# PESTICIDE USAGE PATTERN AND ASSOCIATED HEALTH IMPACTS AMONG VEGETABLE FARMERS IN BADULLA DISTRICT



## M. A. SACHINTHA PRASAD JAYASINGHE



# FACULTY OF AGRICULTURE EASTERN UNIVERSITY SRI LANKA

2017



1

### ABSTRACT

Pesticides have become inevitable ingredients in vegetable cultivation with green revolution technologies. There is a higher risk in pesticide usage due to hazardous nature of them and indiscriminate use of pesticides causes health hazards to humans and long lasting bad effects to the environment. But nowadays only very less consideration was given to the health impact of farmers in pesticides handling. Present study was conducted to assess the pesticides usage pattern and associated health impacts among vegetable farmers in Badulla district. 100 vegetable farmers were selected by using proportionate sampling method.

Descriptive statistics provide frequency distribution and percentage of the response in each variable and standard deviation were analyzed. Result revealed that mean family size of farmers was 4.21 per family and the average annual income from vegetable cultivation was Rs.182700. Almost all the farmers depended on the chemical pesticide for the management of weeds, pest and diseases. Cabriotop (Pyraclostrobin 5%+ Metiram 55% WG) was considered as one of the extremely hazardous fungicide used by 68.18% of farmers and among them 67.06% used this fungicide above the recommended dosage. 43% of farmers used a moderately hazardous weedicide namely Sencor (Metribuzin 70% w/w) above the recommended dosage.

About 75% of respondents were affected by any type of acute disease due to pesticide application. Only 16% of farmers got treatment from hospital. Average health cost for treatment was Rs.542.13 per treatment among the farmers in Badulla district.

An independent-samples t-test was done to compare occurrence of acute diseases among the respondents with selected independent variables. The result showed that usage of mask (P<0.05) was significantly affect on occurrence of Acute disease. But, usage of gloves was not significantly effect on the occurrence of acute disease.

Most of the negative issues at the user's level were related to lack of awareness, negative attitudes and behaviors of farmers and weaknesses in the extension system. Thus, there is a need for strong awareness campaign through all possible means including print and electronic media to educate farmers and change their attitudes and to empower the farmer organizations on pesticide related issues at the farmers' level.

Keywords: Acute disease, Health cost, .Health impacts, Pesticides.

# TABLE OF CONTENTS

	Page No
ABSTRACT	i
ACKNOWLEDGEMENT	iii
TABLE OF CONTENTS	iv
LIST OF TABLES	X
LIST OF FIGURES	xi
ABBREVIATIONS	xii
CHAPTER 01	
1.0 INTRODUCTION	1
1.1 Background	
1.2 Research Problems	4
1.3 Research questions	4
1.4 Objectives	4
1.4.1 Specific Objectives	5
1.5 Limitations of the study	
1.6 Summary	5
CHAPTER 02	6
2.0 LITERATURE REVIEW	6
2.1 Pesticides	6

	2.1.1 World Pesticide Usage	
	2.1.2 Pesticides Use in Sri Lanka	
	2.1.3 Pesticide Regulatory Framework in Sri Lanka	
2	.2 Effect of pesticide usage9	
	2.2.1 Effects of Pesticides on Environment	
	2.2.2 Overview of Harmful Effects of Pesticides	
	2.2.2.1 Acute Effects	
	2.2.2.2 Delayed Effect	
	2.2.2.3 Allergic Effect	
2.	.3 Harmful Effect of Insecticide	
2.	.4 Harmful Effect of Herbicide	
2.	.5 Harmful Effect of Fungicide	
2.	6 Evidence for diseases related to of Pesticide Usage	
	2.6.1 Congenital Anomalies due to Pesticide Exposure	
	2.6.2 Weight loss in fetus due to pesticide exposure	
	2.6.3 Carcinogenic effects of pesticide	
	2.6.4 Endocrine disrupting	
	2.6.5 Childhood leukemia	
	2.6.6 Bladder and colon cancer	
	2.6.7 Thyroid cancer	

2.6.8 Brain cancer	.17
2.6.9 Asthma	.17
2.7 Harmful Effect of pesticides in World wide	.18
2.8 Impacts of pesticide in Sri Lanka	.19
2.8.1 Overview of Impacts of pesticide in Sri Lanka	.19
2.8.2 Harmful Effect of pesticides in Sri Lanka	.20
2.8.2.1 Chronic Kidney disease of uncertain aetiology in Sri lanka	.20
2.8.2.2 Incidence of Insecticide Poisoning among Upcountry Vegetable Farmer.	.21
2.8.2.3 Overview of Health Cost of Pesticide usage in Sri lanka	.22
CHAPTER 03	.24
.0 RESEARCH METHODOLOGY	.24
3.1 Study Area	.24
3.1.4 Badulla district	.25
3.1.2 Uva-Paranagama DS Division	.25
3.1.3 Welimada DS Division	.25
3.1.4 Bandarawela DS Division	.26
3.2 Selection of sample	
3.3 Data collection	.26
3 1 Data Analysis	27

3.5 Summary	27
CHAPTER 04	28
1.0 RESULTS AND DISCUSSION	28
4.1 Profile of Vegetable Cultivating Farmers	28
4.1.1 Socioeconomic Characteristic of Vegetable Cultivating Farmers	28
4.1.1.1 Education Level of the Vegetable Farmers	29
4.1.1.2 Engagement in Vegetable Cultivation.	30
4.1.2 Land Ownership Type of Vegetable Farmers	30
4.1.2.1 Type of Vegetable Cultivated in Badulla District	31
4.1.3 Irrigation Methods Used	32
4.2 Insect Pest, Disease and Weeds Control in Badulla District	33
4.2.1 Insect Pest Control in Badulla District	33
4.2.1.1 Time of Insecticide Application	33
4.2.1.2 Insecticide Used in Vegetable Cultivation in Badulla District	34
4.2.2 Disease control in Badulla District	34
4.2.2.1 Time of Fungicide Application	34
4.2.2.2 Fungicides Used in Vegetable Cultivation in Badulla District	35
4.2.3 Weeds Control in Badulla District	35
4.2.3.1 Time of Weedicide Application	36
4.2.3.2 Weedicides Used in Vegetable Cultivation in Badulla District	36

.3 Awareness and Precaution of Pesticides Usage	36
4.3.1 Awareness about Pesticides	36
4.3.2 Precaution of Pesticides Usage	36
4.3.2.1 Protective Covering	36
4.3.2.2 Other Common Precautionary Measures	37
4.3.2.3 Consideration of Wind Direction	37
4.3.2.4 Hand Washing After Spray	38
4.3.2.5 Disposal of Empty Container	39
4.3.2.6 Disposal of Washing Water	39
4.3.2.7 Storage of Pesticides	40
4.3.2.8 Activities after Spraying Pesticides	41
.4 Health Effect of Pesticide Application on Vegetable	42
4.4.1 Acute Disease	42
4.4.2 Health Cost for Acute Disease.'	
4.4.3 Death and Suicide due to Pesticide*	42
4.4.4 Training and Awareness on Pesticide	42
4.4.5 Reasons for Pesticide Usage	
4.4.6 Hypothesis Testing	43
4.4.6.1 Hypothesis Testing for Training Program – T-test result	44
4.4.6.2 Hypothesis Testing for Usage of Mask – T-test Result	45