



ISSN (E): 2277-7695  
ISSN (P): 2349-8242  
NAAS Rating: 5.23  
TPI 2023; SP-12(10): 84-87  
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Received: 09-07-2023

Accepted: 14-08-2023

#### Kanchan Devi

Ph.D. Research Scholar,  
Department of Home Science  
Extension Education &  
Communication Management,  
C.S. Azad University of  
Agriculture & Technology,  
Kanpur, Uttar Pradesh, India

#### Dr. HC Singh

Professor Agricultural  
Extension, Department of  
Agricultural Extension  
Education, C.S. Azad University  
of Agriculture & Technology,  
Kanpur, Uttar Pradesh, India

#### Dr. Sangeeta Gupta

Department of Home Science  
Extension Education &  
Communication Management,  
C.S. Azad University of  
Agriculture & Technology,  
Kanpur, Uttar Pradesh, India

#### Corresponding Author:

#### Kanchan Devi

Ph.D. Research Scholar,  
Department of Home Science  
Extension Education &  
Communication Management,  
C.S. Azad University of  
Agriculture & Technology,  
Kanpur, Uttar Pradesh, India

## Study on opinion of farmers about minimizing the harmful effects of pesticides

**Kanchan Devi, Dr. HC Singh and Dr. Sangeeta Gupta**

#### Abstract

The Present study entitled “study on Knowledge and Opinion of Farmers regarding Pesticides’ use in Agriculture and its effects on Human health in Fatehpur district (U.P)” was undertaken in the year 2022-2023 with objective to measure the study on in Ashothar and Bahua blocks of Fatehpur, From each block six villages were selected randomly 25 farmers were selected from two blocks twelve villages randomly. A total number of 300 farmers were selected. Out of total farmers 39.0 percent of farmers belonged to 30-40 years age group, 36.0 percent of farmers were educated up to primary level and 42.7 percent of farmers whose, maximum annual income was up to Rs. 50, 000 to 1, 00,000. The Opinion of maximum farmers about minimizing the pesticides use were that crop rotation reduces the use of pesticides; trap crops diminish the use of pesticides, resistant varieties of crop can reduce the use of pesticides and minimize the use of pesticides.

**Keywords:** Farmers, knowledge, opinion, health effects, pesticides

#### Introduction

Pesticide pollution has affected worldwide environmental health by contaminating soil, water, and air, exposing humans and animals to dangerous toxins. Chemical-based pesticides are dangerous not only to farmers but also to consumers. Farmers indiscriminately apply pesticides, putting their health at risk. Pesticides used in agricultural regions are released into the environment and come into touch with humans, either directly or indirectly.

Pesticides are chemicals that are used on plants, soil, and water to control pests and illnesses. These chemicals include insecticides, herbicides, fungicides, nematicides, and others. The use of pesticides to prevent pre harvest and post-harvest losses has assumed a greater significance during the last two decades in an attempt to provide sufficient nutritive food for the ever growing world population, the use of synthetic pesticides in agriculture has increased rapidly during last four decades (2,353 Mt to 90,586 MT) and has over showed the traditional method of crop damages due to insects, pests, diseases and weeds. Though pesticide use in said to have contributed significantly to the food security by the way of increase in crop production and reduction of post-harvest losses, there is growing concern over the ill- effects of pesticide on human health, environment, natural resources and sustainability of agriculture production.

#### Research Methodology

To complete the above objective, by employing the appropriate research methodology, the study was conducted in district Fatehpur during the year 2022-2023. Two blocks were selected randomly Bahuwa and Ashothar in this study area. From these blocks twelve villages were selected. 25 respondents were selected randomly from each village. Thus, in all 300 farmers were selected randomly. Dependent variables, namely awareness, opinion, health effects, and constraints of farmers about pesticides use in agriculture and independent variables namely Age, gender, education, caste and religion, occupation, type of family, size of family, annual income etc. were undertaken The data so collected were subjected to analyses for which statistical tools, such as percentage, average, weighted mean, median rank, standard deviation, Variance, Cronbach’s alpha, Levene’s test and correlation coefficients were use.

#### Results and Discussion

The data revealed in table 1 shows that the 36.0 percent of farmers had only primary education followed by 27.0 percent of farmers who were educated up to high school. The 16.0 percent of farmers were intermediate whereas, 14 percent of farmers were found to be illiterate and only 7.0 percent farmers were educated up to graduation and above in the research study area.

**Table 1:** Distribution of farmers according to educational qualification.

Educational qualification	Frequency	Percent
Illiterate	42	14.0
Up to primary	108	36.0
Up to high school	81	27.0
Up to Intermediate	48	16.0
Graduate and above	21	7.0
Total	300	100.0

**Table 2:** Distribution of farmers according to annual income.

Annual Income (Rs.)	Frequency	Percent	Mean Income (Rs)	S.D. (Rs)
Up to Rs 50000/-	74	24.7	47730	3004
Rs 50000/- to Rs 100000/-	96	32.0	75432	15966
Rs 100000/- to 150000/-	93	31.0	134903	12428
Rs 150000/- and above	37	12.3	174184	30895
Total	300	100.0	99543	46841

Table 2 reveals that the 32.0 percent of farmers earned Rs. 50000 to 100000 annually with mean income Rs. 75432 and standard deviation Rs. 15966 followed by 31.0 percent of farmers who earned Rs. 100000 to 150000 annually with mean income Rs. 134903 and standard deviation Rs. 12428, 24.7 percent of farmers have earned annual income Rs. 50000

with mean income Rs. 47730 and standard deviation Rs. 3004 whereas only 12.3 percent of farmers earned annually Rs. 150000 and above with mean income 174184 and standard deviation 30895. The overall mean income of farmers was Rs. 99543 and standard deviation Rs. 46841. Agriculture is the major source of annual income in research study area.

**Table 3:** Distribution of farmers according to cultural practices. (n=300)

S. No.	Cultural practices	Symbol	Strongly agreed	Agreed	Undecided	Disagreed	Strongly disagreed	S.D.	Mean Score	Rank
1.	Proper irrigation and weeding in crop cultivation reduce the use of pesticides.	A	8.7	39.3	27.0	23.3	1.7	2.9	3.30	IV
2.	Crop rotation reduces the use of pesticides.	B	14.0	72.0	12.3	1.3	0.3	3.5	3.98	I
3.	Sufficient use of organic manure in crop cultivation diminishes the use of pesticides.	C	6.0	24.7	34.3	29.7	5.3	2.6	2.96	V
4.	Deep tillage in the summer reduces the need for pesticides.	D	11.7	63.0	15.0	9.7	0.7	3.3	3.75	II
5.	The use of pesticides is reduced if appropriate nutrients are provided to the soil.	E	6.3	48.7	34.7	10.0	0.3	3.1	3.51	III
6.	There is no need to use pesticides if the seedbed is properly prepared.	F	2.3	22.3	31.3	39.3	4.7	2.4	2.78	VI

The perusal of table 3 indicates that the 14.0 percent of farmers strongly agreed and 72.0 percent of farmers were agreed with crop rotation practices reduces the use of pesticides with mean score 3.98, S.D. 3.5 and rank I followed by 11.7 percent of farmers who strongly agreed and 63.0 percent of farmers agreed with doing deep tillage in the summer season reduces the need of pesticides with mean score 3.75, S.D. 3.3 and rank II. While 6.3 percent of farmers were strongly agreed and 48.7 percent of farmers agreed with the use of pesticides is reduced if the appropriate nutrients are provided to the soil with mean score 3.51, S.D. 3.1 and

rank III, 8.7 percent farmers were strongly agreed and 39.3 of farmers were agreed that proper irrigation and weeding practices in crop cultivation reduces the use of pesticides with mean score 3.30, S.D.2.9 and rank IV 6.0 percent farmers who strongly agreed and 24.7 percent who agreed about sufficient use of organic manure in crop cultivation diminishes the use of pesticides with mean score 2.96, S.D. 2.6 and rank V and 2.3 percent farmers who strongly agreed and 22.3 percent of in the were agreed with there is no need to use pesticides if the seedbed is properly prepared in the initial stage with mean score 2.78, S.D. 2.4 and rank VI.

**Table 4:** Distribution of farmers according to mechanical practices. (n=300)

S. No.	Mechanical practices	Symbol	Strongly agreed	Agreed	Undecided	Disagreed	Strongly disagreed	S.D.	Mean Score	Rank
1.	Yellow sticky trap in crop cultivation minimizes the use of pesticides.	A	10.3	30.7	34.3	23.3	1.3	2.9	3.25	III
2.	Collection and destruction of pest affected plants from the field decreases the use of pesticides.	B	3.3	42.0	25.3	27.7	1.7	2.8	3.18	V
3.	Trap crops diminish the use of pesticides.	C	6.3	47.3	38.7	7.3	0.3	3.1	3.52	II
4.	Pheromone trap reduces the use of pesticides.	D	3.3	58.7	29.0	8.7	0.3	3.1	3.56	I
5.	Picking the beetles and caterpillars from the field by hand and soaking them in kerosene oil, decreases the use of pesticides.	E	3.0	28.0	33.0	33.3	2.7	2.6	2.95	VI
6.	Collection and destruction of pest affected fruit and vegetable parts lessen the use of pesticides.	F	4.3	42.7	23.7	26.7	2.7	2.8	3.19	IV

The data presented in the table 4 indicates the that, 3.3 percent farmers were strongly agreed and 58.7 percent of

farmers were agreed with the use of pheromone trap reduces the use of pesticides with mean score 3.56, S.D. 3.1 and rank

I. followed by 6.3 percent farmers strongly agreed and 47.3 percent farmers who were agreed with use of trap crops diminish the use of pesticides in the with mean score 3.52, S.D. 3.1 and rank II., whereas, 10.3 percent farmers were strongly agreed and 30.7 percent of farmers were agreed with mechanical practices as yellow sticky trap in crop of cultivation minimize the use of pesticides with mean score 3.25, S.D. 2.9 and rank III. Further 4.0 percent respondents strongly agreed and 42.7 percent were agreed about collection and destruction of pest affected fruit and vegetable parts in which the minimum use of pesticides with mean score 3.19,

S.D. 2.8 and rank IV followed by 3.3 percent farmers who were strongly agreed and 42.0 percent agreed about collection and destruction of pest affected plants from the field decreases the use of pesticides with mean score 3.18, S.D. 2.8 and rank V and 3.0 percent farmers who were strongly agreed and 28.0 percent of farmers agreed with picking the beetles and caterpillars from the field by hand and soaking them in kerosene oil, that practices decreases the use of pesticides in the field with mean score 2.95, S.D. 2.6 and rank VI in the research study area.

**Table 5:** Distribution of farmers according to genetically practices. (n=300)

S. No.	Genetically practices	Symbol	Strongly agree	Agree	Undecided	Disagree	Strongly disagreed	S.D.	Mean Score	Rank
1.	Genetically modified seed can reduce the use of pesticides.	A	10.0	26.0	54.7	9.3	0.0	2.9	3.37	IV
2.	Resistant varieties of crop can reduce the use of pesticides.	B	6.7	62.0	28.0	2.7	0.7	3.2	3.71	I
3.	Tolerant varieties of crops can lessen the use of pesticides.	C	6.3	48.0	38.7	6.7	0.3	3.1	3.53	II
4.	If we do not use pest attractive varieties in crops then it decreases the use of pesticides.	D	3.7	25.0	21.7	42.7	7.0	2.4	2.76	V
5.	Transgenic technology aids in reducing the use of pesticides, agricultural production expenses, and agricultural diseases and pests.	E	3.3	42.7	52.7	1.0	0.3	3.0	3.48	III

Table 5 indicates the opinion of farmers about minimizing the harmful effects of pesticides in genetically practices, 6.7 percent farmers were strongly agreed and 62.0 percent farmers were agreed that genetically modified seeds can reduce the use of pesticides in the with mean score 3.71, S.D. 3.2 and rank I., followed by 6.3 percent farmers who were strongly agreed and 48.0 percent farmers who agreed that tolerant varieties of crops that can lessen the use of pesticides with mean score 3.53, S.D. 3.1 and rank II, 3.3 percent of farmers were strongly agreed and 42.7 percent of farmers

were agreed with transgenic technology aids in reducing the use of pesticides, agricultural production expenses, and agricultural diseases and pests with mean score 3.48, S.D. and rank III, 10.0 percent farmers who were strongly agreed and 26.0 percent agreed that genetically modified seeds can reduce the use of pesticides in the field with mean score 3.37, S.D. 2.9 and rank IV and 3.7 percent strongly agreed and 25.0 percent were agreed about that do not use of pest attractive varieties in a crops in the field with mean score 2.76, S.D. 2.4 and rank V in the research study area.

**Table 6:** Distribution of farmers according to biological practices. (n=300)

S. No.	Biological practices	Symbol	Strongly agree	Agree	Undecided	Disagree	Strongly disagreed	S.D.	Mean Score	Rank
1.	TRICO CARD can diminish the use of pesticides.	A	5.3	36.3	38.7	19.0	0.7	2.9	3.27	III
2.	Botanical practices can minimize the use of pesticides.	B	13.7	46.7	35.0	3.7	1.0	3.2	3.68	I
3.	Parasitoids can reduce the use of pesticides.	C	2.7	30.3	42.3	23.7	1.0	2.7	3.10	IV
4.	Bio-herbicides/insecticides can lessen the use of pesticides.	D	7.0	51.7	36.3	5.0	0.0	3.1	3.61	II
5.	Predators can reduce the use of pesticides.	E	2.3	19.7	51.3	26.0	0.7	2.5	2.97	V

Table 6 indicates the opinion of farmers about minimizing the harmful effects of pesticides in biological practices that 13.7 percent farmers were strongly agreed and 46.7 percent of agreed about the botanical practices can minimize the use of pesticides in the pesticides. with mean score 3.68, S.D. 3.2 and rank I followed by 7.0 percent of farmers strongly agreed and 51.7 percent farmers who were agreed that Bio-herbicides/insecticides can minimize the use of pesticides with mean score 3.61, S.D. 3.1 and rank II., while 5.3 percent farmers were strongly agreed and 36.3 percent of agreed with TRICO CARD that was diminish the use of pesticides in the field with mean score 3.27, S.D. 2.9 and rank III, 2.7 percent farmers were strongly agreed and 30.3 percent of farmers were agreed with the parasitoids can reduce the use of pesticides with mean score 3.10, S.D. 2.7 and rank IV, 2.3 percent farmers who were strongly agreed and 19.7 percent were agreed that predators can reduce the use of pesticides in the field with mean score 2.97, S.D. 2.5 and rank V in the research study area.

‘Crop rotation reduces the use of pesticides related to culture practices. In case mechanical practices most important was Pheromone trap reduces the use of pesticides. In case genetically practices most important were resistant varieties of crop can reduce the use of pesticides. Among biological practices most important was botanical pesticides can minimize the use of pesticides. Therefore using four types of practices play very important role in reducing the use of pesticides in crops.

**Recommendations/Suggestions**

1. Government should support for extending financial support and subsidies with first aid and medical support.
2. Awareness programme should be increase among farmers regarding bio- pesticide, organic farming and natural farming etc.
3. The executions of different programmes / schemes are necessary for farmers by government and non-government organization.
4. The govt. should provide/facilitate important advice and guidance for the farmers and also other information related to effects of pesticides on human health.

**Conclusion**

The maximum number of farmers gave opinion about the four practices, the most important for reduce the pesticides use,

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