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Short Communication

ASSESSMENT OF PESTICIDE USAGE IN LEAFY VEGETABLE FARMING IN MATARA DISTRCT

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INTRODUCTION

Low country vegetable cultivation is most popular among the farmers of Southern Province in Sri Lanka. Brinjal, luffa, snake gourd, bitter gourd, and leafy vegetables are the major vegetable crops cultivated in the area. The use of high-yielding varieties, inorganic pesticides and fertilizers has led to a significant increase in agricultural production. The climatic conditions of the Matara district combined with high yielding varieties of crops and the increase use of chemical pesticides have resulted in a conducive environment for development and multiplication of pests and diseases (Aheeyar *et al.*, 2014). However, indiscriminate use of agro chemicals, especially chemical pesticides has caused negative externalities such as health hazards to human and other beneficial organisms, pollution of the environment and water, build up of insect resistance to pesticides, and outbreak of secondary pests (Dutcher, 2007). Although, most of the consumers know health hazards of consuming vegetables grown by applying chemicals, they prefer healthy, succulent and fresh looking vegetables with no visible lesions or damages caused by pests or diseases. Therefore, heavy use of chemicals in vegetable cultivation is still a common problem. Meanwhile, the use of agrochemicals including pesticides has been recognized as an easy and cheap way to produce unblemished vegetables and attain increased farm productivity. There is a disagreement among scientists about the contribution of pesticides to crop production (e.g., reducing losses) and the negative impacts of their use on the environment and human health (Aheeyar *et al.*, 2014).

Generally, farmers are lack of knowledge about proper pesticide management, including safe handling and storage of pesticides. While studies on productivity of pesticides are relatively common only a few studies has assessed pesticide use pattern of the farmers. However, there are no recent comprehensive studies on the socio-economic impacts of the use of chemical pesticides on leafy vegetables in Matara district.

Therefore, the objective of this study was to estimate the level of pesticide usage in leafy vegetable cultivation in Matara district.

MATERIALS AND METHODS

The survey was conducted in the year 2015. Considering the resources available, a sample of 45 farmers was selected for the survey using the random sampling technique. A pre-tested, structured questionnaire was used to interview the randomly selected farmers from selected localities. Information pertaining to certain socio-economic aspects of farmers and consumers, such as family size, education level, size of land holdings, cropping pattern; details on vegetable cultivation; namely, the area under cultivation, land preparation, inputs used and the outputs obtained were collected through the questionnaire. In addition, data on prices of inputs and outputs, method of sale, handling of pesticides, awareness of farmers on the toxicity level of pesticides, safety measures adopted during applications of chemicals also collected in during harvesting period in 2014. Primary data were collected using different tools such as structured questionnaire, key informant interviews, focus group discussions, and direct field observations while published and unpublished reports were the sources of secondary data. Tabular and descriptive analysis was used to examine different socio-economic factors of the leafy vegetable farmers' and the use of pesticides.

RESULTS AND DISCUSSION

Most of the leafy vegetable growers cannot identify harmful insects, diseases and weeds. Leafy vegetable farmers in the study area use a total of 15 commercially branded pesticides comprising 12 insecticides and three fungicides (Table 1). Almost all farmers used insecticides to control insect pests and the same is true for use of fungicides to control fungal infestation and none used herbicides to control weeds. Reason for no use of herbicides in the cultivation of leafy vegetable crops is that usually manual weeding is practiced after crop establishment in the field. Only 25 % of the farmers used biological pesticide (Neem extract) to control pests and diseases. A majority of farmers (76%) use a measuring device which accompanies the bottle of pesticides to measure the volume, but some farmers use the cap of the bottle to measure the chemical volume. About 60% of the farmers always apply pesticides as a precautionary measure prior to the appearance of any symptoms of pests or diseases, though it is needed for only selected pests and diseases. They frequently apply pesticides without considering the visual symptoms of pests and disease problems. However, 20 % of farmers apply pesticides only after appearance of the symptoms of pests or diseases.

Table 1. Usage of branded pesticides in Matara district.

Type of pesticide	Chemical name	Farmers reporting use (%)
	Insecticide	
1.	Abamectin18g/l EC	50
2.	Cardosulfan 200g/l SC	34
3.	Fipronil 50g/l SC	20
4.	Imidacloprid 70% WG	60
5.	Imidacloprid 200g/l SL	78
6.	Sulphur 80%WG	30
7.	Tebufenozide 200 g/l SC	20
8.	Thiamethoxam 70% WS	20
9.	Thiamethoxam 25% WG	80
10.	Dimethoate 400g/l EC	72
11.	Acetamiprid 20% SP	45
12.	Chlorfluazuron 50g/l EC	65
	Fungicide	
1.	Tebuconazole 250g/l EW	34
2.	Propineb 70% WP	80
3.	Mancozeb 80% WP	65

Results revealed that 15% of the farmers rely on extension officers as the first source of information to choose a pesticide for a given pest or disease. Nearly 45% of the farmers depend on their own experience as the first priority to select a suitable pesticide and another 35% of the vegetable farmers depend on pesticide dealers to select pesticides. A very few (5%) select pesticides from the information distributed through print media such as leaflets, as the first source of information. Pesticide label contains information such as recommended dosage, type of suitable crops, toxicity level, symptoms of pesticide poisoning and first aid measures to guide the user on correct and safe use of it. According to the survey results, 90 % of farmers in the sample read the instructions given in the label before use. More than 67% of the farmers did not pay attention to the expiry date of the product (shelf life).

Around 75% of the farmers are not concerned about the colour band of the pesticide they purchase. Only 27 % of the sample farmers were aware of the colour band denoted in the pesticide packs. The survey findings indicated that most of the farmers (71%) do not follow instructions on the recommended dosage of the pesticide given on the label and tend to use overdose. About 37 % of overdosing farmers believe that it is essential to overdose chemicals as pesticides available in the market do not have strength as per the specifications given in the label and also farmers apply higher dosages based on their past experience of non-effectiveness of applying the recommended dosage in controlling pests and diseases..

The survey has found that 77% of farmers store pesticide bottles in a safe location within or outside the house to make them inaccessible to children. The rest of the farmers mostly place the bottles in unsafe locations in the house without considering safety precautions. Most farmers (70%) dispose empty glass bottles with the garbage and another 15% of the farmers have sold empty glass bottles to collectors. Another 9% of the farmers have thrown their empty glass bottles in irrigation channels and outside the house. In case of plastic bottles and polyethylene packing materials, 46% of the farmers have burned them while 37% have placed them in the garbage. Another 7% of the farmers reuse the empty plastic bottles for feeding bathing etc. of pets. However, 10 % of the farmers have thrown their empty plastic/polythene containers in the irrigation channels and outside the house without any concerns on the consequences of their actions. The majority of them wash the sprayers in the irrigation channels and reservoirs (53%) and another 47% of farmers use domestic water sources such as domestic dug-well and tap to wash sprayers.

CONCLUSION

Majority of leafy vegetable growers in Matara district are small holders and use of pesticide is the main method adopted to control pest attacks. Seventy per cent of farmers use various commercially branded pesticides but do not use herbicides for weed control. To satisfy higher demand and consumer preferences, pesticides are used prior to the economic threshold level or with the absence of attack. Most of the farmers select pesticides by their own experiences and use higher doses than recommended rates. Further, most of them follow good habits in pesticide storage, preparation, application etc. However, they do not have much concern on health and environmental issues of pesticide usage as first priority but, to maximize the profit at any environmental or health cost. Therefore, Department of Agriculture, Southern Province should initiate a comprehensive popularization programme on eco-friendly, healthy, effective and convenient methods for pest and disease control of leafy vegetable grown in Matara district.

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