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AN EVALUATIVE STUDY ON TRAINING PROGRAMMES ORGANIZED BY KRISHI VIGYAN KENDRA IN ADOPTION OF INTEGRATED CROP MANAGEMENT PRACTICES

D. Niruban Chakkaravarthy and T. Balakrishnan

Department of Agricultural Extension, Faculty of Agriculture, Annamalai University, Annamalai nagar, Pin-608002 (Tamil Nadu) India.

Abstract

Agriculture is the main sector of the country's economy. Now a day's various technologies, innovative ideas have ensured the development of agriculture. The farmers are not following the newer practices, because of the lack of interest, lack of awareness and lack of training on a particular technology. The transfer of technology from the lab to land is the very important need of the current situation of agriculture. Every agricultural Extension Scientists try to reduce the farmer's problem even though some lacks are there to transfer the technology from lab to land. Krishi Vigyan Kendra is India's innovative institution to transfer the technology at the grass-root level. To bridge the gap between the scientists and farmers the training is needed. Keeping this in view, the research was focused on the training and an attempt has been made to know the overall adoption and practice wise adoption of recommended practices given by KVK. The research was taken up in Sivagangai district of Tamil Nadu. A total of 120 trainees were selected as respondent using proportionate random sampling technique. It is revealed that majority of the respondents (75.83 percent) had medium to a high level of adoption for the recommended ICM practices in paddy crop. Eight technologies were studied under practice wise adoption. Among the eight technologies, thirty-five recommended practices were taken for the research. Majority of the respondents adopted recommended varieties, recommended seed rate, hand weeding, Stubble incorporation, summer ploughing, raising pest and disease-resistant varieties with a higher percentage.

***Key words*:** *Agriculture, Farmers, Training, Adoption, Impact.*

Introduction

Agriculture is the backbone for India's development concerns and is regarded as the largest sector of the country's economy. The demand for higher food production in India is growing year by year resulted from our alarming population growth. This ever-increasing population has put tremendous pressure by consuming the food in the country even though; India has produced 251 million tonnes of food grain production during 2016-17 (Anon, 2016). Training is a fundamental concept in human resource development and it refers to the teaching, learning activities which are carried out to help members of an organization to attain knowledge and skills. An agricultural invention and innovation continuum in all facets of agriculture and allied activities with its effective diffusion is the key to sustainably increase the production and productivity with environmental sustainability. The lab to land transfer of technology is very much important in the fruitfulness of every innovation; hence Krishi Vigyan Kendra (KVK) was launched in our country to impart knowledge to the grass-root level. The KVK is an educational institution of the farmers, it offers a real opportunity by organising trainings to work closely with trainees in developing a skill. Sivagangai is an important district in Tamilnadu where the majority of farmers depend on dry land agriculture. KVK is located at Kundrakudi and is fully funded by ICAR. This vocational training centre acts as a bridge for the transfer of advanced technology from the lab to land and acts as a source of hope to the rural farming and allied communities. Considering the developing nature of the district, the research was conducted to examine the adoption level of KVK trainees.

***Author for correspondence :** E-mail: chakkarainiruagri95@gmail.com

Materials and Methods

This research was taken up in Sivagangai district of Tamil Nadu. The sivagangai district comprises of eight taluks namely, Sivagangai, Manamadurai, Ilayankudi, Devakottai, Karaikudi, Thirupathur, Thiruppuvanam and Kalayarkovil. Among the eight taluks, Ilayankudi, Thirupathur and Kalayarkovil were selected based on the trainees list obtained from the KVK. A list of total villages was collected from Krishi Vigyan Kendra, Kundrakudi. From the list, four villages namely Kallankuthu, Kalayarkovil, Ammanendal and Salaikiramam were selected purposively because of the maximum numbers of trainees participated in the topic Integrated Crop Management practice. The Integrated Crop Management topic was purposely selected as the research focussed on Agriculture. A list of trainees who attend the training on Integrated Crop Management on paddy was obtained. To know the impact of training programmes organised by KVK a sample size of 120 respondents were selected purposively for the research. The numbers of respondents for each village were selected using a proportionate random sampling technique. The extent of adoption was taken for the research. The 8 technologies were selected in consultation with the specialists and officials of Krishi Vigyan Kendra, Kundrakudi. The data were collected with the help of well-structured and pre-tested interview schedule. The ex-post facto research design was used for the research. The statistical tools like percentage analysis and cumulative frequency method are used.

Results and Discussion

The adoption of recommended technologies by the farmers is the prime importance of the KVK. In order to ascertain adoption about improved agricultural technologies of paddy crop, the respondents were asked to give the account of a package of practices they followed in ICM for paddy. Adoption quotients for each respondent were calculated and they were classified into three categories of adoptions *viz*. low, medium and high-level adoption. Knowledge generally leads to adoption. Thirty-five recommended technologies were selected for identifying the extent of adoption among the respondents. Results on the extent of adoption of the technologies are presented in table 1.

It could be observed from the table 1 that 45.83 percent of the respondents fell under medium category followed by 30.00 percent of the respondents fell under high adoption category and 24.17 percent of the respondents fell under low adoption category. Hence it may be inferred that the majority of the respondents (75.83 percent) had medium to the high level of adoption for the recommended ICM practices in paddy crop. This might be due to their medium to the high level of knowledge gained during the training programmes organised by KVK. Therefore, it can be concluded that the KVK is playing a significant role in increasing the adoption level of the respondents. This finding is in line with the findings of Siddardhan (2011) who also reported that respondents had medium to the high level of adoption on recommended practices.

Table 1: Distribution of respondents according to their extent of adoption. (n=120).

S. No	Category	Number	Percent
1.	Low	29	24.17
2.	Medium	55	45.83
3.	High	36	30.00
	Total	120	100.00

Practice wise adoption of respondents

The results on the distribution of respondents according to their practice wise adoption of thirty-five recommended technologies were furnished in table 2.

Varieties

Majority of the respondents (91.66 percent) were adopting the recommended varieties in their cultivation. Selection of a particular variety is one of the important critical factors for obtaining higher yields in any crop. High level of adoption of this practice may be due to the high level of knowledge of the respondents. Moreover, the respondents could get certified seeds of recommended varieties in Government depots and input shops. This would have enabled them to adopt the same. This finding derives support from the findings of Praveen Babu (2014).

Seed rate

It could be seen from table 2 that a higher percentage of the respondents (95.83 percent) had followed the recommended quantity of seed rate. As the majority of the respondents had high knowledge about the recommended seed rate, they might have adopted correctly. During the training programmes organised by KVK, the respondents were made aware of using the recommended seed rate. They were informed that if they use excess seed rate, then they had to go for thinning operation due to excess plant growth. This leads to waste of time, money and labour. Hence the respondents would have adopted the exact seed rate.

Seed treatment

The mean adoption percentage score for seed treatment was calculated as 57.70 percent. Among the sub-items, more than two-thirds of respondents (69.16

Table 2: Practice wise adoption of the recommended practices. (n=120).

S. No	Practices	Number	Percent
I	**Varieties**		
1.	Recommended variety	110	91.66
II.	**Seed rate**		
1.	Recommended seed rate	115	95.83
III.	**Seed treatment**		
1.	KCL solution recommended for seed hardening	60	50.00
2.	Pseudomonas fluorescens recommended for seed treatment	55	45.83
3.	Bio-fertilizers recommended for seed treatment	83	69.16
4.	Quantity of bio-fertilizers / acre recommended for seed treatment	79	65.83
	Mean percentage		**57.70**
IV	**Land preparation**		
1.	Summer ploughing	107	89.16
V	Integrated weed management		
1.	Recommended time for first-hand weeding	112	93.33
2.	Recommended time for second-hand weeding	95	79.16
3.	The recommended quantity of pre-emergence herbicides	45	37.50
4.	Recommended quantity post emergence herbicides	20	16.66
	Mean percentage		**56.66**
VI.	**Integrated nutrient management**		
1.	The recommended quantity of FYM per/ acre	97	80.83
2.	Practicing stubble incorporation	102	85.00
3.	The recommended quantity of bio- fertilizer	40	33.33
4.	The recommended quantity of NPK per/ acre	80	66.66
5.	The recommended quantity of phosphorus for basal application per acre	74	61.66
6.	Split doses recommended	60	50.00
7.	The recommended quantity of zinc sulphate and / acre	95	79.16
	Mean percentage		**65.23**
VII	**Integrated pest management**		
A.	**Cultural practices**		
1.	Summer ploughing (recommended tillage operation)	110	91.66
2.	Selection of right time of sowing season	98	81.66
3.	Raising pest and diseases resistant varieties	105	87.50
4.	Maintenance of weed-free environment	102	85.00
5.	Trimming and plastering of bunds	110	91.66
	Mean percentage	**87.49**	
B.	**Mechanical practices**		
1.	Removal and destruction of pests in the infected plants	80	66.67
2.	Use of light traps	30	25.00
3.	Use of yellow sticky traps	22	18.33
4.	Use of bird perches	45	37.50
5.	Use of rat trap / Tanjore kitty	75	62.50
	Mean percentage		**42.00**
C.	**Biological practices**		
1.	Use of beneficial insects.	10	08.33
2.	Use of pheromone traps	24	20.00
3.	Use of neem and pungam for pest control	70	58.33
	Mean percentage		**28.88**
D.	**Chemical practices**		
1.	Use of recommended dose of insecticides	85	70.83
2.	Application of soil test based recommended fertilizers	80	66.66
3.	ETL recommendation for spraying pesticides	45	37.50
	Mean percentage		**58.33**
VIII	**Disease management**		
1.	Recommended fungicide to control diseases	50	41.66

percent) adopted recommended bio-fertilizers for seed treatment and 65.83 percent of the respondents adopted the recommended quantity of bio-fertilizers for seed treatment. The bio-fertilizers packets are distributed in all Government depots to the farmers at free of cost. This would have enabled the farmers to adopt the practices. This might be due to their knowledge of these practices. Half the proportion of the respondents (50.00 percent) adopted seed hardening with KCL solution. Poor knowledge about this practice and non-availability of KCL solution may be attributed as the reasons for non-adoption. Less than half the proportion of the respondents (45.83 percent) adopted seed treatment with Pseudomonas fluorescens. The respondents were not known about the importance of pseudomonas fluorescens. In addition, pseudomonas fluorescens is not available in the local input shops. Hence the respondents were unable to adopt this practice.

Land preparation

It could be observed from table 2 that the majority of the respondents (89.16 percent) adopted the summer ploughing. Majority of the respondents were aware of land preparation to get higher yield and maintaining weed-free condition throughout the crop period. This practice conserves rain water during the summer period and also exposes the egg masses, larvae and pupae of the insect pests to sun light thereby destroying them. This higher knowledge level of the respondents would have resulted in a higher level of adoption of the above-said practices.

Integrated weed management

The mean adoption percentage score for integrated weed management was 56.66 percent. The recommended time for first-hand weeding (10-15 days after germination) was found to be adopted by 93.33 percent of the respondents and its followed by recommended time for second-hand weeding (30-45 days after first-hand weeding) by 79.16 percent of the respondents. Hand weeding was adopted by most of the respondents because hand weeding is a simple and traditional method. Majority of them rightly perceived that weeds affect the growth of paddy crop that it leads to a reduction in yield and most of them followed the proper time of weeding. In addition, hand weeding helps in better soil aeration and yet it is eco-friendly and also it prevents an environmental hazard. Less than forty percent of the respondents (37.50 percent) followed the recommended quantity of pre-emergence herbicides and only 16.66 percent of the respondents followed the recommended quantity of post-emergence herbicides. As already discussed, the farmers were not aware of post-emergence herbicides and their role in weed control. Even though most of the respondents were aware of pre-emergence herbicides, their adoption level was found to be low. This might be due to the high cost of weedicides and non-availability of labourers for spraying operations. This finding derives support from the findings of BalajiNaik (2011).

Integrated nutrient management

The mean adoption percentage score for integrated nutrient management practices was 65.23 percent. Most of the respondents (85.00 percent) were adopted the practice of stubble incorporation. As the majority of the respondents had appropriate knowledge of this practice, they might have adopted this practice. Moreover, this is a low-cost practice and has major advantages like enrichment of soil fertility, adding organic matter to the soil, reducing the use of chemical fertilizers, etc., as the farmers have experienced these advantages, they would have adopted it. This finding derives support from the findings of Channamallikarjuna (2013)

Recommended quantity of FYM was applied by 80.83 percent of the respondents. Most of the farmers were aware that FYM application will enhance the crop growth and enrich the soil. This might be the reason for better adoption.

Most of the respondents (79.16 percent) had applied zinc sulphate in their field. Most of the respondents had more conviction about the benefits of the application of zinc to overcome nutrient deficiency and also possessed more knowledge of this practice. This might be the main reason for adoption.

The percentage of adoption was medium for the practices namely recommended a quantity of NPK per acre (66.66 percent). Sixty (61.66 percent) of the respondents had adopted the recommended phosphatic fertilizer as basal in their field. This might be due to their better knowledge and adequate availability of phosphatic fertilizers in the input shops. The farmers revealed that application of phosphorous enhances root growth and hence resulted in better crop development. So they were giving the importance to ‘phosphorous’ application.

Half the proportion of the respondents (50.00 percent) had adopted the recommended split doses of application of N, P and K fertilizers. As this is a routine practice and farmers were convinced on the results of the application of N, P, K fertilizers, they would have adopted the practice. The high cost of fertilizers may be a major reason for non-adoption. One-third of the respondents (33.33 percent) had adopted the recommended quantity of bio-fertilizers to the main field. This might be due to their poor knowledge. Moreover,the bio-fertilizers are needed

in huge quantities for applying in the main field, but they are not available in the input shops and Government depots in larger quantities. This, in turn, would have resulted in poor adoption. This finding derives support from the findings of Siddardhan (2011) and Balakrishnan, (2010).

7. Integrated pest management

Cultural practices: The mean percentage score of adoption for cultural practices was found to be 87.49 percent. High adoption was observed for the cultural practices namely summer ploughing (91.66 percent), trimming and plastering (91.66 percent), raising pest and disease-resistant varieties (87.50 percent), maintenance of weed-free environment (85.00 percent) and selection of right time for sowing season (81.66 percent). As these practices are some extent easy and many farmers had better knowledge gained through training. More experience and better conviction about these practices would have adopted the same.

Mechanical practices: The mean adoption percentage score of 42.00 percent was found under the mechanical practices of Integrated Pest Management.

Two-thirds (66.67 percent) of the respondents had followed the removal and destruction of pests in the infected plants followed by the use of rat trap/Tanjore kitty (62.50 percent). The trainer had given sufficient and alarming information regarding the yield loss occurs by the pest and rats. This alarming information might have cautioned the trainees in acquiring more knowledge which in turn would have helped them to adopt these practices. Low adoption was noticed for the practices like the use of bird perches (37.50 percent), use of light traps (25.00 percent) and use of yellow sticky traps (18.33 percent). The farmers had poor knowledge of mechanical practices of Integrated Pest Management as already discussed. This would have not enabled them to realize the importance of these practices and hence would have resulted in poor adoption.

Biological practices: The mean adoption percentage score for biological practices of integrated pest management was very low (28.88 percent). More than half the proportion of the respondents (58.33 percent) adopted the use of Neem and Pungam for pest control. Neem and Pungam are readily available in the environment and easy to use in the form of leaf, oil and kernel extracts. Moreover, this is an indigenous wisdom possessed by the farmers and they were benefitted by the application of these practices in their fields. They understood that these are eco-friendly practices and hence would control the pests effectively, without harming the environment.

One-fifth of the respondents (20.00 percent) adopted the use of pheromone traps. The low level of adoption may be due to non-availability of traps in the particular location and lack of knowledge in using the traps. Only a meagre proportion (08.33 percent) of the respondents adopted the use of beneficial insects. Majority of the respondents were unaware of the use of beneficial insects as already witnessed. This might be the reason for non-adoption.

Chemical practices: The mean adoption percentage score for chemical methods was found to be 58.33 percent. Majority of the respondents (70.83 percent) had adopted 'recommended dose of insecticides'. This might be due to their more knowledge of these practices. Some of the respondents revealed that they would prefer chemical application due to its immediate effect. Lack of knowledge about pest management techniques, doses of chemicals and non-availability of labour and high cost of chemicals might be the reasons for non-adoption. More than sixty per cent of the respondents (66.66 percent) adopted the application of soil test based recommended fertilizers. Most of the respondents had appropriate knowledge on soil testing and they were visiting KVK lab frequently for soil testing. Regular field visits by the KVK scientists would have helped in creating more awareness about the soil test. These may be attributed to the reasons for better adoption.

The ETL based recommended for spraying pesticides was rightly followed by (37.50 percent) of the respondents. Eventhough KVK imparts training on assessing ETL for various pests in paddy, the farmers felt difficulty in understanding this concept as it was complex to perceive. The farmers revealed that they can gain better knowledge if they were given regular training.

Disease management

Less than half the proportion of the respondents (41.66 percent) had adopted recommended fungicide for controlling diseases. Lack of interest and high cost of fungicides might be the probable reasons for non-adoption.

Conclusion

Farm productivity increases with an increase in the extent of adoption by the farmers. Based on findings of the study, it can be concluded that three-fourths of the respondents had medium to the high level of adoption of ICM practices. The trainees should be encouraged to strengthen their contact with their KVK scientist to get sufficient information on crop production which helps in increasing the adoption process. The standard of living and the economic status of the farmers were adopting recent technologies. So it's the duty and responsibility of

the KVK and other training institutions in creating awareness and wide publicity of the trainings regarding date, topics, venue, etc. The further regular evaluation must be done on the KVK trainings so as to improve the effectiveness of the training programmes, thereby the trainees might have got benefitted and the socio-economic status will improve which in turns leads to the economic growth of the nation.

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