Indian J. Applied & Pure Bio. Vol. 39(2), 769-774 (2024). **ISSN: 0970-2091**
A Web of Science Journal

Awareness level of plant health engineering practices among vegetable growers in Krishnagiri District

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Abstract

The vegetable plays a vital role in the daily supplement of food. Frequency of the pesticides spray is higher in the vegetable crops. In order to optimize the use of pesticide and proper PPE usage plant health engineering practices will help to overcome this. The present study was conducted in the Hosur and Kelamangalam blocks of Krishnagiri district of Tamil Nadu with 300 respondents. A well constructed interview schedule was used to collect data. The findings reported that vegetable growers had medium level of awareness about the plant health engineering practices. But most of the respondent were not awareness about the effect of pesticide on the field. Lack of awareness about the toxicity labels, measuring device for pesticide quantity, recommended chemical for pest and diseases in brinjal and tomato.The agricultural engineering department should be directed to evolve specified nozzles for the various pest and disease should be well educated to the farmers and the applicators. Nozzle type should be well explained to the farmers by conducting the exhibition or demonstration with the help of private agencies. Since most of the farmers and applicators does not service the equipment frequently. It is necessary to service the equipment for effective use.

Key words : Awareness, vegetable crops, plant health engineering, pesticide application.

Exposure to pesticides affects the human health severly. Since they are not degradable it affects the environmentally by reducing the soil fertility, mortality of natural enemies, drainage of residues into canals there by increase in water pollution etc. In recent times, use of the pesticides in vegetables increased dramatically which shows the need to reduce the pesticide residue in the vegetable food since they are the rich source of nutrients.

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Table-1. Distribution of respondents according to the awareness of plant health engineering practices

(n=300)

S. No.	Plant Health Engineering Practices	Awareness	
		Number	Per cent
I	**Preparation of spray fluid**		
	I) Preparation of spray fluid	300	100.00
	II) Quantity of water	300	100.00
	III) Pesticide mixture	300	100.00
II	**Toxicity colour code**		
	I) Toxicity colour codes	140	46.66
III	**Calibration and nozzles**		
	I) Calibration of sprayer	30	10.00
	II) Type of nozzles used in sprayer	104	34.66
	III) Regulation of droplet size in mist blower	250	83.33
	IV) Spraying techniques (low/ultra low/high)	150	50.00
	V) Swath width	50	16.66
	VI) Spray fluid requirement for low volumesprayer	125	41.66
IV	**Precautions and safety measures**		
	I) Instructions in the pesticide container	219	73.00
V	**During spraying**		
	I) Protective gears	260	86.66
	II) Consideration of wind direction	300	100.00
	III) Eat, drink or smoke while sprayingpesticide	300	100.00
VI	**After spraying**		
	I) Taking of bath after spraying	260	86.66
	II) Change clothes after spraying	251	83.66
	III) Washing the bottle/sprayer in the river/pond / canal /others after spraying	300	100.00
	IV) Flag to mark pesticide sprayed plot	60	20.00
	V) Storing the pesticides at higher level that are not reachable to children	272	90.66
VII	**Care and maintenance of equipment**		
	I) Disconnection lance, nozzle, dischargelines from the equipment (sprayer) when not in use.	130	43.33

The reason for this due to the low level of awareness among the farmers of selecting the correct pesticides by observing the pest and disease problems and also the quantity of the pesticides is not known to them as recommended by the department of horticulture and agriculture.

Considering the all the above negative effects of pesticides on human and environments and their drawbacks it is very necessary to should the trend towards the optimum use of pesticides and the correct time of using it. Hence, the study of awareness level of plant health engineering practices among the vegetables growers in Krishnagiri district of Tamil Nadu.

The study area was conducted in Krishnagiri district of Tamil Nadu, India. In this district Hosur and Kelamangalam blocks were selected based on the higher area under vegetable cultivation. There were 300 respondents were selected for this study. Among them 150 tomato and 150 brinjal farmers were selected based on the proportionate random sampling technique. Data were collected with the help of structured and pre-tested interview schedule. The collected data were analysed using cumulative frequency distribution method and percentage analysis.

The survey measures the main aspects is the awareness of plant health engineering practices among vegetable growers. The respondents were asked to select the correct and appropriate answers for the questions on awareness. A total of two points are given to the aware (2 score) and not aware (1score).

Findings

Awareness level regarding plant health engineering practices :

The practicewise awareness level of vegetable growers on plant health engineering were collected and the results are presented in Table-1.

There are seven sub-item practices under plant health engineering practices regarding awareness level of vegetable growers viz, preparation of spray fluid, toxicity colour code, calibration and nozzles, precautions and safety measures, during spraying, after spraying and care and maintenance of equipment.

Preparation of spray fluid :

It could be seen from the Table-1, that under preparation of spray fluid. There were 100.00 per cent of the respondents were found to be awareness about the preparation of the spray fluid (100.00 per cent), quantity of water (100.00 per cent) that should be mixed to prepare the spray fluid and pesticide mixture (100.00 per cent). From the perusal of the results, it may be concluded that cent per cent of the respondents were well aware about the preparation of spray fluid and the process involved in it.

This finding corroborates with the findings of Rajapandi[2] and Revathi[4] who also reported that majority of the vegetable growers had cent per cent of the awareness level in plant health engineering practices.

Toxicity colour code :

From the Table -1, it could be observed that little more than two-fifth of the respondents

(46.66 per cent) were awareness about toxicity colour code. Less than fifty percent of the respondents understood the categorization of toxicity colour codes of scientific interpretation, while remaining percentage of the respondents could not understood the toxicity colour codes. This showed that the majority of the respondents were not aware about the toxicity of the labels like red (extremely toxic), green (slightly toxic), blue (moderately toxic) and yellow (highly toxic) are printed on the pesticide containers.

This finding is in line with the findings of Dubey[1] who also reported that majority of the respondents had not awareness about toxicity colour code in his study.

Calibration and nozzles :

It could be noticed that only one-tenth of the respondents (10.00 per cent) had awareness about calibration and nozzles. Calibration of the sprayer is the rate at which the pesticide is sprayed uniformly over the whole field area. It is determined by the nozzle spray discharge rate swath width and walking speed of the operator and it can be worked out theoretically and practically in the field by using the formula F = SDA/10000. This may be the possible reason for meger percentage of the respondents were awareness about the calibration of the sprayer.

Table-1, depicts that little more than one – third of the respondents (34.66 per cent) were aware of the types of nozzles used in sprayer. The reason for the low level of awareness on types of nozzles used in sprayer. Nozzles like hollow cone (ring of spray), flat fan (line of spray), impact nozzles (wide angle fan pattern), gaseous energy nozzles or air blast nozzle (in mist blower) etc., are used in sprayer to determine the size of the spray liquid while spraying. It is found that most of the respondents were not aware about the type of nozzles used in the sprayers since they were not aware about the type of nozzle name in the market. In the field scenario, most of them were using gaseous energy nozzles which is used in the motorised knapsack sprayer but they were not awareness about it. About 34.66 per cent of the respondents were awareness about the nozzles used in the hand held sprayers.

Droplet consideration is also important for spraying the pesticide. It is found that nearly 83.33 per cent of the respondents regulate the droplet size in knapsack sprayer by using the flow regulator knob while spraying according to their need and growth of the crop. It is said that fine droplets are regulated when the vegetable crops are in initial growth stage and coarse droplet are regulated when the crops are in near to full growth of the crop. Although most of the respondents were found to use both (coarse and fine droplets) based on the availability of the spray liquid in the tank.

Swath width is the width of the field covered by a nozzle while spraying. Swath width is also determined by the pressure of the spray, wind velocity and crop growth. More the pressure and wind velocity greater the swath width of the nozzle. Only 16.66 per cent of the respondents were awareness about the swath width while spraying the pesticide in the field.

With respect to their awareness level on spray fluid requirements for low volume

sprayer was 41.66 per cent. The awareness of spraying techniques of low volume, high volume and ultra volume is also a important vital factor for spraying the pesticides. Most of the respondents (58.33 per cent) were not aware about the spraying techniques. This finding is in line with the findings of Rajapandi *et al*.,[3]. Who also reported that less than fifty per cent of the respondents had awareness about the calibration and nozzles techniques.

Precautions and safety measures :

An overwhelming nearly three-fourth of the respondents (73.00 per cent) had awareness about the precautions and safety measures. It may be the possible reason is instructions that are printed in the pesticide containers but they seek others like, fellow farmers, sons and daughters who know english) help to read it since it was not printed in the vernacular language and they rarely adopts the instructions as given in the containers.

During spraying :

From the data in Table-1, it could be seen that cent per cent of the respondents were awareness about consideration of wind direction speed and eat, drink or smoke while spraying pesticides. More than eighty five per cent of the respondents (86.66 per cent) were awareness about protective gears.

Scientific handling of the pesticides involves protective gears like masks, gloves boots etc., to be worn while spraying. An overwhelming majority of the respondents (86.66 per cent) were aware about the protective gears to be put on while spraying.

Consideration of wind also plays a major role in the pesticide spraying. More the wind lesser the effective spray. It leads to drifting of most of spray liquid into the atmosphere. It is evident from the table that cent per cent of the respondents (100.00 per cent) considers the wind direction while spraying the pesticides. The cent per cent of the applicators do not eat or smoke while spraying the pesticides.

After spraying :

Under the plant health engineering practices of after spraying. There was vast majority of them (79.00 per cent) reported that they would took bath after spraying and 83.66 per cent of the applicators change their clothes after spraying. It is seen that even some of them have separate clothes for spraying purpose. It is attributed that few respondents who didn't take bath and changing of clothes immediately after spraying had other works to do in the field but they take bath or change the clothes after little later only.

Cent per cent of the respondents were not washing the empty pesticide container in the rivers or canals or any near by water bodies. This shows that respondents are well aware about the environmental consequences that is caused by pesticides even after emptying it. After spraying the pesticide in the field it is essential to mark the flag to show that the field is pesticide sprayed to others or strangers. It is found that 20.00 per cent of the respondents were marking any type of flag or signal in the field, However, it is seen that the owner of the field will inform informally the nearby houses that field is sprayed with pesticide that too sometimes. It was attributed

that marking the flag in a pesticide sprayed field were not in practice and also a time consuming one. About 90.66 percent of the respondents were store their pesticides that are not reachable to children.

Care and maintenance of equipment :

From the data in Table-1, it could be observed that more than two-fifth of the respondents were awareness about care and maintenance of equipment.

After completing the spraying in the field, it is essential to disconnect the lance, nozzle and the discharge lines from the sprayer to prevent the clogging and erosion. It was evident that 43.33 per cent of the respondents disconnect the discharge lines, nozzles and lance from the sprayer. After spraying they used to keep as it is in the store room.

The findings revealed that majority of the vegetable growers had medium level of awareness about plant health engineering practices. The agricultural engineering department should be directed to evolve specified nozzles for the various pest and disease should be well educated to the farmers and the applicators. Nozzle type should be well explained to the farmers by conducting the exhibition or demonstration with the help of private agencies. Since most of the farmers and applicators does not service the equipment frequently. It is necessary to service the equipment for effective use. Only megar percentage of the farmers knowns about the calibration and the swath width so step by step pesticide spray operations with explanation of the calibration of the sprayer including the swath width should be demonstrated to the farmers and the pesticide applicators.

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