

PEST DIAGNOSIS AND PESTICIDE USE BY COTTON GROWERS OF MULTAN AREA AND THEIR OCCUPATIONAL HEALTH

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Economy of Pakistan is based on exports of cotton and cotton products, and cotton-growing farmers are the vertebrae of Economical backbone of the country. Cotton growing farmers (male) involved in monitoring of quality and quantity of cotton crops by handsome usage of pesticides for better yield and marketing. To assess their knowledge for diagnosing the pests, attacking their crops and their orientation about the pesticide chemicals and their usage, study in hand was designed and conducted in 20 villages of district Multan selected by multistage random sampling technique. The selected 20 villages, from the list bearing the villages, mouzas and union councils of district Multan. 220 cotton growers were selected by simple random sampling technique and interviewed through a reliable and validated interview schedule. The data collected were processed through Statistical Package for Social Sciences (SPSS). The results showed that almost 71% of cotton growing farmers were in a position to diagnose the pests, damaging their cotton crops whereas; almost 29% of respondents had no pest diagnosis concept. The data showed that 75% of cotton growing farmers were having orientation about side effects of pesticide chemicals, whereas almost 94% of respondents were involved in pesticide using practices.

Keywords: Pest diagnosis, pesticides, knowledge, usage, cotton growing farmers.

INTRODUCTION

Economy of Pakistan is based on cotton mainly and more than 80% of foreign exchange revenue is earned through cotton exports, either through yarn exports or finished goods and products of cotton (EPB 2006). Cotton fiber is at the top priority in choice by almost six billion people all over the world for their clothing and wearing accessories. From Bermen to Beijing to Brasila, consumers worldwide overwhelmingly preferred cotton, according to the recent Global Lifestyle Monitor Survey–GLM III–the findings were declared in 2004 by Cotton Council International and Cotton Incorporated. A survey conducted third time since 1999, showed the results that more consumers than ever considered cotton fiber content a key factor in clothing selection, 78% of respondents, up from 75% in the previous survey in 2001. More than half i.e. 70% of those in the latest survey informed that they preferred clothing made of cotton to any other fiber natural or synthetic material (World Report, 2005). According to ICACI the world cotton production in 2005-06 was decreased by 1.5 million tons or 6.96 million bales from previous season to 24.78 million tons (113.81 millions bales of 480 lbs). While cotton production was forecasted at 24.69 million tons or 113.4 million bales in 2006 07, major increases in production of cotton crops were expected in China (mainland), Pakistan and India.

During (2005-06), cotton crop yield was also declined to 713 kgs. per hectare, thereby showing a decrease 9.3% over the target and 6.2% over the achievement of 2004-05 season (GOP, 2006). From the desk of Export Promotion Bureau of Pakistan, exports of textile manufactures grew by 19.2%, prominent among those were exports of bed wear (58.4%), readymade garments (31.0%), cotton yarn (21.4%), cotton cloth (16.5%) and towels (12.0%). (EPB, 2006). The Federal Committee on Agriculture in Pakistan (FCA) had fixed the cotton production target for 2005-06 at 12 million bales. Subsequently, it was enhanced to 15 million bales from an area of 3,247 million hectares. National yield was thus envisaged at 786 kgs. per hectare. According to available information, the weather conditions and flood in some districts of the Punjab, pest attack and fake pesticides in Sindh had effected the cotton crop, resulting the declined production to 13.0 million bales achieved from 3.10 million hectares, showing decrease of 13% in production and 4.53% in area over the targets of 2005-06 season and 8.87% and 2.88% respectively over the achievements in the last season (2004-05). The national yield during (2005-06) declined to 713 kgs per hectare, thereby showing a fall of 9.3% over the target and 6.2% over the achievement during (2004-05) season (GOP, 2006). Cotton growing community comprise cotton growing male farmers and cotton picker women. The role of women in national growth and development has been reaffirmed in the 1994 International Conference on

Population and Development (ICPD) which emphasized to provide women with more rights and choices in access to education, health services, skill development, and employment and eliminate the practices that discriminate against women all over the world (United Nation, 1995).

Both of these two groups of cotton growing community are exposed to pesticide chemicals directly or indirectly, leading to pesticide related health hazards. Cotton picker women are engaged in cotton picking for a period of two to three months per year. This phenomenon of cotton picking eclipses their persistent and prolonged exposure to pesticides and toxic chemicals, which may cause severe health problems. During cotton picking, they are vulnerable to abrasions, cut and skin rashes that further expose them for absorption of pesticides into blood circulation resulting in health hazards and problems (Ruma *et al.*, 2004). Married cotton picker women have history of cotton picking during pregnancy and lactation, which poses additional complicated reproductive health problems. It was observed during data collection that cotton pickers rarely covered their mouth and nose during their working therefore; inhalation of dust particles was there, resulting in respiratory tract problems. During cotton picking, pesticide poisoning enhances the sign and symptoms of sneezing, rhinitis, vague muscular pains, vertigo, dizziness, nausea, vomiting, skin rashes, urticaria, itching, cough, headache, dermal blisters, respiratory disorders and other health problems (Garcia, 2003). Jack (2003) observed that corneal abrasions, trauma, corneal ulcers and fungal ulcers were proved to be chronic in nature in farmers particularly among cotton picker women. These ulcers if not treated properly or misdiagnosed, may lead to thinning, prolapsing and perforation of cornea leading to prolapsed or collapsed eyeball, ending in corneal opacities or blindness. Javaid *et al.* (2006) conducted a study, the effect of organophosphate (OP) pesticide exposure on cholinesterase (ChE) activities and concluded that pest controlling workers had significantly lower plasma cholinesterase (PChE) and erythrocyte cholinesterase (AChE) activities as compared to control sample of respondents ($P < 0.001$). In addition, 13.5% and 10.9% of the exposed respondents were found to have PChE and AChE activities below the lower levels of the controls respectively. Among population exposed to pesticides, the "spray men" and the respondents who had exposure for five years were found to be the most affected groups. The study revealed that the health risks were more eminent in farmers and workers with exposure to pesticides and were of acute in nature. Regular periodic medical examination and creation of

awareness about pesticide related health problems among the exposed population were recommended to minimize the pesticide related health hazards. In another research work, Karin (2007) narrated her study entitled "weakest link in the textile chain cotton pickers' pesticides exposure" about health hazards of pesticides exposure in Pakistan. In the study she described pesticide situation in Pakistan. She depicted from her results that 80% of total pesticides consumption was for cotton crops. The trade liberalization and pesticide treadmill raised consumptions of pesticides and plant protection practices. The lethal health hazards faced by respondents were carcinogenic in nature. Direct exposure to pesticide chemicals by pesticide spray and cotton picking; indirect by drinking water; food chain and inhaling were the root of entrance into the human body. The pesticides related health problems were observed from respiratory problem to death. Also there were chronic health hazards e.g from impaired memory to depression. She also described that 25 to 77 million workers directly or indirectly effected by pesticides. Whereas, approximately one million hospitalized every year with 37000 cancer cases and 20000 deaths annually due to pesticides poisoning. Cotton pickers were affected by direct exposure through inhalation, in taking poisoned water, food, seed oils, while handling cotton stalks for fuel purposes, increasing vertically risk in pregnancy and breast feedings.

MATERIALS AND METHODS

By using multiple stage, simple random sampling technique, 20 villages from district Multan as mentioned in the list of cotton growers by the local government of district Multan were selected. Therefore, 220 cotton grower respondents from a population of 5000 were selected by using Fitzgibbon *et al.* (1987) table. Keeping in view the objectives of the study, an interview schedule was developed for data collection. The data collected were analyzed by using Statistical Package for Social Sciences (SPSS).

RESULTS AND DISCUSSION

The levels of orientation, awareness or knowledge of respondents regarding various aspects of cotton and pesticides used was assessed. The results regarding this aspect are presented in this section.

To keep and maintain cotton crops healthy and free from damaging factors, knowledge, awareness about the causative agents; regular and continuous monitoring of crop was required by the cotton growers otherwise chances of poor yield were there as told by

respondents. Cotton growers (male) were assessed through questionnaire that either they were in a position to diagnose any problem to their crop in time or not and Table 1 showed their level of knowledge in this respect.

Table 1. Distribution of the cotton growers according to their knowledge about diagnosing insect/pest attack on cotton crop

Diagnosing knowledge about insect/pest attack	f.	%age
Yes	156	70.9
No	64	29.1
Total	220	100.0

The data mentioned in Table 1 are showing the orientation, knowledge and observation of cotton growers about the pests, attacking their cotton crops. Results of this table emphasized that almost 71% of respondents were equipped with knowledge to diagnose their crop problems i.e. they were in a position to observe the sign and symptoms of disease affecting their cotton crop. Therefore, if they were in a position to make early diagnosis, pests might be managed well in time, saving the crop and maintaining or improving the yield, otherwise late or without diagnosis results might be lethal for their cotton crops as respondents informed. On the other hand 29% of respondents had no or least knowledge about the signs of disease and it was not easy for them to save or improve their cotton crop. Respondents explained their school of thought that it was the responsibility of extension department to play its role in educating and teaching the cotton growers/farmers about integrated pest management and how to save and improve their cotton crop.

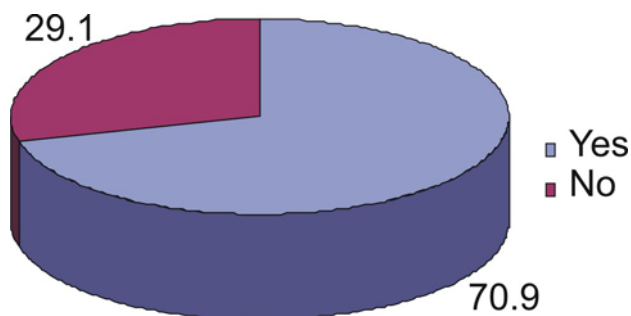


Fig. 1. Knowledge of cotton growers about diagnosing insect/pest attack on their cotton crop

The data showed a healthy feedback about orientation for diagnosing the species of cotton crop damaging insects and pests. Nodought to diagnose the disease is very important but to treat the disease is even more important as in case of any carcinogenic disease if diagnosed during early stage, in time, chances of successful treatment and recovery are bright or vice versa, therefore to diagnose the stage or phase of crop disease by pest counting practice and to decide whether the application of pesticides is required or not and with what dosage and frequency of dosage will be the crucial factor for healthy cotton crops and better yield.

Anand (1995) found that none of farmers adopted Plant Protection Management (PPM) due to lack of knowledge, which is not in parallel to current study. It is almost one-decade-old study when there was least concept of chemical pesticide usage but today, is the scientific and modernized agriculture in practice where usage of pesticides is considered to be vital.

When the reason for the gap between the knowledge about the pests/insects counting and its application for diagnosis of pests affecting the crops was asked, respondents replied that they were not sure about their self-diagnosis and they thought that extensionists and agriculture experts equipped with latest research might have this job with more accuracy and refined way.

After making the confirmed diagnosis for cotton crop disease, proper treatment by using accurate and specific medicine i.e. required pesticide should be applied; improper dosage and frequency may be ineffective, useless, wastage of time and money described by Yaqub, (1983). Therefore, information for level of knowledge of cotton growers was assessed only because no cotton pickers (female) was involved in this practice. Data about timing and dosage of pesticide usage were collected and presented in Table 2.

It is depicted from results mentioned in Table 2 that 94% of cotton growers were having the practice of usage of pesticide to improve their cotton yield while 5% farmers used pesticides very occasionally for their cotton crop and only approximately 1% of farmers rarely used chemical pesticides. It was probed that whether they consulted to some expert/ competent person or agro-pharmaceutical agent for selection of pesticides to be used or it was their own choice. Reply to this quarry was yes from almost 84% of cotton growing farmers, very occasionally from 3%, occasionally from 14% and never from none of cotton producing farmers. When researcher asked that either available branded pesticide were genuine or fake. Almost 84% of the respondents replied in favor for genuine and original branded pesticides available in

Table 2. Distribution of the cotton growers according to their knowledge about pesticides and their usage

Response	NA/Never		Very occasionally		Occasionally		Frequently		Total	
	f.	%age.	f.	%age.	f.	%age.	f.	%age.	f.	%age.
Use of pesticides	0	0.0	11	5.0	2	0.9	207	94.1	220	100.0
Consultation in the choice of pesticides	0	0.0	6	2.7	30	13.6	184	83.6	220	100.0
Availability of pure pesticides	0	0.0	12	5.5	23	10.5	185	84.1	220	100.0
Side effects of pesticides on crops and environment	3	1.4	25	11.4	64	29.1	128	58.2	220	100.0

the market, almost 5% of respondents showed their experience of having fake pesticides and approximately 11% of respondents answered for occasionally they had experience of impure pesticides for their cotton crops. When awareness about or having an idea of side effects of pesticides on human, crops and environment was asked from the respondents, almost 11% of respondents had no concept of any health hazard of pesticides on human health, crops or environment and 29% of respondents answered in a diplomatic way. This table provided information that the farmers were found to be familiar with side effects of pesticides on crops as well as health hazards on human beings, animals and environment, so that they may try to avoid these pesticides and minimize their health hazards. The data indicated that almost 58% of cotton growing farmers were having concept of side effects of pesticides on crops, animals, and environment.

Chemicals used as toxic ingredients in pesticides to kill the pests are either harmful for human beings or not, the level of orientation of cotton growers (male) involved in pesticide usage practice, was probed and the feedback was mentioned in Table 3.

Table 3. Distribution of the cotton growers according to their awareness for side effects of pesticides on human health

Side-effects of pesticides on human health	f.	%age
Yes	165	75.0
May be	38	17.3
Not at all	17	7.7
Total	220	100.0

The data presented in the Table 3 indicate that 75% cotton grower farmers were oriented with health hazards of pesticides on human beings used to control insects and pests, almost 17% of respondents were having a little knowledge about injurious effects of pesticides while almost 8% of respondents considered them to be harmless for human health. Similar results

were also mentioned by the Siddaramaiah and Srinivas (u.d.). Some respondents informed that they used to desal/open the pesticide containers by using their teeth and some times small amount of pesticide got entry in to their oral cavity and they further added that it was tasteless having no bitter or sour taste and nothing was serious with them and it happened multiple times with many respondents. Respondents told that they had the knowledge about the toxicity of pesticides that was, why they stored it carefully, away from reach of kids. Even non-educated cotton growing respondents informed the researcher that they had common sense that the pesticides could kill the pests which were living creatures and it might not be possible that the same pesticide chemical might be the harmless for human beings because in both cases, targets were the living creatures and had almost similar pharmacokinetics for most of the chemical ingredients used in pesticides.

CONCLUSIONS

It is depicted from the data that almost 71% of cotton growing farmers were equipped with knowledge enough to diagnose their diseased crops, it is an indicator to be focused to improve the mentioned figure in approximation of 100% if possible through the proper, periodic trainings of cotton growers and cotton crops might be ideal in quality and quantity by adoption of this strategy. It is concluded that almost 94% of cotton growers were using pesticides, mostly after having consultation with Extensionsist, therefore it might be declared all cotton growing farmers had pesticide usage practices where as 75% of them were having awareness about the side effects of pesticide chemicals on human health, even then they were in a run to achieve better cotton crop yield with help of pesticides. It is concluded that survival of cotton growing farmers is doubtful without pesticide usage, therefore proper periodic trainings are required to avoid the pesticide related health hazards among cotton growing community.

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