Adoption Level of IPM Practices in Cabbage and Cauliflower growers of Manipur

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ABSTRACT

The diverse agro-climatic situations in the North Eastern Region offer excellent scope for growing different fruits and vegetables crops. There is immense potential for vertical and horizontal growth in horticulture sector in the region. However, attack of disease and pest particularly in vegetable crops are higher in the region. Keeping this in view the present study on adoption level of IPM practices was carried out in Imphal East District of Manipur. By following proportionate random sampling method 100 vegetable growers were selected and primary data were collected though personal interview method. Findings revealed that majority of the respondents had medium level of adoption of IPM practices while equal per cent of respondents (20%) had high and low level of adoption, respectively. With regard to cultural practices, majority of the farmers had adopted the practice of transplanting of recommended number of seedling per hill. As mechanical control measures, the use of bamboo-cage-cum-perchers to control pest in cole crops had adopted by 70 per cent farmers. In respect to biological control measures, use of neem products/neem-based pesticide was also noticed in case of 40 per cent farmers. Application of chemical control measures was insignificant among the farmers. Among the cultural, mechanical, biological and chemical measures of integrated pest management, respondents mainly followed cultural and mechanical methods for management pest of cabbage and cauliflower crops. Utilization of locally available resources and promotion of the Farmers Participatory Approach by incorporating the vegetable growers' indigenous wisdom about the Bio-pesticides and the natural enemies of the pests of the vegetables in the sphere of IPM techniques of the vegetables grown by the farmers is very essential in this State.

Key words: *Integrated Pest Management; Cultural; Mechanical; Biological and Chemical Practices;*

Insect pests, diseases and weeds inflict enormous losses to the potential agricultural production. Anecdotal evidences also indicate rise in the losses, despite increasing use of chemical pesticides. At the same time, there is a rising public concern about the potential adverse effects of chemical pesticides on the human health, environment and biodiversity. These negative externalities, though, cannot be eliminated altogether; their intensity can be minimized through development, dissemination and promotion of alternative technologies such as bio-pesticides and bio-agents as well as good agronomic practices rather relying solely on chemical pesticides. Integrated pest management (IPM) is an ecological approach to managing pests by combining biological, cultural, and chemical tools to minimize economic, health, and environmental risks (*Vanderman et al. 1994), Zehnder (1994*) reviewed the 150-year history of pesticide use in vegetable crops and summarized constraints and examples of successful adoption of IPM practices. Although IPM tactics have been used to varying degrees during the past 100 years, formal strategies were not well recognized or crafted into practices until the 1970s. Pest management in vegetable crops had not received the same level of attention as in agronomic crops because of the vast number of vegetable crops, diversity in production systems and arthropod complexes (*Capinera, 2001*). The success of IPM largely depends on the proper adoption of IPM practices by farmers. However, empirical evidences as to the impact of IPM in terms of knowledge, adoption, particularly in vegetable crops are meager. The diverse agro-climatic situations

in the North Eastern Region offer excellent scope for growing different horticultural crops like fruits, vegetables, spices, plantation crops, medicinal and aromatic plants. A wide range of tropical, sub-tropical and temperate fruits and vegetables, both indigenous and exotic are grown in the region. In terms of its contribution to the national production, the region contributes about 5.1% of fruits and 4.5% of vegetables. Amongst NEH States contribution of Sikkim is highest followed by Manipur. There is immense potential for vertical and horizontal growth in horticulture sector in the region. However, attack of disease and pest particularly in these crops are higher in the region. Hence, a study on the extent of adoption of IPM practices by farmers was designed which will be great use to orient extension activities to take advantage of IPM by farmers in the cultivation of vegetables crops particularly cabbage and cauliflower in the region.

METHODOLOGY

The study was conducted during the year 2009 in Imphal East District of Manipur. Out of three Community Development Blocks of the district one block namely Keirao Bitra was selected randomly. Further, out of 25 Gram Panchayats of the block five Gram Panchayats were selected randomly and one village from each Gram Panchayat were selected by using random sampling method. From five villages, a total of 100 respondents those were engaged in cultivation of cabbage & cauliflower and practiced IPM were selected using proportionate random sampling method. The level of adoption of different IPM practices was measured as farmers taking on a particular practice. The primary data were collected from the sampled households (cabbage and cauliflower growers) through personal interview with the help of pre-tested, structured interview schedule.

RESULTS AND DISCUSION

The IPM is a dynamic approach and process which varies from area to area, time to time, crop to crop and pest to pest etc., and aims at minimizing crop losses with due consideration to human and animal health besides safety to environment. The IPM practices followed among Cabbage and Cauliflower growers in Imphal East District of Manipur are presented hereunder with an extent of adoption of these practices.

Adoption level of cultural practices: The data in Table 1 projects the extent of adoption of various IPM practices by cabbage and cauliflower growers. With regard to cultural practices, 60 per cent farmers had adopted the practice of transplanting of recommended number of seedling per hill followed by destruction of vegetables

Table 1. Distribution of farmers according to use of IPM practices in cabbage and cauliflower (N = 100)

S.No.	IPM Practices	No.	%	Rank
A.	Cultural practices			
1.	Deep summer ploughing	38	38	V
2.	Trimming of bunds	10	10	VIII
3.	Soil testing	2	2	IX
4.	Destruction of vegetables residues	50	50	II
5.	Time of planting	50	50	II
6.	Transplanting of seedlings per hill	60	60	I
7.	Proper water management	32	32	VI
8.	Fertilizer application			
(a)	Nitrogenous	45	45	III
(b)	Phosphatic	42	42	IV
(c)	Potassic	50	50	II
(d)	Zinc sulphate	0	0	X
9.	Use of resistant varieties	12	12	VII
B.	Mechanical practices			
1.	Use of rope method	50	50	II
2.	Clipping/pruning of vegetable seedlings	40	40	III
3.	Use of bamboo-cage-cum-perchers	70	70	I
4.	Use of light traps	10	10	IV
C.	Biological practices			
1.	Use of Neem-based pesticides	40	40	I
2.	Boipesticides			
(a)	Larvogel and Mycogel	2	2	III
(b)	G.V isolate and Biocarp/Dipel	5	5	II
3.	Yellow sticky trap	0	0	IV
D.	Chemical Control			
1.	Imidacloprid	12	12	III
2.	Inidacloprid	15	15	II
3.	Thiocloprid	17	17	I
4.	Deltamethrin	5	5	IV
5.	Spinosad	0	0	V

residues, time of planting and application of potassic fertilizers had practiced equally by the half (50%) of the respondents. The table further shows that 45 per cent of the farmers were using nitrogenous fertilizers followed by Phosphatic fertilizer (42%). It is interesting to note that none of the farmers had used zinc sulfate in the cole crops however, only 2 per cent farmers had gone for soil testing. Significant number of farmers (38%) had practiced deep summer ploughing. Imbalance use of macro and micro nutrients may be due lack of awareness and soil testing. Economic factors viz., high cost of fertilizers and poor purchasing power of farmers of the study area may have some effects on lesser adoption since many labour intensive cultural practices of IPM adopted by the respondents.

Adoption level of Mechanical practices: In case of mechanical control measures, use of bamboo-cage-cum-perchers to manage the cole crops pest had adopted by 70 per cent farmers. The second most IPM practice among the cabbage and cauliflower growers of Manipur was use of rope method, adopted by 50 per cent of the farmers followed by Clipping/pruning of vegetable seedlings practiced by 40 percent farmers. Only 10 per cent farmers were using light traps to control the insect pest of cabbage and cauliflower. The reason for using of bamboo cage-cum-percher might be that they were aware about the practice and they could visualize the pronounced effect of the practice. Another reason might be bamboos are easily available in this area.

Adoption level of Biological Control methods: With regard to biological control measures, use of neem products/neem-based pesticide was noticed among 40 per cent of the farmers. Biopesticides like *Larvogel and Mycogel* used only among 2 per cent of the respondents, whereas *G.V isolate and Biocarp/ Dipel* had applied by the 5 per cent respondents. Yellow sticky traps are a non toxic way to control and monitor aphids, cucumber beetles, fruit flies, fungus gnats, leafhoppers, froghoppers, moths, whiteflies, flea beetles, leaf miners etc. however none of the respondents had adopted this trap. This may be due to non-availability of required materials, biopesticides in the local markets and due to lack of awareness about the bio control measures among the growers of the vegetable.

Adoption level of Chemical Control measures: In the application of chemical control measures, pesticides like *Thiocloprid, Inidacloprid and Imidacloprid* were used by the 17, 15, and 12 per cent respondents respectively. *Spinosad* which is used to controls a variety of insect pests, including caterpillars, leafminers, thrips, flies etc none of the respondents had used this organic insecticide. This may be due to more reliance on traditional methods of pest management or unawareness about the organic insecticides. However, chemical control measures are used under IPM as a last resort.

It is also clear from the Table 1 that among the cultural, mechanical, biological and chemical measures of integrated pest management, respondents mainly followed cultural and mechanical methods to manage the insect pest of cabbage and cauliflower crops. This may be due to higher cost of pesticides, lack technical knowledge, non-availability of required biological agents in time and not effective in controlling pests through biopesticide. Similar constraints in adoption of IPM practices were also reported by *Reddy et al. (2008).*

Table 2. Distribution of farmers according to their adoption level of IPM practices in cabbage and cauliflower (N=100)

S. No.	Adoption of IPM practices	No.	%	Mean	S. D.
1.	Low	20	20.00	52.27	7.57
2	Medium	60	60.00		
3	High	20	20.00		

The data in Table 2 indicates that 60 per cent respondents had medium level of adoption of IPM practices while equal per cent of respondents (20%) had high and low level of adoption, respectively. Therefore, it may be inferred that there is a vast scope for increasing the adoption of IPM practices. Similar findings were also reported by *Patel et al. (2003)* and *Kher (1992).* Mean adoption score of IPM practices for all the farmers were 52.27 (Table 2). The lower value of standard deviation shows less variation with respect to adoption level of IPM practices in the study area. This argues for the intensification of training and educational programs for potential adopters of IPM practices.

CONCLUSION

In changing global scenario, the extension researchers have been rethinking on the process of adoption level of IPM practices. The findings of the study indicates that majority of the respondents had medium level of adoption of IPM practices while equal

per cent of respondents (20%) had high and low level of adoption, respectively. Therefore, there is a vast scope in the study area for promoting the adoption of IPM practices by educating and visualizing the importance of IPM practices among the farming community. Promotion of the Farmers Participatory Approach by incorporating the vegetable growers' traditional knowledge about the Bio-pesticides and the natural enemies of the pests of the vegetables in the ambit of the IPM techniques (consisting of cultural, mechanical, biological and chemical methods) of the vegetables grown by the farmers is very essential in this region. The extension activities have to be made in such a way as to increase the economic attachment in their adoption.

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