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Short comunication

Effect of promising herbicides on weed control efficiency and yield of wheat

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Wheat competes with a large number of weeds leading to reduction in yields. Therefore, effective weed control measures can reduce the risk of weed problem in wheat. Application of suitable herbicide may be quite easy, cheap and effective weed control practice in wheat. During last decades isoproturon has been identified for effective control of weeds including most problematic weeds like *Phalaris minor* but there are a few reports of having resistance of *P. minor* for isoproturon. *Phalaris minor* infestation alone caused 30-80% reduction in grain yield of wheat depending upon its intensity (Brar and Walia 1993). Hence, the present study was carried out to evaluate an alternate herbicide for effective weed control in wheat crop.

A field experiment was conducted at research farm of Birsa Agricultural University, Ranchi (Jharkhand) during the year 2005-06 and 2006-07. The treatments comprised of three levels of carfentrazone-ethyl (1.5, 1.75 and 2.0 kg/ha), isoproturon (1.25 kg/ha), isoproturan +2,4-D sodium salt + (1.0 and 0.625 kg/ha), fenoxaprop-p-ethyl (1.0 kg/ha), clodinofop-propargyl (0.4 kg/ha), sulfosulfuron (0.32 kg/ha), weed free and weedy check were treated in randomized block design with three replications. The soil of experimental field was sandy loam with low in available N (165 kg/ha) medium in available P (32 kg/ha) and low in available K (180 kg/ha) contents. The crop was sown in the first week of November and harvested in first week of March during both the years of investigation.

The dominating weeds infesting wheat in weedy check plot were *Phalaris minor*, *Chenopodium allbum*, *Melilotus indica* and *Medicago denticulata* and some minor weeds in both the years of investigation (Table 1). The population of these weeds during 2005-06 and 2007 at 60-day growth stage of crop was 117, 22, 32, 17 and 12 and 140, 26, 43, 21 and 15 plants/m^2, respectively. Post emergence application of carfentrazone-ethyl (2 kg/ha) and sulfosulfuron (0.032 kg/ha) being at par significantly allowed lowest density of almost all weeds in both the years. Exceptionally, clodinafop-propargyl (0.4 ka/ha) had the lowest density of *P. minor* in both the years. Application of lower dose of carfentrazone-ethyl (1.75kg/ha) and isoproturon (1.25 kg/ha) although had slightly higher density of weeds but weed dry matter was comparable with the above mentioned two herbicides. Consequently, weed control through carfentrazone-ethyl (1.75 and 2.0 kg/ha), sulfosulfuron (0.032 kg/ha) and isoproturon (1.25 kg/ha) proved equally good. Weed free plots produced maximum grain yield of wheat in both the years which were comparable to the yield obtained with post emergence application of carfentrazone-ethyl (2.0 as 1.75kg/ha). Sulfosulfuron (0.032 kg/ha) and isoproturon (1.25 kg/ha) mainly due to superiority of ear head/m^2 and grain/ear as a result of higher weed control efficiency (Table 2). Similar results were reported by Yadav *et al.* (2006) with the application of sulfosulfuron.

REFERENCE

Brar LS and Walia US. 1993, Studies on integration of nitrogen and clodinofop for controlling isoproturon resistant *Phalaris minor* in wheat. *Fertilizer News* **49**:41-48

Yadav A, Malik RK, Gil Gurjeet, Singh S, Chauhan BS and Bellinder RR. 2006 Current status of weed resistance to herbicides in rice–wheat cropping system in Haryana and its management. *Indian Journal of Weed Science* **38** (3&4): 194-206.

Table 1. Effect of treatments on weed density, dry weight of weeds and weed control efficiency

Treatments	Density of weeds/m^2 at 60 DAS										Dry weight of weeds at 60DAS g/m^2		WCE (%)	
	Phalaris minor		*Chenopodium album*		*Melilotus indica*		*Medicago denticulata*		Others					
	05-06	06-07	05-06	06-07	05-06	06-07	05-06	06-07	05-06	06-07	05-06	06-07	05-06	06-07
Carfentrazone-ethyl+IPU 1.5 kg/ha	6.42 (42)	6.92 (40)	0.71 (0)	1.1 (1)	4.13 (17)	4.59 (21)	4.29 (19)	4.75 (23)	2.73 (9)	3.24 (11)	65.8	79.0	52.10	54.01
Carfentrazone-ethyl+IPU 1.75 kg/ha	3.19 (11)	3.74 (14)	0.71 (0)	0.71 (0)	2.35 (5)	2.54 (8)	2.58 (7)	3.32 (11)	1.8 (3)	3.03 (9)	13.4	16.1	90.20	90.63
Carfentrazone-ethyl+IPU 2.00 kg/ha	2.37 (6)	2.87 (8)	0.71 (0)	0.71 (0)	1.32 (2)	1.79 (3)	2.3 (5)	2.46 (6)	1.52 (2)	2.49 (6)	5.2	6.2	96.21	96.39
Isoproturon 1.25 kg/ha	2.55 (7)	2.55 (9)	1.56 (2)	1.86 (3)	3.39 (11)	3.80 (14)	3.67 (13)	4.18 (17)	2.04 (5)	2.83 (8)	12.8	15.4	90.73	91.04
Isopproturon 1.0 kg/ha+2,4-D Na 0.625 kg/ha	5.57 (39)	6.66 (46)	0.71 (0)	0.71 (0)	2.74 (7)	3.23 (10)	3.52 (11)	3.67 (13)	2.56 (7)	2.83 (8)	48.5	58.2	64.72	66.12
Fenoxaprop-p-ethyl 1.0 kg/ha	3.49 (13)	3.70 (15)	5.1 (27)	5.59 (32)	4.56 (21)	4.58 (23)	4.18 (17)	4.57 (21)	3.02 (9)	3.38 (11)	44.3	53.2	67.81	69.03
Clodinofop propargyl 0.4 kg/ha	1.17 (1)	1.43 (2)	3.74 (29)	5.94 (35)	5.2 (27)	5.44 (32)	3.67 (13)	4.29 (19)	3.90 (15)	4.20 (18)	36.7	48.0	73.32	72.06
Sulfosulfuron 0.032 kg/ha	2.26 (5)	2.63 (7)	1.79 (3)	1.96 (4)	2.37 (7)	3.07 (11)	2.34 (5)	2.80 (8)	1.43 (2)	2.73 (7)	3.6	6.9	97.41	95.98
Weed free	0.71 (0)	0.71 (0)	0.71 (0)	0.71 (0)	0.71 (0)	0.71 (0)	0.71 (0)	0.71 (0)	0.71 (0)	0.71 (0)	0.0	0.0	100.00	100.00
Weedy check	10.80 (117)	4.22 (22)	4.20 (22)	4.47 (26)	4.83 (32)	6.35 (43)	4.16 (17)	4.55 (21)	3.43 (12)	3.92 (15)	137.4	171.8	-----	------
LSD(P=0.05)	0.96	1.03	1.03	0.77	0.89	0.9-6	0.65	0.63	NS	NS	15.4	24.9		

Figure in parenthesis indicate original vaues ; IPU = Isoproturon

Table 2. Effect of treatments on yield attributes and yields of wheat

Tretments	No. of ears/m^2		Grains/ear		1000,grain weight(g)		Grain Yield(kg/ha)	
	2005-2006	2006-2007	2005-2006	2006-2007	2005-2006	2006-2007	2005-2006	2006-2007
Carfentrazone-ethyl+IPU 1.5 kg/ha	186	193	38	36	36.8	35.2	2675	2938
Carfentrazone-ethyl+IPU 1.75 kg/ha	276	283	45	52	35.4	33.6	4090	4489
Carfentrazone-ethyl+IPU 2.00 kg/ha	288	292	47	48	34.2	34.8	4225	4611
Isoproturon 1.25 kg/ha	270	276	38	38	36.6	35.8	4070	4437
Isopproturon 1.0 kg/ha+2,4-D Na 0.625 kg/ha	198	202	35	36	35.8	36.4	3152	3430
Fenoxaprop-p-ethyl 1.0 kg/ha	210	212	39	36	34.4	33.6	3205	3516
Clodinofop propargyl 0.4 kg/ha	198	212	36	38	35.6	35.8	3420	3702
Sulfosulfuron 0.032 kg/ha	278	281	43	51	33.2	34.4	4115	4516
Weed free	279	289	48	52	36.3	32.2	4410	4703
Weedy check	161	181	36	33	33.6	31.2	975	1039
LSD(P=0.05)	21	17	10	16	NS	NS	416	500