



Pesticide usage by Farmers; A case study of District Rawalpindi, Pakistan

Mahwish Raza^{*1}, Umer Ayyaz Aslam Sheikh², Sakhi Muhammad¹

¹*Department of Plant Protection, Pest Warning & Quality Control of Pesticides, Rawalpindi, Pakistan*

²*Department of Entomology, Faculty of Agriculture, The University of Poonch, Rawalakot, Azad Jammu & Kashmir, Pakistan*

Article published on October 26, 2017

Key words: Pesticides, Rawalpindi, Case study, Pakistan, Usage by farmers

Abstract

As well pesticides are playing an important role in enhancing crop yield, but producing resistance against many crop pests and are also harmful to our environment. Surveys were conducted in 21 villages of district Rawalpindi, Pakistan in 2016. Data about pesticide usage were collected from 210 respondents (local farmers). The results show that only 22% local farmers have potential towards use of pesticides. The maximum pesticide users were found in Taxila and the price was the key factor to select pesticides for the farmers. Selection of pesticide maximum depends on previous experience of farmers. Only 3 % farmers adopt precautionary measures before using the pesticides in this area. This study will be helpful in future to aware local people about the safe and accurate use of pesticide to produce healthy and good yield crops and also helpful to conduct awareness programs in the future.

*Corresponding Author: Mahwish Raza ✉ mahwishraza1214@gmail.com

Introduction

Agriculture plays an important role directly and indirectly in generating economic growth.

It provides food to the population and contributes substantial share of foreign exchange for the country. In spite of structural shift towards industry, agriculture is still the largest sector in the economy and contributes 21.8 percent of the GDP. Its contribution in total employment is also significant.

It provides employment to over 44 percent of total employed labour force (Federal Bureau of Statistics, 2008-2009).

Pesticide application is an essential component of modern crop production technology. Their use has been contentiously increasing over the past decades. In Pakistan the pesticides application is maximum on cotton crop followed by fruits and vegetables. Insecticides, herbicides and fungicides are commonly used for crop protection throughout the country. However, among all categories, insecticides are used more frequently.

After ban, over the use of organochlorine insecticides in 80's (Parveen and Masud 2003), organophosphates, synthetic pyrethroids and carbamates are presently in use with less persistence.

Most pesticides used in Pakistan were insecticides (74%), followed by herbicides (14%), fungicides (9%), acaricides (2%), and fumigants (1%) (Khan, 1998). Province-wise share of pesticide market was 90 percent for the Punjab, 8 percent for Sindh and 2 percent for NWFP and Balochistan (Khan, 2000).

Pesticide residues may enter the food chain causing serious hazards to human and animal lives (Khan *et al.*, 2007). Despite the fact that pesticides are used with the aim of controlling insects, diseases, fungi and other pests along with their other beneficial effect, leave trace amounts of residues on fruits and vegetables (Basa Cesnik *et al.*, 2007; Anwar *et al.*, 2011).

Materials and methods

Study was conducted in Rawalpindi district which consist of seven Tehsils including Rawalpindi, Taxila, Kahuta, Gujar Khan, Kallar Syedan, Murree and Kotli Sattian. It has an area of 5,286 km² (2,041 sq mi).

It is situated on the southern slopes of the north-western extremities of the Himalayas, including large mountain tracts with rich valleys traversed by mountain rivers.

Area is lie between 450 m to 2290 m altitude (Table 1) with diverse vegetation pattern both wild and crops.

Tehsil Murree, Kahuta and Kotli Sattian are consists of mountains as compared to Rawalpindi, Taxila, Gujar Khan and Kallar Syedan. Wheat and Maize are major crops along with vegetables and fruits orchards.

Surveys were conducted in 21 different villages together with three villages from each Tehsil. A Total of 210 respondents (Local farmers; 10 Respondents from each village) were selected by using Fitzgibbon *et al.* (1987). Keeping in view the objectives of the study a questioner was developed to collect data from local farmers. The data thus collected were analyzed by using SPSS (Statistical Package for Social Sciences) software.

Results and discussion

To keep and maintain crops healthy and free from damaging factors, safe and accurate use of pesticides by the farmers is a key factor to improve yield/acre.

Present study shows that the potential of local farmers towards use of pesticides is very low in district Rawalpindi; only 22 % respondents were using pesticides and 78% were not applying these chemicals on their crops (Table 2).

The main reason of this low potential towards pesticides may be small land units or less relies on local agricultural productions in this area.

Table 1. Global positions and vegetation type of survey sites in Rawalpindi district.

Tehsils	Altitude	Latitude	Crops
Gujar Khan	450	33°16' 19" N 73°19' 32" E	Wheat+Maize, Vegetables+Citrus
Kahuta	605	33°59'00" N 73°39' 21" E	Wheat+Maize, Vegetables
Kallar Syedan	520	33°24'59" N 73°22'39." E	Wheat+Maize, Vegetables+Orchards
Kotli Sattian	1435	33° 80' 0"N 73° 52' 24" E	Wheat+Maize, Vegetables+Orchards
Murree	2290	33° 35' 02" N 73° 27' 12" E	Orchards (Apple, Peach, Loqout, Pear)
Rawalpindi	508	33° 59' 85" N 72° 97' 74" E	Wheat+ Maize, Vegetables+Orchards
Taxila	550	33° 74' 40" N 72° 85' 58" E	Wheat+ Maize, Vegetables+Orchards

Table 2. Distribution of farmers according to usage of pesticides.

Usage of pesticides	f.	Percentage (%)
Yes	47	22
No	163	78
Total	210	100

Results about control methods shows that 74% of farmer of this area were found with no practice against insect pests and 22% famer were recorded with usage of chemical pesticides to manage their

crops. There were no significant trend found towards mechanical control (1.6%) and biological control (0.8%) by local farmers (Table 3).

Table 3. Distribution of farmers according type of control they emphasize.

Usage of pesticides	f.	Percentage (%)
Biological	2	0.80
Chemical	47	22
Mechanical	4	1.6
None of them	157	74
Total	210	100

Taxila was found with maximum usage of pesticides (31.91%) followed by Gujar Khan with 21.27% and minimum was recorded in case of Kotli Sattian and Muree respectively (Table 4). Taxila was found with maximum usage because it is largest vegetable

growing area of Rawalpindi district and famers use more spray on these crops in this region. From survey it was observed that. Taxila was equipped with more vegetables production and citrus orchards followed by Gujar khan, where farmers use pesticides/

insecticides to prevent diseases/insect attack and to improve yield. The main crops of Tehsil Gujar Khan are pulses, gram and groundnut. Kahuta, Kotli Sattian and Murree these three tehsil having mountainous

areas where mostly apple, peach, walnut were grown and these were found with minimum use of pesticides due to this.

Table 4. Distribution of Tehsils according to the usage of pesticides.

Tehsils	f.	Percentage (%)
Rawalpindi	7	14.89
Taxila	15	31.91
Gujar Khan	10	21.27
Kallar Syedan	6	12.76
Kahuta	5	10.63
Kotli Sattian	2	4.25
Murree	2	4.25
Total	47	100

In the present survey it was recorded that 45% famers of this area were habitual to use precautionary measures during the usage of pesticides on their crops or fruits orchard. Forty one percent (41 %) farmers were those who adopt precautionary measures occasionally and 44% were found who never use any

preventive measure to use pesticides (Table 5). One of the main reasons of this response is because these are remote areas of this region. There is lack of awareness about pesticides hazards and low literacy rate of local farmers in these areas.

Table 5. Distribution of farmers according to use of precautionary measures while spraying.

Usage of pesticides	f.	Percentage (%)
Yes	7	45.
Occasionally	19	41
Never	21	44
Total	47	100

In Rawalpindi district 41% pesticides user consider their previous experience during selection or purchasing of pesticides and 29% farmers give preference to expert opinion. Only 4% accept new

research about pesticides and reaming farmers preferred 11% and 15% price and efficacy of pesticides respectively when they want to purchase pesticides for their crops (Table 6).

Table 6. Distribution of farmers to their consideration while purchasing of insecticides/ Pesticides.

Considering while purchasing of insecticides/ Pesticides	f.	Percentage (%)
Previous Experience	19	41
Price	5	11
Efficacy of Insecticides/ Pesticides	7	15
New research	2	4
Expert Opinion	14	29
Total	47	100

Conclusion

It is concluded from the survey that use of pesticides by local farmers is not very common. And there is a need of awareness about safe and accurate use of pesticides for better production of local crops.

Training and non-formal teaching of cotton growers is required for proper handling of pesticides according to Integrated Pest Management requirements.

This survey will be helpful in the future to conduct awareness programs for farmers of this area. It also will be helpful to estimate the pesticide hazards in Rawalpindi district.

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