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RESEARCH ARTICLE

FACTORs AFFECTING CHEMICAL PESTICIDES USE PATTERN OF VEGETABLE GROWERS IN NADIA DISTRICT OF WEST BENGAL

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ABSTRACT

Farmers who are cultivating vegetables, they are using maximum numbers and amount of pesticides compared to cereal crops per unit area. Plant protection is an exercise basically followed in any crop for control of insect-pests, diseases, weeds etc. to avoid economic losses. 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 is designed to have an assessment of factors affecting the pesticides use pattern of vegetable growers. Therefore, the objective was –to identify the factors affecting pesticides use pattern of vegetable growers in Nadia district of West Bengal. 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. 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 factors affecting chemical pesticides use pattern of vegetable growers were identified. The major factors identified affecting chemical pesticides use pattern of brinjal growers were –land holding, time of application, economic motivation and profit risk avoidance. The major factors identified affecting chemical pesticides use pattern of pointed gourd growers were –time of application, economic motivation and profit risk avoidance. The major factors identified affecting chemical pesticides use pattern of cauliflower growers were –time of application, economic motivation, profit risk avoidance and knowledge about pesticides. 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 and steps should be taken to change the perception of the vegetable growers regarding chemical pesticides use pattern.

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INTRODUCTION

The rapid increase in consumption of pesticide to improve the production and productivity to feed the growing population, leads us to a number of issues which needs attention in recent times. Pesticides should be used judiciously in view of its high social cost as environmental pollution associated with its consumption, production and distribution. Though environmental considerations would warrant the considerations of use of proper pesticides at proper time and time interval in proper doses, the farmers are concerned with private profitability which is not eco friendly and detrimental to the human race. 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. 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. 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. From 13-14% of the total pesticide use in the 1990s (Sardana, 2001) it has reached to 21% in 2010-11. 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 factors affecting the pesticides use pattern of vegetable growers. Therefore, the objective was –to identify the factors affecting pesticides use pattern of vegetable growers in Nadia district of West Bengal.

MATERIALS AND METHODS

The present study was conducted in Nadia district of West Bengal. 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. The reason for selecting the area was • Nadia district is one of the leading vegetable growing areas of west Bengal. • Farmers were habituated in handling different pesticides. • Acquaintance with the local people and language. • The respondents were highly cooperative and responsive. • The concerned areas were easily accessible in terms of transportation for the researcher. • The area was homogeneous in respect of socio-cultural and biophysical conditions which have bearings on crop cultivation in general and plant protection in particular. Pesticide consumption has close relationship with pest and disease infestation. Within a close proximity pest infestation is relatively homogeneous in nature. To maintain this homogeneity in micro climatic condition the areas with close proximity were selected.

RESULTS AND DISCUSSION

Factors influencing Pesticide usage pattern of the vegetable growers: The results of the investigations are presented and discussed in this section after appropriate statistical analysis. In this study, level of consumption of pesticides in a particular crop was the dependent variable (Y) and 11 variables (X_1, X_2, X_3……X_{11}) were the independent variables. The data were analyzed separately for brinjal growers (Bg), pointed gourd growers (Pg) and Cauliflower growers (Cg).

Brinjal growers

Table 1. Coefficient of Correlation (r): Level of pesticide consumption of the brinjal growers (Y) Vs 11 Causal Variables (X_1-X_{11})(N=73)

Sl. No.	Independent Variables	'r' Value	Remarks
1	Education (X_1)	-.030	
2	Land holding (X_2)	.643	**
3	Time of cultivation (X_3)	.611	**
4	Achievement motivation (X_4)	-.071	
5	Knowledge about pesticides (X_5)	.018	
6	Economic motivation (X_6)	.572	**
7	Attitude towards plant protection (X_7)	-.130	
8	Risk orientation (X_8)	-.832	**
9	Profit risk avoidance (X_9)	.775	**
10	Utilization of commercial source of information (X_{10})	-.060	
11	Utilization of non-commercial source of information (X_{11})	-.049	

**Correlation is significant at the 0.01 level, *Correlation is significant at the 0.05 level

Correlation between level of consumption of pesticides by brinjal growers and independent variables: Table-1 revealed that level of pesticide consumption of brinjal growers was significantly and positively correlated at 0.01 level with land holding, time of cultivation, economic motivation and profit risk avoidance and was negatively correlated at 0.01 level with risk orientation. So, the null hypothesis regarding land holding, time of cultivation, economic motivation, profit risk avoidance and risk orientation is rejected. Level of

consumption of pesticides was not significantly correlated with other six independent variables. So, the null hypothesis regarding education, achievement motivation, knowledge about pesticides, attitude towards plant protection, utilization of commercial sources of information and non-commercial sources of information are accepted. The result indicated that the level of pesticide consumption increased with the increase of land holding, economic motivation, profit risk avoidance of the respondents. It was also positively correlated with time of cultivation. Brinjal, being a high value crop, attracts the buyers according to the quality of the crop and appearance of the crop. Maintaining quality and appearance of the fruits are of great importance for the farmers. The farmers, whose economic motivation and profit risk avoidance tendency was high, used more pesticides in their crop. To safeguard their crop they used more pesticides per unit area. Basu (1994) showed that the farmers used more pesticides when chances of risk were high. The relationship between time of cultivation with pesticide consumption depicted that the farmers who cultivated the crop in kharif and pre-kharif season, used more pesticide per unit area than the farmers who cultivated it in rabi season as pest infestation in rabi season is less than the other two seasons. Level of consumption of pesticides was negatively correlated with risk orientation of the brinjal growers. It indicates that as the farmers who did not have enough capability to avoid risk used more pesticide in their crop in order to save their crop from potential pest attack.

Pointed gourd growers

Table 2. Coefficient of Correlation (r): Level of pesticide consumption of the pointed gourd growers (Y) Vs 11 Causal Variables (X_1-X_{11}) (N=62)

Sl. No.	Independent Variables	'r' Value	Remarks
1	Education (X_1)	-.028	
2	Land holding (X_2)	.230	
3	Time of cultivation (X_3)	-.663	**
4	Achievement motivation (X_4)	-.035	
5	Knowledge about pesticides (X_5)	.059	
6	Economic motivation (X_6)	.720	**
7	Attitude towards plant protection (X_7)	-.041	
8	Risk orientation (X_8)	-.700	**
9	Profit risk avoidance (X_9)	.751	**
10	Utilization of commercial source of information (X_{10})	.127	
11	Utilization of non-commercial source of information (X_{11})	.146	

**Correlation is significant at the 0.01 level, *Correlation is significant at the 0.05 level

Correlation between level of consumption of pesticides by pointed gourd growers and independent variables: Table 2 revealed that level of pesticide consumption of pointed gourd growers was significantly and positively correlated at 0.01 level with economic motivation and profit risk avoidance and was negatively correlated at 0.01 level with risk orientation and time of cultivation. So, the null hypothesis regarding economic motivation, profit risk avoidance, risk orientation and time of cultivation are rejected. Level of consumption of pesticides was not significantly correlated with other seven independent variables. So, the null hypothesis regarding education, land holding, achievement motivation, knowledge about pesticides, attitude towards plant protection, utilization of commercial sources of information and non-commercial sources of information are accepted. The results revealed that the crop of kharif season was affected by diseases and required more pesticides than the crop of summer season. Again the farmers who had less capability to encounter risk used more pesticides to avoid possible pest attack. The farmers, who had more economic motivation and more profit risk avoidance tendency, used more pesticide to protect their crop from potential pest attack and to gain better profit from the market. In search of profit they did not think about the possible hazards of pesticide residue and toxicity and in spite of knowing about the adverse effect of uncontrolled pesticide application, they put the health of themselves as well as the health of the consumers at risk. The main cause of this was to gain more profit from the market from selling the pointed gourds they cultivated. Tijani, et al. (2007), identified economic motivation as the driving force behind farmer's pesticide using decision.

Cauliflower growers

Table 3. Coefficient of Correlation (r): Level of pesticide consumption of the cauliflower growers (Y) Vs 11 Causal Variables (X_1-X_{11}) (N=69)

Sl. No.	Independent Variables	'r' Value	Remarks
1	Education (X_1)	-.144	
2	Land holding (X_2)	.069	
3	Time of cultivation (X_3)	.605	**
4	Achievement motivation (X_4)	-.037	
5	Knowledge about pesticides (X_5)	.240	*
6	Economic motivation (X_6)	.827	**
7	Attitude towards plant protection (X_7)	.014	
8	Risk orientation (X_8)	-.165	
9	Profit risk avoidance (X_9)	.809	**
10	Utilization of commercial source of information (X_{10})	.007	
11	Utilization of non-commercial source of information (X_{11})	-.090	

**Correlation is significant at the 0.01 level, *Correlation is significant at the 0.05 level

Correlation between level of consumption of pesticides by cauliflower growers and independent variables: Table-3:revealed that level of pesticide consumption of cauliflower growers was significantly and positively correlated at 0.01 level with time of cultivation, economic motivation and profit risk avoidance and was positively correlated at 0.05 level with knowledge of pesticides. Level of pesticide consumption has significant relationship with time of cultivation, economic motivation, profit risk avoidance and knowledge about pesticides. So, the null hypothesis regarding these four variables is rejected. Level of consumption of pesticides was not significantly correlated with other seven independent variables. There was no significant correlation between level of pesticide consumption and education, land holding, achievement motivation, attitude towards plant protection, risk orientation, utilization of commercial sources of information and non-commercial sources of information. So, the null hypothesis depicting these variables is accepted. Cauliflower crop was mostly cultivated in the rabi season. Infestation of pests and diseases remained low in rabi months and use of pesticides also remained low in this season. But cauliflower grown in kharif season faced more pest and disease problems and respondents had to use more pesticide to avoid damage. Cauliflower is a high value crop and its price depends on the appearance of the curd. A pest and disease free curd attracts the buyers and farmers try to save their crop and keep it attractive in order to get good price of their product. So, the farmers with high economic motivation did not hesitate to use more pesticide in their crop to gain a good profit in the market. Due to this they used more pesticides in cauliflower. The results shows that the urge to get maximum profit made them avoid the risk of pesticide toxicity and health hazards.

REFERENCES

Basu, D. (1994) Farmer's Decision Making Process in Purchasing Pesticides. Ph.D. Thesis (unpublished), Department of Agricultural Extension, BCKV, Nadia.

Muthuraman P. ; Kumar S. A. (2013) Crop growth stagewise IPM practices in rice. Kisan World.;40(4):57.

Sardana H.R. (2001) Integrated pest management in vegetables. Training manual-2, Training on IPM for Zonal Agricultural Research Stations. 2001 May 21:105.

Tijani A. A. ; Osotimehin K.O. (2007) Economics of pesticides use among maize farmers in Edo State, Nigeria. Research Journal of Agricultural Biological Sciences; 3(3):129-32.

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