



## Knowledge level of hill farm women regarding safe use of pesticides in home and farm

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### Abstract

Pesticides have become a part of our life, sustaining many of our activities including prevention and control of many household and farm insects-pests and diseases for higher agricultural productivity. Still these have created a great threat in front of us due to their hazardous effects in our body and environment. Technical measures can be used to prevent pesticides hazards at source, and to prevent the transfer of dangerous pesticides to the human body and environment provided users have appropriate knowledge. Farmwomen have an important role to play not only in homestead activities but in agriculture also. A sample of 60 rural women involved in agriculture was taken from the five villages of Kangra district of Himachal Pradesh to know their knowledge regarding safe use of pesticides both in home and at farm. It was found that though women were aware about certain aspects of safe use of pesticides, still there were some facts about which they were almost ignorant like antidote to be kept while using the pesticides, proper disposal of empty containers after use, toxicity level of different pesticides and first aid to be given in case of any emergency. Thus, appropriate efforts are needed in this context.

**Key words:** Safe use of pesticides, pesticides, insecticides, fungicides, herbicides.

Pesticides are intended to destroy or control agricultural insects-pests, diseases and weeds of all kinds. They are used for various purposes in agriculture and at home. Pesticides can enter the body at the time of handling through ingestion as gases, dusts, vapours, fumes, liquids or solids. Our body has a considerable capacity to excrete and to render dangerous substances harmless, and to protect us. However, our defense system can be overloaded by repeated heavy exposure so that it no longer fulfills its function. It is not just the worker handling pesticides who is at risk, even we may be exposed in our homes through misuse or by accidents, and be contaminated by consumer products including food. Thus, the whole lifecycle of a chemical should be considered when assessing its dangers and benefits. As women play a very significant role not only in home but also tending the animals and farming including handling of pesticides, thus their knowledge regarding safe use of pesticides in home and farm must be studied. Keeping all these points in mind, the present study was carried out with the objective to explore the existing knowledge level of women regarding safe use of pesticides.

### Methodology

The existing study was conducted in five selected villages of Kangra District of Himachal Pradesh adopted under All India Coordinated Research Project on Home Science going on in College of Home Science, Chaudhary Sarwan Kumar Himachal Pradesh Krishi Vishvavidyalaya, Palampur. A sample of 60 rural women involved in agriculture was taken randomly from selected villages for the study. Data were collected with the help of structured interview schedule. Suitable statistical methods were used for data analysis.

### Results and Discussion

#### Back ground profile of the respondents

Data on profile of women given in Table 1 revealed that majority of the respondents (53.33%) fall in the lower middle (31-45 years) age category and rest were from upper middle and young age categories i.e. 28.33% and 18.33%, respectively. Farming was main occupation of majority of the respondents (88.33%). More than half (53.33%) of the farm women have service as the subsidiary family occupation and 21.67% respondents had no subsidiary occupation. Regarding qualification of the respondents, it was observed that 20.00,

23.00 and 28.00% of the women were illiterate, educated up to middle and matriculate, respectively. Rest 11.67% respondents were either educated up to 10+2 level or graduate and above.

#### **Utilization pattern of pesticides**

Table 2 discloses the utilization pattern of pesticides by the respondents for different purposes viz. killing of farm insects-pests, killing of household insects-pests, seed treatment and destroying of weeds. Ninety per cent of the farm women reported that they were using pesticides to kill different household insects-pests. Almost equal percentage i.e. 75.00% and 71.67% reported the use of pesticides to control the farm insects-pests and as weeds, respectively. It is interesting to report that a meagre percentage of respondents (3.33%) used fungicides for seed treatment. Similar results were reported by Shaik and Behal (2000) in a study carried out in Delhi.

#### **Knowledge of farm women regarding precautions**

Information about precautions taken by farm women while purchasing and using the pesticides has been given in Table 3. Data revealed that more than half of the respondents (56.67%) knew that 'pesticides should be purchased from authorized dealers/shopkeepers' whereas, 35.00% of them opined that 'manufacturing and expiry dates should be checked at the time of purchasing'. Almost an equal percentage of women (30.00 and 27.00%) knew that 'packed pesticides should be purchased' and Subject Matter Specialists should be consulted before purchasing pesticides'. Only fifteen percent respondents knew that 'bill must be taken and all the instructions should be read carefully' while purchasing pesticides. Kumari and Reddy (2013) studied the knowledge and practices of safety use of pesticides among farm workers and reported that most of them have reasonably good knowledge but it still has to see, to what extent that knowledge is being used practically.

Safe handling at the time of preparing pesticides for use is also very important aspect. Regarding knowledge about handling of pesticides before use, majority of the respondents (91.67%) were aware of the fact that pesticide solutions should be prepared according to the need/area to be sprayed, followed by those (55.00%) who reported that pesticide should not be mixed with hands. Almost one third of the respondents knew that the parts of the sprayer should not be blown by mouth, where as only 21.67% of the respondents had

knowledge that instruments used for opening the containers should be kept separately.

As far as precautions at the time of using the pesticides is concerned, 90% of the respondents visualized that facemask and respirators should be worn to avoid the inhalation of pesticides. Exactly half of the respondents said that gloves and goggles should be used to avoid the direct contact of chemical with the skin and eyes. A very meager percentage of the respondents knew that spray should be done in the direction of wind (13.33%), it should be done in the morning or evening hours (11.67%), should not be done on a windy day (13.33%), while spraying, farmers, labourers and grazing animals should be evacuated from the vicinity (18.33%) and smoking and eating should not be carried out while applying the pesticides (23.33%). Knowledge of farmwomen about precautions to be taken after use revealed that most of the respondents (93.33%) believed that hands should be washed properly with soap. Different parts of the spraying unit should be disassembled and stored clean after use, equipments not to be washed near a drinking water source, equipments not to be left open when not in use and nozzles of the sprayer to be washed thoroughly with clean water and kept dry was reported by 15.00, 13.33, 11.67 and 8.33% respondents, respectively.

Overall mean knowledge of farm women regarding precautions at the time of purchasing and using the pesticides is given in Fig. I. It was found that women possessed highest knowledge regarding handling of pesticides at the time of preparing pesticide solutions (35.50%), followed by precautions at the time of using the pesticides (16.63%), precautions during purchase of pesticides (15.43%) and after use of pesticides (14.50%).

#### **Knowledge of rural women regarding storage of pesticides and disposal of empty containers**

Table 4 depicts the knowledge of rural women regarding the storage of pesticides and disposal of empty containers. According to majority of the respondents (80.00%) pesticides should be kept under lock and key, where as 11.67% of them viewed that it should be kept in the animal shed. Only 8.33 % of the rural women reported that it could be kept open anywhere in home. Sixty percent respondents opined that empty containers can be thrown in running water like khadd

and 47 % reported that these can be thrown in barren land. Proper dumping and burning was reported by only 23.33% and 10.00% respondents, respectively. A meager percentage of the respondents i.e. 5.00% said that the empty containers could be used for household purpose like watering the plants in the kitchen gardens etc. Mohanty *et al.* (2013) while evaluating knowledge and practice of pesticide use among agricultural workers in Pondicherry found that around 68.00% of farmers indiscriminately disposed empty containers while 48.00% buried the leftover pesticides.

### **Knowledge of rural women regarding effects of pesticides on human body**

Data on knowledge of rural women regarding effects of pesticides on human body was analysed and given in Table 5. Regarding symptoms of poisoning, most of the women (81.67%) articulated giddiness and headache, followed by nausea (40.00%) and breathing problems (35.00%). Some of them also expressed sweating, redness on the face, drowsiness, slow heart beat and low blood pressure as symptoms of poisoning. As far as knowledge about toxicity of the pesticides was concerned, only 10.00% of the women had the concept of the varied toxicity of different pesticides but only 3.33% of them could classify the chemical's toxicity on the basis of colour of triangle drawn on packing.

### **Knowledge of rural women regarding first aid**

The perusal of data about knowledge of rural women regarding first aid to be given during excessive poisoning illustrates that majority of the women were aware of some emetic to be given to the victim (Table 6). Most commonly reported emetic was common salt with water (63.33%). Some other reported emetics were tobacco (20.00%), whey (3.33%) and lemon water (3.33%). One fourth of the respondents (25.00%) articulated that throat should be touched with fingers/ blunt end of spoon or some spatula to induce vomiting to the victim so that the part of the poison inhaled may come out.

In case of excessive poisoning, most of the respondents (95.00%) were of the view that doctor must be consulted. A meager percentage of the women reported that clothing should be loosened (15.00%) and opinion leader should be consulted (10.00%). Only 3.3% of the farmwomen

knew that some antidote should be given. If the chemical enters in the eyes majority of the respondents said that eyes should be washed continuously with fresh water. Twelve percent of the women viewed that doctor must be consulted for it. Few of them (5.00%) were also of the view that eyes should be washed with alum water.

Absorption of harmful amount of pesticides through skin usually happens when handling them in liquid form (Integrated Pest Management, Directorate of Plant Protection, Quarantine & Storage, 2008). There are some precautions regarding use of pesticides, which are given as below:

- Do not purchase pesticides from footpath dealers or from un-licensed person.
- Do not purchase pesticide in bulk for whole season.
- Do not purchase pesticides without approved label on the containers.
- Never purchase expired pesticide.
- Do not purchase pesticides whose containers are leaking/loose/unsealed.
- Never store pesticide in house premises.
- Never transfer pesticides from original to another container.
- Do not store insecticides with herbicides.
- Do not allow children to enter the storage place.
- Pesticides should not be exposed to sunlight or rainwater.
- Never carry/transport pesticides along with food/fodder/other eatable articles.
- Never carry bulk pesticides on head, shoulder or on the back.
- Do not use muddy or stagnant water.
- Never prepare spray solution without wearing protective clothing.
- Do not allow the pesticide/its solution to fall on any body part.
- Never avoid reading instructions on container's label for use.
- Never use left out spray solution after 24 hours of its preparation.
- Do not mix granules with water.

**Table 1. Back ground profile of the respondents****N=60**

Sr. No.	Characters	Frequency	Percentage
1.	<b>Age (Years)</b>		
	Young (18-30)	11	18.33
	Lower middle (31-45)	32	53.33
	Upper middle (46-60)	14	23.33
	Old (61& above)	3	5.00
2.	<b>Family occupation (main)</b>		
	Farming	53	88.33
	Service	5	8.33
	Business	1	1.67
	Labour	1	1.67
3.	<b>Family occupation (subsidiary)</b>		
	Farming	7	11.67
	Service	32	53.33
	Business	1	1.67
	Labour	7	11.67
	None	13	21.67
4.	<b>Education</b>		
	Illiterate	12	20.00
	Up to middle	24	40.00
	High school	17	28.33
	10+2	4	6.67
	Graduate and above	3	5.00

**Table 2. Distribution of respondents according to purpose for which pesticides are used****N=60**

Sr. No.	Purpose	Frequency*	Percentage
1	To kill household insects-pests	54	90.00
2	To kill farm insects-pests	45	75.00
3	To kill weeds	43	71.67
4	For seed treatment	2	3.33

\*Multiple responses

**Table 3. Knowledge of farm women regarding precautions taken by them while purchasing and using pesticides** N=60

Sr. No.	Precautions	Frequency*	Percentage
<b>A) During purchase of pesticides:</b>			
1.	Pesticides should be purchased from recognized shop keeper	34	56.67
2.	Packed pesticides should be purchased	18	30.00
3.	Bill must be taken	9	15.00
4.	Manufacturing and expiry dates should be checked	21	35.00
5.	Granular or powdered pesticides should be purchased	1	1.67
6.	Opinion leader and/or SMS should consulted before purchasing	16	26.67
7.	All the instructions should be read on the label of the packing clearly	9	15.00
<b>B) During handling of pesticides (before use):</b>			
1.	Instruments used for opening the tins and packets should be kept separately	13	21.67
2.	Formulations should be mixed using wooden handles not by hands	33	55.00
3.	Parts of equipments should never be blown by mouth	21	35.00
4.	Spray solutions should be prepared according to the need/area to be sprayed	55	91.67
<b>C) While using the pesticides:</b>			
1.	Facemask and respirators should be worn to avoid inhalation	54	90.00
2.	Use gloves and goggles to avoid direct contact of insecticides with the body	30	50.00
3.	Spray should be done in the direction of wind	8	13.33
4.	Spray should be done in the morning or evening hours	7	11.67
5.	Spray should not be done on a windy day	8	13.33
6.	Antidote like Atropine should be kept	1	1.67
7.	While spraying farmers, labourers and grazing animals should be evacuated from the vicinity	11	18.33
8.	Smoking and eating should not be carried out while applying the pesticides	14	23.33
<b>D) After use of the pesticides:</b>			
1.	Hands should be washed properly with soap every time	56	93.33
2.	Different parts of the spraying unit should be disassembled and stored clean	9	15.00
3.	Nozzles of the sprayer should be washed thoroughly with clean water and kept dry	5	8.33
4.	Equipments should not be left open when not in use	7	11.67
5.	Equipments should never be washed near a drinking water source	8	13.33
6.	Bath should be taken after spray	2	3.33

**Table 4. Knowledge of farm women regarding storage of pesticides and disposal of empty containers** N=60

Sr. No.	Activities	Frequency*	Percentage
<b>A) Storage of pesticides</b>			
1.	Openly any where in home	5	8.33
2.	Under lock and key	48	80.00
3.	In the animal shed	7	11.67
<b>B) Disposal of empty containers</b>			
1.	Throw in waste land	28	46.67
2.	Throw in running water	36	60.00
3.	Dump	14	23.33
4.	Burn	6	10.00
5.	Use for gardening	3	5.00

\*Multiple responses

**Table 5. Knowledge of farm women regarding pesticides and their effects on human body****N=60**

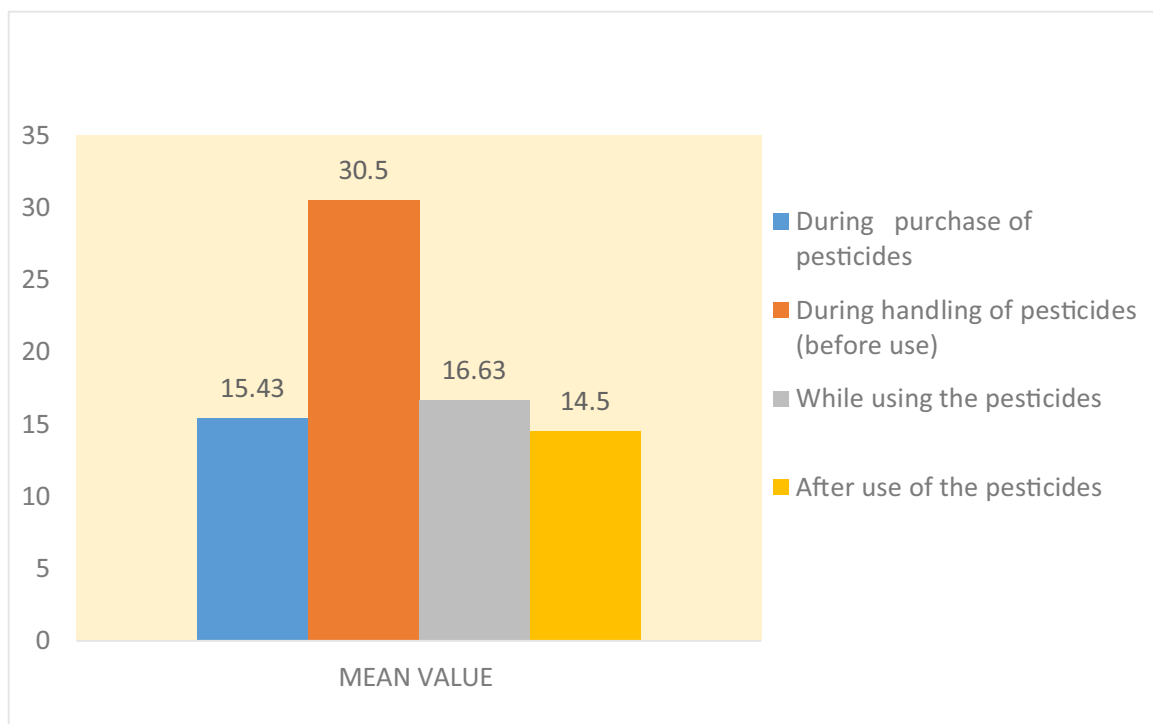
<b>Sr. No.</b>	<b>Area</b>	<b>Frequency*</b>	<b>Percentage</b>
<b>A)</b>	<b>Level of toxicity</b>		
1.	Knowledge regarding level of toxicity	6	10.00
2.	Classification of pesticides on the basis of the colours indicated on the triangle	2	3.33
<b>B)</b>	<b>Symptoms of poisoning</b>		
1.	Giddiness and headache	49	81.67
2.	Nausea	24	40.00
3.	Sweating	15	25.00
4.	Slowing of heart beat and low blood pressure	4	6.67
5.	Breathing problems	21	35.00
6.	Drowsiness	10	16.67
7.	Redness on the face	6	10.00

\* Multiple responses

**Table 6. Knowledge of farm women regarding first aid and treatment during excessive poisoning****N=60**

<b>Sr. No.</b>	<b>First aid and treatment</b>	<b>Frequency*</b>	<b>Percent age</b>
1.	Some emetic should be given		
	a) Common salt in water	38	63.33
	b) Tobacco	12	20.00
	c) Whey	2	3.33
	d) Lemon water	2	3.33
2.	Throat should be touched with blunt end of spoon or fingers or some spatula	15	25.00
3.	Clothing should be loosen	9	15.00
4.	Artificial respiration should be given if breathing is irregular	2	3.33
5.	Victim should be decontaminated in case of skin exposure by washing his body and hair with soap	3	5.00
6.	Opinion leader should be consulted	6	10.00
7.	Doctor should be consulted	57	95.00
8.	Antidote should be used	1	1.67
9.	If pesticide enters in the eyes		
	a) Eyes should be washed with water continuously for 15-20 minutes	50	83.33
	b) Eyes should be washed with alum water	3	5.00
	c) Doctor must be consulted	7	11.67

\* Multiple responses



**Fig. I Mean knowledge of farm women regarding precautions taken by them while purchasing and using pesticides**

- Do not smell the spray tank.
- Do not use overdose, which may affect plant health and environment.
- Do not eat, drink, smoke or chew during whole operation of pesticides.
- Do not use leaky or defective equipments.
- Do not use defective/non- recommended nozzles.
- Do not blow/clean-clogged nozzles with mouth. Instead use toothbrush tied with sprayer.
- Never use same sprayer for both herbicides and insecticides

#### **Conclusion**

Pesticides play a very significant role in the homes as well as farm in sustaining many of our activities, preventing and controlling many household and farm insects-pests, increasing agricultural productivity. Besides using the pesticides to kill farm insects and to control diseases and insects, ninety percent of the farmwomen reported its use to kill household insects-pests. Though many of them are

knowledgeable regarding safe handling of pesticides but certain issues really need to be addressed like:

- Bill must be taken while purchasing the pesticides
- Antidote should be kept while using the pesticides
- Bath must be taken after using pesticides
- Proper disposal of empty containers after use.
- Toxicity level of different pesticides.
- First aid to be given in case of any emergency

Further, an effective control method for any hazardous chemical is substitution: a hazardous chemical should be replaced with a less hazardous one if it is necessary to use. Moreover, indigenous technologies should be used instead of pesticides, which have great scope in contributing towards pesticides residue-free agricultural products and for other purposes. There should be strong incentives to the farmers to produce high quality and safe products. It should not be forgotten that pesticides have power, and that is why they have become an important part of our life, respect that power and handle them with care so that they can give fruitful results.

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