

RESEARCH NOTE

Weed Control Efficiency of Herbicides in Irrigated Wheat (*Triticum aestivum*)

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ABSTRACTS

A field study was conducted during 2009-10 at farmer's field by the farmers under supervision by KVK Sehore for control of both type of weed flora (narrow and broad leaf weed) which is shifted in this monotomy cropping system, to find out suitable herbicide for controlling of both type of weed flora in wheat crop. post emergence of herbicide Metsulfuron and 2, 4-D @6gm and 500gm/ha at 30-35 DAS effectively weed killing efficiency 38.1% and weed control efficiency 78.3% and their dry matter accumulation reduce 67.4% and weed index 23.5% and increase the grain yield of wheat 37.8% compared to farmer practices. Under this demonstration cost benefit ratio was found 1:2.4 under recommended practices compared to farmer.

Key words: Yield; Weed control; Weed killing efficiency; C:B ratio;

Wheat production is directly affected by several factors and one of the most limiting is the problems of weeds. Its due to yield losses of this crop estimated to vary between 30-50% based on weed infestation (Pandey *et.al*, 1997). Its problems is very serious where was their constantly adopted of monotomy cropping system. Such type of cropping system adopted in Sehore districts i.e. soybean-wheat from four decades back. It's due to some dominated weed flora early establishment and luxuriant growth of weeds due to frequent irrigation and dominancy of monotomy cropping system. In this situation manual removal of weeds in wheat crop is laborious time consuming and expensive due to higher rate of labour wages. Therefore chemical control of weeds is the only one option. Metsulfuron and 2, 4-D herbicides have been used for control of weeds in wheat crop. Because this combination control of both type of weed flora i.e. narrow and broad leaved. Keeping in view the losses due to weed infestation and high cast of manual labour, the present study was undertaken to test the efficacy of herbicides for weed control in wheat crops.

METHODOLOGY

The investigation was conducted during 2009-10. The treatment comprised two farmers practices and weedicide viz (Metsulfuron + 2,4-D@6gm +500g/ha) used at 30 days after sowing. The experiment field was

medium black soil, natural reaction 7.5 pH, low 0°C-0.41 and Nitrogen 240 kg/ha, medium available phosphorus 17 kg/ha and high potash 360 kg/ha. The seed was sown in lines with recommeded dose of fertilizers 120:60:40 N.P.K. kg/ha to seed cum ferti drill at 20 cm between row and 10 cm between plant on IInd fortnight of October during 2009-10. The experimental field was heavy infested with broad and narrow leaf weeds. No herbicide use in weedy check plots. And sufficient soil moisture was available at time of herbicide spray. Where sprayed using volume spray of 500 litres/ha with the help of knapsak sprayer fitted with flat fan nozzle. Weed count and weed dry biomass were recorded at 60 DAS by using a 1.0 m² sized quadrate randomly at 6 places in each plot. Weed control efficiency (WCE) and weed index has been calculated with the formula:

$$WCE = \frac{(x-y)}{x} \times 100$$

where x = weed dry weight in weedy check and
 y = weed dry weight and

$$WI = \frac{(x-y)}{x} \times 100$$

where x = yield from untreated plot and
 y = yield from treated plots.

Benefit-cost ratio was determined by dividing net monetary returns by cost of cultivation. Number of

Table 1. Effect of herbicide on weed spectrum.

Treatments	No.of BLW /m ²	No.of NLW /m ²	Total weeds /m ²	Use of herbicide	No.of BLW /m ²	No.of NLW /m ²	Total no. of weeds /m ²	WKE (%)	WI	WDM gm/m ²	WCE (%)
	25 DAS				60 DAS						
RP	10	6.5	16.5	25 DAS	4.0	2.1	6.1	38.1%	-23.5	41.	78.3
FP	9.0	7.0	16.0		9.0	15.0	24.0	-	-	189	-

RP-Recommended practices, BLW-Broad leaf weed, WI-Weed index, FP- Farmer practices, NLW-Narrow leaf weed, WDM-Weed dry matter, DAS - Days after sowing, WKE-Weed killing efficiency, WCE-weed control efficiency

Table 2. Effect of herbicide on yield attributes and economics of wheat

Treatments	Total no. of tillers /m ²	No. effective tillers/m ²	% of in effective tillers	No.of grains /ear	Test weight gm(1000 seeds)	Yield q/ha	Incr-eas yield (%)	Straw yield q/ha	G:S ratio	Cost of cultivation	GR	NR	B:C ratio
RP	356.1	323.7	10.0	38.5	37.5	46.7	37.8	63.0	1:1.35	21500.0	51406	29906.0	1:2.4
FP	328.6	267.2	23.0	37.5	36.6	37.8	-	52.9	1:1.40	20500.0	34545	140450.	1:2.0

RP-Recommended practices, GR-Grass return, FP- Farmer practices, NR-Net return, GS-Grain Straw ratio, B:C –Benefit cast ratio

productive tillers, no. of grains /ear, test wt and grain yield on personal contact basis.

RESULTS AND DISCUSSION

Highest weed population and dry weight of weeds were recorded in weedy check compared to recommended practices. The crop weed competition was markedly reduced by weed control treatments as is evident from the significant decrease in weed population, dry matter accumulation, weed killing efficiency, weed control efficiency and weed control index 6.1, 41g/m², 38.1%, 67.4%, -23.5%. respectively by removing the weeds under herbicide spray (metsufuron+2,4-D) (Table 1) which was significantly superior to farmers practices.

Similar result were reported by (Pandey *et.al.* 2001), whenever pool data indicated that metsulfuron+2,4-D @ 6g and 500g/ha was most effective herbicide for controlling of both type of weed flora i.e narrow and broad leaf weeds throughout the growing season. Because Met sulfuron kills broadleaf weeds and some annual grasses through foliar and soil activity, that inhibits cell division in shoots and roots. And 2,4-D is absorbed through the leaves and is translocated to the meristems for plant death by unsustainable growth ensues, causing stem curl-over, leaf withering from cited by (Tiwari *et.al.*, 1997; Dixit *et.al.*, 1997 and Malik, 1992).

Grain yield : Weed competition lowered crop yield 37.8% under weedy check compared to herbicidal effect along with recommended dose fertilizers (Table 2). This may be attributed to marked decrease in weed population, weed dry weight and there by better crop growth, increased productive tillers, no. of grains/ears, test weight, grain and straw yield 323.7, 39, 37.5, 46.7 and 63.0 q/ha respectively compared to farmer practices 267.7, 36.0, 36.6, 37.8 and 54.1 q/ha, through better utilization of available resource like fertilizers, water, sunlight and space due to less competition of crop and weeds compared to farmers practices. The maximum yield was achieved with the application of metsufuron +2,4-D, increase in grain yield of wheat crop owing to better control of weeds, particularly of narrow and broad leaf weed (Dixit and Bhan (1997), Balyan (1999), Virendra *et.al* (2004) and Jitendra Pandey (2002).

Economic impact: The economic impact as Net return and cost benefit ratio was calculated (Table 2), which found Rs 29906.0 and 1:2.4 recommended practices as compared to farmer practices 140450.0 and 1:2.0 which indicate the directly response of weed control by spray of herbicide.

CONCLUSION

Herbicide significantly affected the mean

difference for all the parameter, while the main effect of control of broad leaved weed. This combination exhibited the best performance through effective broad leaved weed control. Therefore this combination are

recommended for managing dominated broad leaved weed flora and better economic returns.

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REFERENCES

- Dixit, A. and Bhan Y.M. (1997). Weed control efficiency of isoproturon applied at different concentration and its combination with 2,4-D in wheat. *Indian J. Weed Science*, **29** (1,2): 11-14.
- Balyan, R.S. (1999). Efficacy of sulfosulfuron tralkxy and metribzin applied alone and tanks mmix on weeds in wheat. *Indian J. Weed Science*, **31** (1&2): 80-83.
- Gupta, Virender Kumar; Kumar, Sanjeev and Arvind Kumar Singh (2004). Yield quality of wheat (*Triticum aestivium*) as influenced by sulphur nutrition and weed management . *Indian J. Agriculture Science*, **74** (5): 254-56.
- Malik, R.S., Panwar R.S. and Malik R.K. (1992). Chemical control of broad leaf and grassy weeds in wheat (*Triticum aestivium*). *Indian J. Agronomy*, **37**: 324-346.
- Tewari, A.N.; Hussain K. and Singh B. (1997). Evaluation of herbicides in pea (*Pisum sativum*)+Mustard (*Brassica juncea*) inter cropping. *Indian J. Weed Science*, **29** (3&4): 80-83.
- Virender Sardana (2001). Evaluation of herbicides for control of weeds in durum wheat (*Triticum durum*). *Indian J. Agriculture Science*, **71** (9): 602-4
- Jitendra Pandey (2002). Effect of dose and mode of metribuzine application on phalaris minor and yield of wheat (*Triticum aestivium*). *Indian J. Agriculture Science*. **72** (1):11-13.
- Pandey, J.; Singh, R. and Verma, A.K. (2001). Influence of herbicides on weed management in true potato. *Acta Agronomica Hungarica*, **49**: 183-87
- Pandey J. and Singh R. (1997). weed control in wheat is key to higher production. *Indian farming*, **47** (8): 4-7.

