Determination of Factors Affecting Pesticide Use Decision of Vegetable Farmers in Nuwara Eliya, Bandarawela and Welimada Area

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Introduction

Sri Lanka has an area of 6.4 million hectares in which the agricultural area comprising 2.3 million hectares, out of which 20% is located in the up country wet zone of Sri Lanka. Over 64% of the population of the area is engaged in agriculture. Potato and exotic vegetables are the predominant crops grown in this part of the country throughout the year. The agricultural practice in the upcountry area of Sri Lanka is intensive and highly commercialized (Wijewardena, 2010). Hence, up country vegetable farmers use large amounts of pesticides to control the pests on their vegetable crops and to maximize output on limited acres of land (Sivayoganathan *et al.*, 1995). Pesticides play a significant role in the modern agriculture due to easiness of application and quick results. As a result, demand for pesticide has also increased. Similarly, number of agrochemical companies involves in marketing and distributing of pesticides and the companies follow several product promotion techniques to stimulate farmers to buy their pesticides. But, agrochemical companies have inadequate knowledge about the factors affecting the pesticide use decision of the farmers. The purpose of this study is to identify the factors affecting pesticide use decision of farmers. Knowledge on farmer's pesticide use decision is very important for the companies to select most appropriate promotion methods to stimulate the pesticide use decision.

Methodology

The research study was carried out in upcountry vegetable growing areas of Badulla and Nuwara Eliya districts. Three Divisional Secretariat divisions (DS) were selected as the study areas covering 120 vegetable farmers. Stratified random sample technique was used to select 120 respondents from three DS divisions.

This study employed the Theory of Reasoned Action (TRA) to gauge farmers' attitudes, subjective norms and perceived behavioural control towards pesticides use decision. Theory of Reasoned Action, developed by Martin Fishbein and Icek Ajzen (1975) provides a theoretical framework to explain a person's behavior. As well decision making is become behavioral in nature. In this research, according to the TRA, attitudes toward spraying and perceived social pressures and perceived behavioural control are assumed to be the important determinants of farmers' decisions to spray pesticide to protect their crops from pest damages.

Descriptive statistics techniques were used to summarize and describe sample population data in an abbreviated form. Categorical regression model was used to determine the extent

to which the identified factors affect farmers' pesticide use behaviour and correlation analysis was used to analyze between the subcomponents.

Farmers' pesticide use behavior = $\beta o + \beta 1X1 + \beta 2X2 + \beta 3X3 + \beta 4X4 + \beta 5X5 + K$
X1= Attitude towards pesticide application
X2= Perceived Behavioural Control
X3= Interpersonal Influence towards farmers' behaviour
X4= External Influence towards farmers' behaviour
X5= Self Control in decision making

Results and discussion

In the sample population, 92% of the respondents are male farmers while 8% of the responds are female farmers and 40% of the farmers have passed GCE O/L and 3.84% of farmers have not even attended to school.

The average size of the land holding in the studied area is 1.176 acres and 85% of farmers in the sample owned the land they cultivate. At the same time, 24 % of farmers were involved in vegetable cultivation as part time farmers and 76% of the farmers in the sample were found as fulltime. In the sample, seasonal income from vegetable cultivation varied from Rs.5, 000 to Rs. 1,500,000. In up country vegetable growing area, highest amount of pesticide use is recorded for Tomato and Chilli followed by Brinjol and Potato. Tomato cultivation itself required over 12,000 liters of pesticide per acre within one cropping season.

The study found that the most of the farmers were used their own experience to select the pesticide products and the second most common source of information are the products dealers. 90% of the farmers obtain the information about pesticides through the product dealers. In same way, family members, neighbors and promotion campaign helped the farmers to get information about pesticides.

According to the analysis, it was revealed that the theory of reasoned action explained 35.5% of variation of the farmer's pesticide using behavior. Subjective norms and perceived behavioural control are the most important factors influencing farmers' pesticide use behavior. Perceived behavioural control showed negative influence over pesticide using behaviour and recorded the largest coefficient (- 0.82) and therefore this should be highly considered when developing appropriate and effective dissemination techniques. Second highest coefficient was recorded for Self Control (- 0.439) in decision making and showed negative relationship over pesticide usage. It means, increment of farmers' self control ability in decision making decrease their pesticide usage. According to the results, increment of external influence results in increasing in the farmers' pesticide using behaviour.

Farmers' pesticide use behaviour = $5.66446 - 0.82026X_2 - 0.36914X_3 + 0.31520X_4 - 0.43906X_5$

The results further revealed that, neighbor farmers and field demonstration programs recorded negative influence over pesticide usage. It seems that, the field demonstration programs can be used to reduce indiscriminate pesticide usage. Product promotion campaign, advertisements and product dealers positively influence farmer's decision and increase pesticide usage.

Conclusions

Most of farmers use their own experience to select pesticide products and 90% of the farmers obtain information from the pesticide dealers and 65% of farmers revealed that the information coming from pesticide dealers is highly useful to select best pesticide products. Subjective norms and PBC are the most important factors influencing farmers' pesticide using behaviour.

With the increase of the external influence towards the farmers' decision to apply pesticide, the self control ability in decision making decreases. Promotion campaign is the most important promotion technique, which has a positive influence over pesticide using behavior and product dealers have high positive influence over pesticide usage than the TV advertisements. External influential parties except the field demonstrations, have the positive influence towards pesticide using behavior.

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