

Short Communication

ADOPTION OF INTEGRATED PEST MANAGEMENT (IPM) PRACTICES BY FARMERS IN MATARA DISTRICT

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INTRODUCTION

Integrated Pest Management (IPM) is an ecosystem-based strategy that focuses on long-term prevention of pests or their damage through a combination of techniques such as biological control, habitat manipulation, modification of cultural practices, and use of resistant varieties. Pesticides are used only after monitoring indicates they are needed according to established guidelines, and treatments are made with the goal of removing only the target organism. Similar to the other commercial vegetable growing areas, the use of high-yielding varieties, pesticides and synthetic fertilizers are also common in this area. The climatic conditions of the Matara district combined with high yielding varieties of crops provide a favorable environment for the development and multiplication of pests and diseases. Therefore, most farmers in the Matara district tend to use high quantities of pesticides. Integrated Pest Management (IPM) is one such approach recommended to reduce pesticide usage. However, farmers still have not showed much interest to follow IPM or other eco-friendly pest control methods in vegetable and paddy farming in this area. While studies of IPM practices are relatively common, only few studies have assessed the farmers' knowledge, attitude and adoption behavior. In fact there have been no recent studies on the knowledge and adoption of IPM by vegetable and paddy growers in Matara district. Therefore the objectives of this study was to assess the knowledge and attitude on IPM, level of usage of IPM and the factors influencing adoption of IPM practices in vegetable and paddy cultivation in Matara district.

METHODOLOGY

Considering the available resources and the limited time, a sample of 170 farmers were randomly selected for the survey. Primary data from farmers were collected using structured questionnaire survey. Key informant interviews with Agricultural Instructors, Assistant Directors, Leaders of farmer organizations and pesticide dealers etc. and direct field observations were used to collect primary data. The information pertaining to socioeconomic aspects of farmers was collected from the questionnaire survey. In addition, data on handling of pesticides, awareness of farmers on the toxicity level of pesticides, safety measures followed during applications of agro chemicals were also collected in relation to the last season in 2015. Additionally, farmers' knowledge about pest reviewing under six criteria and knowledge on pest control methods under fifteen criteria were collected. Ten practices underlining IPM approach namely, use of hand nets, light traps, removal of pest manually, bagging, disposal of crop residues, mulching, weed control, crop rotation, planting space changing and trap cropping were considered. Tabular and descriptive analysis was used to examine different socio-economic factors of the vegetable farmers and the use of pesticides.

RESULTS AND DISCUSSION

Demographic characters of farmers of this study

The involvement of male farmers for paddy cultivation was comparatively greater than vegetable cultivation, i.e. 80 and 100%, respectively. Age of the respondent farmers varied between 30 to 76 years and most of the farmers were in the age group between 51-70 years followed by 30-50 year age group. The age category indicates a considerable proportion of elder farmer involvement in vegetable and paddy cultivation in Matara district. One of the main characteristics of vegetable farming is farmers' possession of small land holdings. A majority (64%) of the vegetable lands of the farmers were equal or less than 0.125 ac. Another majority (95%) of the paddy farmers had more than 0.50 ac.

Farmers' knowledge on IPM

Results showed that, term IPM was familiar to 44% of the respondent farmers. But only 20% had a good level of understanding about the IPM techniques. It was found that 66% of farmers could identify major pests and 58% of farmers could identify symptoms. Only 36% of farmers have knowledge about interaction of pest and natural enemies such as parasitism, predation, and predators and pray interaction (table 4.1).

Table 4.1 Distribution of respondents according to Farmers knowledge on IPM

Criteria	Good	No idea	Low
Characteristics about healthy crops	65%	28%	8%
Can identify major pest	66%	21%	13%
Can identify infestation symptoms	58%	25%	17%
Can identify natural enemies	51%	35%	14%
Interaction of pest and natural enemies	36%	36%	27%
Knowledge about the life cycle of the pest	31%	48%	21%

Chi square tests were performed to find out relationship of farmer age, crop type, area and pest control method with the knowledge on pest identification. According to chi square test, age of farmers, pest control method and crop type have significant relationship with knowledge on identification of pest. It may be due to experience they obtained with the time. But level of education of farmers did not have any significant relationship with knowledge on identification of pest ($P > 0.05$). Only 22 % of farmers had knowledge on biological pest control methods. For example lady bird beetles are potential natural enemies of aphids (Table 4.2).

Table 4.2 Distribution of respondents according to knowledge about the pest control methods

	Good	No idea	Low
Physical method - Use of hand nets	65	28	8
Use of sticky boards	37	35	27
Light traps	66	21	13
Removal of pest manually	58	25	17
Bagging	45	35	20
Cultural method - Disposal of crop residues	48	28	24
Mulching	59	21	20
Weed control	68	22	10
Crop rotation	31	47	22
Planting space changing	62	28	10
Trap cropping	65	27	8
Biological method - Use microorganisms	22	46	32
Use sex attraction	23	42	35
Use predators	23	43	34

Attitude towards IPM

Integrated pest management (IPM) technique is not popular among the majority of paddy and vegetable farmers and only 45 percent of the farmers are aware of IPM. Only 15% of farmers practice IPM. There were relationships between awareness of IPM and knowledge on pest identification, use of hand net, light trap, removal crop residues, mulching, remove pest manually, trap cropping, plant spacing and crop rotation ($P=0.000$).

The results also indicate that 20 percent of farmers in the Matara district had no trust on IPM technique; therefore, they were reluctant to rely on IPM for pest control. Another 35 percent of farmers believed that, IPM takes relatively longer time to control pests and diseases unlike the chemical method of control. Another 30 percent believed IPM cannot control all pest and disease incidence. As the IPM has several components, 15 % of farmers considered IPM is a complicated method to control pest and diseases

Adoption of IPM

Adoption of IPM technique among farmers is not at a satisfactory level. As indicated in Figure 4.1, weed controlling, disposal of crop residues and removal of pest manually were adopted by 84%, 49% and 45% farmers, respectively. Trap cropping, mulching, planting space management, crop rotation and bagging were next in common for adoption.

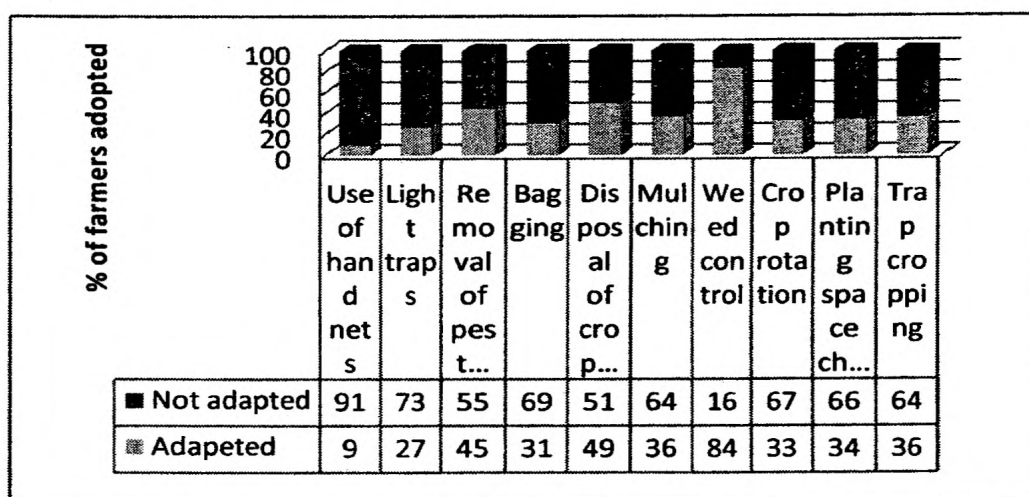


Figure 4.1 Level of adoption of IPM practices by farmers

According to the chi square test education level of farmers and adoption on IPM practices have a significant relationship ($r=0.339$, $P=0.000$). It means that educated farmers followed the IPM practices than low educated farmers and they think about the health benefit of it than others. Gender and age of farmers' have no significant difference in adoption of IPM practices. Despite the adoption level, the farmers regarding level of pest identification, crop type and education level of farmers had significant relationship ($P<0.05$).

CONCLUSSION

Results reveal that, IPM is familiar to 44% of the respondent farmers in the area. But only a 20% had a good understanding about the IPM techniques. Farmers had only a relatively low knowledge on biological pest control method such as use of microorganisms, use of sex attraction methods

and use of predators. Medium knowledge on cultural pest control method and good knowledge on physical pest control methods such as use of hand nets, use of light traps and removal of pest manually. Also farmers had a fairly good knowledge on weed controlling, trap cropping and use plant spacing. Farmers had average knowledge on physical methods such as use of sticky boards, bagging, disposal of crop residue and crop rotation.

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