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PROBLEMS AND SUGGESTIONS FOR FARMERS' ADOPTION OF IPM PRACTICES IN RICE *(Oryza sativa* L) CULTIVATION

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Abstract

A study was carried out to determine the problems in IPM practices for rice cultivation faced by the farmers trained in IPM through Farmers' Field School (FFS) and also to find out the important probable suggestions for overcoming those problems. Data were collected from 158 respondent farmers sampled randomly from 1050 FFS farmers of Godagari Upazila in Rajshahi district. Twenty important problems regarding IPM practices were identified by interviewing teachers, extension personnel, experts and the sampled FFS farmers. Twenty possible solutions/suggestions for overcoming the problems were also collected by using the same procedure. The importance of the problem and the suggestions was measured by using 'Important Problem Score Index (IPSI)' and 'Important Solution Score Index (ISSI)' technique, respectively. The five most important problems as reported by the farmers ranked in the following order: i) need for much more labour, ii) lack of proper training for farmers about IPM, iii) lack of farmers' knowledge regarding IPM practices, iv) availability of insecticides and v) complexity of IPM practices. Similarly, the five most common suggestions were i) establishment of more IPM field school, ii) arrangement of farmers practical training, iii) introduction of IPM practices into the school/college academic course, iv) increase the farmers' awareness on environment pollution and v) to ensure proper supervision of extension worker. IPM is environment-friendly pest management system but due to its complexity need more knowledge and training. So, it is needed to give more emphasis in educational and motivational programme for increasing IPM practices for the farmers by the implementing agencies.

Keywords: Problems, suggestions, IPM practices, rice, cultivation.

Introduction

Integrated Pest Management (IPM) is an effective and environment-friendly pest management system. It is an ecological approach to pest management in which all available effective techniques are deployed in a unified programme so that the pest populations can be managed to avoid economic damage and minimize adverse side effects. A set of decision-making tools is utilized to implement IPM at the farmers level. This approach to rice production in the Philippines was centered for optimizing farmers returns on investment for pest control while minimizing hazards to health and environment quality (Kenmore, 1991). In this aspect, farmers design their own copping pattern to reduce available food

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resources for the pest, planting variety resistant to locally important pests, preparing land and managing fertilizer in an efficient and profitable manner, regular monitoring and estimating pest abundance and applying pesticides in a safe, minimally disruptive and highly profitable fashion. In Farmers' Field School (FFS), integrated pest management has been given the top most priority as a learning topic for rural farmers. Being educated through Farmers' Field School on IPM, farmers are supposed to use alternate means of pesticide to pest management in their field. In a study, Ramasswamy (1992) found that out of 2950 farmers, 59 farmers after receiving FFS training reduced pesticide use by 80%, saving 70% of their pesticide cost. The farmers who produced 3.55 tons of paddy/ha before receiving IPM training produced 4.79 tons/ha after IPM training, effecting on yield increase of 35%. Similarly, rice yield increased by 4% bringing over 20% increase in profit due to FFS training in Vietnam (Kenmore, 1997).

The concept of IPM is not new. In Bangladesh, IPM activity was started in 1981 on small scale basis. In 1989, some trust was given on IPM through FAO's inter-country programme. Based on success of FAO's inter-country programme, IPM activities were undertaken by the Department of Agricultural Extension (DAE) IPM through DAE-DANIDA-SPPS, DAE-UNDP/FAO and DAE-CAD project. DANIDA-SPPS was a five year programme starting from July 1997 (Anonymous, 1999). Presently, the Government of Bangladesh started IPM project from January 2001 for High Value Crop in northwest districts of Bangladesh (Anonymous, 2001). As IPM programme is being implemented at the field level, the farmers are likely be encouraged by certain factors that motivate them for IPM practice in their fields. Similarly, there might also be certain factors which discouraged the farmers in IPM practices in rice cultivation. Keeping this view in mind, the present study was undertaken with the following objectives:

a) to determine the important problems in IPM practices for rice cultivation as perceived by the farmers and

b) to determine the important probable suggestions for overcoming the problems faced by the farmers

Materials and Method

The study was purposively conducted in Godagari Upazila of Rajshahi district because of its agro-ecological placement in the Barind zone. Out of 1050 FFS farmers available in Godagari Upazila, a sample 15 % of the FFS farmers (158 FFS farmers) was selected by using a Table of Random numbers (Kerlinger, 1973). Data were collected from 5th September, 2006 to 28th January, 2007, by using an interview schedule. As many 20 problems regarding IPM practices in rice cultivation were selected by reviewing the literatures and through

consultations with teachers, extension personnel, experts and the contact farmers. Similarly, twenty possible solutions/suggestions were selected for overcoming the problem.

Measurement of the importance of problems in IPM practices

The importance of different problems as reported by the respondents of the study area was categorized as very important, important and not important, and each category was assigned a weight as follows: very important =2; important=1; and not important =0.

The importance score (IS) was computed for each problem by summing up the weights for the responses against a particular problem. Therefore, the IS of any problem could range from zero to 316. For easy understanding of the problem, the importance score (IS) of each of the problems was expressed in percentage by using the following formula:

$$\text{Important Problem Score Index (IPSI)} = \frac{\text{Observed Problem Score}}{\text{Possible Problem Score}} \times 100$$

The possible important problem score index (IPSI) of a problem could thus range from zero (0) to 100, where the statement receiving zero indicated no problem in IPM practices, while 100 indicated very high problem in IPM practices faced by the farmers in rice cultivation. That is, the higher the IPSI the higher the problem is responsible for IPM practices in rice cultivation.

Measurement of the importance of solution/suggestion in IPM practices:

The same procedure used for measuring the problems and was adopted to measure the importance of solution or suggestions received from the respondents. Their responses were quantified and rated using the same categories of responses and formula.

In respect of each of the suggestions, the respondent indicated importance of solution/suggestions. The respondent did it by putting a tick mark in any one of three responses such as very important, important and not important. The responses of the respondents were quantified by assigning weights as shown below:

Responses	Weights
Very important	2
Important	1
Not important	0

Thus the importance score (IS) of solutions or suggestions was computed by summing up the weights for each responses of all the respondents, and the importance score of any solution/suggestions could therefore range from zero (0) to 316. The importance score (IS) of each of the solution/suggestions was then expressed in percentage by using the following formula:

$$\text{Important Solution Score Index (ISSI)} = \frac{\text{Observed Solution Score}}{\text{Possible Solution Score}} \times 100$$

Where, zero indicated no important suggestion for encouraging the IPM practices and 100 indicated very high encouraging suggestion for practicing IPM in rice cultivation by the farmers.

Results and Discussion

Problems in IPM practices for rice cultivation as reported by the farmers

The problems with rank order as opined by the farmers are presented in Table 1. Important Problem Index Score (IPIS) as obtained from farmers in IPM practices ranged from 58.86 to 75.31 percent. Although rice farming has developed substantially, many farmers in Bangladesh still cultivate rice crops in order to ensure their food production for subsistence. The prime objective of the FFS farmers was to avoid pesticide use by adopting IPM tactics. But in reality it becomes difficult for them to take risk in avoiding the use of pesticide. The five top ranked problems reported by the FFS farmers that made them indifferent to using IPM practices were: (1) IPM is very labour intensive; (2) lack of IPM training; (3) lack of IPM knowledge; (4) complexity of IPM practices; and (5) easy availability of pesticides (Table 1). Because of lack of IPM training, and knowledge, and complexity of IPM practices, the FFS farmers became inclined more using pesticides because of their easy application method and availability. The other notable problems that occupied the next ranks from 6 to 10 were: (6) farmers' lack of awareness of environmental pollution; (7) farmers' inability to take risk without pesticides; (8) illiteracy of the farmers; (9) farmers' disinterest to use IPM; and (10) misinterpretation of IPM by the pesticides dealers. The other problems that followed in ranks were also important. Analysis of the problems as reported by the FFS farmers strongly indicated that the knowledge and perception about the benefits of using IPM practices were largely lacking among the farmers and adequate motivational programme were also lacking at the field level. As a result, the farmers could not acquire enough confidence on IPM technologies.

Table 1. Ranks of different problems in IPM practices as reported by the FFS farmers .

Sl. No.	Problems	Very Important (2)	Important (1)	Not Important (0)	IS	IPSI	Rank
1	Need for much more labour	88	62	8	238	75.31	1.0
2	Lack of proper training of the farmers about IPM	93	50	15	236	74.68	2.0
3	Lack of farmers' knowledge regarding IPM practices	88	57	13	233	73.73	3.0
4	Availability of insecticides	81	66	11	228	72.15	4.0
5	Complexity of IPM practices	83	60	15	226	71.51	5.0
6	Lack of awareness of environment pollution	81	60	17	222	70.25	6.0
7	In ability to take risk without using insecticides	74	72	12	220	69.62	7.0
8	Illiteracy of the farmers	79	60	19	218	68.98	8.5
9	Farmers' disinterest in adopting IPM practices	81	56	21	218	68.98	8.5
10	Misinterpretation of IPM practices by the insecticide dealer	75	63	20	213	67.40	10
11	Idleness of the farmers for practicing of IPM	76	60	22	212	67.08	11
12	Insufficient training/IPM knowledge of extension worker	72	67	19	211	66.77	12
13	More fund is needed	69	71	18	209	66.13	13
14	Lack of proper practices for the expansion and conservation of beneficial insects	72	64	22	208	65.82	14
15	Lack of proper supervision of extension worker	85	37	36	207	65.50	15
16	Lack of farmers active organization	78	48	32	204	64.55	16
17	Lack of co-ordination between the farmers and extension workers	70	60	28	200	63.29	17
18	Less importance given to determine of ETL	64	65	29	193	61.07	18
19	Outcome from IPM practices is time being	54	78	26	186	58.86	19
20	Lack of sufficient publicity through different media	57	74	27	188	59.49	20

Suggestions for overcoming the problems in practicing of IPM

The solutions/suggestions with rank order as reported by the farmers are presented with IS, ISSI and rank in Table 2. Important Solution Score Index (ISSI) as obtained from the farmers in IPM practices ranged from 53.16 to 78.48 percent. At present FFSs (Farmers Field Schools) are very popular approaches in the Government organizations and NGOs for controlling pests through IPM and responses of farmers are very high. Through FFS, the knowledge level of farmers for controlling rice pests by avoiding pesticides has increased to a great extent. The five top ranked suggestions reported by the FFS farmers for increasing adoption of IPM practices were (1) establishment of more IPM school; (2) arrangement of practical training for the farmers; (3) introduction of IPM practices into school/college academic course; (4) increasing the farmers' awareness on environmental pollution; and (5) ensuring proper supervision of extension worker. It is obvious that there is no substitute of offering practical training to the farmers in increasing their knowledge, awareness and skills in controlling the rice pests through IPM practices. In the training session of IPM school, the farmers get unique opportunity not only to increase their knowledge, awareness and skills but also to get enough opportunities to exchange their views, ideas and perceptions with other fellow farmers, which help them to adopt IPM practices. The other remarkable suggestions that filled the next ranks from 6 to 11 were: (6) cultivating resistant HYV rice; (7) formation of effective organization for the farmers; (8) increasing the touring facility of extension worker; (9) ensuring the use of balanced fertilizers; (10) ensuring much more publicity of IPM practices through national media; and (11) arrangement of award for the successful adopter of IPM practices. The other suggestions that followed in ranks were also significant. Analysis of the suggestions that reported by the FFS farmers strongly indicated that the Government organizations, NGOs and other relevant agencies may arrange nationwide programme for increasing adoption of IPM practices, giving their suggestions for raising problems and also aware the environmental pollution due to indiscriminate use of agro-chemicals in rice cultivation.

Table 2. Probable ways to overcome the problems.

Sl. No.	Suggestions	Very Important (2)	Important (1)	Not Important (0)	IS	ISSI	Rank
1	Establishment of more IPM field school	98	52	8	248	78.48	1
2	Arranging practical training for farmers	91	55	12	237	75	2
3	Introduction of IPM practices into the schools/colleges academic course	88	54	16	230	72.78	3

Table 2. Cont'd.

Sl. No.	Suggestions	Very Important (2)	Important (1)	Not Important (0)	IS	ISSI	Rank
4	Increasing the farmers' awareness on environment pollution	82	65	11	229	72.46	4
5	Ensuring proper supervision of extension worker	76	72	10	224	70.88	5
6	Cultivating of resistant HYV rice	76	70	12	222	70.25	6
7	Formation of effective organization for the farmers	82	55	21	219	69.30	7.5
8	Increasing the touring facility of extension worker	80	59	19	219	69.30	7.5
9	Ensuring the use of balanced fertilizers	75	61	22	211	66.77	9
10	Ensuring much more publicity of IPM practices through national media	74	61	23	209	66.13	10.5
11	Arrangement of award for the successful adopter of IPM practices	68	73	17	209	66.13	10.5
12	Prohibiting insecticide selling without prescription	62	79	17	203	64.24	12
13	Establishment of adult education	63	76	19	202	63.92	13
14	Arranging appropriate training programme for the insecticide dealer	71	57	30	199	62.97	14
15	Making social movement to adopt IPM practices farmer	65	68	25	198	62.65	15
16	Increasing the sense of responsibility and duty of the extension worker	59	78	21	196	62.02	16.5
17	Increasing of co-ordination between the farmers and extension workers	71	54	33	196	62.02	16.5
18	Giving more price to the crops produced through IPM practices	55	80	23	190	60.12	18
19	Developing local leadership among the farmers	57	71	30	185	58.54	19
20	Implementing synchronized crop cultivation	52	64	42	168	53.16	20

Conclusion

IPM is a holistic approach of pest control, based on sound ecological factors. It was obvious from the results that the farmers faced various problems that

discouraged them to adopt IPM practices for rice cultivation. It may be concluded that the barriers for adopting IPM practices were mostly related to the educational aspects and perception. As a result, they were not confident enough of the effectiveness of IPM practices. Hence, there is need to put more importance and emphasis on increasing motivational and instructional programmes for the farmers by the implementing agencies.

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