

**Awareness and Practices of Household Women and Vegetable Growers
Regarding Pesticides**Vidisha Tomer^{1,2}, Sonika Sharma¹, Jaswinder Kaur Sangha¹1- Dept of Food and Nutrition, College of Home Science, Punjab Agricultural University,
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Abstract

Considering the adverse health effects caused by pesticide exposure, our study aimed to investigate awareness and practices of household women (N=240) and vegetable growers (N=120) regarding awareness, usage, presence of residues and remedial practices for residue dissipation at household level. Difference between urban and rural income groups was compared using t-value, ANOVA and Tukeys' HSD. Results obtained showed that both household women and vegetable growers were aware of the pesticides and their residues in food, health adversities associated with pesticide consumption, organic crops being a better alternative. However, the knowledge wasn't implemented into actions and no specific measures were taken either by household women for residue dissipation in food or by vegetable growers for protection from pesticide exposure. Unsafe measures were adopted for disposal of empty pesticide containers. Almost 35% of growers sprayed pesticides thrice a week. Extensive use of pesticides on vegetables was observed in the present study. Although the farmers were aware of adverse health impact of the pesticides, use of protective measures was poor among both women and vegetable growers. Awareness programmes regarding protective measures need to be conducted for better health measures.

Keywords: Pesticide; Knowledge; Practice; household vegetable growers; Household women**Introduction**

Pesticide use in Indian agriculture is an indispensable part of production technology. Therefore farmers in developing countries apparently overuse pesticides, both in quantity and quality, with mixtures being the favoured method of application (Crissman et al., 1994). Factors favouring unregulated use of pesticides include illiteracy and limited safety training and practices and hence their presence in different food items is a common feature.

Due to this unregulated use, not only farmers but the whole society is facing severe pesticide exposure through diet. There have been several studies in the country which have depicted the presence of pesticide residues in different food items. Maximum contamination was reported in milk products (85%) in Punjab (Menon, 2007). In another survey based on market basket samples in Kolkatta was found out of 62 samples; 19 samples were contaminated with organochlorine pesticides (Auroville, 2003). Recent researches have proven adverse health effects of pesticides affecting all parts of human body (Tomer et al., 2014).

An understanding of the features that influence the perception of farmers and household women, knowledge, attitude and practices are important in development of effective management strategies or modifying the current campaigns for optimum benefit. Besides, identifying the factors influencing pesticide use could be important step in designing policies and programs to reinforce factors which reduce pesticide misuse and thereby nullifying the misuse factors. It can also be important in developing effective management strategies in reducing the intake of pesticide residues through diet.

Material and Methods

The study was carried out with the objectives to explore the attitude and practices regarding pesticide and their residues. By personally administering the questionnaire to the rural & urban household women and vegetable growers during the period from March 2011 to May 2012. For the purpose of carrying out the objectives, a total of 240 respondents were selected from rural and urban areas from district Ludhiana, Punjab. One hundred and twenty vegetable growers were also selected randomly from six vegetable growing villages in Ludhiana viz., Jodha, Dollan Kalan, Saholi,

Chappar, Abbuwal and Bains. Further, the respondents from urban localities were divided in to three income groups by cube root method. For classification of rural respondents, standard classification for Indian small farmers as given by FAO was followed (FAO, 2010).

For judging the attitude, the respondents were asked about their level of agreement with the statement on a 5-point scale ranging from 'Strongly Agree' to 'Strongly Disagree'. For the purpose of analysis, the option of 'Strongly Agree' and 'Strongly Disagree' were given the scores of 2 and -2 respectively. The practices followed by the respondents were also rated on a five- point scale. The extent of agreement of the respondent with the statement ranged from 'Always' to 'Never'. For the purpose of analysis, 'Always' and 'Never' were given the scores 2 and -2 respectively.

Results

General Information

For understanding the results obtained from the study, knowledge about the background of the respondents plays an important role. As shown in table 1, among the rural respondent's majority of the household women were less than 35 years of age. Similar trend was observed in their urban counterparts where 46.67 percent of the respondents were also less than 35 years of age. Majority of the respondents from both rural and urban areas were married (85.83 and 90.83 percent respectively). Most of the household women in the rural areas were educated up to higher secondary while the urban household women were mostly graduates (25%). Mean body weight of the rural and urban respondents (in kg) was 63.48 ± 9.52 and 62.25 ± 9.66 respectively.

Vegetable growers were surveyed and out of those, majority were of the age between 35-45 years. Majority of the respondents had passed Intermediate (Table 2). Sixty percent of the respondents were owner cultivators. Majority of the respondents had a work experience of more than ten years (Table 2).

Awareness regarding pesticides

Table 3 and Table 4 shows the awareness score of rural and urban household women regarding pesticides. Data in table 3 suggests that the knowledge regarding consumption of off-season

vegetables was not known by the respondents (mean score- 0.89). The respondents were highly aware of the occurrence of pesticide residues in vegetables. With a mean score of 1.39, entry of pesticide into human body and its ill impacts was also highly known. Impact of different household processes on pesticide residues was also highly favoured by majority of the respondents. Knowledge of organic foods and their benefits was lesser known by the respondents of the lower income group.

As detailed in Table 4, awareness pattern of respondents living in urban areas was not much different than their rural counterparts. However, knowledge about the consumption of off- season vegetables was lesser known among the urban women. Pattern of awareness about the presence of pesticide residues and their health impacts was similar to the rural household women. The responses of the respondents of the rural and urban household women were at par with each other and there was no significant difference in them.

Results in Table 5 give the mean awareness scores of vegetable growers on general parameters pertaining to pesticides. The respondents were significantly aware of almost all the questions asked and scored above zero. The statements included were expert advice on spraying, health impacts, need for hygienic and protective measures while and after application and concept of organic farming. The respondents were least aware of the fact that empty containers constitute a major source of contamination and scored 0.39.

Practices regarding pesticides and their residues

General practices of rural women regarding reduction of pesticide residues are given in table 6. Off season vegetables were never consumed by 55.83 percent of the respondents and the percentage was quite high in LIG respondents. As given in table 6, washing was the most prevalent practice for all the respondents followed by dipping in luke warm water. Blanching was least practised.

Table 7 shows the practices of urban household women regarding reduction of pesticides. Practice of consumption of off- season vegetables was quite prevalent among the urban women as compared to their rural counterparts. As given in table 7, washing was found to be the most prevalent

and effective technique used by urban household women for getting rid of pesticide residues in vegetables.

Table 8 shows the results of the mean awareness and practice scores of vegetable growers for protection and hygienic measures. It can be seen from table 8 that inspite of the fact that farmers were highly aware of the fact that protective and hygienic measures needs to be taken and it is good for their health and family well being, it was surprising to know that there was huge difference between the awareness and practice scores of the respondents. Under protection parameters, all statements showed high t-value (significant at 1%) for awareness and practice except for the practice of pointing pump towards the ground while spraying. Similar trend was observed for hygiene parameters. However, mean awareness and practice scores for the respondents of higher income group were not statistically significant.

Perception of vegetable growers regarding pesticide application and disposal is given in table 9. As seen from the table, all the respondents sprayed pesticides on vegetables. Majority of the respondents did not follow PAU 'Package of Practices' or any expert advice and relied mainly on the advice of the pesticide dealer or personal past experience. Majority of the respondents 'quite often' observed the waiting period between pesticide application and harvesting. As given in table 9, the pattern of disposal of empty containers was quite confusing and the respondents were not aware of the correct methods of disposal of containers.

Figure 1 shows the frequency of application of pesticides on vegetables. Majority of the respondents sprayed their vegetable almost thrice in a week during the peak season of insect attack. More than four application in a week was also practised by 20.83 percent of the respondents.

Discussion

In the present study, characterisation of factors regarding on-field and household awareness and pesticide use safety practices in a representative sample of vegetable growers and household women. The response rate of the respondents to the pretested questionnaire using interviewer-administered interview in the present study was comparatively higher (Recema, 2006). The educational

background of the women and vegetable growers in the study respondents was low. Similar results were also reported in other developing countries (Hurtig et al., 2003). The use of pesticide was observed to be high, probably because farmers believed more frequent use with different types of pesticides is the best remedy to pest attack (Dinham., 2003). In many countries of the world, several government organisations employ programmes encouraging the use of pesticide application (Abate et al., 2000), neglecting the health adversities caused by pesticides. Bottlenecks in policy-making coupled with lack of basic knowledge affect decision making of household women and farmers regarding pesticide use, safety measures, and dissipation strategies for pesticide residues in food (Recena, 2006).

In general, results indicate high frequencies of pesticides application by farmers. High usage of pesticides lead to frequent contact and entry into body through inhalation or absorption through skin. Continuous prevalence of symptoms lead to adaptation of the farmers and they then consider it as 'normal', thereby leading to continued exposure. Chronic exposure leads to a variety of health (Kishi et al., 1995).

Disposal of the empty containers in the field or by throwing them near or into local waste containers is a totally unsafe practice and has been reported as a major problem in a number of studies (Avory and Coggon, 1994, London, 1994).

Vegetable farmers are highly dependent on insecticides for their produce and this indicates their lack of awareness regarding alternative, environmental friendly pest-management strategies or unwillingness to adopt those. Pest management strategies including intercropping (Legutowska et al., 2002) and tillage type and crop rotation (Hamel et al., 2002) have been shown to significantly reduce insect pest attack.

Conclusion

The study has shown that although most respondents were aware that pesticides can harm their health but were unwilling to use any PPE. Female respondents also did not use any methods of cleaning vegetables with the objective specific to reduction of pesticide residues so as to reduce dietary intake.

It is necessary to increase awareness among the population of the risks from pesticide exposure through continuous local government education programs focused on the rational and safe use of pesticides, and the implementation of risk communication strategies to protect the population.

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Table 1: General profile of the Household women

Characteristics	Rural (N=120) n (%)	Urban (N=120) n (%)
Age		
<35	47 (39.17)	56 (46.67)
35-45	39 (32.50)	37 (30.83)
45-55	24 (20.00)	21 (17.50)
>55	10 (8.33)	6 (5.00)
Marital Status		
Married	103 (85.83)	109 (90.83)
Unmarried	5 (4.17)	3 (2.5)
Widow/Divorced	12 (10.0)	8 (6.67)
Education		
Illiterate	19 (15.83)	21 (17.50)
High School	32 (26.67)	24 (20.00)
Higher Secondary	39 (32.50)	24 (20.00)
Graduate	28 (23.33)	30 (25.00)
Post Graduate	2 (1.67)	21 (17.50)

Table 2: General Profile of the Vegetable growers

Characteristics	Total (N=120) n (%)
Age	
<35	23 (19.17)
35-45	48 (40.00)
45-55	43 (35.83)
>55	13 (10.83)
Education	
Illiterate	23 (19.17)
Matric	38 (31.67)
Intermediate	46 (38.33)
Graduate	12 (10.00)
Occupation	
Owner Cultivator	72 (60.00)
Given on lease	4 (3.33)
Landless Agricultural Labour	6 (5.00)
Tenant Cultivator	13 (10.83)
Duration of work (years)	
0-5	22 (18.33)
6-10	51 (42.5)
>10	47 (39.17)

Table 3: Mean awareness score for rural women regarding pesticides

Statement	LIG	MIG	HIG	Total Score
	Mean $\pm$ SE	Mean $\pm$ SE	Mean $\pm$ SE	Mean $\pm$ SE
Consumption of off-season vegetables is not a good practice	0.50 ^a $\pm$ 0.13	0.75 ^{ab} $\pm$ 0.14	1.43 ^c $\pm$ 0.12	0.89 $\pm$ 0.15
Pesticide residues are present in vegetables.	0.93 ^a $\pm$ 0.16	1.48 ^b $\pm$ 0.09	1.78 ^{bc} $\pm$ 0.07	1.39 $\pm$ 0.13
Pesticides can enter the human body	0.80 ^a $\pm$ 0.16	1.35 ^b $\pm$ 0.10	1.98 ^c $\pm$ 0.02	1.38 $\pm$ 0.13
Pesticide residues have a harmful effect on our body	1.25 ^a $\pm$ 0.12	1.70 ^b $\pm$ 0.08	1.95 ^{bc} $\pm$ 0.03	1.63 $\pm$ 0.10
Pesticide residues are responsible for increased burden of diseases	1.13 ^a $\pm$ 0.13	1.75 ^b $\pm$ 0.08	1.93 ^{bc} $\pm$ 0.04	1.60 $\pm$ 0.11
Household processing act as an aid for reduction of pesticides.	1.48 ^a $\pm$ 0.13	1.80 ^b $\pm$ 0.07	1.85 ^{bc} $\pm$ 0.06	1.71 $\pm$ 0.10
Organic Foods are a good alternate for conventional foods	0.43 ^a $\pm$ 0.10	1.83 ^b $\pm$ 0.06	1.98 ^{bc} $\pm$ 0.02	1.41 $\pm$ 0.13
Consumption of organic food is a healthy practice inspite of being costly	0.63 ^a $\pm$ 0.13	1.83 ^b $\pm$ 0.06	1.88 ^{bc} $\pm$ 0.06	1.44 $\pm$ 0.13
Several organic foods are available in the market	-0.08 ^a $\pm$ 0.08	1.45 ^b $\pm$ 0.11	1.93 ^{bc} $\pm$ 0.06	1.10 $\pm$ 0.16

a-c Means in the same row without common superscripts differ ($P=0.05$).

Table 4: Mean awareness score for urban household women regarding pesticides

Statement	LIG Mean $\pm$ SE	MIG Mean $\pm$ SE	HIG Mean $\pm$ SE	Total Score Mean $\pm$ SE
Consumption of off-season vegetables is not a good practice	-0.13 ^a $\pm$ 0.13	0.00 ^{ab} $\pm$ 0.12	1.15 ^c $\pm$ 0.16	0.34 $\pm$ 0.10
Pesticide residues are present in vegetables.	1.00 ^a $\pm$ 0.16	1.43 ^b $\pm$ 0.10	1.78 ^{bc} $\pm$ 0.07	1.40 $\pm$ 0.07
Pesticides can enter the human body	0.80 ^a $\pm$ 0.16	1.33 ^b $\pm$ 0.10	1.98 ^c $\pm$ 0.02	1.37 $\pm$ 0.08
Pesticide residues have a harmful effect on our body	1.20 ^a $\pm$ 0.13	1.68 ^b $\pm$ 0.08	1.95 ^{bc} $\pm$ 0.03	1.61 $\pm$ 0.06
Pesticide residues are responsible for increased burden of diseases	1.10 ^a $\pm$ 0.14	1.68 ^b $\pm$ 0.08	1.98 ^{bc} $\pm$ 0.02	1.58 $\pm$ 0.06
Household processing act as an aid for reduction of pesticides.	1.48 ^a $\pm$ 0.13	1.80 ^b $\pm$ 0.07	1.88 ^{bc} $\pm$ 0.05	1.72 $\pm$ 0.06
Organic Foods are a good alternate for conventional foods	0.55 ^a $\pm$ 0.10	1.85 ^b $\pm$ 0.06	1.93 ^{bc} $\pm$ 0.04	1.44 $\pm$ 0.07
Consumption of organic food is a healthy practice inspite of being costly	0.33 ^a $\pm$ 0.11	1.83 ^b $\pm$ 0.06	1.90 ^{bc} $\pm$ 0.06	1.35 $\pm$ 0.08
Several organic foods are available in the market	-0.08 ^a $\pm$ 0.08	1.38 ^b $\pm$ 0.12	1.88 ^{bc} $\pm$ 0.06	1.06 $\pm$ 0.09

a-c Means in the same row without common superscripts differ ($P=0.05$).

Table 5: Mean Awareness Score of Vegetable Growers regarding General Parameters

General Statement	LIG Mean $\pm$ SE	MIG Mean $\pm$ SE	HIG Mean $\pm$ SE	Total Score Mean $\pm$ SE
Pesticides must only be sprayed by expert advice	1.03 ^a $\pm$ 0.13	1.48 ^b $\pm$ 0.09	1.43 ^{bc} $\pm$ 0.08	1.31 $\pm$ 0.06
Pesticides have negative impacts on human body	0.10 ^a $\pm$ 0.18	0.28 ^{ab} $\pm$ 0.21	1.13 ^c $\pm$ 0.19	0.50 $\pm$ 0.12
After-symptoms are observed after application of pesticides	0.63 ^a $\pm$ 0.20	1.03 ^b $\pm$ 0.15	1.40 ^c $\pm$ 0.13	1.02 $\pm$ 0.10
Protective measures need to be taken while applying pesticides	1.65 ^a $\pm$ 0.09	1.78 ^{ab} $\pm$ 0.07	1.85 ^{abc} $\pm$ 0.06	1.76 $\pm$ 0.04
Hygienic practices are necessary before, while and after applying pesticides	1.85 ^a $\pm$ 0.06	1.90 ^{ab} $\pm$ 0.05	1.95 ^{abc} $\pm$ 0.03	1.90 $\pm$ 0.03
Label instructions are necessary to be followed before use of pesticides	1.58 ^a $\pm$ 0.15	1.73 ^{ab} $\pm$ 0.13	1.78 ^{abc} $\pm$ 0.11	1.69 $\pm$ 0.08
Empty containers constitute a major source of contamination	-0.13 ^a $\pm$ 0.11	0.48 ^b $\pm$ 0.09	0.60 ^{bc} $\pm$ 0.08	0.32 $\pm$ 0.06
Pesticides can enter human body	1.63 ^a $\pm$ 0.15	1.68 ^{ab} $\pm$ 0.11	1.70 ^{abc} $\pm$ 0.12	1.67 $\pm$ 0.07
Residue intake through food results in accumulation in body	1.55 ^a $\pm$ 0.15	1.65 ^{ab} $\pm$ 0.11	1.70 ^{abc} $\pm$ 0.12	1.63 $\pm$ 0.07
organic farming can be an alternative for safe health	1.65 ^a $\pm$ 0.14	1.68 ^{bc} $\pm$ 0.11	1.70 ^{abc} $\pm$ 0.12	1.68 $\pm$ 0.07

a-c Means in the same row without common superscripts differ ($P=0.05$).

Table 6: Practices of rural women regarding pesticides

Statement	LIG	MIG	HIG	Total
<u>Consumption of off-season vegetables</u>				
Regularly	-	-	-	-
Occasionally	2 (5.00)	5 (12.50)	6 (15.00)	13 (10.83)
Rarely	8 (20.00)	13 (32.50)	19 (47.50)	40 (33.33)
Never	30 (75.00)	22 (55.00)	15 (37.50)	67 (55.83)
<u>Measures adopted for reduction of pesticide residues</u>				
Washing	40 (100)	40 (100)	40 (100)	120 (100.00)
Dipping in water	18 (45.00)	9 (22.50)	13 (32.50)	40 (33.33)
Dipping in luke-warm water	36 (90.00)	38 (95.00)	38 (95.00)	112 (93.33)
Dipping in brine solution	32 (80.00)	35 (87.50)	33 (82.50)	100 (83.33)
Blanching	3 (7.50)	11 (27.50)	13 (32.50)	27 (22.50)
<u>Methods of washing vegetables</u>				
Washing by rubbing	23 (57.50)	40 (100.00)	40 (100.00)	103 (85.83)
Before cutting	33 (82.50)	40 (100.00)	40 (100.00)	113 (94.17)
After cutting	29 (72.50)	11 (27.50)	-	40 (33.33)
<u>Cooking methods used for vegetables</u>				
Open pan	13 (32.50)	4 (10.00)	-	17 (14.17)
Pan with lid	40 (100.00)	40 (100.00)	40 (100.00)	120 (100.00)
Pressure cooking	31 (77.50)	40 (100.00)	40 (100.00)	111 (92.50)

Figures in Parenthesis indicate percentage

* Multiple responses

Table 7 : Practices of urban women regarding pesticides

Statement	LIG	MIG	HIG	Total
<u>Consumption of off-season vegetables</u>				
Regularly	3 (7.50)	9 (22.50)	9 (22.50)	21 (17.5)
Occasionally	11 (27.50)	8 (20.00)	8 (20.00)	27 (22.5)
Rarely	12 (30.00)	15 (37.50)	15 (37.50)	42 (35.00)
Never	15 (37.50)	8 (20.00)	8 (20.00)	31 (25.83)
<u>Specific measures adopted for reduction of pesticide residues</u>				
Washing	40 (100.00)	40 (100.00)	40 (100.00)	120 (100.00)
Dipping in water	6 (15.00)	18 (45.00)	18 (45.00)	42 (35.00)
Dipping in luke warm water	16 (40.00)	6 (15.00)	6 (15.00)	28 (23.33)
Dipping in brine solution	21 (52.50)	12 (30.00)	14 (35.00)	35 (29.17)
Blanching	5 (12.50)	10 (25.00)	11 (27.50)	26 (21.67)
<u>Methods of washing fruits and vegetables</u>				
Washing by rubbing	19 (47.50)	37 (92.50)	40 (100.00)	96 (80.00)
Before cutting	37 (92.50)	40 (100.00)	40 (100.00)	117 (97.50)
After cutting	26 (65.00)	3 (7.50)	-	29 (24.17)
<u>Cooking methods used for vegetables</u>				
Open pan	17 (42.50)	4 (10.00)	-	21 (17.50)
Pan with lid	40 (100.00)	40 (100.00)	40 (100.00)	120 (100.00)
Pressure cooking	38 (95.00)	40 (100.00)	40 (100.00)	118 (98.33)

Figures in Parenthesis indicate percentage

* Multiple responses

Table 8: Mean Awareness and Practice scores of vegetable growers for protection and Hygienic Measures

Statement	LIG			MIG			HIG			
	Mean Awareness Score	Mean Practice Score	t-value	Mean Awareness Score	Mean Practice Score	t-value	Mean Awareness Score	Mean Practice Score	t-value	
	Mean ± SE	Mean ± SE		Mean ± SE	Mean ± SE		Mean ± SE	Mean ± SE		
Protection Parameters										
Wears Gloves	0.25 ^a ± 0.12	-1.80 ^d ± 0.08	± 15.33 ^{**}	0.63 ^{ab} ± 0.18	-1.35 ^{de} ± 0.12	± 9.26 ^{**}	1.58 ^c ± 0.09	-1.03 ^f ± 0.17	15.21 [*]	
Wear Goggles	-0.45 ^a ± 0.14	-2.00 ^d ± 0.00	± 11.20 ^{**}	0.43 ^b ± 0.18	-1.95 ^{de} ± 0.03	± 13.09 ^{**}	0.98 ^c ± 0.14	-1.88 ^{def} ± 0.06	18.48 [*]	
Cover Head while Spraying	0.03 ^a ± 0.10	-1.20 ^d ± 0.16	± 6.78 ^{**}	1.55 ^b ± 0.09	-0.75 ^e ± 0.19	± 11.89 ^{**}	1.93 ^c ± 0.04	-0.78 ^{ef} ± 0.20	13.29 [*]	
Wear Oral/ Nasal mask	-0.20 ^a ± 0.13	-1.98 ^d ± 0.02	± 13.50 ^{**}	1.30 ^b ± 0.10	-1.85 ^{de} ± 0.06	± 25.89 ^{**}	1.80 ^c ± 0.06	-1.70 ^{def} ± 0.11	26.12 [*]	
Wear special boots	0.85 ^a ± 0.18	-1.93 ^d ± 0.04	± 15.35 ^{**}	1.68 ^b ± 0.08	-1.70 ^{de} ± 0.09	± 28.83 ^{**}	1.80 ^c ± 0.06	-1.25 ^f ± 0.20	13.15 [*]	
Use pump pointing to the ground	1.63 ^a ± 0.09	1.83 ^d ± 0.06	2.45 ^{**}	1.88 ^b ± 0.05	1.93 ^{de} ± 0.04	± 1.43	1.93 ^{bc} ± 0.04	1.95 ^{def} ± 0.03	1.00	
Hygiene Parameters										
Never eat while spraying	1.50 ^a ± 0.12	0.83 ^d ± 0.18	2.97 ^{**}	1.93 ^{ab} ± 0.04	1.58 ^e ± 0.12	2.76 ^{**}	1.93 ^{abc} ± 0.04	1.90 ^f ± 0.05	0.44	
Never smoke while spraying	1.28 ^a ± 0.14	0.18 ^d ± 0.20	4.64 ^{**}	1.80 ^b ± 0.07	1.33 ^e ± 0.18	2.55 ^{**}	1.93 ^{bc} ± 0.04	1.78 ^f ± 0.08	1.78	
Never drink while spraying	1.50 ^a ± 0.12	0.83 ^d ± 0.18	2.97 ^{**}	1.93 ^{ab} ± 0.04	1.58 ^e ± 0.12	2.76 ^{**}	1.93 ^{abc} ± 0.04	1.90 ^f ± 0.05	0.44	
Change clothes after spraying	0.40 ^a ± 0.55	0.43 ^d ± 0.09	1.00	1.75 ^b ± 0.07	1.48 ± 0.08	3.85 ^{**}	1.93 ^{bc} ± 0.04	1.93 ± 0.04	1.43	
Wash hands after spraying	1.95 ^a ± 0.03	1.80 ^d ± 0.08	1.64	1.95 ^{ab} ± 0.03	1.98 ± 0.02	0.57	1.98 ^{abc} ± 0.04	2.00 ± 0.00	1.00	

Take shower after spraying	1.65 ^a ± 0.10	1.50 ^d ± 0.11	2.62 ^{**}	1.93 ^{ab} ± 0.04	1.88 ± 0.05	1.43	0.02 1.98 ^{abc} 0.02	±	1.95 ± 0.03	0.57
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^{**} t- values significant at 1% level of Significance

a-c Means in the same row without common superscripts differ ($P=0.05$).

Table 9: Perception of vegetable growers regarding pesticide application and disposal

N=120

Statement	Always	Quite Often	Sometimes	Rarely	Never
Spray pesticides on crops	57 (47.50)	34 (28.33)	21 (17.50)	8 (6.67)	-
Application of pesticides:					
Follow PAU's 'Package of Practices'	0 (0.00)	0 (0.00)	2 (1.67)	8 (6.67)	110 (91.67)
Follow PAU's expert advice	0 (0.00)	0 (0.00)	0 (0.00)	2 (1.67)	118 (98.33)
Pesticide vendor's advice	39 (32.5)	59 (49.17)	13 (10.83)	9 (7.5)	-
Personal Experience	27 (22.5)	73 (60.83)	11 (9.17)	9 (7.5)	-
Consider waiting period between application and harvesting	37 (30.83)	42 (35.00)	29 (24.17)	8 (6.67)	4 (3.33)
Storage of pesticides:					
Store room in the field	41 (34.17)	32 (26.67)	19 (15.83)	11 (9.17)	17 (14.17)
At Home	19 (15.83)	9 (7.50)	24 (20.00)	21 (17.50)	47 (39.17)
Disposal of empty containers of pesticides					
Throw in the field	7 (5.83)	12 (10.00)	29 (24.17)	28 (23.33)	44 (36.67)
Bury in the pit	29 (24.17)	21 (17.50)	34 (28.33)	24 (20.00)	12 (10.00)
Throw in the garbage	14 (11.67)	29 (24.17)	12 (10.00)	23 (19.17)	42 (35.00)
Burn the containers	5 (4.17)	19 (15.83)	25 (20.83)	25 (20.83)	46 (38.33)

Figures in Parenthesis indicate percentage

* Multiple responses

Fig.1 : Weekly frequency of pesticide application by vegetable growers



