Original Research Article

Awareness of safe plant protection measures among vegetable growers in Prayagraj district of Uttar Pradesh

Abstract: The vegetable farmers are generally less aware about the identification of pest and diseases, dose of pesticides, time of application and their side effects on their health. Therefore, it was believed that study would be a great help in measuring the level of perception of safe plant protection measures among the vegetable farmers. The study was conducted in Prayagraj District of Uttar Pradesh to measure the awareness of safe plant protection measures among the vegetable growers in Prayagraj district of Uttar Pradesh. A total number of 120 respondents were selected randomly from ten villages under Chaka block because productivity, production and area under vegetable cultivation were found to be maximum. The data were collected by personnel interview method by using pre structured interview schedule and descriptive research design was used for this study. The findings of the study revealed that 47.50 per cent of the respondents belonged to the middle- aged group, majority of the respondents (55.84%) belong to the OBC caste and majority of the respondents belongs to medium level of annual income i.e. 50,000 – 1 lakh. The findings also revealed that 49.16 per cent of the respondents had medium level of awareness towards safe plant protection measures followed by 23.34% and 27.50% of the respondents with low and high levels of awareness respectively**.** It was found that independent variables like age, caste, economic motivation were positively and significantly correlated with awareness of safe plant protection measures. It is suggested that government should organized awareness camps, campaigns and demonstrations about safe plant protection measures.

Keywords: Awareness, safe plant protection, vegetable growers

Introduction

India is blessed with diverse agro-climates zones with distinct seasons, making it possible to grow wide range of vegetables. Vegetables are good sources of nutrients, dietary fiber, phytochemicals and vitamins. Vegetables with shorter duration, higher productivity have resulted in greater economic returns to farmers. Vegetables are reported to be rich sources of carbohydrates, proteins, vitamin A, Vitamin B, Vitamin C and minerals. It can be grown throughout the year in different seasons.

India is the second largest producer of vegetables next to China in the world. In India contributes 14% of the total world production of vegetables. West Bengal, Uttar Pradesh and Madhya Pradesh are the leading vegetables producers contributing nearly 40% to the total production of in the country, among which West Bengal contributes about 16% followed by Uttar Pradesh with 14% of total production of vegetables. Furthermore, Madhya Pradesh contributing about 8.6%, Bihar with 8.75%, Gujarat with 7%, Odisha with a 6%, Karnataka with 5%, Tamil Nadu and others with a 3.4% contribution in total production.**(**Sources: State Directorates of Horticulture, 2021).

The farmers of India, who lack a technical understanding of pesticides, their uses, and safety aspects, are vulnerable to misguidance, which increases the chance of unnecessary and inappropriate use of pesticides. The ever-increasing population of India also puts constant pressure on agriculture to improve productivity. The misuse of pesticides in such a scenario is very likely. The harmful effects of pesticides are now established worldwide. Farmers and agricultural labourers are the direct users of pesticides and are more likely to be affected by the acute toxicity of pesticides. However, around 550 crops grown in India do not have label claims to all these pesticides. (http://cibrc.nic.in/).

The residue problem in food products is mainly due to the persistent use of pesticides as well as their injudicious use. Following “Good Agricultural Practices” is an option that implies a thorough understanding of the use of various pesticides in an effective and eco-friendly way. During the last five years, the incidence of pesticide residues in various commodities has increased from 1.2 to 2.6%. (Koli and Bhardwaj, 2018).

Although, the unsafe and indiscriminate use of pesticides in agriculture represents a major hazard to the human and environment, changes in legislation, integrated pest management (IPM) and genetically modified crops are upto now not serving the reduction of pesticides use. However, population growth, pesticides resistance and economic factors strongly suggest the continued use of pesticides. By their nature, many pesticides may pose some risk to humans, animals, and the environment. Dermal absorption occurs through direct skin contact with pesticides or from clothing and tools that are contaminated with pesticide residues. Dermal exposure and ingestion may also be relevant for systematic inflammation or sensitization after high level exposures to pesticide at the workplace. The physiochemical properties of the particular pesticide, temperature, humidity, weather conditions, personal hygiene (*e.g.* hand and face washing), and use of personal protective equipment are all factors associated with pesticide exposures.

Research Methodology

Descriptive research design was adopted for the study as it describes the characteristics or phenomena that are being studied. The present study was conducted in Prayagraj district of Uttar Pradesh. Out of 20 blocks in Prayagraj district, Chaka block is selected purposively based on maximum area covered under vegetable cultivation. From the selected block, ten villages were selected purposively based on the maximum area covered under vegetable cultivation. The information was elicited from the respondents with the help of structured interview schedule. Pen, pencil, camera was also use during the data collection. The Primary data was collected with the help of personal interview technique with the help of interview schedule with especially objectives, focused study. Secondary data was collected from library, journals, books, papers, and other materials related to study. The entire data were transformed into score for tabulation. To interpret the results and to show the relationship between independent variable and dependent variables, Mean, Frequency, percentage ,correlation coefficient was followed.

Objectives of the Study:

1- To assess the socio-economic profile of the respondents.

2- To determine the extent of awareness of safe plant protection measures.

Results and Discussion

Table no. 1 .Socio-economic profile of the respondents

S. No	Independent variables	Category	Frequency	Percentage
1.	Age	Young age (Upto 35 years)	22	18.34
		Middle age (36-55 years)	57	47.50
		Old age (above 55 years)	41	34.16
2.	Caste	General	21	17.50
		OBC	67	55.84
		SC & ST	32	26.66
3	Educational qualification	Illiterate	16	13.33
		Primary school	34	28.33
		Junior Higher Secondary	31	25.83
		Higher Secondary	20	16.66
		Intermediate	11	9.16
		Graduate above	8	6.69
4	Annual income	Low (below 50,000)	36	30.00
		Medium (50,000-1lakh)	68	56.66
		High (above 1 lakh)	16	13.34
5	Type of house	Hut (Kuchha)	35	29.16
		Semi cemented	66	55.00
		Cemented	19	15.84
6	Land holding	Marginal (up to 1 ha)	22	18.34
		Small + medium (1.01 to 2 ha)	54	45.00
		Large (Above to 4 ha)	44	36.66
7	Family size	Small	47	36.16
		Medium	57	47.50
		High	16	13.34

8	Family type	Nuclear family	107	89.16
		Joint family	13	10.84
9	Mass media exposure	Low	39	32.50
		Medium	58	48.33
		High	23	19.17
10	Scientific orientation	Low	50	41.66
		Medium	58	48.34
		High	12	10.00
11	Economic motivation	Low	32	26.67
		Medium	54	45.00
		High	34	45.00
12	Extension contacts	Low	35	29.16
		Medium	46	38.34
		High	39	32.50

From the table 1, it is shown that 47.50 per cent of the respondents belonged to the middle age- group. Majority of the respondents (55.84%) belong to OBC caste and 28.33 per cent of the respondents had primary level of education. In terms of annual income, 56.66 per cent of the respondents had medium level of income in which 45 per cent had land holding of 1 ha to 2 ha. It is evident that majority of the respondents (89.16 %) lived in nuclear family. It is also evident that 48.33 per cent of the respondents possessed a medium level of mass media exposure. It is seen that in terms of scientific orientation, 48.34 per cent of the respondents possessed medium level of scientific orientation and 45.00 per cent of the respondents had medium level of economic motivation. Lastly 38.34 per cent of the respondents had medium level of extension contacts. Similar findings were also reported by (Singh *et al.* 2012).

Thus, it may be concluded that the backward caste was found dominantly engaged in vegetable production in the area of study. The similar findings were also reported by Mishra and Ghadei (2015). The average size of family was observed to be 6 members with minimum and maximum in the range of 03 to 15 numbers of family members. It might be due to dominant nuclear family system existence in the study area. The similar findings were also reported by Maurya *et al.*(2017). The small and marginal farmers were mostly there in the study area. It might be due to fragmentation of the family. It may be said that the educational standard of the respondents was considerably good in comparison to average literacy rate of the state and country as such. The similar findings were also reported by Singh *et al.* (2012).

Table no 2 Distribution of respondents based on awareness about safe plant protection measures

SL NO	PARTICULARS	Evaluation		
		Fully aware F (%)	**Partially aware F (%)**	**Not aware F (%)**
1	Familiar with the term safe plant protection.	22(18.34%)	65(54.16%)	33(27.50%)
2	Identification of the insects/diseases.	20(16.67%)	55(45.83%)	45(37.50%)
3	Name of 03 mostly use pesticides and insecticides.	27(22.50%)	61(50.84%)	32(26.66%)
4	Preparation of solution of pesticides (With proper recommended dose)	42(35.00%)	68(56.66%)	10(8.34%)
5	Better safe plant protection methods (Chemical method, biological method, mechanical method, cultural method)	31(25.84%)	59(49.16%)	30(25.00%)
	Pesticide residual found after use			
6	Plants	34(28.33%)	68(56.67%)	18(15%)
7	Soil	26(21.67%)	57(47.5%)	37(30.83%)
8	Clothes	33(27.50%)	59(49.17%)	28(28.33%)

9	Work Equipment's	42(35.00%)	63(52.50%)	15(12.50%)
10	Vegetables	28(23.33%)	47(39.17%)	45(37.50%)
11	Irrigation Water	18(15.00%)	46(38.34%)	74(61.66%)
	Storage of pesticide			
12	Inside the house	38(31.67%)	55(45.83%)	27(22.50%)
13	Under lock and key	29(24.17%)	61(50.83%)	30(25.00%)
14	In the field	32(26.66%)	58(48.34%)	30(25.00%)
15	Tools storage shade	41(34.17%)	63(52.50%)	16(13.33%)
16	Near the irrigation channel /source	27(22.30%)	67(55.83%)	26(21.67%)
17	Any other	23(19.17%)	70(58.33%)	27(22.50%)
	Dispose of empty pesticide containers			
18	Burning	33(27.50%)	54(45.00%)	33(27.50%)
19	Burying	31(25.83%)	46(38.33%)	43(35.84%)
20	Washing and reusing at home	26(21.67%)	53(44.17%)	41(34.16%)
21	Reuse for storage of other pesticides	40(33.34%)	63(52.50%)	17(14.16%)
22	Throw outside	45(37.50%)	66(55.00%)	9 (7.30%)

The above table, Table 2 shows that a majority of the respondents (54.16%) were partially aware about term safe plant protection measures, 37.50 per cent of the respondents were not aware about identification of insects and diseases. About 50.84 per cent of the respondents were partially aware about preparation of solution with proper recommended dose and a majority of the respondents (56.67%) were partially aware about pesticide residual found in plants after use. About 49.17 per cent respondents were partially aware about pesticide residual found in clothes after use; also 39.17 per cent of the respondents were partially aware about pesticide residual found in vegetables after use. About 45.83 per cent of the respondents were partially aware about storage of pesticides inside house and a majority of the respondents (50.83%) were partially aware about pesticide should be stored under lock and key. About 45 per cent were partially aware about dispose of empty pesticide container by burning. (Similar findings were also reported by (Suman 2013)

The level of awareness regarding the safe plant protection measures is vital for providing sound educational and policy strategies. The majority of farmers in this study was well aware of the harmful effects of pesticides with regard to the environment and human health. This suggests that even though farmers may know the hazards of pesticides very well and they may often adopt risky behaviors because of lack of education consequently week knowledge and understanding of safe practices in pesticide use. Hence, the farmers seem more concerned with high economic returns from their crops than with their own health.

This study showed some worrying practices about storage of pesticides. This demonstrates the farmers' lack of awareness of pesticides and the appropriate approach for storing pesticides. Storing pesticides in living areas can increase cancer, especially when these areas/places and where farmers prepare food, eat, and sleep. Farmers also stored pesticides in animal housing that could pose a danger to farm animals.

The farmers generally demonstrated a poor awareness/knowledge about pesticide disposal. These poor pesticide handling practices can lead to harmful residues in harvested produce, soil and water contamination, posing a threat to both human and environmental health.in animal housing that could pose a danger to farm animals.

Table no 3 Awareness level of the respondents about safe plant protection measures.

Sl. No.	Awareness	Frequency	Percentage
1	Low (25-38)	28	23.34
2	Medium (39-51)	59	49.16
3	High (52-64)	33	27.50
Total		120	100.00

The above **Table no 3** reveals that 49.16 per cent of respondent had medium level of overall awareness about safe plant protection measures. Considerable percentages of vegetable farmers were found having high (27.50 %) and low level of awareness (23.34%), respectively. The similar findings were also reported by Suman (2013).

Figure 1: Awareness level of the respondents about safe plant protection measures.

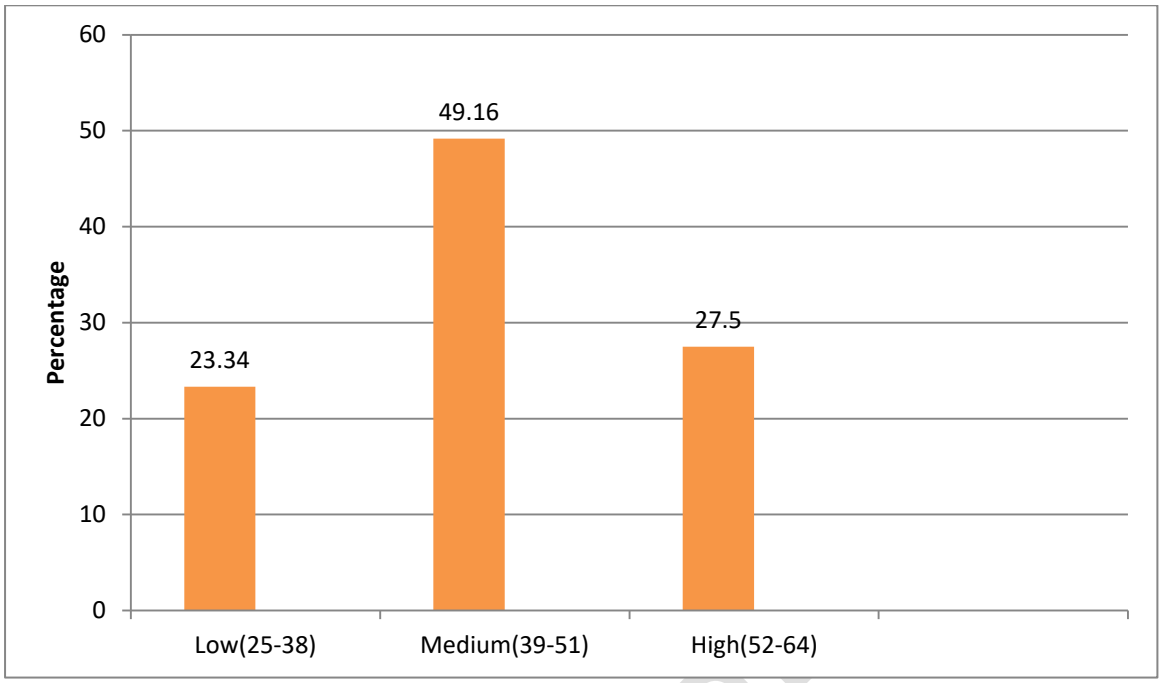

Table no 4 .Association between selected independent variables with awareness

S.No.	Variables	Correlation coefficient (r)
1	Age	0.912*
2	Caste	0.745*
3	Educational qualification	0.781*
4	Annual income	0.857*
5	Type of house	0.881*
6	Land holding	0.833*
7	Family size	0.572*
8	Family type	-0.533*
9	Mass media exposure	0.811*
10	Scientific orientation	0.511*
11	Economic motivation	0.997*
12	Extension contacts	0.977*

*= Significant

It was concluded that the independent variables i.e. Age, caste, educational qualification, annual income, type of house, land holding, family size, mass media exposure, scientific orientation, economic motivation, extension contacts, were positively and significantly correlated with the awareness of vegetable growers towards safe plant protection measures (table 4). Whereas the variable family type availed was negatively and significantly correlated with the awareness of vegetable growers towards safe plant protection measures respectively.

CONCLUSION:

It is concluded that majority of the respondents belonged to middle-aged group, having educationup to primary level, having medium level annual income. Further, backward caste farmers were dominantly engaged in vegetable enterprises belonging to nuclear family system with land holding of more than 1 to 2 hectares. Majority of the respondents had medium levels of mass media exposure, extension contact and scientific orientation .It was found that most of the respondents had medium level of awareness about the safe plant protection measures. It was found that independent variables like age, caste, economic motivation were positively and significantly correlated with awareness of safe plant protection measures. It is suggested that government should provide regular training and demonstration about side effects of pesticides and organized awareness camps, campaigns and demonstrations about safe plant protection measures. Farmers must follow the instruction given on labels of the package/container then use.

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