Research Article

ADOPTION OF IPM PRACTICES IN CAULIFLOWER CULTIVATION IN UDAIPUR DISTRICT OF RAJASTHAN

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Abstract- Present study was conducted in Badgaon and Girwa tehsils of Udaipur district of Rajasthan. Four villages from each selected Tehsil were taken and 12 respondents were selected randomly from each selected village for the study. Data were collected through pre-structured interview schedule. It was found that majority of respondents (47.92%) were found to be from medium adoption level group. whereas, 31.25 and 20.83 per cent respondents were from the low and high adoption level group about IPM in cauliflower cultivation respectively. Among cultural practices, maximum farmers 97.92 per cent were adopted removal and destruction of the plant part and egg masses in cauliflower and among several IPM practices. 71.17 per cent farmers were adopted cultural practices in cauliflower cultivation.

Keywords- IPM, Adoption, Cauliflower, Cultural Practices

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Introduction

Cauliflower is grown for its white tender head or curd, which is used as a vegetable, soup and pickle. It is having a good nutritive value. It contains good amount of vitamins like vitamin A, C and fair amount of proteins and fibers. The cauliflower is also a good source of minerals like P, Ca, Mg, S, Fe, and Na but there are several insect-pests, which attacks on cauliflower and reduces its nutritional value. In which some are common like diamond back moth, cabbage butter fly, tobacco caterpillar, cabbage semilooper etc. Generally, farmers are using pesticides for controlling insect-pests in cauliflower, which are harmful for human health. So, there is essential to give a focus on IPM to maintain the nutritional level and sustainability in production of vegetables.

Integrated Pest Management is one of such systematic approach which emphasizes not only the reduction in use of pesticides and keeping below the level of pest causing economic injury but also it facilitates the use of cultural, mechanical, botanical, biological and chemical methods of control in an integrated manner and restores ecological balance for sustainable agriculture.

Materials and Methods

The present study was conducted in the purposively selected Udaipur district of Rajasthan. There are total eleven tehsils in Udaipur district of Rajasthan, out of which, two Tehsils namely Badgaon and Girwa were selected on the basis of maximum area under cultivation of cauliflower. Further, a comprehensive list of all the major cauliflower growing villages was prepared in consultation with the personnel of Revenue and Agriculture Department from the identified tehsils. Four villages from each selected Tehsil were taken on the basis of maximum area under cauliflower cultivation. For selection of respondents, comprehensive list of cauliflower growers was prepared with the help of village Patwari and Agriculture Supervisor of respective villages. From the list so prepared, 12 respondents were selected randomly from each selected village. Thus, in all 96 farmers were included in the sample of the study. Data were collected through pre-structured interview schedule.

Results and Discussion

Need based and location specific scientifically sound recommendations and their full use at the level of client system is vital for maximization of agricultural production. Still there exists a wide gap between the technology available at the research station and its adoption at the farmers' level. One of the reasons for this may be strong conviction of farmers towards the traditional practices, which they have been following for the last several years. Keeping this view in mind, an effort has been made to find out the extent of adoption of IPM in cauliflower cultivation by cauliflower growers. The results have been presented under following heads:

Distribution of respondents according to IPM in cauliflower cultivation:

To get an overview of adoption level, the respondents were divided into three groups viz., (i) low level of adoption (<21.37) (ii) medium level of adoption (21.38 to 31.07) and high level of adoption (>31.07). The groups were formulated on the basis of calculated mean and standard deviation of the adoption scores obtained by the respondents. The results are presented in the [Table-1].

The data in [Table-1] reveal that out of 96 respondents, majority of respondents (47.92%) fell in medium level of adoption group whereas, 20.83 per cent cauliflower growers were observed in the high level adoption group and remaining (31.25%) respondents were possessed low level of adoption about Integrated Pest Management technology in cauliflower cultivation.

Aspect-wise extent of adoption of IPM Technology:

Adoption of IPM technology was assessed under four major aspects of IPM in

cauliflower, of which, the results have been presented under the following heads:

Extent of adoption regarding key insect pests of cauliflower and their monitoring by the respondents:
Data presented in [Table-2] explicate that most of the respondents assured the identification of insect pests before using control measures was 61.08 per cent

and ranked first by cauliflower growers. But at the time, it is quite dis-satisfying that they had very poorly follow up of economic threshold level (ETL) concept before insecticidal spray with the extent of 20.83 per cent and ranked second by the cauliflower growers, which is indeed an important practice to be followed for IPM in cauliflower cultivation.

Table-1 *Distribution of respondents according to their adoption level of IPM in cauliflower cultivation*   n=96

S.No.	Adoption Level	Badgaon Tehsil		Girwa Tehsil		Total	
		F	%	F	%	F	%
1.	Low (<21.37)	14	29.17	16	33.33	30	31.25
2.	Medium (21.38 to 30.87)	24	50.00	22	45.83	46	47.92
3.	High (>30.87)	10	20.83	10	20.83	20	20.83
	Total	48	100	48	100	96	100

F = frequency, % = per cent

Table-2 *Extent of adoption by the respondents regarding identification and monitoring of key insect pests of cauliflower*   n = 96

S. No.	Practices	MPS	Rank
1.	Identification of insect pests before using control measures	61.08	1
2.	Follow up of ETL concept before insecticidal spray	20.83	2

MPS = Mean Per cent Score

Extent of adoption of cultural practices of IPM in cauliflower cultivation by the respondents:
[Table-3] vividly depicts that extent of adoption about removal and destruction of plant parts & egg masses was 97.22 per cent and ranked first by the cauliflower growers followed by the practice of crop rotation (83.75%) and ranked second by the cauliflower growers.

Table-3 *Extent of adoption of cultural practices of IPM in cauliflower cultivation by the respondents* n=96

S.No.	Cultural Practices	MPS	Rank
1.	Field sanitation and deep ploughing before crop sowing	79.48	3
2.	Crop rotation	83.75	2
3.	High yielding varieties	40.46	10
4.	Seed rate, spacing, transplanting and time of sowing	72.55	4
5.	Seed treatment	41.49	9
6.	Intercropping	66.88	6
7.	Fertilizer management	70.21	5
8.	Weed management	61.25	7
9.	Irrigation management	60.42	8
10.	Removal & destruction of plant parts & egg masses	97.92	1

MPS = Mean Per cent Score

Extent of adoption of biological practices of IPM in cauliflower:
A perusal of data presented in [Table-4] reveals that majority of the farmers had used trichoderma powder was 27.13 MPS and ranked first among biological practices by the cauliflower growers.
Whereas, the poor adoption of the Bt. biopesticide was noted as 2.43 per cent and ranked last by farmers.

Table-4 *Extent of adoption of biological practices of IPM in cauliflower cultivation* n = 96

S.No.	Biological Practices	MPS	Rank
1.	Bt. biopesticide	2.43	2
2.	Trichoderma powder	27.13	1

MPS = Mean Per cent Score

Extent of adoption of chemical practices of IPM in cauliflower cultivation by the respondents:
Data incorporated in [Table-5] reveal that majority of farmers was applying chemical pesticides at appropriate crop stage with the extent of 47.92 per cent and was ranked first among chemical pesticidal practices by the cauliflower

growers.

Table-5 *Extent of adoption of chemical pesticidal practices of IPM in cauliflower cultivation by the respondents* n = 96

S.No.	Chemical Pesticidal Practices	MPS	Rank
1.	Application of chemical pesticides at appropriate crop stage	47.92	1
2.	Spraying of chemical pesticides in recommended doses	46.88	2.5
3.	Use of required quantity of water for preparation of insecticidal solution per unit area	46.88	2.5
4.	Application of chemical pesticides only after when all other control measures have adopted and insect pests population possess ETL	41.25	4

MPS = Mean Per cent Score

Overall adoption of IPM practices in cauliflower by the respondents:
To sum up the scores of all the major aspects of adoption, the scores for the practices selected under each major aspect were added and have been presented in [Table-6].
The data presented in [Table-6] reveal that among the various practices selected for studying their adoption, maximum adoption was found for the cultural practices with the extent of 71.17 per cent and ranked first by the cauliflower growers. Extent of adoption about chemical pesticidal practices was 48.06 per cent and ranked third by the cauliflower growers. On the other hand, overall adoption about key pests of cauliflower and their monitoring was 48.96 MPS and ranked second by the cauliflower growers.

Table-6 *Overall adoption of IPM practices in cauliflower by the respondents*   n = 96

S.No.	IPM practices	MPS	Rank
1.	Identification of key insect pests of cauliflower and their monitoring	48.96	3
2.	Cultural practices	71.17	1
3.	Biological practices	17.58	4
4.	Chemical Pesticides	48.06	2
	Overall	46.47	

MPS = Mean Per cent Score

Comparison of adoption of IPM practices between the farmers of selected tehsils:
Further, in order to find out the significance of difference between the farmers of selected tehsils with respect to the adoption possessed by them, 'Z' test was applied. For this purpose, the following hypotheses was tested and results of which are presented in [Table-7].

Table-7 *Significance of difference in the adoption of IPM techniques by the farmers of selected tehsils*

S.No	Category of sample	Mean	S.D.	'Z' value
1.	Respondents of Badgaon tehsil	28.33	4.33	3.52**
2.	Respondents of Girwa tehsil	25.27	4.81	

** Significant at 1 per cent level of significance

[Table-7] shows that the calculated value of 'Z' (3.52) is greater than its tabulated value at 1 per cent level of significance Thus, null hypothesis (NH_{01}) is rejected and research hypothesis entitled "there is significant difference between farmers of selected tehsils with respect to adoption of IPM practices in cauliflower cultivation." was accepted.

Conclusion
Findings revealed that out of 96 respondents, majority of respondents (47.92 %) were found to be from medium adoption level group whereas, 31.25 per cent cauliflower growers were reported from low adoption level group and remaining only 20.83 per cent respondents were in the high adoption level group about IPM in cauliflower cultivation.

Findings indicated that there was significant difference between the respondents of selected tehsils in adoption of IPM practices in cauliflower cultivation.

Conflict of Interest: None declared

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