



E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2018; 6(1): 825-828
© 2018 JEZS
Received: 01-11-2017
Accepted: 02-12-2017

Neelam Yadav
Post Doctoral Fellow, Dept. of
Entomology, Chandra Shekhar
Azad University of Agriculture
and Technology, Kanpur, Uttar
Pradesh, India

Neerja Agrawal
Head & Prof., Dept. of
Entomology, Chandra Shekhar
Azad University of Agriculture
and Technology, Kanpur, Uttar
Pradesh, India

Renu Yadav
Head & Asst. Prof. Dept. Of
Zoology, Department of Zoology,
C.C.S.P.G. College, Heonra,
Etawah, Uttar Pradesh, India

Correspondence
Jaan Mohammad Wani
Division of Veterinary
Gynaecology & Obstetrics,
F.V.Sc & A.H, SKUAST-
Jammu, J&K, India

Pest management perceptions and practices of farmers growing mustard crop in Uttarakhand, India

Neelam Yadav, Neerja Agrawal and Renu Yadav

Abstract

Surveys were carried out in eight villages of Dehradun and Haridwar district, Uttarakhand in 2016-2017 to investigate the farmer's perceptions and management practices of insect pests of mustard crops. Surveys involving 160 farmers belonging to four villages (Doiwala, Mazra, Rajpura and Kaulagarh) and (Motichoor, Bhoopatwala, Kangrai and Ranipur) Dehradun and Haridwar respectively to collect information on the farmers perception, knowledge and practices related to mustard crops. Data were collected through a survey using pre-tested structured questionnaire. Information on farmer's knowledge and pest management practices as well as aspects related to belief and attitudes governing their pest management decision making was analyzed. The results revealed that the 77.5 per cent of the farmers were aware about pesticidal hazards in the cultivation of mustard crops. The knowledge of pest and pest enemies was recorded in 76.25 per cent and 71.25 per cent farmers respectively. 86.25 per cent of respondents were aware about non pesticidal management and some farmers (35 per cent) aware about the use of biopesticides. So farmers strong belief in the role of beneficial insects, their awareness and effect of pesticides on human health and non- target organisms. Therefore, farmers of both districts were not more educated but they knew about the health hazards caused by pesticides and its ill effects. All age groups members were engaged in farming because their economy was totally dependent on their farm holding.

Keywords: Farmers knowledge, Practices, Perceptions, Insect-pests, Awareness, Natural enemies

1. Introduction

Agriculture in the Himalayan region has always been environmental friendly due to its distinction and rich traditional practices. Agriculture holds a pivotal role in promoting food and nutritional security of people supporting livelihoods of farmers and ensuring sustainable development of nations like India. Agriculture today is increasingly affected by degradation and overexploitation of natural resources, increased frequency of extreme weather events influenced by climate change and excessive application of synthetic inputs on farms including injudicious use of pesticide or even use of banned or spurious ones. Use of eco-friendly chemical pesticides have helped in promotion of beneficial insects, viz., spiders, coccinellids beetles. The great numbers of the coccinellid species are predacious and beneficial from the viewpoint of biological control of pests, feeding during both larval and adult stages upon aphids, scale insects, psyllids, mites etc.

Farmers across the geographical regions of the world have been using a good number of plant protection measures to control pests and diseases in their cultivated crops. Insect pests cause heavy losses to crops especially the production of vegetables. Curative control measures are practiced to protect them. Among them, synthetic insecticides have long been used which have serious drawbacks (Sharaby, 1988) ^[1] and affect non- target organisms and the environment (Islam, 2003) ^[4]. Mustard is an important oilseed crop and frequently attacked by a number of important insect pests. Considering the importance of farmer's knowledge based practices in pest management the present investigation was undertaken to explore documents and encourage the local farmers for the practices in the locality Dehradun and Haridwar district, Uttarakhand. Research and development in pest management may not always lead to improved practices among the farmers. Also farmer's pest management practices represent the direct results of their decision making which is mainly influenced by their perceptions of the problems and related control actions. The farmers choose pest management options that appear to meet their objectives an assessment based on their beliefs and attitudes of pest damage and control.

Cultural practices and other non-chemical pest management methods derived from traditional knowledge have also been shown to be common among some subsistence farmers in developing countries Poswal *et al.* (1993), Morales and Perfecto (2000) [9, 8]. Therefore, a farmer survey is an important data-gathering process for assessing the needs of intended beneficiaries to determine their knowledge and perception their constraints in dealing with problem of pest management and their attitude.

The present study is an effort to understand the pest management perception, Knowledge and practices adopted by farmers of Dehradun and Haridwar, Uttarakhand region.

2. Materials and Methods

A total of 160 farmers were interviewed individually in the eight sites of Dehradun and Haridwar districts between October 2016 to April 2017. Interviews were conducted using structured questionnaires. Basic information on social economic status, which includes farmers age and education level were collected. Information was also collected on pest management.

2.1 Sample Size and Sampling Procedures

Farmers were interviewed individually by a structured questionnaire (see Appendix A). The questionnaire was prepared based on previous questionnaires relating to pest management that were developed by Sang *et al.* (2003), Sudarmaji *et al.* (2003), Makundi *et al.*(2005), Brown *et al.* (2008). [10, 15, 6, 2]

Systematic sampling technique was used to select total eight sites ((Doiwala, Mazra, Rajpura and Kaulagarh) and (Motichoor, Bhoopatwala, Kangrai and Ranipur) Dehradun and Haridwar region respectively, according to their awareness of environmental issues against mustard crops.

160 participants (farmers) were determined using Single population Proportion Formula in the survey study. The questionnaire was collected from villages and 20 participants were selected from each sites of Dehradun and Haridwar district.

Each respondent was asked about perception of specific pesticide application by asking about five reference groups which were neighbors, other farmers, village pradhan, spouse etc. For the measure of normative knowledge, each respondent was asked the questions, what do you think each reference group expected you to do for pests observed in your crops.

2.2 Farmer’s socioeconomic background and general agricultural practices

Data gathered included age and years of formal education, attempts were made to measure the differences in pesticide use, number of applications and against which pest, by asking questions about how they assess the degree of damage and apply pesticides.

2.3 Identification of pests and predators

Farmers were asked as to how they decide to spray pesticides on crops. Samples of pests and predators were collected from the field and brought to the laboratory for identification with the help of experts at the University.

3. Result and Discussion

The Socio-economic data presented in table 1(a) &1(b) showed that in Dehradun District on an average, the highest respondents (30%) were of the age of 40-49 years, 22% were

found in age of 30-39 years while 18% were found in age of 50-59 years and only 9% farmers were found in the age group 18-19 years. Education status of the sample farmers in Dehradun district revealed that maximum number of the farmers (48%) had not passed High school, 24% had High school while 19% Of the sample farmers were illiterate farmers Bharti *et al.* (2014).

Table 1: Demographic characteristic of respondents (Farmers) of Dehradun (four villages-Doiwala, Mazra, Rajpura & Kaulagarh) district- 2017

(a) Variable- Age

S. No.	Variables Age (Years)	Frequency	Percentage
1	18-19	09	09
2	20-29	19	19
3	30-39	22	22
4	40-49	30	30
5	50-59	18	18

(b) Educational background of farmers of Dehradun district- 2017

S. No.	Education	Frequency	Percentage
1	Illiterate	19	19
2	Less than High School	48	48
3	High School	24	24
4	College Undergraduate	08	08
5	Post graduate	01	01

In the survey conducted at Haridwar district, on an average 37% farmers were of the age of 40-49 years, 25% were found in age of 30-39 years while 18% were found in age of 50-59 years only 8% farmers belonged to the age group of 18-19 years. Education status of the sample farmers revealed that most of the farmers (40%) had less than High school qualification, 33% had passed High school and 17% of the sample farmers were illiterate in villages of Haridwar district.

Table 2: Demographic Characteristic of respondents (Farmers) of Haridwar (Motichoor, Bhoopatwala, Kangrai & Ranipur) district- 2017

(a) Variable-Age

S. No.	Variables Age (Years)	Frequency	Percentage
1	18-19	08	08
2	20-29	16	16
3	30-39	25	25
4	40-49	37	37
5	50-59	14	14

(b) Educational background of farmers of Haridwar district- 2017

S. No.	Education	Frequency	Percentage
1	Illiterate	17	17
2	Less than High school	40	40
3	High school	33	33
4	College Undergraduate	07	07
5	Post graduate	03	03

The farmers of Uttarakhand were surveyed by recording data on their perception, Knowledge and management practices for the pest and understanding predator by filling in questionnaire. In Dehradun district it was observed that farmers in the study area were aware of various issues related to pest management. On an average 77.5 per cent of the farmers were aware about pesticidal hazards in cultivation of crops. In case of village Doiwala about 85.0 per cent and in case of Rajpura, Kaulagarh and Mazra 80.0 per cent, 70.0 per

cent and 75.0 per cent of the farmers respectively knew about the hazards of pesticide used.(Table 3) The knowledge of pest and pest enemies was recorded 76.25 and 71.25 per cent farmers, respectively. 86.25 percent of respondents were aware about non pesticidal management indicating their willingness to move towards safer pest control measures which is a good sign for eco friendly farming. Some farmers

(35 per cent) were aware about use of biopesticides. As far as the farmer's knowledge about environmentally safe management was concerned, the sample farmers of Rajpura and Kaulagarh had better awareness as compared to Doiwala and Mazra farmers, reflecting the difference in educational level.

Table 3: Farmer's knowledge about pest management in four sites of Dehradun district (Farmers %) (n=20)

S. No.	Particulars	Doiwala	Rajpura	Kaulagarh	Mazra	Overall
1.	Awareness about pesticides hazards	85	80	70	75	49.6
2.	Awareness about pest	80	80	60	85	57.6
3.	Awareness about pest enemies	80	60	70	75	71.25
4.	Knowledge about non pesticidal management	85	90	90	80	86.25
5.	Awareness about biopesticides	40	45	30	25	35

In the survey conducted, at Haridwar district it was found that about 51.25 per cent of respondents were aware about pesticidal hazards and 72.5 per cent were aware about pests. On an average 60.0 per cent of the farmers were aware about natural enemies and 40.0 per cent knew about non-pesticidal management (Table 4). Only 40.0 per cent respondents were found having knowledge of biopesticides, indicating their poor perception of biopesticides and hazardness of pesticide Mahantesh and Singh (2009)^[7]. Besides strict implementation

of the policies related to the use of pesticides, there is a great of creating awareness among the farmers by both governments and non-government organizations Dwivedi and Sheth (2008), Singh and Kumar (2014), Suman (2014), Banerjee *et al.* (2015)^[3, 12, 14, 1]. Though a number of researches have been conducted to study the using of traditional practices for cropping to save environment Joshi and Kumar (2005), Srivastava and Pandey (2005)^[5, 13]

Table 4: Farmer's knowledge about pest management in four sites of Dehradun district (Farmers %) (n=20)

S. No.	Particulars	Motichoor	Bhoopatwala	Ranipur	Kangrai	Overall
1.	Awareness about pesticides hazards	60	50	65	30	51.25
2.	Awareness about pest	65	80	70	75	72.5
3.	Awareness about pest enemies	55	50	65	70	60
4.	Knowledge about non pesticidal management	30	40	50	40	40
5.	Awareness about biopesticides	30	40	50	40	40

4. Conclusion

It was observed that farmers of both districts were not more educated, most of them were below High school but they knew about the health hazards caused by pesticides and its ill effects. Therefore awareness and understanding of the concept of natural enemies were high. All age group members were engaged in farming because their economy was totally dependent on their farm holding.

This study revealed that large number of farmers still practice the traditional methods of growing mustard crop in their field. Most farmers in these villages had stopped using harmful chemical pesticides, therefore enhance number of natural enemy abundance and generally keep pest numbers at low levels.

These methods are cheap, local and would effectively manage the pest without damage to the environment and natural enemies in Dehradun and Haridwar district.

5. Acknowledgement

Dr. Neelam Yadav is highly thankful to University Grants Commission, New Delhi for providing financial assistance as Post Doctoral Fellowship, to conduct present research work. We are also deeply indebted to all farmers that generously their time to share pest management concerns and practices.

6. References

- Banerjee I, Tripathi SK, Roy AS, Sengupta P. Pesticide Use Pattern among Farmers in a rural district of West Bengal, India. *Journal of Natural Science, Biology and Medicine*. 2015; 5(2):313-316.
- Bharati RC, Singh KM, Chandra, Singh AK. Economic condition of eastern region of India- An statistical evaluation. *Journal of AgriSearch*. 2014; 1(3):173-179.
- Brown PR, Nyunt Yee, Singleton GR, Kenney AJ, Nyo Me, Htwe Myoet *et al.* Than Aye. Farmers' knowledge, attitudes, and practices for rodent management in Myanmar. *International Journal of Pest Management*. 2008; 54(1):69-76.
- Dwivedi R, Sheth M. Survey of pesticides use by farmers in Uttaranchal and Uttar Pradesh states of India. *Asian Journal of Microbiology, Biology, Environmental Sciences*. 2008; 10(4):825-828.
- Islam MN, Talukder MAH, Rahman ML, Nasreen A, Ali SMM, Banu, H. Comparative efficacy of some indigenous plant materials as toxicity and repellent against pulse beetle, *Callosobruchus chinensis* L. *JS PULIDO G BOCCO/ Geoderma*. 2003; 111.
- Kumar B, Joshi. Traditional knowledge and land use management in Indian Central Himalaya. *Indian Journal of Traditional knowledge*. 2005; 6(1):144-152.
- Makundi RH, Bekele A, Leirs H, Massawe AW, Rwamugira W, Mulungu LS. Farmer's perceptions or rodents as crop pests: knowledge, attitudes and practices in rodent pest management in Tanzania and Ethiopia. *Belgian Journal of Zoology*. 2005; 135(Suppl.):153-157.
- Mahantesh N, Singh AA. Study on Farmers' Knowledge, Perception and Intensity of Pesticide Use in Vegetable Cultivation in Western Uttar Pradesh. *Pusa Agri Science*. 2009; 32:63-69.
- Morales H, Perfecto I. Traditional knowledge and pest management in the Guatemalan highlands. *Agriculture and Human Values*. 2000; 17:49-63.

10. Poswal MAT, Akpa AD, Alabai O. Cultural control of pests and diseases: prelude to integrated pest management practices for resource poor farmers in Nigerian agriculture. *Journal of Sustainable Agriculture*. 1993; 3:5-48.
11. Sang PM, Huan NH, Escalada MM, Heong KL. Farmers' beliefs and practices in rat management in the Mekong Delta, Vietnam. In: Singleton GR, Hinds L A, Krebs C J, Spratt D M, editors. *Rats, mice and people: Rodent biology and management*. ACIAR Monograph 96. Australian Centre for *International Agricultural Research*, Canberra. 2003, 426-430.
12. Sharaby A. Evaluation of some Myrtaceae plant leaves as protectants of rice against the infestation of *Sitophilus oryzae* L. and *Sitophilus granarius* L. *Insect Sci Appl*. 1988; 9:465-468.
13. Singh R, Singh AK, Kumar P. Performance of Indian mustard (*Brassica juncea* L.) in response to integrated nutrient management. *Journal of Agri Search*. 2014b; 1(1):9-12.
14. Srivastava SK, Pandey H. Traditional knowledge for Agro ecosystem management. *Indian journal of traditional knowledge*. 2005; 5(1):122-131.
15. Suman RS. Attitude of farmers towards sustainability of vegetable cultivation. *Journal of AgriSearch*. 2014; 1(1):1-3.
16. Sudarmaji, Singleton GR, Herawati NA, Djatiharti A, Rahmini. Farmers' Perceptions and practices in rat management in West Java, Indonesia. In: Singleton GR, Hinds LA, Krebs CJ, Spratt DM, eds. *Rats, Mice and People: Rodent Biology and Management*. ACIAR Monograph 96. Australian Centre for *International Agricultural Research*, Canberra, 2003, 389-94.
17. Uniyal SK, Awasthi A, Rawat SG. Traditional and ethno botanical uses of plants in Bhagirathi valley (Western Himalaya). *Indian journal of traditional knowledge* 2002; 1(1):7-19.