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Knowledge of green chilli growers regarding the use of pesticides in Vidarbha region

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Abstract
The present research was undertaken on topic 'Perception of green chilli growers regarding environmental risk in use of pesticides in Vidarbha region of Maharashtra state' conducted purposively in two district viz, Amravati and Buldana as it considered as a progressive agricultural belt, best suited climate, soil, irrigation facilities, skill and intensive cultivation practices adopted by the green chilli farmers and maximum area under green chilli crop. Ex-post facto research design was used for the present research. Out of two districts, two talukas and 20 villages, 300 green chilli growers constitute the sample size. The findings of the research study revealed that large majority (63.33 %) of the green chilli growers had medium level of knowledge regarding different areas of pesticides, 19.33 of the green chilli growers had low level of knowledge regarding different areas of pesticides, followed by 17.34 per cent of green chilli growers had high level of knowledge regarding different areas of pesticides.

Keywords: Knowledge, pesticide application, green chilli

Introduction
With the growing demand for enhancing food grain production to feed more than 121 crore people at one end and increasing yield losses due to pest infestation on the other, the farmers of India till recently have been relying on pesticides and chemical fertilizers. It is estimated that about thirty percent of the potential of food production is lost due to insect pests, diseases, weeds, rodents and birds. In terms of money, it is estimated that every year crops worth Rs. 6000 crore are lost due to pests.

India, being a predominantly agricultural country, the foundation for the prosperity lies on agricultural production. Since, the task of feeding the large population, which is growing at phenomenal rate of 2.3 per year, is main problems of Indian agriculture to maintain per capita net availability of food grains which is admittedly inadequate. On the other hand there is huge loss of food grains due to damage caused by insect-pests, diseases and rodents. In India, the annual loss in food products by insect pests was estimated to the tune of 50 per cent amounting Rs. 90,000 crores. (Dureja & Gupta 2009).

In the light of this, it is evident that the yield of crop can be increased significantly by adopting integrated pest management approaches. Technologically, chemical control is still the most effective method of controlling most of the insect pests, diseases and weeds, despite intensive researches into alternative methods and is still remain the powerful tools for pest management in spite of recent popular pressure to control and limit their use (Smith and Pimentel, 1978).

Exposure to pesticides both occupationally and environmentally causes a range of human health problems. It is estimated that nearly 10,000 deaths annually due to use of chemical pesticide worldwide, with about three-fourths of these occurring in developing countries. Horrigan *et al*. (2006) [7].

Chilli is one of the most valuable crop of India. Pungency in chillies is due to the active constituent "Capsaicin", an alkaloid, is extracted from chillies and is used to medicine. The fruit is actually called 'Chilli' and is used as a spice in a variety of cuisines all over the world in different forms as green chilli, dried redchilli (Jagtap-2012).

But, now a day's farmer are using excessive amount of pesticides in a wrong manner with disproportionate dosage, which leads to higher cost of cultivation as well as ecological imbalance. Hence, reducing the hazards arising due to pesticides needs, immediate action to be taken by the environmentalists and all other concerned to mitigate the health hazards to the enormous human population.

In a country like India where farming is a family affair, the problem of reaching the target group gets further compounded. The farming family as a whole needs to be educated, then only the damages could be checked or at least minimized to a safe level. Only when they start to understand and appreciate the risks involved in the use of pesticides, then only changes can take place in the desired direction i.e. IPM.

Materials and Methods

Locale of the study

The present study was undertaken in purposively selected, Amravati and Buldana district of Vidarbha region of Maharashtra state. Total two talukas namely Morshi and Chikhali were purposively selected for this study. For this study, Ex-post-facto research design was applied. Thus, from two talukas and 20 villages' 300 green chilli growers constitute the sample size.

Selection of Respondents

The green chilli growers were selected from the list obtained from Taluka Agriculture Officer of Morshi and Chikhli taluka of Amravati and Buldana district. The farmers, who cultivated chilli crops for consecutive last three years, using pesticides and having minimum area 0.40 ha. under chilli cultivation, 15 green chilli growers were selected from each selected village randomly by lottery method of random sampling. Thus, from two talukas and 20 villages' 300 green chilli growers constitute the sample size. The whole sample was considered as respondents and they were interviewed for collection of data.

Measurement of knowledge about different areas of pesticides

Knowledge of the respondents about different areas of pesticide was measured with the help of teacher made test. The questions included in the test were of objective type in nature. They were numbered from 1 to 32. Each question was given the score of one for correct answer and zero for incorrect answer. The possible total score that a respondent could obtain would vary from 0 to 32. The knowledge index was calculated for each respondent with the help of below given formula.

$$\text{Knowledge Index} = \frac{\text{Actual obtained knowledge score}}{\text{Maximum obtainable knowledge score}} \times 100$$

Then green chilli growers were classified into three categories viz. low, medium, high respectively on the basis of mean ± standard deviation.

Results and Discussion

Knowledge regarding different areas of pesticides

In the present study knowledge refers to know how about different areas of pesticide by the green chilli growers. Adequate knowledge is essential to green chilli growers for the efficient and effective utilization of pesticide for profitable cultivation. It was therefore thought necessary to obtain information from the green chilli growers about the knowledge they possessed about different areas of pesticide.

Knowledge of the farmers regarding different areas of pesticide

For measurement of knowledge of the green chilli growers regarding different areas of pesticide, a simple frequently system was applied. The frequencies obtained were work out and on the basis of that percentage were calculated. The data regarding knowledge of green chilli growers were given in Table 1.

It is observed from table 1 that, As regards knowledge regarding handling of pesticides, majority (84.00%) of the green chilli growers had concern regarding expiry date, 71.00 per cent green chilli growers had knowledge regarding mixing ratio of pesticides with water, further it is noted that more than fifty per cent (56.33%) green chilli growers had concern regarding wind direction during pesticide application in the field. Further it is reported that (51.66%) green chilli growers had knowledge regarding proper method of pesticide application.

So for knowledge regarding formulation of pesticides, majority(60.66%) of green chilli growers had concerned regarding liquid formulation, 56.00 per cent green chilli growers had knowledge regarding powder formulation, further it is noted that near fifty per cent (48.00%) green chilli growers had concern regarding granular formulation of pesticide.

Table 1: Distribution of green chilli growers according to their knowledge about different areas of pesticide n=300

S. No	Knowledge	Frequency	Per cent
A	Knowledge regarding handling of pesticides		
1	Mixing ratio of pesticide & water	213	71.00
	Concern on expiry date	252	84.00
	Concern on wind direction	169	56.33
	Proper method of pesticide application	155	51.66
B	**Formulations of pesticides**		
	Liquid	182	60.66
	Powder	168	56.00
	Granular	144	48.00
C	**Precautions at the time of pesticide application**		
	Wearing mask and hand gloves	237	79.00
	Wearing glasses to protect eyes	194	64.66
	Avoid chewing betel/ tobacco	135	45.00
	Avoidsmoking Bidi/ Cigarate.	192	64.00
	Cleaning hands with soap before taking food	270	90.00
	Take bath after spraying	148	49.33
	Change clothes after spraying	157	52.33
D	**Mode of disposal**		
	Selling, Burning, store in boundary of house	260	86.66
E	**Signs and symptoms related to pesticide poisoning**		
	Excessive sweating	165	55.00

	Burning / Stinging / itching eyes	192	64.00
	Dry / Sore throat	135	45.00
	Skin redness / white patches on skin / skin scaling	171	57.00
	Weakness / muscle cramps	134	44.66
	Nausea / vomiting	226	75.33
F	**Do you know bio-pesticides?**		
	Neem Products	267	89.00
	Annona leaves, seed extract, dasparni.	231	77.00
	Bacillus thuringiensis	145	48.33
	Verticilliumlecanii	77	25.66
	Trichoderma spp., HaNPV, Trichodegramma	107	35.66
G	**Where you stored pesticide after purchase?**		
	In dry place and away from small children, animals etc.	300	100.00
H	**Sprayer use practices**		
	Use after wash, care of nozzle	300	100.00
	Type of nozzle(Hood)	137	45.66
I	**Types of spray pump used for application of pesticides**		
	Hand / knapsack spray pump	300	100.00
	Power spray pump	110	36.66
	Tractor operated spray pump	00	0.00

As regards table 1, that the knowledge of selected green chilli growers about precautions at the time of pesticide application is concerned; (90.00%) of the green chilli growers known that it is necessary to clean hands with soap before taking food. It is also reported that (79.00%) green chilli growers had knowledge regarding wearing mask and hand gloves, further it is noted that near two third (64.66%) green chilli growers had knowledge regarding wearing glasses to protect eyes during pesticide application. Further it is reported that 64.00 per cent green chilli growers had knowledge regarding to avoid smoking bidi/ cigarette and (52.33%) change clothes after spraying. The probable reason behind this finding might be due to the selected green chilli grower's knowledge and awareness about hazards effect of pesticide through source of information and exposure of different programmes.

While mode of disposal of pesticide container is concerned; majority (86.66%) green chilli growers had knowledge regarding proper disposal practices of pesticide container *viz.* selling, burning, store in boundary of house.

As regards table 1, that the knowledge of selected green chilli growers about signs and symptoms related to pesticide poisoning is concerned; about (75.33%) of the green chilli growers knowledge regarding poisoning effect of pesticide i.e. nausea/ vomiting. It is also observed that (64.00%) green chilli growers had knowledge regarding burning/ stinging/ itching eyes, further it is noticed that (57.00%) green chilli growers had knowledge regarding skin redness/ white patches on skin/ skin scaling symptoms of pesticide poisoning.

In case of knowledge of green chilli growers about bio-pesticides is concerned; majority 89.00 per cent green chilli growers knowledge regarding neem products. It is observed that (77.00%) green chilli growers had knowledge regarding annona leaves, seed extract, dasparni type of bio- pesticides.

While pesticide storage after purchase is concerned; cent percent of the selected green chilli growers had knowledge regarding proper pesticide storage i.e. in dry place and far away from small children and animals etc.

As regards sprayer use practices is concerned; cent per cent of the selected green chilli growers known that it is necessary to wash sprayer after use and care of nozzle, further it is reported that (45.66%) green chilli growers had knowledge regarding type of nozzle (Hood) used by spray pump.

It is observed table 1 that, As regards knowledge regarding types of spray pump used for application of pesticide is concerned; cent percent of the selected green chilli growers had concerned regarding hand / knapsack spray pump, further it is noted that (36.66%) green chilli growers had knowledge regarding power spray pump, followed by none of the farmers known about tractor operated spray pump for application of pesticides in green chilli crops.

Knowledge is essential to selected green chilli growers for the efficient and effective utilization of pesticide for profitable cultivation of chilli crop. It was therefore thought necessary to obtain information from the green chilli growers about the knowledge they possessed about different areas of pesticide.

Table 2: Distribution of green chilli growers according to their Knowledge level about different areas of pesticide n = 300

S. No.	Level of knowledge	Frequency	Per cent
1.	Low (Up to 43.19 score)	58	19.33
2.	Medium(in between 43.20 to 69.31 score)	190	63.33
3.	High (Above 69.31 score)	52	17. 34
	Total	300	100.00

Mean-56.25, SD=13.06

It is observed from the Table 2 that, majority (63.33%) of the selected green chilli growers had medium level of knowledge regarding different areas of pesticides, while 19.33 and 17.34 per cent green chilli growers had low and high level of knowledge regarding different areas of pesticides, respectively. Thus it can be concluded that (80.67%) of selected green chilli growers had medium to high level of knowledge regarding different areas of pesticides.

This finding is in the line with finding of Venkataramalu (2003) [11], Rajput (2009), Madhu (2013) [5] and Ambavane (2014) [2].

The probable reason might be due to fact that majority of the green chilli growers had good literacy status, source of information, mass media exposure and participation in demonstration/ training etc.

Conclusion

It can be concluded that 80.67 per cent of green chilli growers had medium to high level of knowledge regarding different areas of pesticides. The probable reason behind this finding might be due to green chilli grower's knowledge and awareness about hazards effect of pesticide through source of information, participation in training and mass media exposure of different programmes. Thegreen chilli growers had good literacy status, participation in demonstration, voice mail/SMS services. Knowledge is essential to green chilli growers for the efficient and effective utilization of pesticide for profitable cultivation. This finding is in the line with finding of Badhe (2012) [4], Madhu (2013) [5], Amle (2016) [1] and Indury Reddy (2017) [8].

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