J Krishi Vigyan 2017, 5(2) :142-146 DOI : 10.5958/2349-4433.2017.00031.9

Pesticide Use Behavior of Farmers in Rice-Onion Production System

Sanjeet kumar[1], Shambhu Roy[1], Bidya Shankar Sinha[1], R N Singh[2] and R K Sohane[2]

Krishi Vigyan Kendra, Sheikhpura-811 105 (Bihar)

ABSTRACT

The present study was conducted to assess the pesticide application behavior of farmers with respect to rice- onion production system in Sheikhpura district of Bihar. A total of 200 farmers were selected as respondents through three stage sampling procedure. The selected respondents were interviewed personally using pre-tested well structured interview schedule. Results of the study showed that almost all the farmers were dependent on chemical pesticides for the management of pests. The respondent farmers were using a variety of pesticide formulations. The most frequently used were insecticides followed by fungicides, weedicide, acaricide and bactericide. The data revealed that majority of farmers had low to medium knowledge on various aspects of pesticide use. A majority of the farmers were dependent mostly on input dealers, neighbourer and fellow farmers for their need of technical information.

Key Words: Farmers, Onion, Paddy, Pesticides, Production.

INTRODUCTION

Pesticides represent an important ingredient in current Indian agriculture. The crop loss from pests is estimated to be 18 per cent annually in India where insecticides are the most popular pesticide and are predominantly used on cotton. Since the 1980s, integrated pest management (IPM), the combination of various management methods gained importance in India through favorable policy and extensive programs in rice, sugarcane and some vegetables. However a lack of trained personnel, complex decision-making required on the part of farmers and farmer beliefs in relation to natural enemies have been identified as limitations to the widespread adoption of IPM in India (Singh *et al* 2003). Pesticides have been an integral part of the vegetable production process by reducing losses from the weeds, diseases and insect pests that can markedly reduce the amount of harvestable produce (Aktar *et al*, 2009).

To promote appropriate use of pesticides applications it is crucial to understand the current use of pesticides among farmers. Therefore, this study was conducted to analyze the pesticide use and application behavior of farmers in rice-onion production system. The specific objective of this study was to investigate farmers' perception and the factors that influence their intention to apply pesticide to their crop for pest management with the purpose of improving the IPM extension program.

MATERIALS AND METHODS

The study was conducted in Sheikhpura district of Bihar. A three stage sampling design was used to select the sample households. In first stage, Ariyari and Sheikhpura blocks of the Sheikhpura district where rice followed by onion is grown at a large scale was selected purposively. In second stage, four villages were purposively selected to ensure good representation of the selected block. Finally in third stage, a total of 200 farmers, representing households, were selected from the selected villages in proportion to the population in each selected villages. The selected respondent farmers

Corresponding Author's E mail: sanjeet1272@gmail.com; sanjeetseema@rediffmail.com

1. Krishi Vigyan Kendra, Sheikhpura-811105, Bihar, India

2. Directorate of Extension Education, BAU Sabour Bhagalpur Bihar India

were interviewed personally with the help of a well structured and pre-tested interview schedule.

Knowledge was operationalized as the information possessed by the farmers about pesticide use and handling practices with adequate understanding of the pesticides in use, choice of pesticides, recommended dose and time of application, quantity and method of application etc. The knowledge of the individual farmer was measured through a schedule prepared for the study purpose. The response of farmers was obtained on three point continuum i.e. fully correct, partial correct and incorrect, and scores of 2, 1 and 0 were assigned, respectively. Item wise scores of 2, 1 and 0 were assigned and thus total score was worked out. On the basis of mean knowledge score, the farmers were categorized into low, medium and high knowledge on the basis of equal intervals. Data thus collected were analyzed using statistical tools such as standard deviation (SD), percentage analysis wherever required.

RESULTS AND DISCUSSION

Profile of the respondent farmers

Socio economic characteristics of respondent farmers were analyzed (Table 1). Majority of the respondents (40.5%) belonged to middle age group followed by young age (39.0%) and old age (20.5%) group. The frequency distribution was highly skewed towards the younger farmers. Regarding the educational status of respondent, results showed that a majority (56%) of respondents were functionally literate up to middle class followed by high school (18.5%), illiterate (16.5%), higher secondary (6.5 %) and graduate and above (3.5 %). Data on land holding demonstrated that nearly 80 per cent of respondents were marginal (52.5 %) to small (27.0 %) farmers. It was also observed that majority (54%) of respondents were resource poor. A sizable portion of the sample had more than five years of farming experience.

Pesticide utilization

The study revealed that hundred per cent of the respondent farmers were dependent on the chemical pesticides for the management of pests and diseases. The respondent farmers were using a variety of pesticide formulation of different groups and for different purposes. Most of the respondents remember the pesticides by their trade names without any awareness of their technical names. Among them, the most frequently mentioned were insecticides followed by fungicides, herbicides,

Table1. Distribution of respondents based on their socio economic characteristics

Variable	Category	Frequency	Percentage
Age(in years)	Young (18-35)	78	39.0
	Middle (35-50)	81	40.5
	Old (50 and above)	41	20.5
Education	Illiterate	33	16.5
	Primary	47	23.5
	Middle	63	32.5
	Matriculate	37	18.5
	Intermediate	13	6.5
	Graduate	7	3.5
Operational land holding	Marginal	105	52.5
	Small	54	27.0
	Medium	37	18.5
	Large	4	2.0

Table 2. Types of pesticides used and the number of farmers using.

Types of Pesticide	Common name	Number of farmers	Per cent farmers
Fungicides	Carbendazim	196	98.0
	Carboxin	34	17.0
	Copper oxy chloride	165	82.5
	Hexaconazole	63	31.5
	Mancozeb	200	100.0
	Propiconazole	15	7.5
	Sulpher	175	87.5
	Tebuconazole	25	12.5
	Thiram	135	67.5
Bactericides	Streptomycin	106	53.0
	Acephate	93	46.5
	Carbaryl	100	50.0
	Carbosulfan	23	11.5
Insecticides	Chloropyriphos	59	29.5
	Cypermethrin	64	32.0
	Deltramethrin	38	19.0
	Dichlorvos	105	52.5
	Dimethoate	155	77.5
	Fenvalrate	72	36.0
	Fipronil	43	21.5
	Flubendamide	43	22.5
	Imidachloprid	156	78.0
	Lambda-cyhalothrin	82	41.0
	Malathian	165	82.5
	Methyl parathion	83	41.5
	Monocrotophos	75	37.5
	Phorate	136	68.0
	Phosphamidon	59	29.5
	Profenophos	112	56.0
	Thiomethoxam	53	26.5
	Triazophos	87	43.5
Acaricides	Ethion	76	38.0
	Dicofol	100	50.0
	Dinocap	55	27.5
Weedicides	Pedimethalin	78	39.0
	2,4-D	169	84.5
	Isoproturan	136	66.5
	Bispyribac Sodium	145	72.5

Table 3. Knowledge of farmers on safe and proper use of pesticides.						
Particular	**Low**		**Medium**		**High**	
	Number	**Per cent**	**Number**	**Per cent**	**Number**	**Per cent**
Pesticide in use	98	49	74	37	28	14
Choice of pesticide	96	48	78	39	26	13
Recommended dose and time of application	68	34	96	48	36	18
Handling of pesticide	60	30	104	52	36	18
Disposal and storage	44	22	110	55	46	23
Effects of pesticides on environment	64	32	88	44	48	24
Effects of pesticides on human and animal health	56	28	100	50	44	22

nematicides and bactericides as shown in Table 2. It was also observed that preference of farmers toward pesticide selection was primarily based on their efficacy rather than safety. Mancozeb, Carbendazim and Sulpher fungicides; Melathion, Imidachloprid and Phorate insecticides and 2,4-D herbicides were most commonly used by the respondent farmers.

Knowledge on pesticide use

On the major aspects regarding safe use of pesticides, the knowledge level of the respondents was assessed and results are presented in Table 3. The data revealed that had low or medium level of knowledge about pesticide in use, their toxicity, target pest, recommended dose and time of application, handling of pesticides, disposal and storage, effects of pesticides on environment and on the human health. Similar results were also reported by Nagenthirarajah and Thiruchelvam (2008). Hence, the extension services to farmers need to be improved so that farmers can access the relevant information on the use of pesticides (Table 3).

Source of information

Different sources of information were used by the farmers to adopt a new technology and to solve their problems. It was expected that faith on certain information sources would influence the decision to purchase a pesticide as well as their application. Data indicated that the input dealer has been the major information provider on pesticide use for the majority of farmers (56%). On the other hand, extension personnel were mostly consulted by 24 per cent of the respondent followed by occasionally contacted by 19 per cent. Similarly extension literature was utilized rarely by majority (61%) of respondent. Thus, this depicts the risk of adoption of incorrect practices. Prior studies of Heong and Escalada (1999) also reported similar observation (Table 4).

Table 4. Source of information for farmers regarding pesticides use.

Source of information	**Mostly**		**Occasionally**		**Seldom**	
	Number	**Per cent**	**Number**	**Per cent**	**Number**	**Per cent**
Extension personal	48	24	38	19	114	57
Input dealer	112	56	56	28	32	16
Extension literature	30	15	48	24	122	61
Mass media	32	16	52	26	116	58
Neighbour, fellow farmers	70	35	80	40	50	25

CONCLUSION

It may be concluded that farmers were dependent on chemical pesticides for the management of pests and diseases in crops and were using a variety of pesticide formulations. Some of the pesticides were extremely or highly hazardous. The choice of pesticide by farmer was primarily based on efficacy rather than safety. Lack of knowledge on various aspects of pesticides application made them to inappropriate use of pesticides. The input dealers were acting the role of major provider of information on pesticide use which causes the risk of adoption of incorrect practices. Thus, Agricultural extension need to be employed to follow a systemic, well planned and coordinated approach in the area for improving the knowledge status of farmers for the management of pests and diseases in the rice- onion production system.

REFERENCES

Aktar M W, Sengupta D and Chowdhury A (2009). Impact of pesticides use in agriculture: their benefits and hazards. *Interdisciplinary Toxicology* **2**: 1-12.

Rashid M A, Alam S N, Rouf F M A and Talekar N S (2003). *Socio economic parameters of egg plant protection in Jessore District of Bangladesh*. Technical Bulletin 29. AVRDC – The World Vegetable Center, Shanhua, Taiwan. 37 pp.

Heong K Land Escalada M M (1999). Quantifying rice farmers' pest management decisions: beliefs and subjective norms in stem borer control. *Crop Protection* **18**: 315-322.

Nagenthirarajah S and THiruchelvam S (2008). Knowledge of Farmers about pest Management Practices in Pambaimadu, Vavuniya District: An Ordered Probit Model Approach. *Sabaramuwa University J* **8**: 79-89.

Singh A, Singh S and Rao S N (2003). *"Integrated Pest Management in India."* In KM Maredia (ed.) Integrated Pest Management in the global arena, CABI Publishing, Wallingford.

Received on 28/09/2016 *Accepted on 25/12/2016*