Knowledge of vegetable growers on the ill-effects of agricultural chemicals

Abstract

The present study was conducted in Kolar district of Karnataka state during 2018-19 to understand the knowledge level of vegetable growers on the effects of agricultural chemicals. The data was collected from 120 vegetable growing farmers in Kolar and Malur talukas by applying simple random sampling technique and pretested interview schedule. It was found that more than forty per cent of the vegetable growers (42.50 %) possessed medium level of knowledge on the effects of agricultural chemicals, more than three fourth of the vegetable growers (77.50 %) knew that taking bath using soap immediately after application of agricultural chemicals was a must, only 53.33 per cent of the vegetable growers knew that red colour on the agricultural chemical container indicated extremely toxic level, sixty per cent of the vegetable growers knew that usage of same fertilizer for a long time reduces soil fertility, nearly seventy per cent of the vegetable growers (69.17 %) knew about importance of puncturing the pesticide bottle to prevent its reuse and burying it in the waste land as a safe method of disposal. Out of the 14 independent variables chosen for the study it was found that education, farming experience and extension participation had significantly associated with the knowledge level of vegetable growers on the effects of agricultural chemicals at one per cent level of significance. Other variables like age, family size, annual income, size of land holding hardly associated with their knowledge on the effects of agricultural chemicals.

Key words: Knowledge, vegetable growers, effects of agricultural chemicals

Introduction

India is the second largest producer of vegetables in the world. 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 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 and a lot of Res. papers have been published on them, 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 was undertaken with the following objectives: To understand the knowledge of vegetable growers on the effects of agricultural chemicals and to study the association between profile characteristics of vegetable growers with their knowledge on the effects of agricultural chemicals.

Material and Methods

The investigation was conducted during the year 2018-19 and an Ex-post facto research design was followed to assess the knowledge of vegetable growers on the effects of agricultural chemicals. Kolar district was selected purposively owing to more area and production of vegetables in the State. Kolar district has five talukas, out of which Kolar and Malur talukas 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

1. **Overall knowledge of vegetable growers on the effects of agricultural chemicals**

The results presented in Table 1 revealed that, more than forty per cent of the respondents. (42.50 %) belonged to medium level of knowledge on the effects of agricultural chemicals, followed by low (31.67 %) and high (25.83 %) level.

Table 1: Overall knowledge of vegetable growers on the effects of agricultural chemicals

(n=120)

Category	Criteria	f	(%)
Knowledge	Low (< 9.24)	34	31.67
	Medium (9.24-12.37)	53	42.50
	High (> 12.37)	33	25.83
	Mean	16.19	
	SD	3.13	

2. **Item-wise knowledge of vegetable growers on the ill-effects of agricultural chemicals**

Results in the Table 2 showed that nearly one-fourth of the respondents. (24.38%) were having lower knowledge about the ill-effects of agricultural chemicals on humans and animals. This was because, the adverse effects of agricultural chemicals are not immediately observable, mostly hidden and affect in long run. Therefore, farmers are to be adequately exposed to this serious issue.

Table 2 also reveals that majority of the vegetable growers (59.58 %) had knowledge on the ill-effects of agricultural chemicals on soil fertility, soil microflora and plants and sixty per cent of them knew about the ill-effects on water bodies (60.00%). This may be due to the fact that, most of the farmers in the area approach the soil testing laboratories of horticulture department or KVK wherein the officials and scientists orient them towards importance of soil health conservation. Further farmers of Kolar district are known for judicious use of water. As a result of these, farmers could have gained higher knowledge about the ill effects on soil and water.

Table 2: Item-wise knowledge of vegetable growers on the ill-effects of agricultural chemicals

(n=120)

Sl. No	Knowledge items	Knowledge	
		Frequency	**Per cent**
A	**Knowledge about ill effects on human health**		
1	Poisoning from Agricultural chemicals causes- headache, nausea and vomiting	12	10
2	Agricultural chemicals enter human body through- inhalation, Contact with skin and eyes and ingestion	37	30.83
3	Long term exposure to agricultural chemicals results in- serious health issue	1	0.83
4	Agricultural chemicals effects in humans ranges from- simple skin irritation to death	67	55.83
	Average		24.38
B	**Knowledge about ill effects on soil and plants**		
5	Usage of same fertilizers for a long time- reduces soil fertility	72	60.00
6	Excessive dosage of agricultural chemicals are toxic to- soil microflora	64	53.33
7	Agricultural chemicals residues affect- ground and surface water and edible and economic parts of the plant	39	32.5
8	More than recommended level of application of agricultural chemicals- affects plant health	111	92.5
	Average		59.58
C	**Knowledge about ill effects on water bodies**		
9	Drifting of agricultural chemicals into water bodies- causes growth of unwanted plants, affects aquatic animals	72	60.00
D	**Knowledge about ill effects on non-target organisms**		
10	Exposure of farm animals to agricultural chemicals- affects farm animal health	29	24.17

11	Feeding farm animals with fodder Contaminated by agricultural chemicals- affects their digestive system	37	30.83
12	Application of agricultural chemicals during day time- causes death of honeybees and other natural predators	33	27.50
	Average		27.50
E	**Knowledge of respondents about pesticide labelling**		
13	Following information is given on the agricultural chemicals container- toxicity level, active ingredient, safe storage and usage etc.	36	30.00
14	Red colour on the agricultural chemicals container indicates- extremely toxic level	64	53.33
	Average		41.66
F	**Knowledge on preventing ill-effects of agricultural chemicals**		
15	Applying only recommended dosage of agricultural chemicals	66	55.00
16	Using personal protective equipments like mouth masks, hand gloves, boots etc.	55	45.83
17	Taking complete bath using soap immediately after application of agricultural chemicals	93	77.50
18	Puncture the pesticide bottle to prevent its reuse and burry in the waste land	83	69.17
	Average		61.87
G	**Other ill effects**		
19	Application of non-selective herbicide results in-eradication of desirable plants	84	70.00
20	Agricultural chemicals affect- crop pests, honeybees, earthworms and fishes	31	25.83
21	Increase in pest population even after spraying of agricultural chemicals is due to- destruction of natural enemies	65	54.17
22	Development of resistance by the pests is due to-indiscriminate use of agricultural chemicals	70	58.33
	Average		52.08

3. Item-wise knowledge of vegetable growers on the positive effects of agricultural chemicals

The average knowledge level of vegetable growers on the positive effects of agricultural chemicals presented in the Table 3 was 31.76 per cent. Sixty per cent of the vegetable growers acknowledged that that the economical way to eliminate weeds in the field is by use of herbicide chemicals.

This might be due to the favourable experience of use of agricultural chemicals in

the farm field. The vegetable growers had experiences of saving of time and labour cost by using the agricultural chemicals and also found that the use of herbicides reduced drudgery of manual weeding and use of storage chemicals prevented storage losses.

Table 3: Item-wise knowledge of vegetable growers' on the positive effects of agricultural chemicals

(n=120)

Sl. No.	Knowledge items	Frequency	Per cent
1	The use of herbicides to control the weeds has benefits like- saves time, saves labour cost, reduces drudgery of manual weeding	26	21.67
2	Protective clothing aids used during applying Agricultural chemicals includes- mask, gloves, boots and eyeglass	42	35.00
3	Best way to eliminate weed in the field is- use of herbicides	73	60.83
4	Use of Agricultural chemicals is better option for- Increasing yield, Enhancing fruit size, Enhancing flowering	62	51.67
5	Termites and wood-boring insects can be easily managed by- use of insecticides	38	31.67
6	Efficient way of eradicating parthenium - use of herbicides	41	34.17
7	To undertake eco-friendly farming one should opt for- Integrated farming	26	21.67
8	Best method to prevent seed borne pathogen- seed treatment with recommended chemical	36	30.00
9	Application of recommended dosage of fertilizer- helps in achieving potential yield of the crop	39	32.50
10	Seed dormancy in nursery is overcome by- breaking dormancy using recommended chemical	59	49.17
11	Pest and disease infections in pruned plantations can be easily managed by- Bordeaux mixture	40	33.33
12	Nutrient deficiency at flowering stage of crop can be managed by – application of foliar nutrients	19	15.83
13	Decomposition of crop residue is made easier with- application of composting culture	50	41.67
14	Female flower ratio can be increased through- applying auxins/ ethylene	27	22.5
15	To decrease the ph of alkaline soil- apply gypsum	43	35.83
16	Storage loss of farm produce can be economically managed through- use of storage chemicals	17	14.17

17	Rat menace In farm and home can be easily managed by- use of rodenticides	10	8.33
	Average		31.76

Conclusion

The results revealed that more than forty per cent of the respondents (42.50 %) of the vegetable growers belonged to medium level of knowledge on the effects of agricultural chemicals whereas, 31.67 and 25.83 per cent of the respondents belonged to low and high knowledge categories, respectively. Nearly one-fourth of the respondents (24.38%) were having lower knowledge about the ill-effects of agricultural chemicals on humans and animals, majority of the vegetable growers (59.58 %) had knowledge on the ill-effects of agricultural chemicals on soil fertility, soil microflora and plants and sixty per cent of the vegetable growers acknowledged that that the economical way to eliminate weeds in the field is by use of herbicide chemicals. The independent variables like education, farming experience, extension professional contact and extension participation were found to have significant association with the knowledge of vegetable growers at one per cent level of significance.

Application of research

This is a research study of unique kind which tries to test the non-material aspects of vegetable growers. The findings will be very useful for the government organizations such as Pollution Control Board and other environmental concerned departments. It is a timely study for the Department of Agriculture which is seriously implementing integrated systems of pest control and nutrient application and also thinking of organic farming. For many other environmentalists, it will be an eye opener regarding farmer's knowledge and attitude towards what they have been talking about and why they want to avoid use of agricultural chemicals in crop production. It helps the extension personnel in identifying areas for disseminating the information related to the ill-effects of agricultural chemicals and also develop training programmes for the farmers regarding safe usage, handling and application of agricultural chemicals.

Research category: Social Science category. Ex-Post facto research design. structured interview schedule was used for collection of data from the vegetable growers.

Study area: Kolar district of Karnataka, India, in which Kolar and Malur taluks were selected purposively to know the knowledge level of vegetable growers on the effects of agricultural chemicals.

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