



# Asian Journal of Plant Sciences

ISSN 1682-3974

**science**  
alert

**ANSI***net*  
an open access publisher  
<http://ansinet.com>

## Find out the Efficacy of Different Weed Control Measures on Weed Control and on Yield and Yield Components of Wheat Crop

Naeem Khan, <sup>1</sup>Khalid Naveed and Ikramullah Khan

Department of Weed Science, NWFP Agricultural University, Peshawar, Pakistan

<sup>1</sup>Department of Agronomy, NWFP, Agricultural University, Peshawar, Pakistan

**Abstract:** The effect of different weed control measures was studied in wheat crop. The experiment was laid out in simple RCB design, replicated four times. It was comprised of seven treatments i.e. Irelon 50 SC @ 1.12, Puma S 75 EW @ 0.85, Buctril M 40 EC @ 0.72, Buctril M + Topik 15 WP @ 0.72 and 0.75, 2,4-D (powder) @ 1.20 kg a.i ha<sup>-1</sup>, Hand weeding after 35 days of sowing and a weedy check was kept for the comparisons. Data recorded were weeds count m<sup>-2</sup>, plant height (cm), grains spike<sup>-1</sup>, 1000 grains weight (g), biological yield (kg ha<sup>-1</sup>) and grain yield (kg ha<sup>-1</sup>). The lowest (16.10) weeds m<sup>-2</sup> was count in Puma S treated plots as compared to the highest (69.72) recorded in the weedy check plots. Buctril M and 2,4-D were comparable with Puma S. Buctril M + Topik mixture increased grains spik<sup>-1</sup> and 1000 grains weight significantly in wheat. Significant increase was also occurred in biological and grain yield (kg ha<sup>-1</sup>) with the application of Buctril M + Topik application. It gave maximum of 9236.35 and 2986.43 kg ha<sup>-1</sup> biological and grain yields, respectively. Puma S, 2,4-D, Irelon and hand weeding also increased biological and grain yields significantly.

**Key words:** Weed control measures, wheat crop

### INTRODUCTION

Wheat is the most important staple food crop worldwide. Majority of the world's population depends on wheat food. Wheat is adapted to a variety of soil and climatic conditions. Wheat usually grows well in the temperate regions of the world. Wheat plays an important role in the Pakistan's economy. During the last few years a better progress has been made in increasing the per unit area yield of wheat in the country. If we compare the yield of wheat per unit area of Pakistan with the per unit area yield of wheat of the advanced countries, we are still far behind. Many reasons for low yield of wheat are known, however the most important but less noticeable reason for low yield of wheat is the infestation of different weeds flora. Pakistan suffers 17.25% losses in wheat crop due to weeds (Pervaiz and Quazi, 1992). The losses on annual basis in wheat amount to more than 28 billion at the national level and 2 billion in NWFP (Hassan and Marwat, 2001).

To check the weeds below economic injury level, various methods of weed management are involved. Weeds can be controlled by manual, cultural and chemical methods. Zahir and Gupta (1981) reported that about 50% of the farmers in wheat growing area of India, used a combination of manual and chemical weeds control methods. The best method of weed control is the one

which combines all these activities and could be effective and easy to adopt and finally helpful in increasing crop yield. It has been reported that chemical weed control method is also effective in combination with cultural methods of weed control. Shabir (1990) found that hand weeding gave the maximum increase in the yield of wheat. Khan *et al.* (1999) concluded that Logran, Tolkana and Buctril-M provided the maximum weed control in wheat crop. Isoproturon, Tribunil and Nitrogen gave best weed control and increased grain yield and other yield components of wheat (Borghain *et al.*, 1985). Buctril-M sprayed for weed controlled in wheat crop decreased broad leaf weeds significantly and increased yield and yield components of wheat (Shah *et al.*, 1989; Khan *et al.*, 2001). Therefore, the present study was aimed to find out the efficiency of different weed control measures for controlling weeds in wheat crop for increasing wheat yield per unit area.

### MATERIALS AND METHODS

The research study was launched at the Malakandher Research Farm, NWFP Agricultural University, Peshawar during the rabi season 1999-2000. Wheat variety sown was Bakhtawar-96 with the help of pora. Row to row distance was kept 30 cm apart. The seed was used at the rate of 120 kg ha<sup>-1</sup>. All the required inputs were applied

properly. The simple RCB design was applied. There were 7 treatments, replicated four times with at plot size of 5x1.5m<sup>2</sup>.

The different treatments were as follow:

Treatment	Common name	Rate (kg a.i ha <sup>-1</sup> )
Irelon 50 SC	Isoproturon 1.12	
Puma Super 75 EW	Fenoxypethlyl	0.85
Buctril M 40 EC	bromoxynil+ MCPA	0.72
Buctril-M 40 EC+Topik 15WP	bromoxynil+MCPA +clodinafop	0.72+0.75
2,4-D (powder)	2,4-D powder	1.20
Hand weeding	-----	-----
Weedy check	-----	-----

Note: T6 = A single hand weeding, 35 days after sowing

All the herbicides were sprayed as post emergence and hand weeding was carried out after 35 days of sowing. Data were recorded on the parameters like, weeds count m<sup>-2</sup> after herbicidal spray, plant height (cm), grains spike<sup>-1</sup>, 1000 grains weight (g), biological yield (kg ha<sup>-1</sup>) and grain yield (kg ha<sup>-1</sup>). The accurate and standard procedures and methods were used for recording and calculating the data of various parameters. The data were finally subjected to statistical analysis applying LSD (Least Significant Difference) test (Steel and Torrie, 1980).

## RESULTS AND DISCUSSION

**Weeds count m<sup>-2</sup>:** Statistical analysis of the data (Table 1) revealed that weeds count m<sup>-2</sup> were significantly ( $P \leq 0.05$ ) affected by different weed control measures. Mean values of the data showed that highest (69.72) weeds m<sup>-2</sup> were counted in the weedy check plots followed by hand weeding (30.98) weeds m<sup>-2</sup>. While lowest (16.10) weeds m<sup>-2</sup> were observed in plots treated with Puma Super 75 EW, comparable with Buctril M 40EC treated plots of 19.17 weeds m<sup>-2</sup>. 2,4-D also was comparable statistically with Puma Super 75 EW and Buctril M, in which 21.90 weeds m<sup>-2</sup> were counted. The weeds species found were *Avena fatua*, *Phalaris minor*, *poa annua*, *Rumex crispus* *Euphorbia halioscopia* and *Ammi visnaga*. These results are in conformity with the findings of Khan *et al.* (2001). They reported that grass and broad leaf killers controlled maximum weeds. Ahmed *et al.* (1993) also observed that Buctril M 40 EC controlled the broadleaf weeds efficiently.

**Plant height (cm):** Statistically the effect of different weed management measures were significant for plant height (cm) of wheat crop (Table 1). Tallest plants of 84.15 and 83.95 cm were observed in weedy check plots and plots treated with Irelon 50 SC. The remaining treatments were

statistically at par with each other. The tallest plants in the weedy check plots could be due to the competitive activities between the crop and weeds and tallest plant in plots treated with Irelon should be due to the efficient weed control to ease the growth of wheat crop. These findings are however, at variance from Ahmad *et al.* (1993), who reported non-significant effect of herbicides on plant height.

**Grains spike<sup>-1</sup>:** Different weed control measures had statistically significant effect on grains spike<sup>-1</sup> (Table 1). The mean values showed that maximum 19.17 and 17.67 grains spike<sup>-1</sup> were observed in plots sprayed with Buctril+Topik and Puma. Treatments like Irelon, 2,4-D and Buctril alone were statistically at par with each other. On the other hand the minimum of 9.23 grains spike<sup>-1</sup> were counted in the weedy check plots followed by plots where hand weeding was carried out. The maximum number of grains spike<sup>-1</sup> may be due to the herbicidal effect on the weeds, which provided competition free environment for the crop to utilize the resources to give the maximum grains spike<sup>-1</sup>. These results are in agreement with those of the findings of Khan *et al.* (1999).

**1000 grains weight (g):** Herbicidal treatments and hand weeding significantly affected 1000 grain weight (g) (Table 1). The heaviest 1000 grains weight of 44.75 gm was observed in plots received with Buctril M + Topik. While the lightest of 24.35 and 25.83 g 1000 grain weight was produced by the weedy check followed by hand weeded plots which were statistically at par with each other. Puma super produced (39.88 g) 1000 grain weight, statistically comparable with Buctril M + Topik mixture. The heaviest 1000 grains weight of Buctril M + Topik is due to the efficient control of broad leaf and grassy weeds, which provided an ample opportunity for the crop to utilize the available resources to increase 1000 grain weight. Similar findings were reported by Marinkovic *et al.* (1997).

**Biological yield (kg ha<sup>-1</sup>):** Statistical analysis of the data regarding biological yield (kg ha<sup>-1</sup>) (Table 1) indicated that significant differences were found among the weed control measures in wheat crop. The maximum biological yield of 9236.35 kg ha<sup>-1</sup> was observed in Buctril M 40 EC + Topik 15 WP treated plots. While the minimum (4751.30 kg ha<sup>-1</sup>) biological yield was found in the weedy check plots, followed by 2,4-D. The biological yield of Buctril M 40 EC alone and Puma super 75 EW were statistically at par with each other. Hand weeded plots and Irelon 50 SC, biological yields kg ha<sup>-1</sup> were also statistically at par with each other. The highest biological yield kg ha<sup>-1</sup> is attributed to the better weed control by the broad leaf and

Table 1: Weeds count  $m^{-2}$ , plant height (cm), grains spike $^{-1}$ , 1000 grain weight (g), biological yield and grain yield (kg ha $^{-1}$ )

Treatments	Weeds count $m^{-2}$	Plant height (cm)	Grains spike $^{-1}$	1000 grain weight (g)	Biological yield (kg ha $^{-1}$ )	Grain yield (kg ha $^{-1}$ )
Irelon 50 SC	24.67c	83.95a	14.85b	31.60c	7017.10d	2119.68cd
Puma S 75 EW	16.10e	79.88b	17.67a	39.88ab	8383.90b	2550.13b
Buctril M 40 EC	19.17de	80.63b	13.82b	39.60b	8393.38b	2371.40bc
Buctril M 40 EC+Topic 15 WP	9.00f	80.97b	19.17a	44.75a	9236.35a	2986.43a
2,4-D (Powder)	21.90cd	81.03b	14.02b	35.47bc	7906.30c	2061.38cd
Hand weeding	30.98b	80.97b	11.82c	25.83d	7092.85d	1785.05de
Weedy check	69.72a	84.15a	9.23d	24.35d	4751.30e	1461.60f
LSD value	4.34	2.517	1.567	4.93	386.7	369.0

grassy herbicides combination which efficiently controlled the weeds of wheat crop and thus the crop was able to utilize the resources available efficiently. These findings are in conformity with those of Samar *et al.* (1993) and Bhagat and Jain (1985). They reported that biological yield was significantly increased with the application of herbicides for weed control in wheat crop.

**Grain yield (kg ha $^{-1}$ ):** Statistical analysis of the data showed that weed control measures had significant effect on the grain yield of wheat (Table 1). The highest grain yield kg ha $^{-1}$  (2986.43) was observed in plots treated with the mixture of Buctril and Topik. While the lowest grain yield of 1461.60 kg ha $^{-1}$  was found in the weedy check plots. All the remaining weed control measures gave statistically higher grain yields than the weedy check plots. The highest grain yield in the plots received with Buctril M + Topik mixture is attributed to the effect of these broad leaf and grassy weedicides, which controlled both the broad leaf and grassy herbicides and thus the crop was made able to utilize the land resources and inputs to give maximum grain yield. Similar results were reported by Mantazeri (1994). Tanveer *et al.* (1999) have reported a significant increase in wheat grain yield with application of different herbicides.

## REFERENCES

- Ahmad, K., S. Zahir, K. Inayatullah, K. Himayatullah and M.K. Qasim, 1993. Effects of post emergence herbicides application and hand weeding on wheat and weed pressure. Pak. J. Weed Sci. Res., 6: 40-45.
- Appleby, A.P., P. Olson and D. Colbert, 1976. Winter wheat yield reduction from interference by Italian ryegrass. Agron. J., 68: 463-466.
- Bhagat, K.L. and H.C. Jain, 1985. Influence of herbicides on weeds and on growth, yield and quality of wheat. Dept. Agron, J.N. krishi Vishwa vidyalaya, Jabalpur 482 004, M.P., India. Ann. Conf. of Ind., Soc. Weed Sci.
- Borghain, M., L.P. Upadhaya and N. Deori, 1985. Herbicidal control of weeds in wheat. Pesticides, 19: 18-19.
- Hassan, G. and K.B. Marwat, 2001. Integrated weed management in agricultural crops. National Workshop on Technologies for Sustainable Agriculture, Sep. 24-26, 2001, NIAB, Faisalabad, Pakistan.
- Khan, I.U., Z. Muhammad, G. Hassan and K.B. Marwat, 2001. Efficacy of different herbicide for controlling weeds in wheat crop.1. Response of agronomic and morphological traits in wheat variety Ghaznavi. Scientific Khyber, 14: 51-57.
- Khan, M.A., M. Zahoor, I. Ahmad, G. Hassan and M.S. Baloch, 1999. Efficacy of different herbicides for controlling broad-leaved weeds in wheat. Pak. J. Biol. Sci., 2: 732.
- Marinkovic, I., M. Ziranovic, R. Ognjanovic, D. Knezevic, D. Micanovic and V. Zecevic, 1997. Influence of herbicides on 1000-grain weight and hectoliter mass of wheat. Pesticidi., 12: 15-23.
- Montazeri, M., 1994. Efficiency of several herbicides in control of weeds in wheat. Iranian J. Pl. Path., 30: 69-77.
- Pervaiz, K. and M.H. Quaizi, 1992. Status of food production in Pakistan. Progr. Farming, 12: 5.
- Shabir, G.A., 1990. Integrated weed management. M.Sc. Thesis, Sindh Agric. Univ., Tandojam, Pakistan.
- Samar, S., S. Samunder, R.K. Malik, S. Vireshwar, R.S. Banga, S. Singh and V. Singh, 1993. Evaluation of tank mixture of Isoproturon and diclofop methyl in wheat. Integrated weed management for sustainable agriculture. Proc. Indian Soc. Weed Sci. Intr. Symp. Hisar, India, 2: 179-181.
- Shah, M.L., A. Jalis, M. Ramazan and M. Iqbal, 1989. Chemical weed control in broadcast sown wheat under irrigated conditions. J. Agric. Res., 27: 195-199.
- Steel, R.G.O. and J.H. Torrie, 1980. Principles and procedures of statistics. A biometrical Approach. Second Ed. Mc. Graw. Hill Inc. USA.
- Tanveer, A., M. Ayub and A. Ali, 1999. Herbicides application alone and in combination with urea for control of weeds in wheat. Pak. J. Biol. Sci., 2: 1572-74.
- Zahir, M.A. and V.K. Gupta, 1981. Punjab farmers attitudes to weed control. Tropical pest management, 27: 130.