

## VEGETABLE GROWERS' AWARENESS ABOUT HEALTH SAFETY MEASURES AND PESTICIDE USE IN PUNJAB, PAKISTAN

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Pesticides are poison but their use is essential for crop protection to control pests. Vegetables are very important crop and are susceptible to a number of devastating pests. Vegetable growers have to depend on chemical pesticides for the control of pests. Pesticides sprayed on vegetables do not remain on the targeted area. Pesticide exposure may lead to certain serious and chronic diseases. High number of human's pesticides poisoning are occurring in Pakistan and high risks maximum residue limits (MRLs) of pesticides had been detected in foods (vegetables) in Pakistan. Safe use of pesticide is generally influenced by knowledge possessed by the vegetable growers. The study was conducted to assess the knowledge level of vegetable growers regarding pesticide use in two potato growing districts of Punjab. The data were collected from randomly selected 367 vegetable growers proportionately selected from randomly selected two tehsils of the selected districts. This study concludes that the growers need training for health safety measures on priority basis regarding the areas; knowledge of personal protective equipment and clothing (mean = 1.95); knowledge of routes through which pesticides enters in human body (mean = 2.65); knowledge of personal hygiene and sanitation (mean = 3.26) respectively.

**Keywords:** Vegetable growers; knowledge; pesticides; MRL: health safety

### INTRODUCTION

Pesticides are poisons and their exposure is causing humans' poisonings. Human pesticide poisoning is a global health problem. In 1973, the World Health Organization (WHO) established a series of global pesticide poisoning estimates, reporting 500,000 poisoning cases annually. In 1986, the WHO raised its estimate to one million cases of unintentional poisoning and 20,000 fatalities. A joint study by the WHO and United Nation Environmental Program (UNEP) in 1990 estimated three million hospitalized cases of which 220,000 resulted in fatalities (WHO, 1990).

Health problem is more severe in the developing world. According to an estimate 99 % of human pesticide poisoning fatalities occur in these countries, although these countries consume only about one fourth of all pesticides. Due to poverty, small-scale farmers in developing countries are often the most vulnerable to pesticide exposure and poisoning. The high incidence of pesticide poisonings among small-holders is also related to faulty pesticide practices (Wesseling *et al.*, 1997; WHO, 1990; Jeyaratnam, 1990).

Indiscriminate and heavy use of pesticides on vegetables has been observed in Pakistan (Khan, 2004). Hence, the gravity of the problem is more severe in Pakistan as high-risk pesticide residues have been found on vegetables. Some relatively high levels of pesticide residues were also observed for food/ commodities for which the Maximum Residue Limit (MRL) of pesticide has not yet been established (Masud and Husan, 1992).

In Pakistan, there is no analysis of pesticide residue in the final product that goes to the market. Pesticides residues in agricultural commodities have a significant influence in the area of international market. The importing country may reject commodities bearing pesticides residues above the legally permitted level because Codex Alimentarius Commission (FAO/WHO) has set standards of MRLs for pesticides in food moving in international market. Therefore, the export of vegetables is also at risk because of possible high level of pesticide residues (Hussain *et al.*, 2001).

In the case of vegetables, farmers tend to be even more pesticide-dependent (Heong *et al.*, 1997). Insects and diseases are one of the main constraints to vegetable production (Lantican, 2000). Being less educated, growers pay very little attention to adopt personal protection measures regarding pesticide use. Majority of them seek advice from pesticide dealers at the time of purchasing pesticides. The pesticide dealers are more interested in earning their profit rather than guiding the farmers properly (Rehman, 1994). Hence, the vegetable growers are making the excessive use of pesticides to keep the produce pest free and to force pests inside not to peep out which might reduce the market price. Most vegetable crops

are harvested on daily basis and in many cases are sprayed daily.

Unsafe use of pesticides is damaging the health of the farmers and the community in Pakistan. According to the UN's 1998 report, over 500,000 Pakistanis suffered annually from poisoning due to agro-chemicals, out of which 10,000 died (DAWN, 2004). This presents an alarming situation and serves food for thought for all those who are interested in ameliorating the plight of farming community.

Hence, there is a dire need to empower farmers through updating their knowledge regarding pesticide use to meet the challenges of sustainable environmental health; otherwise, Pakistan will face more poverty, economic crises and health problems of increased numbers of incurable chronic diseases, resulting unbearable losses to national exchequer. The present study was planned to analyze the knowledge of vegetable growers for identification and prioritization of training needs regarding pesticide use.

## MATERIALS AND METHODS

**Table 1. Ranking of possessed level of knowledge of respondents about different routes of pesticides entry in human body as reported by them**

Routes of entry	Vegetable growers knowing roots N (%)	Level of knowledge	Rank order
Inhalation	367 (100)	Very good	1
Skin	107 (29.2)	Poor	3
Mouth	367 (100)	Very good	1
Eyes	364 (99.2)	Very good	2

The potato crop was selected as a reference (study) vegetable. Population of study was all potato growers residing in two districts: Jhang and Okara which are the top potato growing districts in the Punjab. Two tehsils i.e., Chinot and Depalpur- one from each district was selected randomly. For each selected tehsil, a sampling frame was constructed by listing all potato growers. A sample of 367 respondents was randomly selected calculated by using Fitzgibbon, *et al.* (1987) table. The data were collected through personal interviews with the help of validated interview schedule and were analyzed with the help of Statistical Package for Social Sciences (SPSS).

### Development of knowledge assessment scale of pesticide use

The respondent's level of knowledge was determined by using "Pesticide Knowledge Test (PKT)" developed by McCauley *et al.* (2002). The PKT involved a 20 true-false items based to two point response i.e., 1=yes, 0=no.

Each respondent was asked all the questions in all the aspect of pesticide use. One score was given for correct response of one item. Test scores were calculated by summing the number of correct answers and reported as total scores by the area of knowledge tested.

A weight was assigned to each grade as follows:

% Accuracy	Level of knowledge	Weight
<60%	Poor	1
60-74.99%	Fair	2
75-84.99%	Good	3
>85%	Very good	4

The respondents were asked about their knowledge of safety measures being adopted by them during spraying. Three knowledge areas were identified as follow:

1. Knowledge of routes through which pesticides enter in human body
2. Knowledge of personal protective equipment and clothing
3. Knowledge of personal hygiene and sanitation regarding pesticide use

## **RESULTS AND DISCUSSION**

### **Knowledge of routes through which pesticides enter in human body**

Table 1 explains the knowledge that the eyes, mouth and inhalation as routes through which pesticides enter in human body were at very good level. Knowledge that skin as a route for pesticides entrance in human body was at poor level. It means that respondents well knew all routes of pesticides entry such as eyes, mouth and inhalation except skin. The finding regarding eyes is inconsistent with a study in which it was found that majority of the pesticide users were unaware that the eyes were important potential routes of pesticides' absorption (McDougall *et al.*, 1993). The finding regarding skin is not same with that of Yassin *et al.* (2002) who reported that a high percentage (> 84%) of farm workers knew that skin was the route of entry of pesticides into the body.

Table 4 shows that the overall knowledge of routes through which pesticides enter in human body was fair to good with mean value 2.65.

### **Knowledge of personal protective equipment and clothing**

The table 2 shows that the knowledge about glasses, cap and trouser suit as personal protective equipment and clothing were at very good level. Knowledge of respirator, gloves, mask and boots/long shoes as personal protective equipment and clothing were at poor level. The results reveal that the respondents have poor knowledge regarding majority of the personal protective equipment and clothing (4 out of 7). These finding are similar with that of Clarke *et al.* (1997) who revealed that the knowledge of personal protective measures was poor to moderate. These findings are inconsistent with that of Sivayoganathan *et al.* (1995) who reported that most of the farmers were aware of the protective measures to be used when applying pesticides. These findings are also inconsistent with that of Yassin *et al.* (2002) who reported that a high number (>88%) of the farm workers had knowledge that gloves, goggles, a wide brimmed hat, special boots and oral-nasal mask could prevent entrance of the pesticide into the human body.

Table 4 shows that the overall knowledge of personal protective equipment and clothing was poor to almost fair with mean value 1.95.

### **Knowledge of personal hygiene and sanitation regarding pesticide use**

**Table 2. Ranking of possessed level of knowledge of respondents about different personal protective equipment and clothing as reported by them**

<b>Personal protective equipment and clothing</b>	<b>Vegetable growers knowing N (%)</b>	<b>Level of knowledge</b>	<b>Rank order</b>
Boots/Long shoes	185 (50.4)	Poor	2
Trouser suit	367 (100)	Very good	1
Gloves	159 (43.3)	poor	3
Mask	81 (22.1)	Poor	4
Cap	367 (100)	Very good	1
Glasses	367 (100)	Very good	1
Respirator	4(1.1)	Poor	5

Table 3 shows the knowledge about smoking, changing clothes after work, drinking, chewing gum/pawn, washing himself or taking bath after work and eating, as personal hygiene and sanitation regarding pesticide use were at very good level. Knowledge of changing the shoes after work as personal hygiene and sanitation were at poor level. The table revealed that knowledge of majority of the measures regarding personal hygiene and sanitation were at very good level. Such findings are consistent with that of Dechawong (1998) who reported that respondents knew how to protect themselves from poisonous chemicals.

Table 4 shows that the overall knowledge of personal hygiene and sanitation regarding pesticide use was good to very good with mean value 3.26.

## **CONCLUSIONS**

It is concluded from the findings that the vegetable growers have poor knowledge regarding many aspects/items which a vegetable grower should know for health safety. There is need to increase the knowledge of the vegetable growers regarding: skin as a route through which pesticides enters in human body; respirator, gloves, mask and boots/long shoes as personal protective equipment and clothing; changing the shoes after work as personal hygiene and sanitation. It is recommended that that training should be imparted to vegetable growers for health safety measures on priority basis.

**Table 4. Overall ranking of possessed levels of knowledge of respondents regarding health safety in pesticide use as reported by them**

Personal hygiene and sanitation	Vegetable growers knowing N (%)	Level of knowledge	Rank order
Smoking	340(92.6)	Very good	4
Eating	362(98.6)	Very good	2
Drinking	360(98.1)	Very good	3
Chewing gum/pawn	320(87.2)	Very good	5
Washing or taking bath after work	367(100)	Very good	1
Changing clothes after work	367(100)	Very good	1
Changing shoes after work	159(43.3)	Poor	6

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