The Journal of Animal & Plant Sciences, 23(5): 2013, Page: 1473-1476
ISSN: 1018-7081

ROLE OF PRIVATE SECTOR IN PROMOTING IPM PRACTICES AMONG FARMING COMMUNITY IN PUNJAB, PAKISTAN

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ABSTRACT

Due to an aggressive use of pesticides on crops, the insect pests have developed resistance, posing a serious threat to the agriculture in Pakistan. This situation highlights the need to promote IPM among farming community. Private sector in Pakistan has been actively engaged in agricultural extension services since 1988. Currently, about 500 pesticide companies are working in private sector and providing plant protection advisory services to the farmers. This study investigated the role of private sector in promoting IPM practices among the farming community in Punjab, Pakistan. Sixty (60) extension personnel of a private extension agency and some 408 farmers were selected for interview by using simple random sampling technique through Fitzgibbon table. The data were collected through validated interview schedule and analyzed by using SPSS. The results of the study revealed that the mean value for the physical, cultural, and biological control methods, was below 2 indicating that pesticide companies are less interested to promote IPM practices. Farmers also reported that private extension staff emphasized on the aggressive use of pesticides rather its judicious use. It is suggested that private sector should not recommend an extensive use of pesticides and make efforts to promote other pest control methods in combination with chemical control.

Key words: private sector, IPM, farming community.

INTRODUCTION

One of the most important constraints in enhancing crop productivity is the huge crop damage caused by insect pests, diseases and weeds in Pakistan (Khaliq, 2005). An aggressive use of pesticides on crops has developed resistance among the insect–pests, posing a serious threat to the rural economy in the country (Peter, 2005). This situation highlights the need to promote the concepts of integrated pest management (IPM) among the farmers. Integrated Pest Management (IPM) approaches are based upon the judicious mix of physical, cultural, biological and chemical control methods, employed to manage and control pests. IPM is an effective and environmentally sensitive approach to pest management that relies on a combination of common-sense practices (Hoyt, 2001 in Ofuoku *et al.* 2008). It is a sustainable approach to manage pests by combining biological, cultural, physical and chemical tools in a way that minimizes economic, health and environmental risk (Ofuoku *et al.* 2008). Ahmad *et al.* (2005) recommended that IPM must be introduced among the farmers in Pakistan. Ofuoku *et al.*(2008) recommended that an aggressive extension campaign should be launched for the use of IPM to make it popular among the farmers. IPM is becoming increasingly popular in the developed countries. Norton and Mullen (1994) in his study revealed that IPM is one of the most widely practiced approaches to pest eradication among farmers in the developed countries. He further added that this approach is applied on more than half of the agricultural lands of the United States.

In the developing countries, it was realized that IPM should be promoted among farmers by involving the agricultural stakeholders. In this regard, Pakistan is no exception. Private sector was directed by the Government of Pakistan (1988) to provide the total package of plant protection advisory services, consisting of guidance on agronomic, biological and chemical protection practices, in addition to selling the products of their respective companies. It was a beginning of formal IPM efforts in Pakistan. It is a hard fact that complete reliance on pesticides and an extensive use of chemicals for pest control is a serious threat to human health and environmental pollution (Sharp *et al.* 1988). It is need of the hour to take advantage of all appropriate, pest management options i.e. IPM, including but not limited to the judicious use of pesticides (Ofuoku *et al.* 2008). The farmers are now also using cultural, mechanical, physical, biological control in addition to chemical methods of pest control in Pakistan (Khaliq, 2005). The public sector in Pakistan is trying to promote the IPM strategies for control of pests by conducting research and motivating the farmers (Ahmad *et al.* 2005). But, the Government, alone cannot achieve this gigantic task of launching such campaigns without the involvement of private sector. Almost 70-80% of the extension services

are being provided by private sector through their own established independent set-ups (Riaz, 2010). In private sector, the role of pesticide companies (which is a representative and largest segment of private sector) can be viewed in the context that currently, about 500 pesticide companies are working in private sector (Riaz, 2010). This study investigated the role of private sector in promoting IPM practices among farming community in Punjab, Pakistan.

METHODOLOGY

The study was conducted in the Punjab province. A cross-sectional research design was used for the study. The Punjab province comprises five cropping zones, namely cotton-zone, barani-zone, central-mixed-zone, semi-irrigated zone and rice-zone (Younis*et al.*, 1990). Three zones i.e. cotton, rice and central mixed zone, were selected purposively. Because major crops are grown in these zones, and the private sector is also actively engaged in these areas. During first stage, three districts (One from each zone) were selected by using simple random sampling (SRS) technique. At a second stage, from each selected district, one tehsil was selected again by using the same technique. Then, four villages were selected from each tehsil. A sampling frame was designed by listing the names of farmers residing in the selected villages. A sample of 408 farmers was drawn by using Fitzgibbon table (Fitzggibbon & Lynn, 1987). All the (408) respondents were asked about the role of private sector in providing extension services regarding IPM. Only 260 respondents reported that they got agricultural extension services from the sector, that's why only 260 were able to respond out of the experimental population of 408. Similarly, a pesticide company (i.e. Syngenta) was also selected for study to know the perception of private sector in this regard. Sixty field staff personnel of company were selected randomly from the population of 71. Same questions were asked from the field staff personnel about IPM advisory services to identify the difference of opinion (if any) about the same inquiry. The data were collected through personal interviews with the help of pre-tested and validated interview schedule. The data, thus collected were analyzed by using computer software (i.e. SPSS) and interpreted.

RESULTS AND DISCUSSION

Farmers' Response: Integrated pest management refers to the combination of physical, cultural, biological and chemical control metods. The application of Farm Yard Manure (FYM) and Green Manure (GM) also contribute towards IPM. Globally, several reservations had been expressed about the private extension system for deliberately promoting chemical control method, aiming at enhancing the sales of the pesticides and purposely neglecting the integrated pest management in the farming system. Keeping this in view, the data were collected from the respondents about this aspect of private sector extension and are presented in table 1.

The data presented in table 1 show the weakness of private sector extension with respect to IPM advisory services. The overall mean value was 1.42 with SD 0.62 which depicts the great weakness of the private sector extension. All items presented in table were rated by the farmers in the range of weakness and great weakness. Regarding the physical, cultural, and biological control methods, the mean values were below 2 which indicate that pesticide companies are less interested in the promotion of these services, but it was surprising, when farmers rated that private extension staff had a weakness ($\bar{X}$=1.85) regarding the judicious use of pesticides. Farmers told in the informal discussions that main intentions of sales officers were to advise the farmers to apply maximum number of applications with possible high dose for their own sale interest. Farmers had a view that Technical Sales officers did not consider the threshold levels of insect-pest attack. They advised the farmers only to purchase pesticide and spray it on the field. Piters *et al.* (2005) reported that lack of holistic approach is the weakness of private sector. Reddy & Rao (2001) reported that private sector does not care for sustainability instead advocate exploitation of natural resources to the maximum extent. Ahmad (2004) suggested that Pesticide Company should also emphasize on biological method as a control measure. With respect to application of FYM and GM, farmers rated the both items with mean value below 1.5 which depicts the great weakness of private sector extension in this regard. It reflects that Extension Field Staff did not care about the overall farming system instead they were interested in the maximum sale of their companies' products i.e. pesticides. The data displayed in the table-1 reveal that private sector extension discourages the IPM, which is now considered very important for human health and environmental protection. Today with the emergence of WTO, an excessive use of pesticides would ultimately adversely affect the export volume as well. So, there is a need to introduce and promote the concepts and practices of IPM among farming community by focusing on judicious use of pesticides and involving the private sector to play its role in this regard.

Extension Field Staff Response: The questions were asked from the Extension Field Staff regarding IPM advisory services --- physical, cultural, and biological control methods --- provided to the farmers. Similarly, with respect to judicious use of pesticide and application of FYM and GM, the respondents were asked and data are presented in table 2.

Table 1. Frequency distribution and central tendency regarding IPM advisory services rendered by private sector extension as reported by the respondents

n=260

IPMaaw ***Extension field staff provide advisory services regarding:***	***Great weakness***		***weakness***		***Strength***		***Great strength***		***Central tendency***	
	f	*%*	*f*	*%*	*f*	*%*	*f*	*%*	*}X*	*SD*
Physical control	190	73.1	63	24.2	7	2.7	0	0	1.30	0.51
Cultural control	190	73.1	63	24.2	7	2.7	0	0.0	1.30	0.51
Biological control	202	77.7	53	20.4	5	1.9	0	0.0	1.24	0.47
Judicious use of pesticide	101	38.8	102	39.2	53	20.4	4	1.5	1.85	0.80
Farm yard manure (FYM)	180	69.2	54	20.8	18	6.9	8	3.1	1.44	0.76
Green manure (GM)	184	70.8	58	22.3	14	5.4	4	1.5	1.38	0.66
Overall mean									1.42	0.62

Scale: 1=great weakness 2= weakness 3=strength 4=great strength

Table 2. Frequency distribution and central tendency regarding IPM advisory services rendered by private sector extension as reported by the EFS

n=60

IPM *Extension field staff provide advisory services regarding:*	*Great weakness*		*Weakness*		*strength*		*Great strength*		*Central tendency*	
	f	*%*	*F*	*%*	*f*	*%*	*F*	*%*	*}X*	*SD*
Physical control	6	10.0	16	26.7	38	63.3	-	-	2.57	0.83
Cultural control	6	10.0	19	31.7	33	58.3	-	-	2.47	0.83
Biological control	58	96.7	2	3.3	-	-	-	-	1.37	0.88
Judicious use of pesticide	-	-	-	-	-	-	60	100	3.83	0.53
Farm yard manure (FYM)	-	-	-	-	33	55.0	27	45.0	3.08	0.83
Green manure (GM)	-	-	-	-	33	55.0	27	45.0	2.68	1.10
Overall mean									2.67	0.81

Scale: 1=great weakness 2= weakness 3=strength 4=great strength

The data presented in table 2 show the strength of the Private Extension System with respect to focus on judicious use of pesticide ($\bar{X}$=3.83), farm yard manure ($\bar{X}$=3.08) and a trend of strength regarding green manure ($\bar{X}$=2.68), as reported by the EFS themselves. It means Extension Field Staff reported that they promote judicious use of pesticide and application of FYM and GM.

Moreover, EFS claimed that focus on cultural, physical and mechanical control was no more weakness of PES. They assert that they advise the farmers to control the insect-pest with these practices. But it is obvious from the study that farmers did not agree with the view and they considered these aspects as the weakness of the system. EFS reported that advisory services with respect to biological-control was the weakness ($\bar{X}$=1.37) of the system. It is need of the hour that despite of the business interest of private sector extension, it should be advised to the farmers to apply control measures like cultural, physical and mechanical control other than pesticide application. Because inappropriate pesticide application can cause very hazardous effects on human health and can also

Table 3 T-Test considering IPM

IPM *Extension field staff provide advisory services regarding:*	**EFS (n=60)**			**Farmers (n=260)**			**T-value**	
Physical control	2.57	±	0.83	1.30	±	0.51	15.16	*
Cultural control	2.47	±	0.83	1.30	±	0.51	13.95	*
Biological control	1.37	±	0.88	1.24	±	0.47	1.52	NS
Judicious use of pesticide	3.83	±	0.53	1.85	±	0.80	18.43	*
Farm yard manure (FYM)	3.08	±	0.83	1.44	±	0.76	14.91	*
Green manure (GM)	2.68	±	1.10	1.38	±	0.66	11.99	*
Overall values	2.67	±	0.54	1.42	±	0.48	17.78	*

*NS = Non-significant (P>0.05); * = Significant (P<0.05); ** = Highly significant (P<0.01).*

severely disturb the agro-ecosystem (Margni *et al.*, 2002). In this situation, Private sector should be shifted its paradigm towards the use of organic farming inputs and advisory services for their promotion because without adopting them we may be left alone in the world market of food and fibrous products in the newly emerged era of WTO and globalization.

A T-test was run to find out if there was any difference in the mean value of the responses by the two groups of the respondents regarding IPM advisory services. Overall T-value (T=17.78) was significant at 0.05 level which indicates that farmers and EFS have different opinions. The farmers' point of view might be according to the real situation, because it is more realistic approach to expect from the EFS that they do not believe in judicious use of pesticide and they do not advise the farmers for application of FYM. Only biological control method is a component in IPM for which both farmers and EFS agree that services about this aspect has not been provided by the private sector extension.

Conclusions: The adoption of the concepts and practices of IPM has become inevitable in the context of WTO era. Its application and use is also important for human health and environmental protection. The excessive use of pesticides would ultimately adversely affect the export volume of the country. In this scenario, there is a dire need to introduce and promote the IPM practices among the farming community. Private sector is not interested in promoting IMP practices among farming community for plant protection. Private Extension Field Staff are advising an aggressive use of pesticide without considering the threshold level of insect pests. Farmers had a view that private EFS did not promote judicious use of pesticides instead they focused on their heavy use due to their sales interest. It is suggested that private sector should step forward to promote IPM practices among farming community by shifting their paradigm from exclusive chemical control to alternative plant protection methods.

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