Indian Journal of Weed Science **50**(1): 69–71, 2018

Print ISSN 0253-8040 Online ISSN 0974-8164

Adoption of integrated weed management practices correlates with farmers profile characteristics

P.K. Singh*, Yogita Gharde and V.K. Choudhary

ICAR - Directorate of Weed Research, Jabalpur, Madhya Pradesh 482 004

**Email: drsinghpk@gmail.com*

Article information

DOI: 10.5958/0974-8164.2018.00015.1

Type of article: Research article

Received : 2 December 2017
Revised : 13 January 2018
Accepted : 22 January 2018

Key words

Adoption level

IWM practices

Profile characteristics

ABSTRACT

This study explored the adoption level towards integrated weed management (IWM) practices and the associated relationship with various profile characteristics of 108 farmers from 12 villages of 6 blocks of Jabalpur district of Madhya Pradesh with an ex-facto sampling design. A list of various IWM practices in major crops suited to the study area and recommended by ICAR-Directorate of Weed Research, Jabalpur, was prepared after consultation with experts in the area. It was found that majority of the respondents had medium extent of adoption of IWM practices with reference to rice (56%), soybean (49%), greengram (50%) and wheat (55%). A positive and significant correlation between level of adoption of respondents on overall IWM practices with other variables *viz*. age, education, farm size, training, extension contact, mass media exposure, input availability and innovativeness were noticed.

INTRODUCTION

Agriculture plays an important role in economic growth, enhancing food security, poverty alleviation and rural livelihood development. It is main source of income for about 60% of people in India. Presently in India, foodgrains production is about 252 million tonnes (GOI 2016). However, still there exist a wide gap between the production potential and the actual production realized by the farmers. The lower yields are due to heavy infestation of pest in general, and weeds in particular. To minimize these losses, different methods of weed management practices have been developed in different crops and cropping systems. However, adoption of weed management practice at farmers' fields varies as per the resource availability. Various reasons such as lack of knowledge and skill, non availability of herbicides, spray equipments, technical know-how, climatic and social-economic conditions, poor extension mechanism *etc*. are hindrance on adoption. Non-adoption of weed management practices leads to cause heavy yield penalty.

The knowledge level of the farmer has significant role on adoption of integrated weed management (IWM). Knowledge level improves with education, farming experience, training, accessible to farm machineries, extension contacts and innovativeness (Rajashekar *et al*. 2017). Age has both negative as well as positive effect on adoption of IWM as aged persons has more farming experience but majority are late adopter of new technologies. In contrary to this, lower age persons are fond of new technologies and ready to take risk to obtain higher profit although they have less farming experiences. Similarly, education level play crucial role and has positive effect on adoption level of the IWM practices. The adoption level of IWM also depends on farming experience, as knowledge increase over the years. Experience also influences the adoption level of IWM at different stages of crop. Capacity building through training, on-farm demonstration, farm visits *etc*. may also increases the knowledge level of farmers.

Considering the diversity of weed problem and agro-ecosystems, no single method of weed control could reach the desired level of efficiency under all situations (Singh 2010). Thus, IWM has been suggested as a sustainable and long-term management technique. Several studies have been conducted on adoption and impact of new technologies, but few are accomplished especially on adoption and the impact of IWM on farmer's fields. It is therefore, important to find out the existing level of knowledge and extent of adoption of IWM practices by the farmers, and also to identify the constraints faced by them in adoption of IWM practices. Thus,

efforts were made to study the adoption level of IWM and factors affecting it at farmers' level in different farming situations.

MATERIALS AND METHODS

An ex-post facto sampling design was used in the present investigation. Field survey based study was conducted at randomly selected six blocks of Jabalpur district of Madhya Pradesh during 2014-15 and 2015-16. For the selected blocks, a list of villages containing farmers practicing IWM practices was obtained from the Department of Agriculture, Madhya Pradesh. A random sampling method was employed to select two villages from each block and thus making total of 12 villages. In the study area, rice, soybean, greengram and wheat were the major crops. Nine IWM practicing respondents from each village were selected using random sampling method. The final sample size consisted of 108 respondents. For measuring respondents' knowledge on IWM practices, a knowledge test was developed. Data were collected using developed interview schedule and based on obtained scores, the respondents were grouped into low, medium and high extent of adoption categories according to equal interval method. Collected data were analyzed using appropriate statistical tools like frequency and percentage, class interval, arithmetic mean, standard deviation and correlation coefficient.

RESULTS AND DISCUSSION

Majority of the respondents irrespective of the crop had medium level of adoption (**Table 1)**. Among all the respondents, medium level of adoption were noticed to the tune of 56, 49, 50 and 55% in rice, soybean, greengram and wheat growers, respectively. Correspondingly, high level of adoption of IWM practices was observed in 27.5, 19.3, 26.3 and 25.0% farmers associated with rice, soybean, greengram and wheat crops, respectively.

Adoption level of integrated weed management practices

Adoption level of various integrated weed management practices varied irrespective of crops and locations (**Table 2**). Application of post-emergence herbicides was the most popular among farmers to the tune of 52.7%, followed by application of pre-emergence herbicides with one hand weeding (HW). The adoption level of only one HW and application of pre-emergence herbicide only were the next most popular adopted weed management practices adopted by the farmers irrespective of crops. However, use of wheel hoe followed by (*fb*) 1 HW was the least preferred (12.5%) weed management practice.

Table 1. Classification of the respondents based on their extent of adoption of IWM practices

Extent of adoption	Class interval	Frequency	Percentage
Rice (n=36)			
Low	12-14	6	16.5
Medium	14-16	20	56.0
High	16-18	10	27.5
Soybean (n=41)			
Low	07-10	13	31.7
Medium	10-13	20	49.0
High	13-16	8	19.3
Greengram(n=38)			
Low	08-10	9	23.7
Medium	10-12	19	50.0
High	12-14	10	26.3
Wheat (n=40)			
Low	11-13	8	20.0
Medium	13-15	22	55.0
High	15-17	10	25.0

Table 2. Extent of adoption of the recommended integrated weed management practices (n=108)

Integrated weed management practices	Adoption level (%)
Application of pre-emergence herbicides *fb* 1 HW	46.2
Application of herbicide (pre *fb* post)	37.4
Application of post-emergence herbicide *fb* 1 HW	31.8
Application of pre and post-emergence herbicide *fb* 1 HW	15.5
Application of pre-emergence herbicide only	40.6
Application of post-emergence herbicide only	52.7
Use of wheel hoe *fb* 1 HW	12.5
Two hand weeding only	30.4
One hand weeding only	41.3

n - number of respondents

Relationship between profile characteristics of respondents and adoption level of IWM practices

While studying the relationship between profile characteristics and adoption level of IWM practices in rice (**Table 3**). It was found that farming experience, extension contact and input availability influenced the adoption level significantly at 5% level of significance, whereas, training in IWM and innovativeness affected significantly at 1% level of significance. However, age, education, farm size, mass media exposure, information seeking behaviour, farm mechanization status, risk orientation and labour availability had no impact on adoption.

In case of soybean, all the independent factors influenced the adoption level at 1% level of significance except farm size, risk orientation and labour availability. Similarly, in case of greengram, age, farm size and extension contact influenced the adoption significantly at 5% level of significance and

Table 3. Relationship between profile characteristics and extent of adoption of IWM practices (n=108)

Characteristics	Correlation coefficient (r)			
	Rice	Soybean	Greengram	Wheat
Age	0.127^{NS}	0.713**	0.391*	0.443**
Education	0.278^{NS}	0.458**	0.610**	0.439**
Farm size	0.083^{NS}	0.258^{NS}	0.350*	0.431**
Farming experience	0.336*	0.616**	-0.158^{NS}	0.290^{NS}
Training in IWM	0.502**	0.533**	0.455**	0.164^{NS}
Extension contact	0.371*	0.637**	0.453*	0.316*
Mass media exposure	0.143^{NS}	0.455**	0.115^{NS}	0.401**
Information seeking behaviour	-0.129^{NS}	0.608**	0.522**	0.477**
Farm mechanization status	0.321^{NS}	0.549**	0.158^{NS}	-0.127^{NS}
Risk orientation	0.206^{NS}	0.272^{NS}	0.252^{NS}	0.393*
Innovativeness	0.535**	0.710**	0.687**	0.684**
Input availability	0.359*	0.682**	0.029^{NS}	0.592**
Labour availability	0.098^{NS}	-0.134^{NS}	0.088^{NS}	0.221^{NS}

n= number of respondents; *significant at 5% level of significance; ** significant at 1% level of significance; NS - Non-significant

education, training in IWM, information seeking behaviour and innovativeness at 1% level of significance influenced the adoption level of respondents with reference to IWM practices. However, farming experience, mass media exposure, farm mechanization status, risk orientation, input availability and labour availability had no effect on adoption. In case of wheat, extension contact and risk orientation affected the adoption level at 5% level of significance and age, education, farm size, mass media exposure, information seeking behaviour, innovativeness and input availability influenced the adoption level at 1% level of significance. On the other hand, farming experience, training in IWM, farm mechanization status and labour availability had no impact on adoption.

Venkattakumar (2012) reported while studying the adoption of IPM technologies in rice and/or greengram that half of the proportion (50.67%) of the respondents had medium level of adoption followed by 38% who had low level of adoption. Desale *et al.* (2012) reported that three-fourth of the hybrid rice growers in Kheda district of Gujarat had medium to high level of adoption of recommended hybrid rice production technology. Similar observation was also made by Perera (2008) and Nirmala (2012) in rice cultivation.

It may be concluded that innovations and extension contact were the major factors which had significant impact on adoption level of IWM practices. Further, farmers should be provided with more practical training on IWM technologies that will accelerate the rate of adoption of technologies for improving the productivity of crops. The present study also highlighted that the socio-economic factors of farmers were important in deciding the adoption of recommended IWM technologies. Hence, for the introduction of new IWM technologies in different crops, the farmers' characteristics and conditions must also be considered apart from the technical factors.

REFERENCES

Desale MM, Badhe DK and Patel RC. 2012. Adoption of recommended hybrid rice production technology by the rice growers. *Agricultural Science Digest* **32**(3): 233-236.

GOI. 2016. *Agricultural Statistics at a Glance.* Department of Agriculture, Cooperation & Farmers Welfare, Directorate of Economics and Statistics, Ministry of Agriculture & Farmers Welfare, Government of India, p 488.

Nirmala K. 2012. A study on diffusion status and adoption of System of Rice Intensification (SRI) in Mahaboobnagar district of Andhra Pradesh. M.Sc. (Agri) thesis, Acharya NG Ranga Agricultural University, Hyderabad, Andhra Pradesh, India.

Perera MS. 2008. Socio-economic factors affecting the technology adoption level of paddy in rainfed sector in Sevenagala. *Tropical Agricultural Research* **10**: 157-168.

Rajashekar B, Sudharani V, Neema Parveen SK and Shivacharan G. 2017. Knowledge of farmers about integrated weed management (IWM) practices in major crops. *International Journal of Farm Sciences* **7**(1): 33-36.

Singh B. 2010. Adoption of mungbean production technology in arid zone of Rajasthan. *Indian Research Journal of Extension Education* **10**(2): 73-77.

Venkattakumar R. 2012. Relationship of Socio-economic profile with impact of SRI cultivation in Kannur district of Kerala. *Journal of Plantation Crops* **34**(3): 708-714.