

EXTENT OF AWARENESS OF PLANT PROTECTION MEASURES AMONG VEGETABLE AND FRUIT GROWERS

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ABSTRACT

The present study was conducted in Pune district of Maharashtra state. Pune district was purposively selected for the study because it is having large area under vegetable and fruit cultivation. From Pune district Ambegaon, Junnar and Khed tahsils were selected on the basis of area under vegetable and fruit cultivation as the area of present research study. There were 13 villages from 3 tahsil selected. The findings of the study are based on the data collected by interviewing 115 selected vegetable and fruit growers. Out of 110 vegetable and fruit growers who used 'Fipronil', vast majority (80.00 per cent) were using it 'more than recommended dose', while in case of 'Dimethoate', majority (90.00 per cent) of the respondents were using 'more than recommended dose' and of those who were using 'Thiamethoxam', 52.00 per cent were using it 'as per recommended dose'. Majority (94.78 per cent) of the respondents were aware about adverse effects namely, 'Headache' (94.78 per cent), 'Irritation in eyes' (93.91 per cent), 'Itching on skin' (90.43 per cent), 'Nausea' (84.35 per cent), 'pesticide causes death of valuable pollinators like honey bee' (72.17 per cent), 'persistent chemicals contaminate soil for longer period' (59.13 per cent) and 'developed pesticide resistant in pest due to constant use' (53.91 per cent). 'Pesticides should be kept away from reach of children and animals' (98.26 per cent), 'pesticides should be stored in cool, dry, safe and locked room' (85.22 per cent), 'washing of spray pumps near the river and wells should be avoided' (70.43 per cent), 'the clogged nozzle and other parts should not be blown by mouth' (64.35 per cent) and 'empty tins of pesticides should not be used' (53.91 per cent) were the major suggestions given by them. There is a need to convey the message that prevention of adverse health effects and promotion of health are profitable investments for employers and employees as a support to a sustainable development of economics. To sum up, based on our limited knowledge of direct or inferential information, the domain of pesticides illustrates a certain ambiguity in situations in which people are undergoing life-long exposure. There is thus every reason to develop health education packages based on knowledge, attitude and practices and to disseminate them within the community in order to minimize human exposure to pesticides.

Keywords : plant protection measures, vegetable & fruit growers

INTRODUCTION

'Agriculture pollution' is defined as the liquid and solid wastes from all types of farming, including the run-off from pesticides, fertilizers and feed lots. Crop protection in India begun in 1947- 48 with introduction of Benzene Hexa Chlorine (BHC) and Dichloro Diphenyl Trichloro Ethane (DDT) for the control of insect pest of agriculture and public health importance. Later, copper based Bordeaux mixture and Burgundy mixture became prominent as they were more effective and not phytotoxic. From 1950 onwards, mercury compounds were introduced from Germany particularly, as seed dressers. Later, organophosphorous compounds, organosulphur fungicide, rodenticides were released for use. Today, India is the largest manufacturer of pesticides in the world.

There are more than 234 registered pesticides in India and the Indian pesticide industry includes more than 125 large and medium scale producers of more than 500 pesticide products. Among the various pesticide formulations produced, dust formulations constitute about 85% of the total, followed by water-soluble dispersible powder (12%) and dispersible powder (2%). India is one of the few remaining countries still producing and using some of the chlorinated pesticides such as DDT and lindane (Abhilash and Singh, 2009; Vijgen *et al.* 2011).

Use of pesticides in India is increasing at the rate of 2.00 to 5.00 per cent per annum and is about 3.00 per cent of total pesticides used in world. About 90,000 metric

tonnes of technical grade pesticides are currently produced and more than 67.00 per cent is used in agriculture sector alone (Nigam and Murthy, 2000). However, the consumption of pesticides in India is relatively less i.e. 0.400 kg / ha than in USA (3 kg/ha), Malaysia (9 kg/ha) or Japan (11 kg/ha). Among the various states, Uttar Pradesh is the largest consumer followed by Punjab, Haryana and Maharashtra. Regarding the pesticide share across agricultural crops, cotton account for 45%, followed by rice (25%), chillies/vegetables/fruits (13-24%), plantations (7-8%), cereals other than rice seeds (6-7%), sugarcane (2-3%) and other (1-2%) (Gupta, 2004; Abhilash and Singh, 2009). There are 400 insecticides in the schedule of Insecticide Act 1968 as against 129 at the time of enactment of the Act. Of these, 164 pesticides are registered so far, 78 products are being produced in India (Kulsheshta 1992).

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 per cent) is engaged in agriculture and therefore exposed to the pesticides used in agriculture. 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.

Although efforts are made to restrict pesticides to the targeted crops and their pests, pesticides easily reach adjacent vegetation, wild life, soil, water and sometimes humans. In this way, the impact of pesticides is felt throughout the environment and public health. Frequent use of pesticides often adversely affects the health of humans when they are exposed to them. Health and environment problems arise not only from use of chemicals and pesticides, but also from their production. Frequent use of pesticides destroy not only targeted pest, but also naturally present beneficial predators and parasites, which help keep pest population in cultivated

and wild areas in check. Without their natural enemies, secondary pests present in the crops are able to reach outbreak levels. Another serious and costly side effect of heavy pesticides use has been the development of pesticide resistance in pest, insects, pathogens and weeds.

OBJECTIVES

- (1) To study the profile of the respondent farmer
- (2) To study the extent use of pesticides and plant protection practices followed by respondent farmer
- (3) To study the awareness of respondent farmers about adverse effects of pesticides

METHODOLOGY

The study was conducted in Pune district of Maharashtra. Considering the maximum area under vegetable and fruit cultivation, three tahsils viz; Khed, Ambegaon and Junnar were selected. From Ambegaon and Junnar tahsil, four villages were selected. Ten vegetable and fruit growers were selected randomly from each village from Ambegaon and Junnar tahsil and from Khed tahsil five villages were selected and seven vegetable and fruit growers were selected randomly from each village. In all, 115 farmers were selected. An interview schedule was specially designed in line with the objectives set forth to collect the needed information. The data were collected by personally interviewing the selected farmers.

RESULTS AND DISCUSSION

Profile of the vegetable and fruit growers

It was observed that majority (62.61 per cent) of the respondents was in the 'middle' age group and their average age was 46.00 years. As regards education, a maximum number (60.87 per cent) of the respondents had completed 'Secondary' followed by 'College' education (14.78 per cent). Amongst the respondents, 46.09 per cent and 35.65 per cent had 'marginal' and 'small' land holdings, respectively. The average land holding of the respondents was 1.75 ha. It is revealed that, majority number (62.61 per cent) of the respondents had 'medium' annual income. The average annual income of the respondents was Rs. 3.77 lakh. Regarding experience in vegetable and fruit cultivation, 61.74 per cent of the respondents had 'medium' experience in vegetable and fruit cultivation. On an average, the respondents had 19 years of experience in vegetable and fruit cultivation. With regards to area under vegetable and fruit,

53.91 per cent of the respondents were having 'low' area under vegetable and fruit cultivation with an average area of 1.5 ha. Maximum numbers of the respondents (68.70 per cent) were in the 'medium' category of extension contact. Majority of the respondents (59.13 per cent) were in the category of 'medium' source of information. Whereas, 74.78 per cent of the respondents had 'medium' risk preference and 71.30 per cent of the respondents in the 'medium' category

of economic motivation.

Extent of use of pesticides and plant protection practices followed by the vegetable and fruit growers

The results of the present investigation, in respect of nature and extent of use of pesticides by the vegetable and fruit growers is given in Table 1.

Table 1: Distribution of the respondents according to nature and extent of pesticides used by them

n=115

Chemical method						
Sr. No.	Crop (Major pest)	Pesticides& dose (ml/10 lit)	As per recommended dose	More than recommended dose	Less than recommended dose	Total
a	Vegetables					
1	Onion (Thrips)	Fipronil (20 gm)	22 (20.00)	88 (80.00)	-	110 (100.00)
2	Tomato (Leaf-miner)	Dimethoa-te (20 ml)	07 (10.00)	61 (90.00)	-	68 (100.00)
3	Potato (Aphid)	Thiamet-hoxam (250 gm)	26 (52.00)	24 (48.00)	-	50 (100.00)
4	Chilli (Thrips)	Imidachl-orpid (20 gm)	16 (31.00)	22 (42.00)	14 (27.00)	52 (100.00)
5	Brinjal. (Stem borer)	Dichlorv-os (20 ml)	-	33 (89.00)	4 (11.00)	37 (100.00)
b	Fruits					
6	Mango (Mangohopper)	Acephate (10 gm)	-	24 (100.00)	-	24 (100.00)
7	Sapota (Moth)	Carbaryl (15 ml)	13 (15.00)	76 (85.00)	-	89 (100.00)
8	Grapes (Mealy bug)	Monocrot-ophos (16 ml)	05 (18.00)	23 (82.00)	-	28 (100.00)

It is observed from table 1 that, out of 110 vegetable and fruit growers who had used 'Fipronil' of which vast majority (80.00 per cent) of them were using it 'more than recommended dose' and only 20.00 per cent of the respondents were using 'as per recommended dose'. Among tomato growers, in case of 'Dimethoate', majority (90.00 per cent) of the respondents were using 'more than recommended dose', followed by one-tenth of the respondents (10.00 per cent) 'as per recommended dose'.

The respondents of potato growers those were using 'Thiamethoxam' 52.00 per cent of them using it 'as per recommended dose' and 48.00 per cent of them were using 'more than recommended dose', whereas, out of 52 respondents of chilli growers those who were using 'Imidachlorpid' maximum number (42.00 per cent) of them were using

'more than recommended dose', followed by 31.00 per cent 'as per recommended dose' and 27.00 per cent 'less than recommended dose'. Out of 37 'Dichlorvos' using respondents, majority (89.00 per cent) of them were using 'more than recommended dose' followed by 11.00 per cent respondents 'less than recommended dose'.

In case of 'Acephate' all mango growers (100.00 per cent) were using these pesticides 'more than recommended dose'. Whereas out of 89 'Carbaryl' users majority of them (85.00 per cent) were using it 'more than recommended dose' while 15.00 per cent of them were using it 'as per recommended dose'. In case of 'Monocrotophos' users majority of them were using 'more than recommended dose' (82.00 per cent), while only 18.00 per cent of them were using 'as per recommended dose'.

Other measures		Yes	No	Total
(a) Mechanical measures				
1	Cutting of infected branches	44 (38.26%)	71 (61.74%)	115 (100.00)
2	Cleaning of orchard	107 (93.04%)	8 (6.96%)	115 (100.00)
3	Use of smoke	-	115 (100.00%)	115 (100.00)
4	Intercultural operations	71 (61.74%)	44 (38.26%)	115 (100.00)
(b) Biological measures				
5	Use of “Rakshak trap”	69 (60.00%)	46 (40.00%)	115 (100.00)
6	Use of parasites and predators	-	115 (100.00)	115 (100.00)

Note : Figures in parentheses indicate percentages

In case of other measures, it was observed that majority (61.74 per cent) of the respondents had not followed the practice of ‘cutting of infected branches’, whereas majority (93.04 per cent) of the respondents were following the practice of ‘cleaning of orchard’. Out of 115 respondents none of them followed the practice of ‘use of smoke’ for the control of insect-pest. Three-fifth (60.00 per cent) of the respondents were using ‘Rakshak trap’ for the control of fruit fly, while 61.74 per cent followed ‘intercultural operations’. It is observed that, none of the respondents were ‘using parasites and predators’ for the control of pest and diseases in vegetable and fruit.

Awareness of vegetable and fruit growers about adverse effects of pesticides

The results regarding overall awareness about adverse effects of pesticides is given in table2.

Table 2: Distribution of respondents according to their awareness about adverse effects of pesticides

n=115

Sl. No.	Awareness	Number	Percent
1	Low (Up to 14 score)	23	20.00
2	Medium (15 to 19 score)	71	61.74
3	High (20 score and above)	21	18.26

It is observed from table 2 that, majority (61.74 per cent) of the respondents had ‘medium’ awareness about adverse effects of pesticides, while remaining 20.00 per cent

and 18.26 per cent of the respondents had ‘low’ and ‘high’ awareness, respectively. On an average, awareness of the respondents had 17 score.

CONCLUSION

Majority of the vegetable and fruit growers belonged to the middle age group most of them had received secondary education, having marginal land holding and followed by small, medium income group, medium experience in vegetable and fruit cultivation, had medium extension contact, medium Source of information, medium risk orientation, with medium economic motivation. Majority of vegetable and fruit growers possessed medium awareness about adverse effect of pesticides.

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