

EXTENT OF PESTICIDE USES FOR SUSTAINABLE LADIES FINGER PRODUCTION AT CLIMATIC HAZARDS PRONE COASTAL RAMPAL UPAZILA BANGLADESH

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ABSTRACT

The study was conducted from November 2018 to May 2019 to investigate various aspects of pesticides use in ladies finger cultivation at coastal Rampal Upazila Bagerhat district. In the research, data were collected through preparatory and pre-tested questionnaires related to the characteristics of ladies finger growers, frequency of pesticide use and its environmental aspects. A total of 150 farmers were randomly selected for the critical analysis of pesticides used in ladies finger cultivation. Ten FGDs were conducted on the survey site. During the interview, it was discovered that participants had been cultivating ladies finger since 19.8 years and had almost 30 decimals land. The survey also showed that farmers' monthly incomes were almost 30,000 Tk. The study comprehensively stated that the growers used five different types of pesticides, where more frequently used Cypermethrin (79%) over a period of 7 to 10 days interval. They maintained a mid-term safe period (9-12 days) prior to the ladies finger harvest after application of insecticides. The bad sign is the use of higher doses, which must be minimized immediately, and consultation with the Agricultural Extension Department (DAE) is most welcome. After using insecticides, they safely discarded empty packages and bottles, which were usually buried underground. While spraying, they followed different types of health/safety principles/regulations, of these the most commonly followed were spraying accordingly wind direction and paid little attention to eating. Although pesticides increased the ladies finger yield, farmers showed their dissatisfaction with expensive and ineffective action. So they often demand cheap prices and effective pesticides for vegetables.

Key words: pesticides, sustainable environment, ladies finger, Rampala upazila.

Introduction

Pesticides are used to better protect the field crops from estimated damage caused by insects and pests. Despite all the advanced techniques used to grow crops, pest control cannot be ignored. Oerke *et al.* (1995) reported several hundred success stories in which chemical pesticides provided complete plant protection and increased yield drastically. Pesticides and related agricultural chemicals have thus become an integral part of sustainable agriculture mostly in developing countries. Occasionally, several pests attack completely and damage standing crops. This enormous loss can be overcome by adopting appropriate practices for quality pesticides and pest control on the farmer's field. Commercial farmers are currently completely dependent on the use of pesticides for insect control. Now days it is assumed that the irrational use of pesticides and harvesting vegetables after 1-2 days of pesticides used, is the normal practice (Kabir *et al.*, 1996). On the other hand, the widespread use of pesticides has caused the environmental contamination, namely soil, air, water and food; even under well-managed conditions, application of spray materials remain into soil, water, and other biotic materials is likely to cause residue deposition. Over the past three decades, the selective use of chemical pesticides in agriculture has caused serious health and environmental problems in developing countries like Bangladesh (World Resources, 1999). Gani (1997) reported that the use of pesticides also kills beneficial creatures and insects and renders the soil infertile. In addition, the indiscriminate use of pesticides creates insect resistance, which in turn poses an increased threat to the crop. Sattar (1983) reported that pesticides after application directly or indirectly come into contact with plants, livestock, wildlife, aquatic and terrestrial life, the terrestrial environment and pose minor or serious risks to biodiversity. Increased use of pesticides in agriculture has thus led to the presence of residues in

food, which has always been a major concern, especially when these commodities are consumed fresh (Solechi *et al.*, 2005). However, the safe application of pesticides to agricultural crops is essential to ensure healthy human health and a safe ecological balance, where field-specific pesticide studies and crop-specific studies in the Bangladeshi environment are essential. In addition to the systematic study, there is no specific guidance on the use of pesticides at the farm level. It is so important for exploring the different dimensions of pesticides used for specific vegetable in different areas of Bangladesh. The present study, therefore, conducted regarding investigation the farmers' perception of pesticide use in the production of ladies finger (a nutritious vegetable that has an important role to play in meeting the country's demand for vegetables when there is a shortage of vegetables on the market) at coastal Rampal Upazila, Bangladesh.

Materials and Methods

The current study examines the exclusive characteristics of ladies finger producers along with the analysis of various aspects of pesticide use including its obstacle and great advices regarding safe and secured environment in coastal Rampal Upazila Bangladesh. The survey period was from November 2018 to May 2019. A total of 150 farmers were randomly selected for the study. Face-to-face interviews with farmers were conducted with the help of structured and pre-tested questionnaires on i) age, ii) education level, iii) farm size, iv) agricultural experience, v) monthly income, vi) pesticides use for ladies finger production, vii) intervals for pesticides applying, viii) amount of ingredients, ix) harvest (days) after pesticide application, x) use of personal protective equipment (PPE) Xi) insecticide efficacy, xii) obstacles and xiii) correct instructions to ensure a safe and secure environment. In addition, books, magazines, online documents, research reports, articles and newspaper articles on pesticide use in ladies finger are being focused for better understand and manage the environmental degradation caused by pesticide use in Bangladesh. Ten FGDs were conducted at the study site. Finally, the analyzed data was combined, presented as a table and included in the manuscript.

Results and Discussion

Farmers' exclusive characteristics of ladies finger growers: This study investigated the farming age, educational background, farm size, agricultural experience and monthly income of the ladies finger growers (Table 1). The majorities of farmers (84% and 60% respectively) were adults and mid level (secondary level) educated, while around 19% and 21% were in primary and upper secondary level. The study found that the interviewed farmers cultivated ladies finger since 19.8 years ago and had almost 30 decimals land. The survey also showed that farmers' monthly incomes were almost 30,000 Tk (Table 1).

Extent of pesticides application in ladies finger: The study comprehensively describes the different dimension of pesticides use in ladies finger and found that they used five different types of pesticides, where more frequently used Cypermethrin (79%) over a period of 7 to 10 days interval. They maintained a mid-term safe period (9-12 days) prior to the ladies finger harvest after application of insecticides. It is quite safe for human consumption. But before any concrete conclusions, residue analysis is perquisite. The bad sign is the use of higher doses, which must be minimized immediately, and consultation with the Agricultural Extension Department (DAE) is most welcome. After using insecticides, they safely managed empty packages and bottles, which were usually buried underground. While spraying, they followed different types of health / safety principles / regulations as shown in Table 2. Of these four measures, the mostly practiced: spraying accordingly wind direction and paid little attention to eating. Although pesticides increased the ladies finger yield, farmers showed their dissatisfaction with expensive and ineffective action. So they often demand cheap prices and effective pesticides for vegetables.

In survey study, the growers did not responded regarding IMP techniques, though it is an effective and environmentally friendly approach to pest management (Kabir and Rainis, 2015), and Perching is being practiced vastly for rice cultivation. Again, IPM techniques protect the natural enemies of pest insects and aid in the restoration of ecosystem activities (Naranjo *et al.*, 2015). So vast consulting from DAE regarding IPM is highly appreciated for assuring the secured environment in Bangladesh.

Table 1. Exclusive characteristics of the growers engaged in ladies finger cultivation

Indicator	% of respondent farmers	Range	Mean	SD
Age				
Teens (12-18 yrs)	0			
Adults (18+ yrs)	84	40-66	52.17	3.68
Elderly (65+ yrs)	16			
Level of education				
Illiterate (no education)	0			
Primary (class I-V)	19	5-12	8.67	4.61
Secondary (class VI-X)	60			
Above secondary (>class X)	21			
Farm area for ladies finger (decimal)				
Small (0.00-15.00 decimal)	9			
Medium (16.00-30.00 decimal)	68	11-52	29.82	7.31
Large (above 30.00 decimal)	23			
Farming experiences (yrs)				
Short (0.00-10.00 yrs)	47			
Moderate (11.00-20 yrs)	32	7-21	19.8	6.01
Long (above 20.00 yrs)	21			
Monthly income ('000' Tk.)				
Bottom (up to 25)	59			
Middle (26-50)	20	16-53	28.67	4.71
Top (> 50)	21			

Table 2. Dimension of pesticides application in ladies finger

Sl no.	Line items of pesticide application	Expression
1	Insecticides use in karala	Cypermethrin (79%), Sumithion 50 EC (29%), Malathion (23%), Ripcord 10 EC (17%) and Nimbicide (9%)
2	Interval of application	7-10 days
3	Harvesting after applying of insecticides	9-12 days
4	Rate/acre	450-550 ml
5	PPE use/precautions followed while applying of insecticides	Spray to wind direction (93%), Use of mask (92%), Wearing of full shirt (39%) and No eating (37%)
6	Disposal system of empty packet/bottle	Buried in soil (100%)
7	Effect of insecticides on karala yield	Increased
8	Satisfaction on insecticides use	No (100%)
9	Obstacle in insecticides use	Costly (93%), ineffective (91%)
10	Recommendations	Cheap rate (93%), banned the ineffective pesticides (91%)

Conclusion

This study was conducted to understand the nature of pesticide use and various (environmental and economic) aspects of ladies finger cultivation. Although it is one of the model and pilot study of the study site, it does not include any pesticide residue study. Thus, the next continued study of the dose and subsequent application of the pesticide is recommended.

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