
INSECT PEST MANAGEMENT PRACTICES OF RICE FARMERS IN NORTHERN SAMAR, PHILIPPINES

Leah C. Tuan

Associate Professor, College of Agriculture, Fisheries, and Natural Resources, University of Eastern Philippines,
University Town, Catarman, Northern Samar, Philippines

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ABSTRACT

This study tried to determine the insect management practices of rice farmers in Northern Samar, Philippines. A survey method through a face-to-face interview from a complete enumeration and proportionally allocated sample of 213 households using an interview used to collect data from rice farmer irrigators in Northern Samar, Philippines. The findings showed that Chemical Control (75.18%), Cultural Control (34.74%), and Integrated Pest Management (29.11%) were the top three insect pest management practices employed by the rice farmers. Other insect control measures practiced were Traditional Control (15.49%), Biological Control (1.88%), and Use of Resistant Varieties (1.41%). Surprisingly, there were rice farmers (7.98%) who did not bother to control insect pests at all. Factors which were directly and significantly related to the choice of insect pest control practices of rice farmers were financial and material resources, tenure status, frequency of listening to radio, cropping intensity and knowledge on identity of insect pests.

Keywords: Insect pest management practices, rice farmers.

1. INTRODUCTION

Over the years, various pest control practices for rice insect pests have been introduced to farmers. Although they were taught by extension workers or informed through news and print media of recent trends in managing pests (Pathak, 1970; Aguda, et. al., 1994; Pathak and Khan, 1994; Reissig, et.al, 1986; Khan, 2013). Others still opt to adopt those which are indigenous (Asghar, et al., 2013; Ooi, 2005). They believe that these practices are effective, time-tested to be economically sound and environment friendly.

This paper is a documentation of the insect pest control practices of irrigated lowland rice farmers in Northern Samar. It is believed that this information is indispensable in the program planning of various government and private institutions, and will specifically cater to the needs of Philippine Rice Research Institute (PhilRice) whose goal is geared towards promoting a productive, profitable and sustainable rice farming industry in the locality.

2. OBJECTIVES OF THE STUDY:

1.To provide benchmark information on insect pest control practices on rice by the farmers in Northern Samar.

2.To identify contributory factors towards adoption of the identified IPC practices.

3. METHODOLOGY

The survey was conducted in the major rice producing municipalities throughout the province. Since there were only few municipalities with functional irrigation systems in the province, complete enumeration by proportional allocation was used in this study. From the list of farmer irrigators taken from National Irrigation Administration (NIA) Provincial Office, 217 respondents were drawn by means of random sampling; however some were not available during the actual survey thus only 213 were interviewed. An interview schedule was used to gather data on insect pest control practices, the level of adoption and factors associated with adoption of these practices from rice farmer respondents.

4. RESULTS AND DISCUSSION

Farmers in Northern Samar adopt various practices in controlling insect pests. These are categorized by the manner which they are implemented.

Biological control includes ways by which natural enemies like predators, parasites and pathogens limit reproduction and population build-up of rice insect pests.

Chemical control makes use of chemicals as insecticide to control insects.

Cultural control refers to farmer-based technology with little dependence on outside resources and reapplication of resources not originally intended for pest control. This is done by manipulating crop environment in order to make it less favorable to pests thereby slowing their rate of increase or suppressing their effect.

Mechanical Control covers practices employed by farmers which make use of materials (bamboo twigs, branches, sticks) or by handpicking to protect plants from insect damage.

Traditional control is where farmers believe they combat rice pests by talking to spirits, placing food in the field, reciting prayers and using homemade mixtures which have gained acceptance for over a period of time and were passed from father to son generations.

Biological Control

Use of predators. Farmers allow ducks to roam around the field to feed on insects such as mature stages of grasshoppers, rice bugs, leafrollers and others. Likewise, they conserve beneficial insects and other arthropods like dragonflies, damselflies and spiders. This is done by using insecticides from plant extracts which are less toxic to the natural enemies than the synthetic chemical insecticides.

Use of botanical insecticides. Farmers make use of sap from korot (*Dioscorea hispida*) by grating its tubers, tubli (*Derris derres trifoliata*), and neem (*Azardirachta indica*) by pounding

their leaves, barks and stems to facilitate extraction of plant juice. Pulp of hot pepper (*Capsicum frutescens*) are finely chopped and added to the mixture. The concoction, believed to have insecticidal property is sprayed on the rice plants.

Cultural Control

Flooding. In it, farmers maintain standing water of 3-5 cm deep in the field to prevent soil insects especially mole crickets from tunneling in the soil and damaging the crop. Flooding rice fields also kills the larvae of rice root weevils in their pupal cells.

Draining. Insects like caseworms and maggots when dislodged from rice plants use the field water as a medium to really get back to other plants. To eliminate, if not minimize damage done by these insects, farmers drain the paddies for 1-3 days to make sure that they are killed.

Smoking. This is the practice of burning tires and coconut husks by the sides of the field to drive away insects or prevent them from getting into the field. Smoke serves as a repellent to flying insects especially rice bugs.

Removing infested plants. Farmers detach affected plant parts or remove infested plants to prevent contamination of or spread of damage to other plants.

Use of seedlings. Farmers transplant older seedlings (25 to 30 days old) to shorten field time and therefore lessen population build-up of insects and other pests. Older seedlings are also more competitive with weeds.

Adjusting time of planting/synchronized planting. Rice plants are planted at a time when pest population is still low. Or else farmers make it a point to plant them on the same date as their neighbors, inasmuch as plants are of the same age all over the area, every farm has an equal chance to be infested by insects, thus losses due to pest are not concentrated on any one field.

Mechanical Control.

Use of plant parts. Some farmers utilize plant parts such as bamboo twigs or branches drawn mechanically over the water in the field to drive away insects like caseworms and plant hoppers. Others place branches and twigs alongside paddies to ward off insects. Others hang brown algae (*Sargassumcrispitolium*) locally known as “kolapo” to replace insects.

Handpicking. Farmers, with their hands, pick and kill young and adult insects which they find in the field to minimize or control their population and minimize infestation.

Traditional Control

Talking to spirits. Farmers, friends and their immediate family members gather in one corner of the field. A leader, usually the elderly person communicates with the spirits through chants and prayers. In this séance, spirits are requested to drive away destructive forces such as insect pests, diseases, birds, rodents and even calamities.

Placing food in field. A farmer sets a table along side of the field with special food items which may vary from native delicacies, fish, meat, and tuba, and cigarette sticks, etc. at times a live animal like a white or black hen or pullet or even a piglet is brought to the site as sacrificial offering to the spirits of their loved ones. It is their belief that these spirits will help them watch over the field to free it from any form of destruction caused by insects, diseases and others.

Reciting prayers. During the booting stage of the rice plants an old man or woman is usually hired to recite prayers over and around the field to drive away bad spirits. Farmers claim that this arrests events which have negative effect on rice production like insect outbreak and the like. Good spirits, on the other hand, are invited as guardians of the field. A thanksgiving prayer is also done when the crop is ready for harvest to acknowledge the favors they had given.

Using homemade mixtures. Farmers mix extracts from plants like kiro (*Dioscoreahispida*), tubli (*Derrisderrestrifoliata*), tuba (*Crotontiglium*) igasud (*Strychosignatii*), tobacco(*Nicotianatabacum*), neem (*Azadirachtaindica*), and hot pepper (*Capsicumfructescens*), with water, soap and kerosene according to their preferred proportions. The mixture is sprayed on rice plants to control insect pests.

Table 1 presents the rice insect pest control practices adopted by farmers in the irrigated areas in Northern Samar categorized under different insect pest control methods

Table 1. Rice insect pest control practices by rice farmers in Northern Samar, Philippines.

Insect Pest Control Method	Indigenous Insect Pest Control Practices
Biological Control	use of predators (ducks, spiders and dragonflies) use of botanical insecticides
Chemical Control	makes use of chemical insecticides
Cultural Control	flooding draining smoking removing infested plant use of old seedlings adjusting time of planting/synchronized planting
Mechanical Control	use of plant parts handpicking
Traditional Control	talking to spirits placing food in field reciting prayers using homemade mixtures

Among the 7 major insect pest control practices, 3 were mostly used by the rice farmers, namely: chemical control, cultural control and integrated pest management (Table1.). Other control methods employed were traditional control, biological control and use of resistant varieties

(Khan, 2013; Ooi, 2005; Gangurde, 2007). Surprisingly, some of the farmers have not adopted a single practice (Table 2).

Although most of the farmers use chemicals to control insect pests, they complained about its high cost. Notably, they are aware of the ill effects that these chemicals bring yet they still succumb to this method because it is the most common practice that they know.

The cultural control measures known and adopted by the farmers include using plant parts, flooding, draining, smoking, removing infested plant parts, using old seedlings and adjusting time of planting. Synchronizing planting with neighbors, plant spacing, crop rotation and use of fertilizer are cultural control practices which they are not aware of. The adoption of cultural management practices by rice farmers was earlier reported by Khoo, et al., (1991); Litsinger, (1994), Litsinger, (2008).

Combining two or more control practices is tagged as integrated pest management. Few of the rice farmers unknowingly, ventured on this method because according to them it had good results. Employing ducks as predator is the only biological control that they know. Use of resistant varieties, the most economical and safest means of controlling insect pests was the least adopted method. The use of various approaches to insect control among major rice growing areas in the Philippines and throughout Southeast Asia was also reported by (Gangwar, et al. 2015; Simon, et al., 2016; Thongphak, 2012; Gangurde, 2007; Ooi, 2005; Poolprasert, 2014; Khan, 2013; Asghar et al, 2013).

On the other hand, rice farmers who did not care about insects attacking the rice stressed the following reasons: “insects should not be destroyed, they are God’s little creatures”; “insect damage will not affect production anyway”; and “landlords do not provide the needed inputs”. It was noted that these farmers were already old and had low education level.

Table 2. Distribution of rice farmers by methods of insect pest control practices used.

INSECT PEST CONTROL METHOD	FREQUENCY	PERCENT
Chemical Control	160	75.18
Cultural Control	74	34.74
Integrated Pest Management	62	29.11
Traditional Control	33	15.49
Biological Control	4	1.88
Use of Resistant Varieties	3	1.41
Zero Control	17	7.98

Based on the findings of the study, the factors which were directly and significantly related to the choice of insect pest control practices of rice farmers were financial and material resources, tenure status, frequency of listening to radio, cropping intensity and knowledge on identity of insect pests.

5. CONCLUSION

Most of the farmers prefer to employ insect pest control practices that are efficient in controlling insect pests unmindful of their ill effects in the environment. Often times listening to radio is where they get information related to pest control.

In general, the result of the study implies that insect pest control in the province urgently needs strengthening to address the low rice productivity in the locality.

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