

Attitude of Vegetable Growers Towards Mitigating the Ill-effects of Agricultural Chemicals

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ABSTRACT

The study was conducted in Kolar district of Karnataka state during 2018-19 to ascertain the attitude of vegetable growers towards mitigating the ill-effects of agricultural chemicals. The data was collected from 120 vegetable growers in Kolar and Malur talukas through simple random sampling technique and pretested interview schedule. Out of the 14 independent variables chosen for the study, variables like education, risk orientation, extension participation, mass media exposure, and extension contact had positive and significant association with attitude. Other variables like age, family size, annual income, size of land holding had no significant association with their knowledge on the effects of agricultural chemicals. The co-efficient of determination (R^2) of the independent variables was 0.790 which means that 79.09 per cent of the total variation in the attitude level was explained by the 14 selected independent variables.

Keywords: Effects of agricultural chemicals, Knowledge, Vegetable growers

INTRODUCTION

Vegetables are a rich source of minerals and high in nutrition value and are being grown in almost all the states in the country under varied agro-climatic and soil conditions in plains as well as hilly regions. Every year in India 35-45 per cent of agricultural produce is lost due to pests and diseases besides post-harvest losses. Further the rising population and decreasing arable land is stressing greater demand for increasing food production. These conditions necessitate ensuring higher production by applying all available technological options including use of agricultural chemicals. In the recent past, efforts have been made to increase the production of vegetables by developing large number of high yielding, good quality and disease resistant varieties/hybrids and other required cultivation packages. These high yielding varieties/hybrids are more input responsive. Our ancestors had followed farming practices which were eco-friendly and used inputs available on the farm itself to grow the crops. Later,

use of agricultural chemicals as the major technological option to ensure crop productivity and even reducing post-harvest losses got impetus and it was considered as a boon for the sector.

The use of high yielding varieties (HYVs) has promoted the use of fertilizers and pesticides without paying attention to adequate dosage, proper application method and waiting times. However, the haphazard use of fertilizers and pesticides gradually leads to many dangerous environment and human impacts. Pesticides have been carelessly used which has led to the death of individuals, livestock, birds and other non-target organisms. Even with all these ill-effects it is inevitable to use agricultural chemicals to grow the crops to feed the growing population and therefore they can be called as necessary evil. Although there are lot of studies about the use of these chemicals and their adverse effects, little has been revealed about the understanding of farmers about the impact of these agricultural chemicals and their

attitude towards mitigating the adverse effects of agricultural chemicals. Therefore, a research study focused on understanding the attitude of vegetable growers on the effects of agricultural chemicals and find out the association between characteristics of vegetable growers with their knowledge on the effects of agricultural chemicals.

METHODOLOGY

The investigation was conducted during the year 2018-19 and an Ex-post facto research design was followed to ascertain the attitude of vegetable growers towards mitigating the ill-effects of agricultural chemicals. Kolar district was selected purposively owing to more area and production of vegetables in the State. Kolar district has five taluks, out of which Kolar and Malur taluks were purposively chosen for the study considering the larger area under vegetable crops in the district. Statistical tools like frequency, simple percentage, mean, standard deviation and chi-square test was used and the data was collected from the vegetable growers using the pretested interview schedule.

RESULTS AND DISCUSSION

The results presented in Table 1 revealed that, more than half of the respondents (52.50%) had highly favourable attitude towards mitigating the ill-effects of agricultural chemicals followed by less favourable (29.17%) and favourable attitude (18.33%) levels. This may be due to experience of the ill-effects of agricultural chemicals like skin and eye irritation by the farmers themselves during application of agricultural chemicals and the other reason may be is the concern of farmers towards protecting their soil, soil microorganisms, groundwater and surface water and the environment as a whole. On the other side 18.33 per cent of the respondents had favourable attitude towards mitigating

the ill-effects of agricultural chemicals. One of the main reasons may be is that they do not have sufficient knowledge regarding the ill-effects of agricultural chemicals. It is interesting to note that still more than one fourth of them (29.17%) had less favourable attitude towards mitigating the ill-effects of agricultural chemicals. One of the major reasons may be that the use of agricultural chemicals has become inevitable option for controlling pests and obtaining economic benefits. Other reason may be due to no direct visualization of the ill-effects or their inability to recognize the adverse consequences of agricultural chemicals on soil, water, humans and environment as a whole due to no exposure to scientific background, training on mitigation measures and practices, non-availability of personal protective equipment's in the locality etc.

Statement wise attitude of vegetable growers towards mitigating the ill-effects of agricultural chemicals

Statement wise attitude of respondents in Table 1 revealed that nearly half of the respondents. (47.00%) strongly agreed that one should mandatorily wash the fruits and vegetables thoroughly before consumption to remove the chemical residues which would affect the health. More than two-third of the respondents (69.16%) agreed that every farmer should ensure that the pesticide container is always tightly closed to avoid leakage or spillage during transportation and storage. It was found that sixty per cent of the respondents were undecided whether to apply agricultural chemicals in the opposite direction or along the direction of wind. Slightly more than half of the respondents (51.66%) disagreed that one should always use protective gloves to mix/stir the agricultural chemicals. More than one third of the vegetable growers (35.83%) strongly disagreed that one should choose only a calm day for better application of agricultural chemicals to avoid any drift.

Table 1: Overall attitude of vegetable growers towards mitigating the ill-effects of agricultural chemicals (n=120)

Category	Criteria	Frequency	Percentage
Less favourable	Less than (Mean-0.5 SD)	35	29.17
Favourable	In between (mean \pm 0.5 SD)	22	18.33
Highly favourable	More than (mean + 0.5 SD)	63	52.50

Mean=50.72, SD=2.04

Table 2: Statement wise vegetable growers' attitude towards mitigating the ill-effects of agricultural chemicals

S. No.	Statements	Level of agreement (%)					Score	Rank
		SA	A	UD	D	SD		
1	Farmers' should always use only scientists' recommended chemicals for controlling pests	19.16	47.50	0.00	22.50	10.83	368	4
2	Should apply only scientifically recommended dosage of agricultural chemicals to prevent any ill-effects	22.50	52.50	0.00	25.00	0.00	370	2
3	Farmer should ensure that the pesticide container is always tightly closed to avoid leakage or spillage during transportation and storage	30.83	69.16	0.00	0.00	0.00	367	5
4	Should ensure that the equipment used for spraying agricultural chemicals is perfect in working order and calibrate every time before using them	18.33	35.83	13.33	7.5	25.00	366	6
5	One must cover the economic and edible parts of the plant before applying agricultural chemicals	5.83	26.66	5.83	27.50	34.16	146	19
6	One should never use his mouth to siphon the chemical from the container	35.00	54.16	10.83	0.00	0.00	372	01
7	One should always handle the agricultural chemicals container safely without any physical damage	27.50	60.00	12.50	0.00	0.00	369	03
8	One should always use protective gloves to mix/stir the agricultural chemicals	2.50	6.60	3.3	51.66	36.66	139	20
9	One should choose only a calm day for better application of agricultural chemicals to avoid any drift	1.66	5.83	9.16	47.50	35.83	135	22
10	One should always apply agricultural chemicals in the opposite direction of wind	2.50	10	60.00	19.16	8.33	327	12
11	One should apply agricultural chemicals during dawn and dusk as honeybees are inactive at that time	5.00	22.50	44.16	24.16	4.16	365	8
12	One should not smoke or eat anything during application of agricultural chemicals	27.50	47.50	8.33	10.83	5.83	366	6
13	One must take bath with soap and clean water after the application of agricultural chemicals	25.00	52.50	5.83	9.16	7.5	365	8
14	One should compulsorily follow the waiting period for harvesting to avoid residues of agricultural chemicals in produce	2.50	13.33	39.16	30.83	14.16	156	17
15	One should dump the empty pesticide bottle into water body as a best disposal method	15.83	22.50	40.00	14.16	7.50	331	11
16	One should ensure decontamination of agricultural chemical container before burying it in the wasteland	5.83	15.83	47.50	19.16	11.66	246	14
17	One should always puncture empty agricultural chemicals container and never use for domestic purpose	3.33	12.50	50.00	25.00	9.16	166	16
18	One should burn the empty agricultural chemicals container as a safe disposal practice	19.16	30.83	9.16	26.66	14.16	173	15
19	One should not use simple eye drops to address the eyes affected during spraying of agricultural chemicals but consult the doctor immediately	14.16	22.50	24.16	30.00	9.16	148	18
20	Vomiting should be induced immediately by administering two table spoon of salt in a glass of water to a person who has consumed agricultural chemicals as a right first aid	11.66	17.50	20.83	35.83	14.16	137	21
21	One should ensure to read out the instructions on the label before using agricultural chemicals	17.50	37.50	18.33	17.50	9.16	320	13
22	One should mandatorily wash the fruits and vegetables thoroughly before consumption to remove the chemical residues which would affect the health	39.16	52.50	0.00	5.83	2.5	355	10

Ranking of attitude statements based on score

The results presented in the Table 2 further indicate that the statements saying, 'one should never use his mouth to siphon the chemical from the container', and 'one should apply only scientifically recommended dosage of agricultural chemicals to prevent any ill-effects' was given the 1st and 2nd rank with the total scores of 372 and 370 respectively. This indicated that generally like others, vegetable growers are also aware of Dos and Don'ts with respect to use of agricultural chemicals. Not using mouth to siphon of the chemical is merely a common sense but still some of the farmers open the container through their mouth without knowing of its consequences and majority of the respondents agreed that only scientifically recommended dosage of agricultural chemicals has to be sprayed. It may be because they may have personally experienced the consequences of excessive application of agricultural chemicals or they might have got the advice of extension professional in this regard. Whereas statements like 'one should always use protective gloves to mix/stir the agricultural chemicals' and 'one should choose only a calm day for better application of agricultural chemicals to avoid any drift' were given the lower ranks of 20 and 22 with the total scores of 139 and 135 respectively. This indicated that farmers are still not serious about the adverse effects of agricultural chemicals. They are not ready to undertake safety measures because the effects of agricultural chemicals are not immediately visible or mostly hidden or affect in the long run. As a result of this, vegetable growers are unable to recognize the hidden ill-effects of these chemicals and hence do not show favourable attitude towards mitigating these ill-effects.

It is apparent from Table 3 that, the variables such as education, risk orientation, extension participation, mass media exposure, and extension contact had positive and significant association with attitude at one per cent level. Whereas, farming experience, cosmopolitaness, scientific orientation, innovative proneness and achievement motivation were found to have positive and significant association with attitude at five per cent level. Other variable such as age, family size, annual income, size of land holding, showed positive but non-significant association with attitude. This might be due to fact that,

Table 3: Association between independent variables with the attitude of vegetable growers towards mitigating the ill-effects of agricultural chemicals

Characteristics	Chi-square value	Contingency value
Age	1.69 ^{NS}	1.305
Education	10.16 ^{**}	3.201
Family size	2.60 ^{NS}	1.619
Annual income	3.11 ^{NS}	1.771
Land holding	0.99 ^{NS}	0.999
Farming experience	5.78 [*]	2.414
Scientific orientation	11.67 [*]	3.430
Risk orientation	10.01 ^{**}	3.177
Innovativeness	12.61 [*]	3.566
Achievement motivation	9.99 [*]	3.174
Cosmopolitaness	12.66 [*]	3.573
Mass media participation	15.11 ^{**}	3.903
Extension agency Contact	13.67 ^{**}	3.713
Extension participation	14.11 ^{**}	3.772

** = Significant at 1 per cent level; * = Significant at 5 per cent level; NS = Non-Significant

majority of the respondents (52.50%) showed more carefulness in handling, application and storage of agricultural chemicals. Their high level of extension contact (38.33%) would have helped them in acquiring ill-effects mitigation practices and their medium level of extension contact exposed them to the information regarding death of humans from pesticide consumption which made them to turn their attitude favourable in mitigating the ill-effects of agricultural chemicals. Age showed non-significant association with respect to attitude towards mitigating the ill-effects of agricultural chemicals, this may be due to the fact that almost one fifth of the respondents (19.17%) belonged to old age category who had no knowledge on the ill-effects of agricultural chemicals. The other reason may be is that they are feeble and no more interested in using on-farm resources effectively and efficiently, as a result of which they show less favourable attitude towards mitigating ill-effects of agricultural chemicals.

The above variables could be considered as good predictors of attitude of vegetable growers towards mitigating the ill-effects of agricultural chemicals.

Table 4: Extent of contribution of independent variables to the vegetable growers' knowledge on the effects of agricultural chemicals (N=120)

Characteristics	Regression co-efficient	Standard error of regression co-efficient	't' value
Age	0.41 ^{NS}	0.38	0.92
Education	0.11 ^{**}	0.36	3.27
Family size	0.51 ^{NS}	0.39	0.76
Annual income	0.42 ^{NS}	0.20	0.47
Land holding	0.41 ^{NS}	0.36	0.87
Farming experience	0.56 [*]	0.71	2.93
Scientific orientation	0.36 [*]	0.86	2.38
Risk orientation	0.42 [*]	0.89	2.11
Innovativeness	0.28 [*]	0.81	2.89
Achievement motivation	0.55 [*]	0.66	2.83
Cosmopolitaness	0.39 [*]	0.86	2.20
Mass media exposure	0.11 ^{**}	0.36	3.27
Extension agency contact	0.10 ^{**}	0.38	3.80
Extension participation	0.13 ^{**}	0.42	3.23

** = Significant at 1 per cent level; * = Significant at 5 per cent level; NS = Non-Significant

Whereas, co-efficient of determination (R^2) of the independent variables was 0.790. It means that 79.09 per cent of the total variation in the attitude level was explained by the 14 selected independent variables. It implied that there are other unidentified variables contributing to the variation not included in the present study (Table 4).

CONCLUSION

The results revealed that more than half of the respondents (52.50%) of the vegetable growers belonged to highly favourable attitude towards mitigating the ill-effects of agricultural chemicals whereas, 18.33 and 29.17 per cent of the respondents belonged to favourable and less favourable attitude levels respectively. Sixty per cent of the vegetable growers were undecided whether to spray agricultural chemicals in the opposite direction of wind or along the direction of wind, nearly half of the vegetable growers. (47.50%) agreed that farmers should always use only those chemicals that are recommended by scientists for controlling insects and pests, exactly (50.00%) of them were undecided that disposal of empty agricultural chemical container by puncturing and never using it for domestic purpose ensures safety, one fourth.

of the vegetable growers (25.00%) strongly disagreed that one should make sure that the equipment used for spraying agricultural chemicals is perfect in working order and calibrate every time before using them. The independent variables like education, risk orientation, extension participation, mass media exposure, and extension contact had positive and significant association with attitude at one per cent level. This is a research study of unique kind which tries to test the non-material aspects of vegetable growers. With the findings the government organizations such as Pollution Control Board and other environmental concerned departments may take lead to seriously implement integrated systems of pest control and nutrient application.

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