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ADOPTION PATTERN OF INTEGRATED PEST MANAGEMENT IN BASMATI RICE IN HARYANA

Agricultural Economics

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ABSTRACT

The present study was carried out with the objective to study the adoption pattern of IPM among farmers in Basmati paddy. Four districts of Haryana namely Karnal, Kaithal, Sonipat, Jind was purposively selected. One block was selected randomly from each district. From each Block, 20 IPM and 10 CPM farmers were selected. The primary data for the agriculture year 2019-20 was collected by survey method through personal interview of the selected farmers with the help of specially designed interview schedule. The overall findings reveals that mostly cultural practices are adopted by IPM farmers. The majority (70%) of the IPM paddy growers had medium level of adoption followed by high extent of adoption (16.25%) and then low extent of adoption (13.75%). Therefore, it is suggested that the extension activity need to be intensified to create awareness among the farmers for higher adoption of IPM technology for sustainable production of paddy.

KEYWORDS

integrated pest management, conventional pest management, sustainable

INTRODUCTION

Agriculture remains one of the major sustaining activities for mankind despite all the advancement in the technology throughout the world. The performance of agricultural sector influences the growth of India's economy besides being vital for food and nutritional security of the nation.

Insect pests, diseases, and weeds are the major factors limiting agricultural productivity growth. Pest problem is one of the major deterrents for achieving higher production in agriculture crops. India loses about 30% of its crops every year due to pests and diseases. Paddy is one of the important crops which is generally attacked by insects like brown plant hopper, yellow stem borer, rice leaf folder, rice hispa, whorl maggot, etc. which can destroy the whole field with quick succession. At present to control such pest and disease problems, insecticides and fungicides are used at large scale.

Unscrupulous and large-scale use of pesticides in paddy cultivation has led to many problems like, adverse effect on non-targeted organisms, insecticide resistance in insects, health hazards, pollution of environment, and unsustainable farming systems. As evident from the consumption rate in India as well as in Haryana, there is a need for other alternatives to make cultivation practices sustainably feasible. Therefore, Integrated Pest Management (IPM) have come in front as solution.

In crop production technology, IPM is a schedule of practices, which begin from field selection till harvest of a crop. It is a broad ecological pest control approach aiming at best mix of all known pest control measures to keep the pest population below economic threshold level (ETL). The major components in this approach are i) biological ii) mechanical iii) cultural methods iv) genetic control v) chemical.

India accounts for over 70 per cent of the world's basmati rice production and is a leading exporter of the basmati rice in the global market. The increasing demand of basmati rice in both domestic and international market requires a sustainable production of the crop, thus IPM practices will help in attaining sustained yield and thereby benefiting the Indian farmers. Hence the study was carried out with the objective to examine the extent of use of IPM practices in paddy (Basmati) cultivation.

MATERIAL AND METHODOLOGY

Multistage random sampling technique was used for selection of sample farmers. Four districts of Haryana state namely Karnal, Sonepat, Jind and Kaithal were selected randomly from paddy growing districts. Four blocks namely 'Assandh', 'Kaithal', 'Jind' and 'Kharkhoda' were selected randomly from identified districts of Karnal, Kaithal, Jind and Sonepat, respectively. The selection of village is the third stage of sampling. The selection of villages from identified blocks were based on availability of desired information for this research work. The details of villages selected for the study is shown below. From identified villages of each selected block, 20 farmers adopting IPM practices/technologies and 10 farmers adopting CPM method in cultivation of paddy (basmati) was selected. Thus, a total sample of 120 farmers was surveyed.

To obtain the extent of adoption of various activities of the IPM practices by farmers, a survey schedule was prepared with a list of 26 IPM practices. Responses of the farmers about every practice were recorded. Therefore, possible maximum score for adoption that could be obtained was 26 and minimum was zero. All the IPM farmers were grouped into three categories as under on the basis of mean and standard deviation.

The adoption quotient was calculated for every respondent. Later on, all the respondents were grouped into three categories on the basis of mean and standard deviation (S.D.).

The farmers' IPM adoption level was determined by calculating adoption quotient based on formula developed by Sengupta (1976).

$$\textbf{Adoption Quotient} = \frac{\text{Number of practices used}}{\text{Number of applicable practices}}$$

Table – 1 Method Of Categorization Of Farmers According To Adoption Level Of IPM

Sr. No.	Category	Score
1	Low level of Adoption	< (mean – S.D.)
2	Medium level of Adoption	Between (mean + S.D.)
3	High level of Adoption	> (mean + S.D.)

RESULTS AND DISCUSSION

Extent Of Use Of IPM Practices

There were mainly four major groups of IPM technology components namely biological, cultural, mechanical, and chemical. The extent of use of these components in paddy cultivation by IPM farmers is shown in Table 2.

The IPM component wise analysis revealed that among cultural components, almost all the IPM farmers perform uprooted nursery in standing water and summer ploughing (100%), irrigate field continuously after 45 days of transplanting (97.5%), selection of healthy seeds (95%), disease and Insect resistant seed (90%), followed right spacing between seedlings (37.5%), timely planting and raising of healthy nursery (82.5%).

IPM practices like summer ploughing expose pupae to sun light and minimize insect pests. Uprooting of nursery in standing water helped to prevent damage of the roots during transplanting, this resulted in the

decrease of soil borne diseases and better performance of paddy crop.

In mechanical components, 27.5 per cent of the farmers practiced hand picking of insect and infected plants. About 17.6 per cent farmers were using neem oil spray and around 90 per cent farmers were using neem coated urea to preventing sucking insect attack. Mechanical methods were used by farmer in limited number. It is mainly due to non-availability and lack of knowledge about use of mechanical measures like pheromone trap and light trap and bird perches etc.

In case of biological control methods for pest control, about 17.5 per cent farmer used neem oil spray and about 7.50 per cent farmers practiced seed priming with Pseudomonas fluroescens. In chemical component, about 67.5 per cent farmers were using chemical at economic threshold level.

Table – 2 Extent Of Use Of IPM Practices In Haryana

Sr. no.	A. Cultural Practices	Overall
a)	Seed/Seedling	
1.	Selection of healthy seeds	95
2.	Disease and Insect resistant seed	90
3.	Salt water treatment of seeds	25
4.	seed priming with Bavistin 50WP/Emisan + Streptocycline	65
5.	seed priming for 24 hours	25
b)	Nursery	
6.	Timely planting and raising of healthy nursery	82.5
7.	Application of Bavistin @ 1 gm/sq.m. 5 Days before nursery uprooting?	26.25
8.	Uprooted of seedling from nursery in standing water (flood irrigation)	100
c)	Field/ Transplanted Rice	
9.	Summer ploughing	100
10.	Removal and proper disposal of stubbles	48.75
11.	Field sanitation	76.25
12.	Right Spacing between seedlings	37.5
13.	Recommended dose of fertilizer	33.75
14.	Water stagnation upto 45 DAT and keeping wet soil after 45 DAT & upto harvesting?	46.25
15.	Non-draining of water of infected field in the disease-free field?	20
c)	Physical/Mechanical Control	
16.	Clipping of infected and folded leaves for reduction of caterpillar populations	27.5
17.	Hand picking of insect and infected plant	32.5
18.	Installation of bird perches	5
19.	Use of pheromone Trap	-
20.	Use of light trap	-
C	Biological Control	
21.	Releases of egg parasitoid Trichogramma chilonis	-
22.	Use spray of Neem oil 2%?	17.5
23.	Seed priming with Pseudomonas fluroescens or Trichoderma sp. (Bio-pesticide)	7.5
d)	Chemical Control	
24.	ETL based application of pesticide	27.5

A perusal of Table 3 reveals that the majority (70%) of the IPM paddy growers had medium level of adoption about various selected IPM practices followed by 16.25 per cent with high extent of adoption and 13.75 with low extent of adoption about various selected IPM practices.

Table – 3 Adoption Pattern Of IPM Practices By Farms In Haryana (2019-20)

Sr. No.	Level of Adoption	Overall
		Frequency
1	Low	11 (13.75)
2	Medium	56 (70)
3	High	13 (16.25)
	Total	80 (100)
(μ: 41.09) (S.D.: 12.17)		

Figure in Parenthesis indicate the percentage to frequency.

CONCLUSIONS

It is concluded that use of IPM technology needs to be expanded among all the paddy growers. The farmers are risk adverse and have been using chemical pesticides since long to limit the crop loss. Thus, making them to switch over to IPM technology may require considerable efforts and resources.

IPM being the knowledge intensive method, require extension workers and farmers to have sufficient knowledge of timing and method of application of bio-agent and pest suppressing cultural practices. This aspect needs to be strengthened. Hence, there is a need to educate the farmers on benefits of IPM technology by the extension workers of state agricultural department and CCS HAU, Hisar. If these steps are followed, it will go a long way to make sustainable paddy cultivation in the state.

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