



RESEARCH ARTICLE

VEGETABLES GROWERS CAUSES OF ABERRATIONS FROM PROPER CHEMICAL PESTICIDES USE IN NADIA DISTRICT OF WEST BENGAL

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ARTICLE INFO

Article History:

Received 20th September, 2024
Received in revised form
17th October, 2024
Accepted 24th November, 2024
Published online 30th December, 2024

Key Words:

Vegetable Growers, Pesticides
Application, Aberrations, training,
Judicious Application, Proper Regulations,
Extension Agencies.

ABSTRACT

Plant protection is an exercise basically followed in any crop for control of insect-pests, diseases, weeds etc. to avoid economic losses. Farmers who are cultivating vegetables, they are using maximum numbers and amount of pesticides compared to cereal crops per unit area. For proper application of pesticides –there are specific recommendations. Due to lack of awareness of farmers regarding those recommendations, they are using pesticides deviating its proper processes and considerations. As a result, they are facing health related problems. Keeping all these in view the present study was designed to identify the aberrations from proper chemical pesticide use by the vegetable growers and reasons behind it. The present study was conducted in Nadia district of West Bengal. Nadia district was purposively selected for the study and Chakdah community development block of Kalyani sub division was randomly selected for the study. Rautari gram panchayat was selected randomly from all the gram panchayats of Chakdah community development block. Three villages namely Teghara, Ruppur and Rameswarpur was selected purposively as the villages were in close proximity. Complete enumeration of the farmers in the villages was attended. Farmers who were available up to three times were included in the sample. In this way 73 brinjal growers from Teghara, 62 pointed gourd growers from Ruppur and 69 cauliflower growers from Rameswarpur were selected for the study who grow crops in parcels of plots under bigger common field. The farmers' major aberrations from safe pesticide handling and safety measures taken were the followings-(1) 19.60% respondents sometimes and 47.05% respondents never read the label of pesticide carefully before using pesticides (2) 53.92% of respondents were not aware of the classification of pesticides based on toxicity (3) At the most 86.76% and 90.68% of respondents did not use gloves or mask respectively while applying pesticides (4) 13.72% vegetable growers mixed pesticides with bare hand (5) 35.29% of respondents used soap water and 64.70% used plain water while washing hands after pesticide application (6) 3.92% of respondents always and 19.60% sometimes took food or smoke immediately after pesticide application. The major reasons behind farmer's aberrations from proper pesticide handling and usage were (1) lack of knowledge of the farmers regarding proper pesticide handling and use. (2) lower level of education (3) non availability of training regarding safe use of pesticides was another important reason behind the problem(4) reasons included lack of credit to arrange precautions(5) lack of availability of safety inputs. To avoid the unnecessary use of pesticides, regulations regarding the use or pesticides and proper verification of the procedure should be carried out. Creation of awareness on the basis of family based training, sensitization through value and ethics based capacity building and utilization of religious and community leaders in this regard may be useful to overcome the issue. Various deviations from safe usage and handling of chemical pesticides were identified in the study. So, steps should be taken to change the perception of the vegetable growers regarding the use of the safety measures. Therefore, the base level extension agencies should take proper measures on the basis of findings of the study to make their further extension programme more effective.

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Citation: Swarna Sekhar Kumar, Hiralal Jana and Debabrata Basu, 2024. "Vegetables growers causes of aberrations from proper chemical pesticides use in nadia district of west bengal". *International Journal of Current Research*, 16, (12), 31085-31088.

INTRODUCTION

Agriculture being the backbone of Indian economy has a crucial role to play in the country's economic development. India ranks second worldwide in farm outputs and as a predominant rural economy it shares 50 percent of its work force in agriculture and contribution of agriculture in Indian economy is 18 percent. Agriculture is of outmost importance for the vast number of people of this country as it is the largest component of India's economic life. Since crop production is being influenced by a large number of factors it is often impossible to measure all possible factors in every crop management unit. But some of these factors need attention in recent times for betterment of our environment. Plant protection may be defined as the adoption of measures to prevent damage to plants from pests, or to arrest, minimize or obliterate it, once it has occurred. It includes the use of physical, mechanical, cultural, biological, chemical and legal measures to control pests. Plant protection is an exercise basically followed in any crop for control of insect-pests, diseases, weeds etc. to avoid economic losses. Reports indicate that the losses range from 20-30% by each of the insect-pests, diseases and weeds, but on an overall estimation, about 30% average cumulative loss by them appears a fair estimate. This resulted in taking suitable control measures to keep these losses to the minimum (Muthuraman and Kumar, 2013). One of the important plant protection measures is the use of pesticides. The term pesticide encompasses all chemical substances used for the control of pests. According to usage they are classified as insecticides, fungicide, herbicide, molluscicides and antibiotics. Most pesticides are used to serve as crop protection products which in general, protect the plants from weeds, fungi, or insects.

The economic implications of the crop damage and crop loss due to pest incidences have forced many Indian farmers to adopt frequent pesticide applications. Pesticides are considered responsible for the agricultural growth as its benefits associated with improved crop yields. That is the reason behind extensive use of pesticides. It has taken place in the last few years. The unnecessary use of pesticide to meet the ever rising quest for higher profit has resulted in several ecological and environmental consequences as well as unsafe practices in farming sector. The percentage of pesticide used on vegetable crops in the country is regularly increasing for the years. Vegetables are very common diet of the inhabitants of West Bengal as well as Indians in general. As a result of this, the quality of vegetables we eat is a big factor regarding our health issues. So, we need to understand the pesticide use pattern followed by the vegetable growers. The use pattern will reflect the knowledge of the vegetable growers regarding the spraying mechanism, proper doses, time of spraying and time interval needed to be followed while spraying pesticides, awareness regarding type of damage; identification of pest and proper plant protection measures. Keeping all these in view the present study is designed to have an assessment of occupational health issues of pesticide handlers i.e. daily wage labours, farm men or women. Their awareness level regarding the safety measures needed to be taken while handling plant protection chemicals is also an aim of this study. Therefore, the objectives was- to identify the aberrations from proper chemical pesticide use by the vegetable growers and reasons behind it.

MATERIALS AND METHODS

The present study was conducted in Nadia district of West Bengal in 2014. Nadia district was purposively selected for the study. Under Kalyani sub-division of this district, Chakdah community development block was selected randomly for the study. Under this block, Rautari gram panchayat was selected randomly from all the gram panchayats. Under Rautari gram panchayat, three villages namely Teghara, Ruppur and Rameswarpur were selected purposively as the villages were in close proximity. Complete enumeration of the farmers in the villages was attended. Farmers who were available up to three times were included in the sample. In this way 73 brinjal growers from Teghara, 62 pointed gourd growers from Ruppur and 69 cauliflower growers from Rameswarpur were selected for the study who grow crops in parcels of plots under bigger common field. In this way total 204 respondents were selected.

RESULTS AND DISCUSSION

The results regarding vegetable growers' aberrations from safe pesticide handling and safety measures taken by them are stated in **Table-1**. From the study, it was seen that 19.60% respondents sometimes and 47.05% respondents never read the label of pesticide carefully before using pesticides. More than half of respondents (53.92%) were not aware of the classification of pesticides based on toxicity. Majority of persons (86.76%) and 90.68% of respondents did not use gloves or mask respectively while applying pesticides. Only few vegetable growers (13.72%) mixed pesticides with bare hand. Nearly one-third of respondents (35.29%) used soap water and 64.70% used plain water while washing hands after pesticide application. Only 3.92% of respondents always and 19.60% sometimes took food or smoke immediately after pesticide application. At the lowest 3.43% of respondents used the empty container of pesticides afterwards while 50% threw it away and 15.68% and 30.88% burnt it or buried it in the ground respectively. Majority of respondents (86.76%) had no idea about the pre-harvest interval of the pesticides they used. One-fourth percent of respondents (25%) did not do anything to decontaminate their vegetables from pesticides while 63.72% washed it with plain water and 11.27% washed it with salt water. Nearly half of respondents (41.66%) did not keep the pesticides in separate room with proper safety. Surprisingly, 11.27% respondents did not use to wash contaminated clothes and 18.13% used their mouth to remove blockage of the nozzle used in pesticide sprayer. The study showed that there are various segments where farmers do not abide by the norms needed to be followed while using chemical pesticides. This could be really a warning sign and developments are needed in these aspects to lower the health hazards faced by the farmers related to pesticide toxicity. Previous studies in this field by Bhardwaj, et. al. (2004), Singh, et. al. (2009), Vemuri, et. al. (2016) and Gaganpreet, et. al. (2018) showed similar kind of responses from the farmers.

Important reasons behind farmers' aberrations from proper pesticide handling and usage:- The results depicting the important reason behind farmers' aberrations from proper pesticide handling and usage are presented in Table-2. The result revealed a number of reasons behind the aberrations of the farmers regarding proper pesticide handling and usage.

Table 1. Aberration from safe pesticide handling and safety measures

Sl.	Statements	Total Respondents (N=204)	
		Number	Percentage (%)
1.	Do you read the label carefully before using pesticides?		
	Always	68	33.33
	Sometimes	40	19.60
	Never	36	47.05
2.	Are you aware of pesticide classification based on toxicity?		
	Aware	94	46.07
	Unaware	110	53.92
3.	Do you use gloves while applying pesticide?		
	Always	17	8.33
	Sometimes	10	4.90
	Never	177	86.76
4.	Do you wear mask while applying pesticide?		
	Always	6	2.94
	Sometimes	13	6.37
	Never	185	90.68
5.	Do you mix pesticides to make solution?		
	With bare hand	28	13.72
	With stick	176	86.27
6.	How do you clean your hands after applying pesticides?		
	Soap water	72	35.29
	Plain water	132	64.70
7.	Do you take food or smoke immediately after applying pesticides?		
	Always	8	3.92
	Sometimes	40	19.60
	Never	156	76.47
8.	What do you do with empty container of pesticides?		
	Bury it in the ground	63	30.88
	Burn it	32	15.68
	Throw it away	102	50.00
	Use it in farm and household works	7	3.43
9.	Do you aware of the pre-harvest interval of each of the pesticide you use?		
	Yes	27	13.23
	No	177	86.76
10.	What do you do to decontaminate vegetables from pesticide residue?		
	Wash with plain water	130	63.72
	Wash with salt water	23	11.27
	Nothing	51	25.00
11.	Do you store pesticide in separate room with proper safety?		
	Always	119	58.33
	Never	85	41.66
12.	Do you wash contaminated cloth properly?		
	Always	151	74.01
	Sometimes	30	14.70
	Never	23	11.27
13.	If nozzle is blocked, what do you do to remove blockage?		
	Use small wire to remove blockage	167	81.86
	Blow it with my mouth to remove blockage	37	18.13

Table 2. Important reasons behind farmer's aberrations from proper pesticide handling and usage

Sl.	Important Reasons	RII	Rank
1	Lack of knowledge regarding proper pesticides handling and use	0.82	I
2	Non-availability of training regarding safe pesticides handling	0.72	II
3	Lack of credit to arrange precautions	0.70	III
4	Lack of availability of safety inputs	0.68	IV
5	Doubt on efficacy of the precautions	0.60	V
6	Discomfort feeling after wearing safety items	0.52	VI

(RII= Relative Importance Index)

The most important reason was lack of knowledge of the farmers regarding proper pesticide handling and use. Most of the farmers of the study area had a lower level of education and this was one of the main reasons of adopting risky measures of pesticide handling and use. They also did not have the ability to read and understand the label properly. As we can see a lot of farmer does not read the level, it is a great cause of concern and sometimes depicts the general ignorance of the importance of pesticide label in reducing exposure risk. Non availability of training regarding safe pesticides handling was another important reason behind the problem.

Proper training can make the farmers aware of the pesticide toxicity and health hazard and thus can change their perception on pesticide use and handling. Other important reasons included lack of credit to arrange precautions, lack of availability of safety inputs, doubt on efficacy of the precautions and discomfort feeling after wearing safety aids. Various previous studies in this field of work by Staiff et al. (1982) and Damals et al. (2006) around the globe supports the result.

CONCLUSION

The unnecessary use of chemical pesticides create a number of problems i.e. destruction of beneficial organisms, development of resistant pest species, remaining of toxic residues in soil, plants, produces and water bodies and human and animal health hazards. Resistance to pesticides ensures increasing pesticide requirements. Due to lack of knowledge on the part of the farmers, higher than the recommended doses of pesticides are used and number of application is increased. Sometimes use of pesticide mix can also be noticed. These are not at all profitable for the farmers from their economic point of view. To avoid the unnecessary use of pesticides, regulations regarding the use or pesticides and proper verification of the procedure should be carried out. Creation of awareness on the basis of family based training, sensitization through value and ethics based capacity building and utilization of religious and community leaders in this regard may be useful to overcome the issue. Various deviations from safe usage and handling of chemical pesticides were identified in the study. Protective measures taken by the farmers at the time of handling of chemical pesticides was a prior issue in this study and negligence among the farmers regarding those measures were evident. So, steps should be taken to change the perception of the vegetable growers regarding the use of the safety measures. To overcome these issues, attention is required at several points, some of which are discussed below:

- Development of biotechnological methods such as resistant crop varieties. Use of biological and physical methods of plant protection. Identification of beneficial organisms and multiplication of the organisms.
- Use of easy and cheap decontamination procedures. Development of situation specific cultural practices.
- Building a nationwide monitoring of pesticides residues in soil, water and food items. Proper survey of the pest life cycle throughout the year and forecasting of the situation.
- Tight laws regarding chemical pesticide use, manufacturing and marketing. Mandatory services by the pesticide companies for the cause of safe use.
- More funding to raise awareness regarding IPM technologies.
- Mass campaigning to create awareness among farmers, pesticide dealers and people about the dangers of pesticide toxicity and misuse. To make the farmers understand the detrimental effects of pesticide misuse.
- Training programmes for the farmers and pesticide dealers for proper usage and handling of chemical pesticides. In – field training of the farmers regarding safe handling and use of pesticides.

“The final principle of natural farming is NO PESTICIDES. Nature is in perfect balance when left alone.”-Masanobu Fukuoka

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