



Problems of Usage of Pesticides by Vegetable Growers of Kullu Valley in Himachal Pradesh

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ABSTRACT

Pesticides indisputably are poisonous, their random use and abuse may result in ecological disturbance and environmental pollution, carrying serious health hazards to man and animals. So, special emphasis was given in this study to assess the problems faced by the vegetable growers due to improper use of pesticides on vegetable crops in Kullu district of Himachal Pradesh. Multi-stage random sampling technique and universe method were adopted for the selection of area and respondents. The study revealed that majority of respondents in the valley had no information on safe use of pesticides and were dependent on Agricultural input retailers' for pesticide usage advisories. While only one per cent respondents had information from formal information sources and did pesticide application safely. The main health related problems faced by the vegetable growers due to unsafe application of pesticides were bad odour, breathing problem, weakness, vomiting, body pain, headache, itching, and drowsiness. This study highlights the need for sensitization of vegetable growers of the valley for safe use of pesticides by government extension agencies and NGOs through awareness programmes so that these health hazards can be avoided.

Keywords: Pesticide uses, vegetable growers, kullu, valley

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INTRODUCTION

India has made a remarkable progress through the various five yearly plans starting from 1951. As a result, the social and economic scenario of the country has changed considerably. Agricultural production has risen (Bharati *et al.*, 2014). Indian pesticide market is the 12th largest in the world and stands first in Asian continent. India produces 90,000 metric tonnes of pesticides in a year with over 400 million acres under cultivation and over 60 percent of the country's population depends on agriculture as well as the country's economy mainly depends on the agriculture. India's 30 percent potential crop yield is damaged by the attack of insect-pests, diseases, weeds and rodents. The pesticides play a crucial role in protecting crops from damage both before and after harvest which helps to increase crop yields (Kundu and Wale, 2013). In India it is impossible to completely avoid pesticides usage in agriculture. Farmers are forced to use pesticides at different crop stages from planting to harvesting due to various biotic stresses. A large amount of pesticides are applied annually,

however less than 5 per cent are estimated to reach the initial target, with the remainder being dumped in soil, water, plants, animals and human beings. Intensification of agriculture through massive adoption of high yielding varieties, increased use of synthetic inputs like chemical fertilizers and pesticides, greater exploitation of irrigation potentiality of surface and groundwater resources and farm mechanization have largely been responsible for a spectacular achievement in the food grain production that we have achieved over last three decades. Increased use of pesticides has emerged as a potential source of danger to sustainability of environment that endangers the existence of all forms of life on this planet. Perils and pitfalls of pesticides have been well evidenced due to their residual toxicity in our food chain (Verma *et al.*, 2013). Among the all measures to raise the productivity level, plant protection is in central position. Plant protection is a basic exercise in any crop for control of insect-pests, diseases, weeds etc. to avoid economic losses.

Selection of research area of Kullu Valley in Himachal Pradesh due to the very good conditions for production of temperate vegetables as well as their seed. Mild summer

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is suitable for many sub-tropical vegetables. In spite of this the vegetable production is low, because improved package of practices of plant protection measures was not followed by the vegetable growers (Suman, 2014). Among the various crops, in vegetables, the number of plant protection chemicals is used with maximum amount due to intensive application for the purpose of protecting them from attack of several insect-pests and diseases. Hence, the special emphasis was given in this study to identify the problems faced by the vegetable growers in application of pesticides on vegetable crops during and after application of pesticides.

MATERIAL AND METHODS

The study was undertaken in the State of Himachal Pradesh. For the selection of area and respondents of the present study, multi-stage random sampling technique and universe method were adopted. At the first stage of sampling, Kullu district was selected among the 12 agricultural districts of the State purposively based on its higher area coverage in vegetable cultivation. Out of 5 blocks of Kullu district, two blocks Kullu and Manali were randomly selected at the second stage of sampling. In these selected blocks a relatively homogenous field cultivated with vegetable crops was chosen on the basis of the opinion of the agricultural input retailers. The farmers who were growing vegetables in that field were selected as respondents of the present study through total enumeration. Thus total 600 farmers were considered as respondents of the study. The data were collected by personal interview method using local language for getting their exact response and simple percentage method was used for analysis of data statistically to reach at meaningful results and conclusion.

RESULTS AND DISCUSSION

Level of Education

Information collected while interaction with the representative vegetable growers. Statistical techniques were applied to draw some inferences, based on information received from vegetable growers. Perusal of data presented in table 1, it is clear from that the majority of respondents (39%) in study area were primary level followed by illiterate (36%). At the most 5 per cent of growers had higher secondary and above level of education which indicates a positive sign of agriculture, which beckons more scientific cultivation in near future because they are the good adopter of agricultural technologies. Vegetable cultivation needs proper time management, following crop rotation, more

scientific application of fertilizers, pesticides, irrigation water, weeding in proper time, thinning, harvesting in proper time etc. so, it is easy to say that educated persons in the field can be comparatively more suitable in dealing these activities. One-fifth of respondents (20%) had secondary level of education.

Table 1: Level of education of vegetable growers (n=600)

Level of Education	Number of respondents	Percentage of respondents
Illiterate	216	36
Primary level	234	39
Secondary level	120	20
Higher secondary level and above	30	5

Own cultivable land and vegetable cultivable land

Results depicted in the table 2, clearly indicates that the most of the respondents in study area were marginal farmers. At the most 14 percent of respondents had up to one bigha of cultivable land (1 bighas=0.2 acre), 17 per cent of respondents had 1.1-2 bigha of cultivable land, 30 per cent of respondents had 2.1-4 bighas of cultivable land, 32 per cent of respondents each had 4.1-6 bighas and 8 per cent of respondents had above 6 bighas of cultivable land. Nearly one third per cent respondents (12%) had upto 10 biswa (20 biswa=0.2 acre) of vegetable cultivable land, 16 per cent of respondents had 10.1-20 biswa of vegetable cultivable land, 40 per cent of respondents had 1.1-2 bighas of this land, 22 per cent of respondents had 2.1-4 bighas of vegetable cultivable land whereas remaining 10 per cent of respondents had above 4 bighas of vegetable cultivable land.

Table 2: Own cultivable land and vegetable cultivable land (n=600)

Own cultivate land (Bigha)	No. of respondents	Percent-age of respondents	Veg-etable cultivable land	No. of respondents	Percent-age of respondents
Up to 1.0	84	14	Up to 10 Biswa	72	12
1.1 – 2.0	102	17	10.1-20.0 Biswa	96	16
2.1 – 4.0	180	30	1.1-2.0 Bighas	240	40
4.1 – 6.0	192	32	2.1-4.0 Bighas	132	22
> 6.0	42	7	> 4.0 Bighas	60	10

Experience in vegetable cultivation and experience in application of pesticides

It is clearly evident from the table 3 that at the most (35%) of respondents had up to 10 years of experience followed by 11-20 years (30%) of experience on vegetable cultivation, in other categories were 21-30 years (20%), 31-40 years (10%) and remaining 5 per cent of respondents had above 40 years of experience on vegetable cultivation. In case of application of pesticides, at the most 45 per cent of respondents had up to 10 years of experience on application of pesticides in controlling insect-pests, diseases, etc. 30 per cent respondents had 11 – 20 years of experience in this respect, 19 per cent respondents had 21-30 years of experience and remaining 6 per cent of vegetable growers had above 30 years of experience in application of pesticides. The respondents also reported that recently the farmers are using pesticides in massive scale and now a day cultivation is pesticide dependent along with other factors because the attack of insect-pests, diseases, etc. are more due to intensive cultivation, vagaries of weather etc. and above all highly profit mindedness of vegetable growers.

Table 3: Experience in vegetable cultivation and experience in application of pesticides (n=600)

Number of years engaged in vegetable cultivation	No. of respondents	Percentage of respondents	No. of years engaged in application of pesticides	No. of respondents	Percentage of respondents
Up to 10	210	35	Up to 10	270	45
11 – 20	180	30	11 – 20	180	30
21 – 30	120	20	21 – 30	114	19
31 – 40	60	10	31 – 40	36	6
Above 40	30	5	Above 40	-	-

Sources of information regarding use of pesticides

Most of the respondents (65%) reported that (Table 4) they mainly got information in using pesticides from agricultural input retailers at the time of purchasing followed by big farmers (16%) and fellow farmers (10%). Five per cent of respondents' got information from neighbours and three per cent from relatives, whereas 1 per cent respondents collected that information from other information sources. These were Agricultural Development Officers (ADOs), Krishi Prayukti Sahayaks (KPSs), experts of agricultural university, company

personnel or other agricultural field functionaries. After collecting the information from various sources, each respondent evaluated it in their level best and finally applied the appropriate one.

Table 4: Sources of information regarding use of pesticides (n=600)

Sources	Number of respondents collected information	Percentage of respondents collected information
Retailers	390	65
Big farmers	96	16
Fellow farmers	60	10
Neighbours	30	5
Relatives	18	3
Others	6	1

Problems during application of pesticides and problems after application of pesticides

The respondents of the study area reported that (Table 5) they faced many types of problems during application of pesticides. The various problems were bad odour (24%), breathing problem (14%), weakness (9%), vomiting (5%), body pain (6%), headache (21%), itching (12%) and drowsiness (9%). In the study area, few respondents expressed their opinion that many problems arise due to application of pesticides in empty stomach and that they always applied the pesticides after eating. In case of problems after application of pesticides, the table 5 also indicates that 30 per cent respondents had the problem of weakness, 24 per cent respondents felt headache, 20 per cent of respondents had the problem of feelings of burning of skin, 11 per cent of respondents had the problem of vomiting, 9 per cent respondents felt drowsiness and 6 per cent of the respondents had the problem of bad odour after the application of pesticides. The respondents opined that now a day's highly poisonous pesticides cause these problems up to a certain extent.

Problems created by chemicals after application of pesticides

Results summarized in table 6 indicate that the maximum (65%) respondents replied that they felt comparatively more problem after application of Phorate 10g. In case of applying other pesticides, the respondents felt the problem after application of these pesticides were - Thiodan (11%), Cymbush (42%), Furadon (55%), Kritaf (49%), Sumidon (46%), Challenger (40%), Ekalux (30%)

Table 5: Problems during application of pesticides and problems after application of pesticides (n=600)

Problems during application of pesticides	Number of respondents	Percentage of respondents	Problem after application of pesticides	Number of respondents	Percentage of respondents
Bad odour	144	24	Weakness	180	30
Breathing problem	84	14	Headache	144	24
Weakness	54	9	Feeling of burning of skin	120	20
Vomiting	30	5	Vomiting	66	11
Body pain	36	6	Drowsiness	54	9
Headache	126	21	Bad odour	36	6
Itching	72	12			
Drowsiness	54	9			

and Metacid (37%). Kumar *et al.* (2010) reported that majority of the respondents (75.76%) had the main constraint in using plant protection in pulse cultivation was non availability of plant protection chemicals in the market. It was also seen from the study that 91.25 per cent of the respondents had lack of knowledge about seed treatment whereas 72.15 per cent respondents had lack of knowledge about insect-pests and diseases management. Patel *et al.* (2010) reported that 58 per cent of the respondents had medium level of knowledge on pest and disease control measures, 30 per cent of respondents had low level of knowledge whereas remaining 12 per cent of respondents had higher level of knowledge. In case of adoption recommended pest and disease control measures, only 48 per cent of the respondents adopted those measures.

Table 6: Problems created by chemicals after application of pesticides (n=600)

Name of chemicals	Number of respondents	Percentage of respondents
Thiodan	66	11
Cymbush	252	42
Phorate 10G	390	65
Furadon	330	55
Kritap	294	49
Sumidon	276	46
Challenger	240	40
Ekalux	180	30
Metacid	222	37

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CONCLUSION

67% of the respondents in study area were literate, only one per cent respondents had information from government extension agencies and did pesticide application safely. Majority of the vegetable growers in the valley are marginal farmers cultivating vegetables since 10-40 years back. The respondents are using pesticides from 10 to 30 Years. Invariably pesticides application has become need for them for intensive vegetable cultivation. Only one per cent people are applying pesticides safely as per scientific advice of govt extension agencies. The problems faced include bad odour, breathing problem, weakness, vomiting, body pain, headache, itching, and drowsiness. The study emphasizes need to educate vegetable growers through awareness programmes for safe use of pesticide.

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