P-ISSN: 2618-0723
E-ISSN: 2618-0731

NAAS Rating: 5.04
www.extensionjournal.com

International Journal of Agriculture Extension and Social Development

Volume 7; Issue 8; August 2024; Page No. 124-128

Received: 04-06-2024
Accepted: 11-07-2024

Indexed Journal
Peer Reviewed Journal

Impact of cluster frontline demonstrations on farmers knowledge level regarding mustard production technology

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DOI: https://doi.org/10.33545/26180723.2024.v7.i8b.884

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Abstract

Frontline demonstration is an approach that demonstrates the worth of recently released crop production technology and its management practices to the farmers at their field and convincing them about their potentialities for further adoption. The present study was conducted to assess the impact of cluster frontline demonstrations (CFLD) on farmers' knowledge about mustard production technology. The study was carried out in 2020-21 in Haryana. Four clusters were purposively selected from two districts having maximum area under mustard cultivation. 60 each beneficiary and non-beneficiaries of CFLD were selected for the study making the total sample size of 120. The study revealed that CFLD beneficiaries had more knowledge level in comparison to non-beneficiaries about varieties, agronomic practices, irrigation and fertilizer management and plant protection measures of mustard crop. The overall knowledge of CFLD beneficiaries and non-beneficiaries about mustard production technology was to the extent of 74.36 and 62.73 percent, respectively. The 't' value of 3.89 was significant which shows that both the groups differ significantly with regard to their knowledge about mustard production technology.

Keywords: CFLDs, impact, knowledge, mustard production technology

Introduction

Oilseeds play an essential role in the agricultural economy in many regions of the world. Major oilseed producing countries globally are USA, Brazil, Argentina, China and India and they account for 82 percent of oilseed production in the world. In India's agricultural economy, oilseeds come after food grains in terms of acreage and production. The rapeseed-mustard crop is grown over 36.59 million hectares area in the world with a production and productivity of 72.37 million tonnes and 1980 kg/ha, respectively, during 2018-19 (Chauhan *et al.*, 2021) [3]. In India, it is the second most crucial edible oilseed after soybean, sharing 23.33 percent of the oilseed crops area and 26.24 percent of total oilseed crops production of the country, making it critical edible oilseed crop of the country. The Indian mustard (*Brassica juncea*) is grown over 5.97 million hectares with production of 8.49 million tonnes and productivity of 1410 kg/ha (Jat *et al.*, 2019) [6]. Mustard is grown largely in Rajasthan state, followed by Uttar Pradesh, Haryana, Gujarat, Madhya Pradesh, Punjab, Assam and West Bengal. Haryana was the second most crucial state in the country, with a production of 1.29 million tonnes over an area of 0.61 million hectares with an average yield of 2018 kg/ha during the year 2017-18 which is highest in the country (Statistical Abstract of Haryana, 2021) [21].

Transferring knowledge and information to bring out positive change in attitude of farmers about improved agricultural technology is a key to agricultural development. For this, several approaches have come into play to generate more widespread and rapid agricultural knowledge diffusion. Frontline demonstration is one such unique approach that demonstrates the worth of newly released crop production technology and its management practices to the farmers at their field and convincing them about their potentialities for further adoption. The Department of Agriculture, Cooperation and Farmers' Welfare (DAC&FW) initiated "Cluster Frontline Demonstrations of Oilseeds" during 2015-16 under the National Mission on Oilseeds and Oil Palm (NMOOP) project in cooperation with Division of Extension Education, ICAR, New Delhi, and it was continued till 2017-18. To boost the indigenous production of oilseeds, this project was implemented by ICAR-Agricultural Technology Application Research Institutes (ATARI) all over India through Krishi Vigyan Kendra (KVKs) to enhance the oilseed production in the country. NMOOP scheme has been merged with revamped National Food Security Mission (NFSM). Consequently from 2018-19, the existing NMOOP is being implemented under NFSM as NFSM-Oilseeds. The objective for conducting CFLDs on mustard under NMOOP and NFSM-oilseeds was to show the potential of mustard production technologies generated by ICAR and State Agricultural Universities (SAUs) to the farmers for higher production and better productivity and profitability. Keeping in view of the realistic approach of CFLD for dissemination of technology, the present study was planned to assess the impact of mustard CFLDs on knowledge level of farmers regarding mustard production technology.

Methodology

The study was conducted in Haryana state. The ICAR funded KVKs of Haryana state are implementing CFLDs on mustard under NMOOP and later on under NFSM-Oilseeds. Out of 18 ICAR funded KVKs of Haryana, two KVKs having a maximum area under mustard in the district *viz.*, KVK, Bhiwani and KVK, Mahendergarh were selected purposively. Cluster-wise list of CFLDs conducted from the year 2015-16 to 2018-19 by the selected KVKs were collected and from the list of clusters, two clusters from each KVK having maximum number of beneficiaries were selected purposively. Thus, four clusters, namely, Gopalwas and Hariyawas (cluster 1) and Mandhi Hariya and Mandhi Kehar (cluster 2) from Bhiwani and Khudana and Adalpur (cluster 3) and Lawan and Malra (cluster 4) from Mahendergarh district were selected for the present study. From each cluster, 15 CFLD beneficiary farmers and 15 non-beneficiary mustard growers were selected randomly. Thus, a total of 60 beneficiary and 60 non-beneficiary mustard growers were selected from four clusters to make a total sample size of 120 farmers. To assess the knowledge level, an interview schedule was developed based on the package of practices of mustard crop recommended by CCSHAU, Hisar. The data was collected with the help of well-structured pre-tested interview schedule. The responses were obtained in a three-point scale as 'completely right', 'partially right' and 'wrong' and with scores of 2, 1 and 0, respectively. The data so collected was analyzed by using suitable statistical techniques to draw meaningful inferences. The extent of knowledge was calculated by using the formula:

$$\text{Extent of knowledge} = \frac{\text{Total knowledge score obtained by respondent}}{\text{Maximum obtainable score}} \times 100$$

Results and Discussion

Component-wise knowledge of CFLD beneficiaries and non-beneficiaries regarding mustard production technology

The component-wise knowledge level of respondents regarding mustard production technology was measured and comparison of knowledge level of respondents between two groups *i.e.*, CFLD beneficiaries and non-beneficiaries was done to assess the impact of cluster frontline demonstrations. The data furnished in Table 1 indicates that CFLD beneficiaries had maximum knowledge about agronomic practices (84.44%) followed by varieties (78.50%), irrigation and fertilizer management (73.00%) and plant protection measures (56.50%) of mustard production technology. The overall knowledge about mustard production technology was found to be 74.36 percent. Non-beneficiary respondents also exhibited similar trends but their knowledge level in terms of percentage was low in comparison to CFLD beneficiaries. 69.56 percent of them had knowledge about agronomic practices followed by varieties (67.88%), irrigation and fertilizer management (63.00%) and plant protection measures (47.30%). Overall knowledge about mustard crop was found to be 62.73 percent. Further probing of data indicated that the calculated 't' values of 2.65, 4.58, 2.39, 2.41 and 3.89 regarding knowledge about varieties, agronomic practices, irrigation and fertilizer management, plant protection measures and overall knowledge about mustard production technology, respectively, were found significant which indicated that both the groups differ significantly with regard to their knowledge about different components of mustard production technology.

The above results clearly showed that CFLD beneficiaries had an edge in possession of knowledge over non-beneficiaries. This higher knowledge might be due to the trainings imparted, group meetings on different components of mustard production technology organized by KVK personnel during CFLD implementation period. Secondly, frontline demonstrations were conducted at the beneficiary's field to show the worth of mustard production technology. "Seeing is believing" is the basic philosophy of these demonstrations. This might be the reason of enhanced knowledge of beneficiaries as they have witnessed the advantages of new production technologies first hand. On the basis of above findings, it can be suggested that CFLD programme had significant impact on farmers in terms of gain in knowledge regarding mustard production technology. These findings are in line with findings of Rai *et al.* (2012) [15], Sharma *et al.* (2016) [18] and Patil *et al.* (2018) [14].

Table 1: Component-wise mean knowledge of CFLD beneficiaries and non-beneficiaries regarding mustard production technology

n= 120

S. No.	Components	Maximum Knowledge score	Mean Knowledge Score		Mean difference	't' value
			CFLD (n_1=60)	Non- CFLD (n_2=60)		
1.	Varieties	08	6.28 (78.50)	5.43 (67.88)	0.85	2.65**
2.	Agronomic practices	16	13.51 (84.44)	11.13 (69.56)	2.38	4.58**
3.	Irrigation & fertilizer management	12	8.76 (73.00)	7.56 (63.00)	1.20	2.39*
4.	Plant protection measures	10	5.65 (56.50)	4.73 (47.30)	0.92	2.41*
Overall knowledge		46	34.21 (74.36)	28.86 (62.73)	5.35	3.89**

Note- Figures in parentheses indicate the percentage.
* Significant at 5 percent level of significance.
** Significant at 1 percent level of significance.

Association of respondent's socio-personal attributes with their knowledge level regarding mustard production technology

Pearson's coefficient of correlation was worked out to find out the relationship between the independent variables and respondents' knowledge level regarding mustard production technology and tested for its statistical significance. Moreover, the data was subjected to regression analysis to find out the variation caused in the dependent variables jointly explained by independent variables. The results so obtained have been presented in Table 2 and 3.

Relationship of socio-personal traits of CFLD beneficiaries and non-beneficiaries with knowledge level regarding mustard production technology

It was observed from the data reported in Table 2 that the variables like education, socio-economic status, extension contacts, mass media utilization, source of information and risk orientation had a positive and significant relationship with the knowledge level of CFLD beneficiaries at one percent level of significance with their respective 'r' values of 0.349, 0.457, 0.555, 0.440, 0.347 and 0.355. In contrast, age was found to have negative correlation. In case of non-beneficiaries, the variables like socio-economic status, mass media utilization, innovativeness, extension contacts and risk orientation were found to have positive and significant relationship with the knowledge level regarding mustard production technology at 0.01 level of probability with their respective 'r' values 0.333, 0.467, 0.534, 0.420 and 0.380, whereas education had positive and significant relationship at five percent level with 'r' value 0.265, while age was found to have negatively correlated with the knowledge level regarding mustard production technology. Generally, CFLD beneficiaries who possessed higher education, socio-economic status, extension contacts, mass media utilization, source of information and risk orientation were found to possess higher knowledge level regarding mustard production technology, in case of non-beneficiaries, respondents possessing higher education, socio-economic status, mass media utilization, extension contacts, innovativeness and risk orientation possessed higher knowledge. Therefore, it can be concluded that an increase or improvement in the influential independent variables would lead to an improvement in knowledge level of CFLD beneficiaries and non-beneficiaries. The findings are in conformity with the findings of Bhadodiya *et al.* (2011) [1], Bhoi *et al.* (2014) [2] and Meena *et al*. (2020) [13].

Table 2: Relationship of socio-personal traits of CFLD beneficiaries and non-beneficiaries with knowledge level regarding mustard production technology

(n= 120)

S. No.	Characteristics	CFLD (n_1=60)	Non- CFLD (n_2=60)
		Correlation coefficient (r)	Correlation coefficient (r)
1.	Age	-0.084	-0.056
2.	Education	0.349**	0.265*
3.	Socio-economic status	0.457**	0.333**
4.	Irrigation potential	0.032	0.078
5.	Extension contacts	0.555**	0.467**
6.	Source of information	0.347**	0.027
7.	Mass media utilization	0.440**	0.534**
8.	Innovativeness	0.099	0.420**
9.	Risk orientation	0.355**	0.380**
10.	Decision-making pattern	0.109	0.119

* Significant at 5 percent level of significance.
** Significant at 1 percent level of significance.

Multiple regression analysis of socio-personal traits of CFLD beneficiaries and non-beneficiaries with knowledge level regarding mustard production technology

The data in Table 3 shows the significant regression coefficients of variables like education (3.143), socio-economic status (0.188), extension contacts (0.590) and mass media utilization (0.330) of CFLD beneficiaries which indicated that these variables exerted their influence on the overall knowledge level regarding mustard production technology at one percent level of significance. In contrast, source of information (0.306) was found to exert influence at five percent level. Age (-0.031) was found to exert a negative influence on the overall knowledge level. Similarly, in case of non-beneficiaries, mass media utilization (0.402) and innovativeness (0.378) exerted their influence on the overall knowledge level regarding mustard production technology at one percent level of significance. Extension contacts (0.361) were found to exert influence at five percent level, while age (-0.026) was found to exert a negative influence on overall knowledge level. Further, it could be concluded that all the variables together contributed the variation in the overall knowledge level of CFLD beneficiaries to the extent of 64.23 percent. While in case of non-beneficiaries, the independent variables contributed 57.69 percent of the variation in the knowledge about mustard production technology. Singh *et al*. (2011) [20] also reported the similar findings in their study.

Table 3: Multiple regression analysis of socio-personal traits of CFLD beneficiaries and non-beneficiaries with knowledge level regarding mustard production technology

(n=120)

S. No.	Characteristics	CFLD beneficiaries (n_1=60)	Non-beneficiaries (n2=60)
		Regression coefficient ('b' value)	Regression coefficient ('b' value)
1.	Age	-0.031	-0.026
2.	Education	3.143**	0.486
3.	Socio-economic status	0.188**	0.104
4.	Irrigation potential	0.075	0.050
5.	Extension contacts	0.590**	0.361*
6.	Mass media utilization	0.330**	0.402**
7.	Source of information	0.306*	0.106
8.	Innovativeness	0.032	0.378**
9.	Risk orientation	0.228	0.291
10.	Decision-making pattern	0.142	0.168
R^2 Value		0.64	0.57

* Significant at 5 percent level of significance.
** Significant at 1 percent level of significance.

Conclusion

The study revealed that CFLD beneficiaries had more knowledge level in comparison to non-beneficiaries about mustard production technology. Significant calculated 't' values indicated that two groups differ significantly with regard to their knowledge about different components of mustard production technology. On the basis of results of the study, it can be concluded that CFLDs had exerted a positive impact on the knowledge level of beneficiaries. Therefore, it is suggested that the CFLDs on other crops should also be conducted in the study area. It is also suggested that the scientists of KVKs and field functionaries should encourage the farmers to become more involved so that there is more awareness and learning among the farmers and eventually, there is an increase in adoption level of farmers regarding crop production technology.

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