

## Evaluation of Herbicides on Growth and Yield of Wheat Crop in Upper Gangatic Plain of India

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### Abstract

*A field experiment on weed control in wheat was conducted at RSM College, Dhampur, Bijnor. The experiment was laid out in a randomized complete block design, replicated four times, and consisted of 8 treatments including 2 herbicide treatments; 2,4 -D, Isoproturon that were used individually and in different combinations and one treatment was kept as weedy check for comparison. All the herbicide treatments provided significant control of weeds causing significant reduction in density of target weed flora and also significantly improved the grain yield in comparison with the weedy check. Eight treatments were kept in each replication with different combination weedy check (unweeded control), Hand weeding (Twice), 2,4-D (Sodium Salt 50%) @ 0.5 Kg.a.i./ha at 25 DAS, 2,4-D (Sodium Salt 50%) @ 1.0 Kg.a.i./ha at 25 DAS, 2,4-D (Sodium Salt 50%) @ 0.5 Kg.a.i./ha at 35 DAS, 2,4-D (Sodium Salt 50%) @ 1.0 Kg.a.i./ha at 35 DAS, Isoproturon (50%W.P.) @ 1.0 Kg/Ha 25 DAS, Isoproturon (50%W.P.) @ 1.0 Kg/Ha 35 DAS. Highest mortality of weeds (94.7%) and maximum grain yield of 4925 kg ha<sup>-1</sup> were recorded where Isoproturon (50%W.P.) @ 1.0 Kg/Ha applied. Study shows that T<sub>8</sub> that is Isoproturon (50%W.P.) was found superior among all treatments.*

**Key Words:** Wheat, Triticum Aestivum, Days After Sowing, herbicides, weeds.

### Introduction

Plants are the source of all kind of food for Human beings directly or indirectly. In Gramineae (Poaceae) family produce most of the cereal crops of edible grains, providing one-half of man's food calories and contribute more for nutrient requirements. Wheat (*Triticum aestivum* L.) plays as chief cereals among all crops, as a direct source of food. Being a cheapest source of food for a large population of the world it also supplies 73 percent of the calories and protein in the average diet. Crop production mainly affected by weed problems. Weeds provide competition with crop plants for light, moisture, nutrients and space. They also increase cost of harvesting, inferior quality

### Material and Methods

The experiment entitled "Evaluation of herbicides for weed control in wheat production in upper Gangetic Plain of India" was conducted at R.S.M.

grains, clog water ways, and increase fire hazards. Therefore, it is, essential to control weeds in order to obtain maximum yield of wheat having good quality grain. However, the choice of most appropriate herbicide, proper time of application and proper dose is an important consideration for lucrative returns<sup>[1,2,4,5]</sup> since it also reported higher N uptake in herbicides treated plots<sup>[3]</sup>. Management of weeds has been practiced from time immemorial by manual labor or animal drawn implements. These methods, besides being laborious and tiresome, are expensive due to increasing cost of labor, draft animals and implement.

college, Allehpur Farm, Dhampur (Bijnor) during the Rabi Season 2015-2016 using the wheat variety UP-2338. Wheat was sown on November, 2015. The experiment

was laid out in a RCBD design with 4 replications. In each replication, there were eight treatments each with size of 7m x 3.45m. Row to row distance was kept at 30

cm. All the herbicides were applied as post emergence as detailed in Table1.

Data on the concerned treatment combination recorded on the 30, 60, 90, 120 days of interval.

**Table 1 Treatments Used In The Study**

Weedy check (Unweeded Control)
Hand weeding (Twice)
2,4-D (Sodium salt 50%) @0.5kg.a.i./ha 25 DAS
2,4-D (Sodium salt 50%) @1.0 kg.a.i./ha 25 DAS
2,4-D (Sodium salt 50%) @0.5kg.a.i./ha 35 DAS
2,4-D (Sodium salt 50%) @1.0 kg.a.i./ha 35 DAS
Isoproturon (50%W.P.) @1.0 Kg./ha. 25 DAS
Isoproturon (50%W.P.) @1.0 Kg./ha. 35 DAS

**Result and Discussion**

**Table 2 No. of shoots/metre row length at various stages of crop growth**

Treatments	Days after sowing				
	30	60	90	120	At harvest
T <sub>1</sub>	45.73	72.36	75.00	70.50	69.25
T <sub>2</sub>	42.48	75.63	78.50	71.00	70.50
T <sub>3</sub>	44.80	76.35	60.00	72.50	71.25
T <sub>4</sub>	43.36	78.56	66.50	71.50	77.50
T <sub>5</sub>	43.34	74.11	61.00	77.00	75.25
T <sub>6</sub>	45.67	77.77	62.50	78.50	76.00
T <sub>7</sub>	46.48	79.35	64.00	80.50	76.50
T <sub>8</sub>	47.76	83.26	68.52	83.00	79.00
S.Em±					4.85
C.D. at 5%					N.S.

It is evident from the above table 2 that, in general, the number of shoots per metre row length was increased upto 60 days stage and thereafter a decrease in the number of shoots per metre row length was observed. Data set out in Table-2 clearly show that comparatively higher number of shoots per metre row length

was recorded under T<sub>8</sub> (Isoproturon 50% W.P. sprayed @ 1kg/ha 35 D.A.S.) at different stages of crop growth.

At harvest stage, the number of shoots/metre row length could not be affected by different treatments. However, more number of shoots/metre row length was noted under T<sub>8</sub>.

**Table 3 Plant height (cm) at various stages of crop growth**

Treatments	Days after sowing				
	30	60	90	120	At harvest
T <sub>1</sub>	15.01	50.33	86.64	94.63	95.00
T <sub>2</sub>	15.61	50.83	86.98	95.78	96.05
T <sub>3</sub>	15.57	51.00	87.88	96.08	96.33
T <sub>4</sub>	16.23	52.93	90.32	98.75	99.15
T <sub>5</sub>	15.45	51.90	87.43	97.65	98.00
T <sub>6</sub>	15.45	51.16	88.57	97.84	98.11
T <sub>7</sub>	14.84	52.77	88.59	98.53	98.86
T <sub>8</sub>	15.38	55.25	90.63	98.88	99.20
S.Em±					1.67
C.D. at 5%					N.S.

From the Table3 it indicates ,in general, the plant height increased upto the harvest stage. The data presented in Table-3 show that the treatments could not affect

the plant height significantly. However, at harvest stage comparatively taller plants were observed under T<sub>8</sub> (Isoproturon used @1.0 kg/ha 35 days after sowing.

**Table 4 Biomass, grain and straw yield (q/ha) and harvest index**

Treatments	Biomass (q/ha)	Grain Yield(q/ha)	Straw Yield (q/ha)	Harvest Index
T <sub>1</sub>	85.36	37.02	49.56	42.89
T <sub>2</sub>	87.95	38.56	50.32	43.58
T <sub>3</sub>	88.65	40.36	52.36	44.85
T <sub>4</sub>	100.21	46.89	55.06	45.89
T <sub>5</sub>	92.54	43.68	49.75	46.89
T <sub>6</sub>	96.21	44.68	52.69	46.72
T <sub>7</sub>	98.23	45.23	54.28	46.87
T <sub>8</sub>	108.36	49.25	60.89	49.36
S.Em±	5.04	--	3.25	1.48
C.D. at 5%	N.S.	7.93	N.S.	N.S.

### Conclusion

From the given study T<sub>8</sub> is the best treatment since mortality of weeds (94.7%) and maximum grain yield of 4925 kg ha<sup>-1</sup>

were recorded where Isoproturon (50%W.P.) @1.0 Kg/Ha used as herbicide.

### References

1. Abbas, S.H., Muhammad, Saleem, Muhammad, Maqsood, M. Yaqub Mujahid, Mahmood-ul-Hassan and Rashid, Saleem (2009). Weed density and grain yield of wheat as affected by spatial arrangements and weeding techniques under rain fed conditions of Pakistan. *Journal of Agricultural Science*, **46**(4):354-359
2. Marwat, K.B., Muhammad Saeed, Zahid Hussain, Bakhtiar, Gul and Haroon-ur-Rashid, (2008). Study of

- various weed management practices for weed control in wheat under irrigated conditions. *Pakistan Journal of Weed Science Research*, **14**(1-2):1-8.
3. Kumar, S. and A., Agarwal (2010). Effect of weed management practices on nitrogen removal by Phalaris minor and wheat (*Triticumaestivum*). *Asian Journal of Experimental Biological Science*, 81-84.
  4. Khalil, Gul Hassan, Gulzar Ahmad and Nazeer, Hussain, Sha, (2008). Individual and combined effect of different weed management practices on weed control in Wheat. *Pakistan Journal of Weed Science Research*, **14**(3-4): 131-139
  5. Sherawat, Manzoor, Inayat and Maqbool, Ahmad (2005). Bio-efficacy of different graminicides and their effect on the growth and yield of wheat crop. *International Journal of Agriculture and Biology*, 7(6):438-440.