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SD Amle
Guest Lecturer, S. V. G. I. College of Agriculture Jalgaon, Jamod, Maharashtra, India

KT Lahariya
Director of Extension Education, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Krishinagar, Akola, Maharashtra, India

BN Hingne
M.Sc. Scholar, Department of Extension Education, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Krishinagar, Akola, Maharashtra, India

Rewendra Kumar Sahu
Ph.D. Research scholar, Department of Agricultural Extension, Indira Gandhi Krishi Vishwavidyalaya, Raipur, Chhattisgarh, India

Correspondence
Rewendra Kumar Sahu
Ph.D. Research Scholar, Department of Agricultural Extension, Indira Gandhi Krishi Vishwavidyalaya, Raipur, Chhattisgarh, India

Safety measures adopted by vegetable growers in pesticide application

SD Amle, KT Lahariya, BN Hingne and Rewendra Kumar Sahu

Abstract
The present study was under taken in Akola district in Vidarbha region of Maharashtra state. From this selected district one Tahsil has been selected purposively. The selected Tahsils is Patur respectively. From this Tahsil ten villages have been selected randomly and from each selected village ten farmers have been interviewed. Thus the total 100 respondents is the sample for this study. The objectives of the study were, to study the extent of safety measures adopted by the vegetable growers in pesticide application and to study the constraints faced by vegetable growers in safety use of pesticides. The exploratory research design was used for present study. The findings revealed that majority of the respondents having medium level of adoption about safety measures. Higher cost of insecticides/pesticides, the market price are not fixed, no knowledge about preservation/storing methods of vegetable crops, inadequate/costly labour availability is the major constraints of vegetable growers.

Keywords: Adoption, safety measures, chemicals, recommendation

Introduction
Exposure to pesticides, both occupationally and environmentally, causes a range of human health problems. It is estimated that nearly 10,000 deaths occur annually due to use of chemical pesticide worldwide, with about three-fourth of these occurring in developing countries. At present, India is the largest producer of pesticides in Asia and ranks twelfth in the world for the use of pesticides with an annual production of 90,000 tons (Meera and Bahal, 2000). A vast majority of the population in India (56.70 percent) is engaged in agriculture and is, therefore exposed to the pesticides used in agriculture. Use of pesticides in India is increasing at the rate of 2.00 to 5.00 percent per annum and is about 3.00 percent of total pesticides used in world. About 90,000 technical grade pesticides are currently produced and more than 67.00 percent is used in agriculture sector alone. (Nigam and Murthy, 2000). Pesticides being used in agricultural tracts are released into the environment and come into human contact directly or indirectly. Humans are exposed to pesticides found in environmental media (soil, water, air and food) by different routes of exposure such as inhalation, ingestion and dermal contact. Exposure to pesticides results in acute and chronic health problems. These range from temporary acute effects like irritation of eyes, excessive salivation to chronic diseases like cancer, reproductive and developmental disorders etc.
The northern part of Akola district lies in Purna valley itself is a part of Tapi river basin. River Purna has formed fertile basin in Akola, Balapur and Murtizapur Tahasil of Akola. Akola district is divided into seven Tahsil for smooth Administration. The district ranks 4th is respect of size and 5th is respect of population Among the 11 district of Vidarbha region of Maharashtra.
The soil of the district basically derived from volcanic trap rock and it is quite fertile. It is classified into categories as course soil found in the south, medium black soil in plane and deep black soil found in river valley. Climate and rainfall being away from the sea, the district is extreme climate. The weather during winter is cool, while in summer it is too hot. The average minimum and maximum temperature extremities observed throughout the year was 10 ^{o}C 46.5 respectively. Akola district falls is assured rainfall zone of Maharashtra state having on an average rainfall between 750 to 1000 mm

Methodology
The present study was under taken in Akola district in Vidarbha region of Maharashtra state. From this selected district one Tahsil has been selected purposively where more vegetable

growers. The selected Tahsil are Patur. From this Tahsil ten villages have been selected randomly and from each selected village ten farmers have been interviewed. Thus the total 100 respondents is the sample for this study. The exploratory research design was used for present study. Data were collected by the personally interviewing the respondents with the help of pre- tested and structured schedule.

Results and Discussion

The distribution of respondents according to practice wise adoption of safety measures during pesticides application in Table 1 shows that It could be observed from Table-1 that nearly majority of the respondents (69.00%) were always keep the foodstuff and drinking water away from spraying area, it was followed by 64.00 percent of the respondents who adopt complete cleaning of hands and face should before consumption of food, drinking of water or smoking while spraying, 63.00 percent of the respondents told that they regularly follow to take bathe the body completely and wash the clothes to remove traces after the spraying operation, 60.00 percent, 57.00 percent, 54.00 percent, 51.00 percent and 50.00 percent of the respondents also told that they regularly keep the Insecticides/pesticides out of reach of children, never use the dirty, leak or under repair sprayer / duster for spraying, use funnel for pouring insecticides/pesticides mixture in sprayer every time, never treat the harvested vegetables with insecticides/ pesticides or chemical fertilizer solution before taking to the market and always purchase the Insecticides/ pesticides in original packing respectively. The other 38.00 percent, 35.00 percent, 32.00 percent and 31.00 only of the respondents told that they regularly were adopting immediate cleaning of body or clothes, if insecticides/pesticides accidentally comes direct in contact of body or clothes, never transport the food and edibles along with Insecticides/ pesticides, always use recommended dose of insecticides/pesticides by taking exact measurement with measuring cup given with container and mostly take the spraying in wind free environment and towards direction of wind, if spraying is necessary respectively,

Whereas it was also observed that more than half of the respondents (56.00%) were sometimes adopting not cleaning the nozzle of sprayer by mouth out breathing, it was followed by more than half of the respondents (55.00%) who were sometimes reading the label and leaflet of insecticides and pesticides carefully before spraying, 53.00 percent of the respondents were not taking spray of highly toxic or long persistence insecticide/pesticide at harvesting stage of vegetables, 50.00 percent of the respondents were sometimes adopting to take the spraying in wind free environment or towards direction of wind, 45.00 percent of the respondents sometimes follow not transport insecticides/pesticides along with food and edibles, 44.00 percent of the respondents were sometimes following immediately cleaning the body parts or clothes, if insecticides/pesticides comes directly in contact accidentally with body or clothes, 43.00 percent of the respondents were sometimes using stick or long handled spoon for mixing of insecticides/pesticides with water and 41.00 percent of the respondents bathe and wash cloths sometimes after spraying operation is over.

Further it was revealed that Majority of the respondents (81.00%) never follow regular check up of economic threshold level to avoid frequent spraying of Insecticide/pesticide on vegetables crops, it was followed by nearly majority of the respondents (74.00%) who never dispose off or burry the empty container of insecticides/pesticides in the corner of the field to keep the environment pollution free, 70.00 percent of the respondents never check statutory warning given on insecticide/pesticide container for its toxicity level, 69.00 percent of the respondents were not spraying highly toxic or long persistence effect insecticides/pesticides at harvesting stage of vegetables, 62.00 percent of the respondents were not using mask, cap, gloves, sleeves and apron while spraying and 46.00 percent of the respondents found to be not following the storage of insecticides/pesticides in cool, dry, safe place, and in lock and key.

The study thus concluded that medium to low level of adoption was followed actually by the respondents during application of insecticides/pesticides in vegetable crops on part of safety measures.

Table 1: Distribution of respondents according to their adoption about safety measures for pesticide application

Sl. No.	Statements	Respondents (n=100)		
		Always	Sometimes	Never
1.	Insecticides/pesticides should be purchased in original packing only.	53.00 (53.00%)*	34.00 (34.00%)	13.00 (13.00%)
2.	The label and leaflet of insecticides and pesticides should be read carefully before spraying	23.00 (23.00%)	55.00 (55.00%)	22.00 (22.00%)
3.	Examination of statutory warning symbol given for toxicity level on insecticides/pesticides container	05.00 (05.00%)	25.00 (25.00%)	70.00 (70.00%)
4.	Insecticides/pesticides should be stored in cool, dry, safe place, and in lock and key.	13.00 (13.00%)	41.00 (41.00%)	46.00 (46.00%)
5.	Insecticides/pesticides should be kept out of reach of children.	60.00 (60.00%)	28.00 (28.00%)	12.00 (12.00%)
6.	Insecticides/pesticides should not be transported along with food and edibles	35.00 (35.00%)	45.00 (45.00%)	20.00 (20.00%)
7.	Use of recommended dose of insecticides/pesticides by taking exact measurement with measuring cup	32.00 (32.00%)	17.00 (17.00%)	51.00 (51.00%)
8.	Stick or long handled spoon should be used for mixing of insecticides/pesticides with water	09.00 (09.00%)	34.00 (34.00%)	57.00 (57.00%)
9.	Dirty, leak or under repair sprayer / duster should not be used for spraying	57.00 (57.00%)	33.00 (33.00%)	10.00 (10.00%)
10.	Nozzle of sprayer should not be cleaned by mouth out breathing	18.00 (18.00%)	56.00 (56.00%)	26.00 (26.00%)
11.	Funnel should used for pouring insecticides/pesticides mixture in sprayer	54.00	36.00	10.00

		(54.00%)	(36.00%)	(10.00%)
12.	Mask, cap, gloves, sleeves and apron should be used while spraying	10.00 (10.00%)	28.00 (28.00%)	62.00 (62.00%)
13.	Spraying should be taken in wind free environment or should be taken towards direction of wind	31.00 (31.00%)	50.00 (50.00%)	19.00 (19.00%)
14.	Foodstuff and drinking water should not be kept in the spraying operation area	69.00 (69.00%)	27.00 (27.00%)	04.00 (04.00%)
15.	Consumption of food, drinking of water and smoking should be strictly avoided while spraying operation	09.00 (09.00%)	22.00 (22.00%)	69.00 (69.00%)
16.	Complete cleaning of hands and face should be done before consumption of food, drinking of water or smoking	64.00 (64.00%)	31.00 (31.00%)	05.00 (05.00%)
17.	Highly toxic or long persistence insecticide/pesticide should not be sprayed at harvesting stage of vegetables	16.00 (16.00%)	53.00 (53.00%)	31.00 (31.00%)
18.	If insecticides/pesticides comes directly in contact with body or clothes accidentally, proper cleaning should be done immediately	38.00 (38.00%)	44.00 (44.00%)	18.00 (18.00%)
19.	In case of accidental poisoning by insecticides/pesticides, first-aid should be given to the victim and to call the doctor immediately	02.00 (02.00%)	03.00 (03.00%)	95.00 (95.00%)
20.	Complete bath should be taken and the clothes used should be washed cleanly to remove traces after the spraying operation	63.00 (63.00%)	31.00 (31.00%)	06.00 (06.00%)
21.	Empty containers of insecticides/pesticides should be disposed off and buried in the corner of the field to keep the environment pollution free.	13.00 (13.00%)	23.00 (23.00%)	64.00 (64.00%)
22.	Economic threshold level of pest incidence should be checked regularly to avoid frequent spraying of Insecticide/pesticide on vegetables crops	15.00 (15.00%)	17.00 (17.00%)	68.00 (68.00%)
23.	Insecticide/pesticide having highly toxic or long persistence effect should not be sprayed at harvesting stage of vegetables	17.00 (17.00%)	24.00 (24.00%)	59.00 (59.00%)
24.	Harvested vegetables should not be treated with insecticides/ pesticides or chemical fertilizer solution before taking to the market	51.00 (51.00%)	30.00 (30.00%)	19.00 (19.00%)

Table 2: Distribution of respondents according to their adoption about safety measures for pesticide application

Sl. No.	Adoption index	Respondents (n=100)	
		Frequency	Percentage
1	Low (Up to 33.33)	17	17.00
2	Medium (33.34 to 66.66)	58	58.00
3	High (Above 66.66)	25	25.00
	Total	100	100.00

data about adoption of safety measures for pesticide application in vegetable crops was presented in Table-2 it indicates that, more than half of the respondents 58.00 percent had medium level of adoption, it was followed by 25.00 percent of the respondents had high level of adoption. And 17.00 percent of the respondents had low level of adoption of safety measures for pesticide application in vegetable crop. Thus, it is concluded that more than fifty percent (58.00%) of the respondents adopted safety measures during pesticide application in vegetable crops.

Table 3: Distribution of respondents according to constraints faced in adoption of safety measures in application of insecticides/ pesticides

Sl. No.	Constraints	Respondents (100)	
		Frequency	Percentage
1	Higher cost of insecticide/pesticides	100	(100%)
2	The market price are not fixed	100	(100%)
3	No knowledge about preservation/ storing methods of vegetable crops	90	(90.00%)
4	Inadequate/costly labour availability	80	(80.00%)
5	Lack of knowledge about use of accurate dose of insecticides/pesticides	80	(80.00%)
6	Lack of information about safety measures	75	(75.00%)
7	Transport facility not available timely	70	(70.00%)
8	Lack of technical guidance	60	(60.00%)
9	Inadequate supply of irrigation water for vegetable crops	52	(52.00%)
10	Non-availability of money at proper time.	45	(45.00%)
11	Rains after spraying increases cost due to repeated spraying	45	(45.00%)

It is observed from Table-3 that all of the respondents (100.00%) expressed the constraints higher cost of pesticide and market prices are not fixed respectively, it was followed by majority of the respondents (90.00%) who were facing the constraint no knowledge about preservation/ storing methods of vegetable crops, it was followed by majority of each of the respondents (80.00%) who were facing the constraints Inadequate/costly labour availability and Lack of knowledge about use of accurate dose of insecticides/pesticides, 75.00 percent of the respondents expressed the constraint lack of information about safety measures, followed by the respondents (70.00%) had non availability of transport facility available at proper time, 60.00 percent of the respondents felt constraint lack of technical guidance, 52.00 percent of the respondents had constraint Inadequate supply of irrigation water for vegetable crops, 45.00 of the respondents faced the constraint non-availability of money at proper time and 45.00 percent of the respondents told the faced constraint rains after spraying increases cost due to repeated spraying.

Conclusion

Thus, study concluded that (69.00%) of the respondents were always keep the foodstuff and drinking water away from spraying area and (64.00%) of the respondents adopt complete cleaning of hands and face should before consumption of food, it is also found that some constraints like a higher cost of insecticides/pesticides and the market price are not fixed faces cent percent of the respondents.

References

1. Apio Racheal. Pesticide knowledge, practice and attitude and how it affects the health of small-scale farmers in Uganda: a cross-sectional study, African Health Sciences. 2014; 14(2):420-433.
   DOI: http://dx.doi.org/10.4314/ahs.v14i2.19
2. Mahantesh N, Alka Singh. A Study on Farmers' Knowledge, Perception and Intensity of Pesticide Use in Vegetable Cultivation in Western Uttar Pradesh, Division of Agricultural Economics, Indian Agricultural Research Institute, New Delhi - 110 012 Pusa Agri Science. 2009; 32:63-69.
3. Sheikh, Hoque. Unsafe Use of Pesticide and Its Impact on Health of Farmers: A Case Study in Burichong Upazila, Bangladesh IOSR Journal Of Environmental Science, Toxicology And Food Technology (IOSR-JESTFT) e-ISSN: 2319-2402, p- ISSN: 2319-2399. Ver. V 2014; 8(1):57-67 www.iosrjournals.org
4. Shrivastava KK, Patel HL, Bareth LS. Constraints in adoption of recommended chilli production technology. Maharashtra J Extn. Educ. 1998; XVII:390-398.
5. Wasudha Malgie. A study of pesticide usage and pesticide safety awareness among farmers in Commewijne in Suriname. J. of Agricultural Technology 2015; 11(3):621-636. http://www.ijat-aatsea.com ISSN 1686-9141