

Weed Management and Reasons for its Non Adoption

P. K. Singh¹, K. K. Barman² and Jay G. Varshney³

1. Principal Scientist 2. Sr. Scientist 3. Director, Directorate of Weed Science Research, Jabalpur (M.P.)

Corresponding author e-mail: drsinghpk@gmail.com

ABSTRACT

*The study was conducted in Jabalpur region of Madhya Pradesh to find out the present status of adoption and non-adoption stages of chemical weed control technologies against grassy weeds (*Phalaris minor* & Wild Oat) in wheat, constraints faced by farmers and their suggestions for wider adoptability of the said technology. A representative sample of 147 farmers was selected by following the criteria of stratified multi stage sampling procedure. On the basis of interview with the sampled respondents, it was recorded that only 12% farmers have fully adopted the technology to control weeds in wheat crop. Half of the remaining 88% of respondents had not adopted it at the knowledge stage of innovation decision process due to ignorance. The main reasons for non-adoption of this practice were lack of knowledge (42%) and lack of guidance (23.3%). About 65% of non-adopter farmers suggested that extension system should publicise the method of herbicide use and highlight related instructions through mass media prior to onset of the cropping season.*

Key words: Adoption; Chemical weed control; Wheat;

As the harbinger of green revolution, wheat has played a key role in achieving self reliance in the food production in the country. With the introduction of high yielding varieties, responsive to intensive irrigation and fertilizer application, wheat production increased from 12.5 MT during 1963-64 to 75 MT in 2005. However there is still a wide gap between potential yield of wheat and yield obtained at farmer's field. Indian farmers are now convinced with the role of quality seeds, fertilizers and irrigation in wheat production and they do apply these inputs as per their economic conditions and availability. However, very few resourceful farmers are aware of the role of weed management in increasing the wheat productivity. *Phalaris minor* and wild oat are serious weeds of wheat crop especially under rice-wheat cropping system. Control of these weed through herbicide is more efficient than mechanical and manual methods of weeding in terms of economics, time and labour saving. Farmers in some major wheat growing area of our country like Punjab and Hariyana are extensively using herbicides to manage these weeds. Although the rice-wheat cropping system is commonly followed in Jabalpur region and consequently the problem of *P. minor* and wild oat is routinely encountered by

the farmers, the use of herbicides in wheat is not yet so wide spread. In view of this the study was planned to know the present status of adoption and constraints responsible for non-adoption of chemical weed control technologies in wheat in Jabalpur region of Madhya Pradesh.

METHODOLOGY

The study was under taken in Jabalpur district of Madhya Pradesh. A stratified multi stage sampling procedure was adopted to select the respondents. Initially 4 out of 7 development blocks were randomly selected from the district, and then three villages from each of these blocks were randomly chosen. Thus, 12 villages constituted the sample for the study. A total of 147 farmers were randomly selected from these villages with the condition that the number of representative respondents included in the total sample size from a given village is proportional to its population. The data were collected by interviewing all the sample farmers personally with the help of structured interview schedule that was pre-tested on non-sampled farmers.

Non-adoption of chemical control measure against *Phalaris minor* and wild oat was the dependent variable

and various factors having direct or indirect bearing on non-adoption of this practice was taken as independent variables. The selection of independent variables were made on the basis of the model given by *Sharma (2004)*, which gave a four factor explanation of non adoption of agricultural practices. The data were analysed and interpreted in terms of frequencies, percentage and score values.

RESULTS AND DISCUSSION

Adoption of Chemical Weed Control Technology: Only 18 out of 147 total respondents have fully adopted the chemical technologies to control *P. minor* and *wild oat* in wheat. The data thus showed that nearly 88 per cent of the farmers rejected the technology at different stages of adoption (Table 1). Non adoption of recommended practice can occur at any stage of innovation-decision process. *Romerson (2005)* assumed that for the adoption of an innovation, an individual passes from the state of knowledge persuasion, decision implementation and confirmation.

Table 1. Adoption stages of chemical weed control technologies (N = 147)

S. No	Stage	Non-adopter rejecting the practice at different stages		
		No.	%	% Cumulative
1.	Knowledge	54	36.7	36.7
2.	Persuasion	23	15.6	52.3
3.	Implementation	31	21.1	73.4
4.	Confirmation	21	14.3	87.7
5.	Full adoption	18	12.2	100.0
	Total	147	100	

The data showed that 36.7 per cent of total farmers did not adopt the technology at knowledge stage itself. A significant proportion of respondents (15.60%) did not go with the technology due to lack of persuasion. Thus around half of the respondents rejected the technology at knowledge stage of innovation decision process. This indicated that the existing extension machinery was not effective enough in sensitizing the farmers even at the initial stage of adoption in respect to weed management technology. The data further revealed that compared to knowledge stage the percent of farmers involved in the process of non-adoption of the said technology were significantly lower in

implementation (21.10%) and confirmation (14.30%) stages of adoption, thereby rejecting the null hypothesis (H_0 : no stage is more important than other in respect to non-adoption). The finding thus indicated that some adoption stages could be more critical depending upon the prevailing circumstances or the nature of technology.

The data in respect to the non-adoption of chemical weed control technology at implementation stage (21.10%) of adoption as recorded in the given study is in agreement with the results reported by *Johnson (2006)* and *Caughnour (2004)*. These researchers also reported that around one fifth of respondents rejected the technologies in respect to plant protection measures and fertilizer application at implementation stage.

Reasons for Non-Adoption: The different reasons cited by the non-adopters towards their decision of non-adoption of the chemical weed management technologies in wheat are enlisted in Table 2. Lack of knowledge was found to be the most important and frequently cited reason for the non-adoption of chemical weed control measure against *P. minor* and wild oat. Forty two percent of the total non-adopters did not heard about the said technology earlier. Lack of guidance (23.30%), less weed infestation in the field (17.10%) and lack of herbicide spraying tools (15.50%) were the other major reasons towards non-adoption. A sizeable portion (15.50%) of non-adopters showed their low aspiration/carelessness towards the innovation. Lack of skill (13.20%) in handling herbicides and psychological fear towards cost involvement (11.00%) and possible side effect of herbicides on the crop (9.300%) also contributed significantly towards the decision of non-adoption. Altogether one third of the total non-adopters did not go with the technology because of skill and fear factors.

All the reasons of non-adoption of chemical weed control technology against *P. minor* and wild oat were classified in components of four factor model as described by *Sharma (2004)*. As per this model the major factor found responsible for non-adoption of the technology under the given study was ignorance (50%), followed by inappropriateness (32.00%), inability (9.00%) and unwillingness (9.00%).

Table 2. Reasons for non-adoption of chemical weed control against *Phalaris minor* & *Wild oat*.(N= 129)

S. No.	Reasons	No.	%	Range
1.	Lack of knowledge	54	42.0	I
2.	Lack of skill to handle herbicides	17	13.2	V
3.	Lack of guidance	30	23.3	II
4.	Less infestation of weed	22	17.1	III
5.	Fear of high cost involvement	14	11.0	
6.	Fear of herbicide side effect on crop	12	9.3	
7.	Fear of ineffectiveness of herbicides in black cotton soil	8	6.2	
8.	Faith towards traditional control methods	7	5.4	
9.	Low aspiration	20	15.5	IV
10.	Fear of low benefit : cost ratio	6	4.7	
11.	Non availability of spray pump	20	15.5	IV
12.	Lack of skilled labour	9	6.9	
13.	Lack of irrigation facilities needed after herbicide spray	5	3.9	
16.	Adopted mechanical weed control	6	4.6	
17.	Bad weather conditions	10	7.8	
18.	Dissatisfaction with herbicide performance	3	2.3	

Recorded multiple responses

Farmers' suggestions for adoption: Suggestions were received from the non-adopters who had partial knowledge of chemical weed control against *P. minor* and wild oat. Out of 129 non-adopters, 98 respondents offered their suggestions for wider adoptability of the said technology. The results as given in Table 3 indicate that there is urgent need of intensive extension work in this region to popularize the technology among the farming community. Nearly half (49.00%) of the farmers had suggested to publicise the details in respect to dose, time and method of application, safe handling measures, etc. through various extension activities and mass media. Besides that the need of conducting

intensive training programme on herbicide use in farmers' field was also felt as a crucial step for increasing the adoption level. A significant fraction of the respondents (24.00%) wanted training by an extension personnel regarding the trade name of herbicides to be procured for a given kind of weed in a given crop, how to calculate quantity of herbicide and water to prepare the solution, spraying technique, stage of crop when herbicide is to be applied, and the precautions to be taken in respect to human and farm animal health hazards while following chemical weed control method. The other important suggestions were credit facility and easy availability of herbicides through co-operative society. The findings are in line with the observations as reported by *Sohil (2007)*.

Table 3. Suggestion of the farmers to bring improvements in chemical weed control in wheat. (N=98)

S. No.	Suggestions	Response* (%)	Rank
1.	Intensive training on herbicide use.	24	II
2.	Laying out more number of adoptive trails/ demonstration	8	
3.	Publicising detail instruction of handling, and time and method of use of herbicides.	49	I
4.	Supply of herbicides through co-operative societies	8	
5.	(No profit no loss basis) Credit facility for equipment and herbicides	3	
6.	Local names of herbicides be given	9	III

* Recorded multiple responses

It is worth mentioning that some farmers used wrong herbicides on the basis of in-correct advice given by local shop keeper. There were also incidences of using improper dose as well as higher concentration of herbicides in the crop by some over adventurous farmers. Few farmers have applied the herbicides at wrong time. As a consequence of these incidences some negative impact of applied herbicides on weed control efficiency and also on crop itself was noticed which in turn demoralized and created fear in the significant fraction of the farming community in the region under

study. This could be the probable reason behind the kind of suggestions received from the farmers in this study.

CONCLUSION

The adoptability of chemical weed control technologies against *Phalaris minor* and wild oat in wheat in the Jabalpur region was very poor. Only 12% farmers have adopted this method of weed control. The study bring out that majority of the farmers could not adopt the recommendations of chemical weed control technology against *P. minor* & wild oat due to lack of technical information.

Lack of detail knowledge and fear factors prevailing in the mind of farmers regarding herbicide use in wheat were the other important reasons for non-adoption of the said technology. It appears from the suggestions received from the respondents that the mass media should be extensively used to create awareness and provide technical know-how of improved weed management practices. Besides that intensive training and field level demonstrations would help to remove the hurdles including the fear factor that is preventing the adoptability of herbicide technology in wheat in the region under study.

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