Beneficiary (n=80)		Non-beneficiary (n=80)		
	Mean	SD	Mean	SD	
Selection of land, soil testing and field preparation	04.72	00.50	04.50	00.50	02.78**
Improved varieties	03.96	00.19	03.73	00.44	04.29**
Time of sowing	04.33	00.57	04.08	00.55	02.82**
Seed rate and spacing	04.10	00.70	03.53	00.91	04.44**
Seed Treatment	05.93	01.16	04.68	01.64	05.56**
Nutrient Management	07.02	01.34	06.11	01.75	03.69**
Irrigation management	06.46	01.12	06.21	01.08	01.43[NS]
Weed Management	06.51	02.60	04.97	02.92	03.52**
Plant protection measures	05.00	01.28	04.42	01.29	02.85**
Harvesting	03.00	0	03.00	0	∞
Pooled	05.10	00.94	04.52	01.11	03.56**

**Significant at 0.01 level of probability; NS = non-significant; SD =Standard deviation

demonstrated under CFLD among the beneficiary respondents in comparison to the non-beneficiary respondents might be due to the fact that beneficiary farmers had participated in trainings, demonstrations and other extension activities organized by KVK and had more contacts with extension agencies and experts.

Whereas, the non-beneficiary respondents were not benefitted under CFLD and thus didn't receive necessary guidance regarding groundnut production technologies demonstrated under CFLD. This might have resulted in high level of knowledge of beneficiary farmers than that of the non-beneficiary farmers. It was also ascertained that none of the beneficiary as well as non-beneficiary respondents was having knowledge regarding the storage technologies in groundnut. The findings are in conformity with finding of *Singh and Sharma (2005)* and *Kumawat et al., (2018)* stated that the level of knowledge of beneficiary farmers regarding different practices of rapeseed and mustard production technology was higher than non-beneficiary farmers.

Association between the level of knowledge : To find out the association between selected attributes (independent variables) of CFLD respondents with the dependent variable knowledge level of respondents, correlation analysis and multiple linear regression analysis was done. Correlation reveals about the relationship between the two attributes and the strength of relationship is measured in terms of correlation coefficient, whose limit range from minus unit to plus unit. The two variables are not correlated if the increase or decreases of one variable do not affect the other variable. The partial regression coefficient (b) determines the degree of prediction of dependent variables from independent variables. By using the multiple linear regression analysis, the prediction of dependent variable i.e., knowledge from independent variables (selected characteristics) has been studied.

Correlation analysis : As per the correlation coefficient (r) analysis, the data presented in Table 4 reveals the correlation of dependent variable which is knowledge on eleven independent variables concerning to the respondents. Through correlation coefficient, data were critically examined to work with the separates as well as combined relative effect of the selected independent variables on the knowledge level of respondents about groundnut production technologies demonstrated under CFLD. The correlation of all the eleven selected independent variables such as age, caste, education, social participation, occupation, land holding, source of irrigation, mass media exposure, extension agency contact, information seeking behaviour and information sharing behaviour used with the knowledge level of the respondents were calculated by correlation coefficient equation. The findings had been presented in Table 4. The r-values in Table 4 indicated that the education (0.550**) and information sharing behaviour (0.290**) of beneficiary respondents was positively related with knowledge level of respondents about groundnut production technologies demonstrated under CFLD

Table 4. Correlation analysis between independent variables with knowledge of respondents about CFLD

Variables	Correlation coefficient (r)		
	Beneficiary (n=80)	Non-beneficiary (n =80)	Pooled (N =160)
Personal and Social attributes			
Age	0.048 NS	0.169 NS	0.099 NS
Caste	0.105 NS	0.024 NS	0.008 NS
Education	0.550**	0.306**	0.465**
Social participation	0.091 NS	-0.106 NS	0.102 NS
Economic attributes			
Occupation	0.093 NS	0.106 NS	0.073 NS
Land holding	0.022 NS	0.147 NS	0.040 NS
Source of Irrigation	0.061 NS	0.147 NS	0.055 NS
Communicational attributes			
Mass media exposure	0.267*	0.312**	0.383**
Extension agency contact	0.159 NS	0.052 NS	0.189 NS
Information seeking behaviour	0.243*	0.221*	0.312**
Information sharing behaviour	0.290**	0.360**	0.397**

** Significant at 0.01 level of probability; *Significant at 0.05 level of probability; NS = Non-Significant

and association was found significant at one per cent level of significance. The r-values of mass media exposure (0.267*) and information seeking behaviour (0.243*) of beneficiary farmers were positively and significantly related with knowledge of respondents about groundnut production technologies demonstrated under CFLD and the association was found significant at five per cent level of significance. age, caste, social participation, major occupation, land holding, source of irrigation and extension agency contact of beneficiary respondents showed positive and non-significant relation with knowledge level of the respondents about groundnut production technologies demonstrated under CFLD. Education (0.306**), mass media exposure (0.312**) and information sharing behaviour (0.360**) of non-beneficiary respondents was positively related with knowledge of respondents about CFLD and the association was found significant at one per cent level of significance and mass media exposure (0.312*), information seeking behaviour (0.221*) and were positively related with knowledge of respondents about groundnut production technologies demonstrated under CFLD and the association was found significant at five per cent level of significance. The r-values of age, caste, major occupation, land holding, source of irrigation and extension agency contact of non-beneficiary respondents showed positive and non-significant relation with level of knowledge of respondents about

groundnut production technologies demonstrated under CFLD. Social participation of non-beneficiary respondents showed negative and non-significant relation with knowledge of respondents about groundnut production technologies demonstrated under CFLD.

Further analysis of Table 4 to know the relationship of selected independent variables with knowledge of overall respondents about CFLD indicated that education (0.465**), mass media exposure (0.383**), information sharing behaviour (0.312**) and Information seeking behaviour (0.397**) of overall respondents were found positively related with knowledge level of farmers about CFLD and the association was found significant at one per cent level of significance of overall respondents. The findings of the study are in compliance with the findings of *Badhala (2012)* who stated that education found to be highly significant with knowledge level of the beneficiary

Regression analysis between personal, social, economic and communicational attributes with knowledge level of respondents about CFLD : With the help of multiple regression analysis, the data showed in Table 5 stated the association of all the selected independent variables i.e., age, caste, education, social participation, occupation, land holding, source of irrigation, mass media exposure, extension agency contact, information seeking behaviour and

**Table 5. Association between personal, social, economic and communicational
attributes with knowledge level of respondents about CFLD**

Variables	Beneficiary (n=80)			Non-beneficiary (n =80)			Pooled (N =160)		
	b value	SE	t value	b value	SE	t value	b value	SE	t value
Personal and Social attributes									
Age	0.048	0.006	0.420 NS	0.169	0.007	1.516 NS	0.099	0.005	1.248 NS
Caste	0.105	0.052	0.935 NS	0.024	0.062	0.212 NS	0.008	0.042	0.095 NS
Education	0.550	0.035	5.821**	0.306	0.045	2.842**	0.465	0.029	6.609**
Social participation	0.091	0.122	0.803 NS	-0.106	0.127	-0.943 NS	0.102	0.089	1.288 NS
Economic attributes									
Occupation	0.093	0.106	0.827 NS	0.106	0.105	0.943 NS	0.03	0.080	0.918 NS
Land holding	0.022	0.072	0.191 NS	0.147	0.088	1.316 NS	0.040	0.060	0.501 NS
Source of Irrigation	0.061	0.047	0.542 NS	0.147	0.051	1.315 NS	0.113	0.037	1.435 NS
Communicational attributes									
Mass media exposure	0.267	0.100	2.449*	0.312	0.091	2.902**	0.383	0.065	5.214**
Extension agency contact	0.159	0.101	1.422 NS	0.052	0.108	0.459 NS	0.189	0.075	2.423*
Information seeking behaviour	0.243	0.112	2.215*	0.288	0.094	2.657**	0.312	0.079	4.123**
Information sharing behaviour	0.290	0.098	2.627**	0.360	0.091	3.412**	0.397	0.067	5.434**
	R^2 =0.59			R^2 =0.60			R^2 =0.60		

R^2= Coefficient of multiple determinations; **Significant at 0.01 level of probability;
*Significant at 0.05 level of probability; NS= non-Significant

information sharing behaviour with the knowledge level of the respondents were calculated by multiple regression equation. The magnitude of coefficient of determination (R^2) for beneficiary farmers had been found as 0.59. The value of (R^2) shows that 59 per cent variation occurs in dependent variable was because of the eleven independent variables chosen for the present investigation; remaining 41 per cent variation in the knowledge was because of the other factors which are not included in present investigation or outside to the perimeter of this investigation. Thus, the dependency relationship of knowledge on each and every selected independent variable was studied with the help of 't' value. A critical analysis of the data presented in Table 5 reveals that for beneficiary farmers, knowledge possessed positive and significant relationship with education (5.821**) and information sharing behaviour (2.627**) at one per cent level of significance. The table also reveals that mass media exposure (2.449*) and information seeking behaviour (2.215*) possessed positive and significant relationship with knowledge at five per cent level of significance. It was also important that personal, social, economic and communicational attributes viz. age, caste, social participation, major occupation, land holding, source of irrigation, extension agency contact had not shown any significant contribution in the multiple regression analysis and were non-significantly associated with

the level of knowledge of beneficiary respondents. This illustrate that there was no such association found with knowledge level of the beneficiary farmers with these selected characteristics. For non-beneficiary farmers, the value of coefficient of determination (R^2) was calculated as 0.60 which means 60 per cent variation in the dependent variable because of the eleven independent variables chosen for the present investigation, remaining 40 per cent variation in the knowledge was because of the other factors outside the perimeter of the present investigation.

The data in Table 5 shows that there was a significant relationship found between the knowledge level of non-beneficiary farmers with education (2.842**), mass media exposure (2.902**), information seeking behaviour (2.657**) and information sharing behaviour (3.412**) at one per cent level of significance. Therefore, regression analysis indicated that the dependent variable which was knowledge level of non-beneficiary farmers mainly made by the contributing elements like education, mass media exposure, information seeking behaviour and information sharing behaviour whereas some other elements like age, caste, social participation, major occupation, land holding, source of irrigation and extension agency contact had non-significant association with the knowledge level of non-beneficiary respondents. For the overall respondents (irrespective of beneficiary

and non-beneficiary) the coefficient of determination (R^2) was calculated as 0.60 which means 60 per cent variations due to these eleven independent variables selected for the present investigation and remaining 40 per cent variation in the knowledge was because of other elements which were not included in the present investigation. The data in Table 5 also illustrate that there was significant association found between the knowledge level of overall respondents with education (6.609**), mass media exposure (5.214**), information seeking behaviour (40123**) and information sharing behaviour (5.434**) at one per cent level of significance. Whereas extension agency contact (2.423*) were found significant at five per cent level of significance. The variables such as age, caste, social participation, major occupation, land holding and source of irrigation were associated non-significantly with the level of knowledge of overall respondents. Therefore, from the above findings it can be concluded that education, mass media exposure, information seeking behaviour and information sharing behaviour were the important determinant of knowledge level of the beneficiary, non-beneficiary and overall respondents. The findings are in conformity with the findings of *Pokar et. al. (2014)* and *Meena et. al. (2019)* who concluded that education and social participation have a positive and highly significant association with knowledge level of mustard growers.

CONCLUSION

On the basis of major findings of the study, it is revealed that all the respondents possessed medium level of knowledge regarding groundnut production technologies demonstrated under Cluster Frontline Demonstration and had comparatively high knowledge about aspect "harvesting" and had less knowledge regarding aspect "time of sowing". There was significant association found between education, mass media exposure and extension agency contact, information seeking behaviour and information sharing behaviour with the knowledge level of the respondents. It was also found that age, caste, social participation, occupation, land holding, source of irrigation, and extension agency contact were non-significantly related with the

knowledge level of respondents. So, for the enhancement of groundnut production, we should focus on the aspects like 'time of sowing' and 'weed management'.

CONFLICTS OF INTEREST

The authors have no conflicts of interest.

REFERENCES

Badhala, B. S. (2012). Impact of front-line demonstrations on adoption of groundnut production technologies by the farmers of Rajasthan M.Sc. Thesis (Unpub.) Swami Keshwanand Rajasthan Agricultural University, Bikaner.

Choudhary, S. and Yadav, J.P. (2012). Knowledge level of beneficiary and non-beneficiary farmers about improved mungbean production technology. *Indian Res. J. Ext. Edu., 12 (2):70-73*

Kale, N.M.; Mankar, D.M.; Wankhade, P.P. and Deshmukh, J.P. (2017). Knowledge and adoption of herbicide application practices by the soybean farmers in Vidarbha. *Legume Res., 40 (5) : 940-948*

Kumawat, R.; Khinchi, R. and Mishra, S. (2018). Knowledge level of farmers about recommended production technology of rapeseed and mustard crop. *Intl. J. Microbio. Res.*; **10** (3): 1111-1112.

Meena, S.R.; Bangarva, G.S. and Khan, I.M. (2019). Association of independent variables of mustard growers with their level of knowledge, extent of adoption and level of yields regarding mustard production technology. *Indian Res. J. Ext. Edu.* **19** *(4): 57-65*

Pokar, M.V.; Javia, R.M. and Sapara, G.K. (2014). Knowledge level of beneficiary and non- beneficiary farmers about improved groundnut production technology. *Agri. Update*, **9** (3):306-310.

Rajashekar, B.; Sudharani, V; Neema, P.S.K. and Shivacharan, G. (2017). Knowledge of famers about integrated weed management (IWM) practices in major crops. *Intl. J. Farm Sci.*, **7**(1): 33-36.

Rathod, D.B. and Gaikwad, J.H, (2016). To study the knowledge and adoption about recommended package of practices of summer Groundnut". *Agri. Update*, **11**(4): 459-461.

Singh, N. and Sharma, F.L. (2005). Impact of FLD on gain in knowledge about mustard production technology among farmers of Bharatpur district. *Indn. Res. J. Extn. Edu.,* **5** *(1):18-20*

●●●●●