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EVALUATION OF SOME HERBICIDES IN CONTROLLING WEEDS IN WHEAT (*Triticum aestivum* L.)

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ABSTRACT

Field trials were conducted during 2004-05 and 2005-06 seasons at Motobis district, Kafr El-Sheikh Governorate to evaluate the efficiency of some post-emergence herbicides in controlling broadleaf and grassy weeds in wheat cv. Sakha 168 .The treatments included Brominal 24% EC, Framinal 24% EC, Koril W 24% EC, Pardner22.5% EC, Proturon 50% SC, IPFlow 50% FL, Turinex 50% SC, Swat 50% SC, Tarok 71.4% WG, Granstar 75% DF, Granon 75% DF, Korestar 75% DF, Ecopart 2% SC and handweeding. The herbicides were applied at 2 and 4-leaf stages of wheat and handweeding was carried out twice at 20 and 40 days after sowing. Results showed that all weed control treatments significantly reduced weed fresh weights and increased grain yield of wheat.However, all tested herbicides gave higher weed control than handweeding . Morever, these herbicides provided better control at 2-leaf stage than at 4-leaf stage of wheat.

Results also indicated that the herbicides formulations could affect the herbicidal efficiency . Generally , Brominal, Framinal and Granstar achieved the best weed control treatments and gave maximum grain yield in the two tested seasons.

INTRODUCTION

Wheat (*Triticum aestivum* L.) is one of the major sources of human food (grains) and animal fed (straw) in Egypt.

The demand for wheat crop is ever increasing because of rapid increase in human populations making it imperative to raise wheat productivity.

The continued competition between wheat plants and wild oat decreased grain yield of wheat by 47% (Omar *et al.*, 1997, and Al-Marsafy *et al.,* 2001). The presence of weeds reduced grain yield of wheat from 4684 to 3788 kg/ha, and from 5110 to 4014 kg/ha (Puina *et al.,* 1996).

Weed competition to wheat usually occurs from the two leaf stage to the onset of reproduction growth, leading to reduction in tillering, ear formation and in stem weight and height besides giving poor grain filling (Lemerla *et al.,* 1979; Smith and Levick, 1974).

Herbicide treatment is one of the important weed control practices in wheat. A decision on herbicide treatment is made after surveying an area in early spring and assessing the level of expected yield decreases caused by weeds in the field based on their numbers and competitiveness. The choice of herbicide(s) and time of application depends on weed flora composition, spectrum of herbicidal activity, crop stage, varietal susceptibility, weather condition and the method of herbicide application Kojic and Šinzar,1988, Šinzar and Testic,1995)

MATERIALS AND METHODS

The filed experiments were conduced during 2004-2005 and 2005-2006 seasons at Motobis district, Kafr El-Sheikh Governorate to evaluate the effect of post-emergence herbicides and handweeding on weeds in wheat crop. Seeds of wheat cv. Sakha 168 were sown in 25 and 30 November in the two successive seasons. The experiments were conducted in randomized complete block design with three replications for each treatment (each plot 21 m^2) . The herbicides were applied at 2 and/ or 4-leaf stages of the crop using 5-litre knapsack sprayer (Gloria Hoppy No. 299 TS) at 200 L/feddan. Handweeding treatment was applied twice, 20 and 40 days after sowing.

Table (1): The herbicidal treatments, rates of application and formulations.

Trade name	Common name and formulations *	Rate product/feddan
Brominal	bromoxynil 24% EC	1L
Framinal	bromoxynil 24% EC	1L
Koril W	bromoxynil 24% EC	1L
Pardner	bromoxynil 22.5% EC	1L
Proturon	isoproturon 50% SC	1.25L
Turinex	isoproturon 50% SC	1.25L
Swat	isoproturon 50% SC	1.25L
IPFlow	isoproturon 50% FL	1.25L
Granstar	tribenuron-methyl 75% DF	8 gm
Granon	tribenuron-methyl 75% DF	8 gm
Korestar	tribenuron-methyl 75% DF	8 gm
Tarok	tritosulfuron-ethyl 71.4%WG	25 gm
Tarok	tritosulfuron-ethyl 71.4%WG	20 gm
Ecopart	pyraflufen-ethyl 2% SC	250 gm
Ecopart	pyraflufen-ethyl 2% SC	200 gm
Handweeding		twice

***bromoxynil- containing formulations(product no. 1- 4) .**
***isoproturon – containing formulations (product no. 5- 8) .**
***tribenuron- methyl- containing formulations (product no. 9- 11) .**
***tritosulfuron- ethyl at two rates (product no. 12- 13) .**
***pyraflufen- ethyl at two rates (product no. 14- 15) .**

After 30 days of treatments, weeds in one square meter were collected using a quadrate of 50 cm x 50 cm placed at 4 randomly selected spots in each experiments plot. Weeds were classified, weighed and fresh weight of each weed species (g/m^2) has been estimated in each plot. The efficacy of each treatment was calculated as a percent reduction (%R) of the fresh weight of weeds using the following formula.

$$\% R = \frac{C - T}{C} \times 100$$

Where:
C = fresh weight of the untreated area
T = fresh weight of the treated area

The grain yields of wheat crop were calculated as kg/plot and percent increase in wheat grain was recorded by the following formula.

$$\% \text{ increase in grain yield} = \frac{T - C}{T} \times 100$$

Where:
T = weight of grain yield in the treatment.
C = weight of grain yield in the unweeded check.

Data were analyzed using ANOVA test and the mean values were tested after Duncan's Multiple Range Test (1955) at P = 0.05 and 0.01.

RESULTS AND DISCUSSION

The obtained results indicated that the predominant weed species in the experimental field in both seasons were three broadleaf weeds, *Melilotus indica* , *Beta vulgaris* and *Anagallis arvensis* and one grassy weed ,*Eragrostis ciliagensis* . In first season, the mean fresh weights (g/m^2) of these weeds in the weedy check were 20 , 22.33 , 19.66 and 19.33 at 2-leaf stage application date, and 35 , 39 , 37 and35 at 4-leaf stage, respectively.

Consedering the sensitivity of the weeds to the tested herbicides , the grassy weed (*E. ciliagensis*) appeared to be the least sensitive. The broadleavd weeds , on the other hand, were highly sensitive to all the tested products . However, significant differences between them in sensitivity were found in the case of bromoxynil-containing products and Tarok at its both rates (Tables 2-5). The broadleaf *B . vulgaris* was the most sensitive followed by *A . arvensis* and *M . indica .* In the case of isoproturon and tribenuron-containing products , no significant differences in sensitivity were found between broadleaf weeds (Tables 2-5). In this respect , Balyan *et at*.(2000) revealed that dominant broadleaf weeds including *Convulves arvnesis* and *melilotus sp.* were effectively controlled (90-98 %) with chlorsulfuron at 30 g/ha applied pre-emergence , 20 or 30 days after sowing . Tank mixture of chlorsulfuron with isoproturon at 20 + 750 g and isoproturon + metsulfuron at 750+4 g /ha provided satisfactory control to the broableaf and grassy weeds. Walia *et al* .(2000) found that application of metsulfuron or tribenuron- mthyl each at 10 g/ha provided excellent control of hardy broadleaf weeds.

In general , candidate herbicides gave higher weed control efficiency than handweeding (Tables 2-7). However, Brominal,Granstar, Framinal,Korestar, Koril W and Granon significantly reduced fresh weight of broad-leaved weeds and gave high control efficiency compared to handweeding. They gave 91.93, 89.25, 88. 7, 87.09, 86.03 and 85.48 % weed control, respectively, at 2-leaf stage in 2004/2005 season (Table 6). Proturon, Pardner, IPFlow, Tarok, Ecopart, and Turinex gave satisfactory weed control as indicated by the reduction in fresh weight of broad-leaved weeds. The least effective control of broad-leaved weeds was recorded with Swat and Ecopart (at 200 g product/fed.).

Grassy weed were effectively controlled by Brominal,Granstar , Granon, Tarok, Proturon, Koril W in season 2004-05 at 2 and 4-leaf stages. Other ratments seemed to be moderately effective against grassy weed (Table 6) .

Table (2): Effect of herbicides and hand weeding on weed fresh weight (gm/m2) at 2-leaf stage in wheat during 2004-2005 season.

Treatments rate product/fed.	*Melilotus indica*		*Beta vulgaris*		*Anagallis arvensis*		*Eragrostis ciliagensis*		L.S.D of weeds	
	mean fresh wt.	% control	mean fresh wt.	% control	mean fresh wt.	% control	mean fresh wt.	% control	at 1%	at 5%
Brominal 24% EC 1 L/fed.	1.00	95.00	0.00	100.00	4.00	79.65	2.33	87.94	0.83	0.63
Framinal 24% EC 1 L/fed.	2.66	86.70	2.33	89.56	2.00	89.82	4.33	77.59	0.64	0.47
Koril W 24% EC 1 L/fed.	4.66	76.70	4.00	82.08	0.00	100.00	5.66	70.71	0.83	0.63
Pardner 22.5% EC 1 L/fed.	6.33	68.35	2.66	88.08	3.33	83.06	7.00	63.78	0.90	0.66
Proturon 50% SC 1.25 L/fed.	4.00	80.00	2.33	89.56	3.66	81.38	5.00	74.13	1.10	0.81
IPFlow 50% FL 1.25 L/fed.	5.66	71.70	3.66	83.60	4.66	76.29	4.33	77.59	0.78	0.57
Turinex 50% SC 1.25 L/fed.	3.00	85.00	7.33	67.17	6.00	69.48	5.66	70.71	0.67	0.49
Swat 50%SC 1.25 L/fed.	8.00	60.00	9.66	56.73	3.33	83.06	7.33	62.07	0.90	0.66
Tarok 71.4% WG 25 g/fd.	3.66	81.70	2.66	88.08	4.33	77.97	4.00	79.30	0.81	0.60
Tarok 71.4% WG 20 g/ fed.	7.33	63.35	4.66	79.13	3.66	81.38	6.33	67.25	0.90	0.66
Granstar 75% DF 8 g /fed.	2.66	86.70	1.33	94.04	2.66	86.46	3.33	82.77	0.76	0.50
Granon 75% DF 8 g/ fed.	3.33	83.35	2.66	88.08	3.00	84.74	4.00	79.30	0.50	0.32
Korestar 75% DF 8 g/fed.	4.66	76.70	4.66	79.13	4.33	77.97	5.33	72.42	0.74	0.48
Ecopart 2% SC 250 g /fed.	6.00	70.00	3.66	83.60	3.33	83.06	5.66	70.71	0.63	0.43
Ecopart 2% SC 200 g / fed.	8.66	56.70	6.00	73.13	6.33	67.80	8.00	58.61	0.70	0.46
Hand weeding twice	11.00	45.00	8.00	64.17	7.66	61.03	8.66	55.19	1.50	1.11
Control	20.00	-	22.33	-	19.66	-	19.33	-	1.57	1.16
L.S.D at 1%	1.18		1.29		1.55		1.46			
5%	0.87		0.95		1.14		1.08			
Herbicides x weeds at 1%=1.92										
at 5%=1.42										

Results in Table 7 indicated that Brominal , Koril W , Granstar , Granon , Tarok , Proturon and IPFlow were highly effective in controlling broad-leaved weeds followed by Korestar , Pardner , Tarok , Turinex and Ecopart at 2 and 4-leaf stages in 2005-06 season . Other treatments gave weed control efficiency of broad-leaved weeds less than the above mentioned treatments . In the same season , best control of grassy weeds was recorded with Brominal , Granstar , Granon , Framinal , Tarok (at 25 g) and Korestar at 2-leaf stage . However, Brominal , Framinal , Proturon , Granstar , Koril W , IPFlow and Tarok at the 4-leaf stage . Other treatments gave moderate control efficiency of these weeds .

All the tested herbicides gave significant reductions in fresh weight of total weeds and high control efficiency compard to handweeding . In this respect , Abou- Donia *et al*. (1985) reported that Brominal , Arelon , Koril DS and IPFlow gave significant control of weeds compared to handweeding . Mekhail *et al.* (1987) reported that Brominal gav best results in controlling broadleaved weeds. Ohtsuka *et al*. (1999) showed that application of pyraflufen to leaves gave excellent control of weeds.

The obtained results also indicated that the formulations of herbicides could affect the herbicidal efficiency. Significant differences in herbicidal efficiency were found between bromoxynil-containing formulations tested .

On the other hand , Brominal gave the highest reduction in fresh weight of weeds, followed by Framinal, Koril W and Pardner. Significant differences were found between isoproturon and tribenuron-containing formulations (Tables 6 and 7) .

Table (3): Effect of herbicides and hand weeding on weed fresh weight (gm/m2) at 4-leaf stage in wheat during 2004-2005 season.

Treatments rate product/fed.	*Melilotus indica*		*Beta vulgaris*		*Anagallis arvensis*		*Eragrostis ciliagensis*		L.S.D. of weeds	
	mean fresh wt.	% control	mean fresh wt.	% control	mean fresh wt.	% control	mean fresh wt.	% control	at 1%	at 5%
Brominal 24% EC 1 L/fed.	4.00	88.57	4.33	88.89	6.00	83.78	5.66	83.82	0.70	0.46
Framinal 24% EC 1 L/fed.	6.66	80.97	5.00	87.17	5.00	86.48	8.66	75.25	0.95	0.62
Koril W 24% EC 1 L/fed.	9.00	74.28	4.66	88.05	6.33	82.89	11.33	67.62	0.84	0.55
Pardner 22.5% EC 1 L/fed.	11.33	67.62	7.33	81.20	8.00	78.37	14.00	60.00	0.66	0.43
Proturon 50% SC 1.25 L/fed.	7.66	78.11	7.66	80.35	5.66	84.70	10.66	69.54	0.80	0.52
IPFlow 50% FL 1.25 L/fed.	10.00	71.42	6.33	83.76	9.33	74.78	12.33	64.77	0.76	0.50
Turinex 50% SC 1.25 L/fed.	6.33	81.91	11.66	70.10	12.00	67.56	15.00	57.14	0.81	0.53
Swat 50%SC 1.25 L/fed.	13.66	60.97	15.66	59.84	10.00	72.97	16.66	52.40	1.13	0.74
Tarok 71.4% WG 25 g/fd.	4.33	87.62	9.66	75.23	7.00	81.08	8.66	75.25	0.93	0.61
Tarok 71.4% WG 20 g/ fed.	10.33	70.48	5.66	85.48	11.66	68.48	11.66	66.68	1.01	0.65
Granstar 75% DF 8 g /fed.	6.33	81.91	4.00	89.74	8.33	77.48	8.00	77.14	0.76	0.50
Granon 75% DF 8 g/ fed.	5.00	85.71	7.66	80.35	8.33	77.48	8.66	75.25	0.81	0.53
Korestar 75% DF 8 g/fed.	7.66	78.11	10.33	73.51	4.66	87.40	11.00	68.57	0.88	0.57
Ecopart 2% SC 250 g /fed.	10.66	69.54	7.33	81.20	12.00	67.56	10.33	70.48	1.05	0.69
Ecopart 2% SC 200 g / fed.	14.33	59.05	13.66	64.97	7.66	79.29	14.66	58.11	0.89	0.58
Hand weeding twice	15.66	55.25	17.33	55.56	13.33	63.97	17.66	49.54	1.26	0.82
Control	35.00	-	39.00	-	37.00	-	35.00	-	1.66	1.09
L.S.D at 1%	1.25		0.98		0.85		1.06			
5%	0.92		0.72		0.63		0.78			
herbicides x weeds at 1%= 2.09										
at 5%=1.55										

Results indicated that all the tested herbicides provided better weed control at 2-leaf stage than at 4-leaf stage (Tables 6 and 7). Brominal, Framinal, Koril W, and Granstar gave the best results in the two application dates . Kassim AL - Khatib (1995) reported that application of bromoxynil (Buctril) at 0.25 to 0.375 pound a. i./ acre (spring wheat) or 0.5 a.i./ acre (winter wheat) when weeds have germinated gave better results than when weeds less than 4 leavs . In addition, thifensulfuron + tribenuron seemed to be more effective on weeds if applied when wheat is larger than the 2-leaf stage, but befor third node is detectable in winter wheat or first node is detectable in spring wheat.

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Table (5): Effect of herbicides and hand weeding on weed fresh weight (gm/m2) at4-leaf stage in wheat during 2005-2006 season.

Treatments rate product/fed.	*Melilotus indica*		*Beta vulgaris*		*Anagallis. arvensis*		*Eragrostis ciliagensis*		L.S.D.of weeds	
	mean fresh wt.	% control	mean fresh wt.	% control	mean fresh wt.	% control	mean fresh wt.	% control	at 1%	at 5%
Brominal 24% EC 1 L/fed.	6.33	86.23	3.66	89.54	4.00	90.60	7.33	77.32	0.93	0.61
Framinal 24% EC 1 L/fed.	5.33	88.41	6.66	80.97	5.66	86.07	8.00	75.25	0.65	0.42
Koril W 24% EC 1 L/fed.	7.00	84.78	5.66	83.82	6.00	85.24	8.66	73.21	0.87	0.50
Pardner 22.5% EC 1 L/fed.	8.33	81.89	7.66	78.11	7.33	81.97	11.00	65.97	0.68	0.44
Proturon 50% SC 1.25 L/fed.	8.33	81.89	8.33	76.20	9.33	77.05	8.66	73.21	0.45	0.29
IPFlow 50% FL 1.25 L/fed.	8.66	81.17	8.66	75.25	10.00	75.40	9.66	70.12	0.70	0.46
Turinex 50% SC 1.25 L/fed.	11.66	74.66	10.33	70.48	12.00	70.48	10.33	68.04	0.90	0.59
Swat 50%SC 1.25 L/fed.	13.66	70.30	13.66	60.97	14.66	63.94	12.33	61.86	0.78	0.51
Tarok 71.4% WG 25 g/fd.	7.33	8.06	6.66	80.97	7.66	81.16	11.33	64.95	0.69	0.45
Tarok 71.4% WG 20 g/ fed.	8.66	81.17	9.66	72.40	10.66	73.78	12.33	61.86	0.87	0.57
Granstar 75% DF 8 g /fed.	6.00	86.95	6.00	82.85	7.66	81.16	8.66	73.21	0.80	0.52
Granon 75% DF 8 g/ fed.	6.66	85.52	6.33	81.91	8.33	81.57	9.66	70.12	0.87	0.65
Korestar 75% DF 8 g/fed.	9.00	80.43	7.66	78.11	7.33	81.97	11.33	64.95	0.95	0.62
Ecopart 2% SC 250 g /fed.	10.33	77.54	9.00	74.28	8.00	80.32	11.33	64.95	0.91	0.59
Ecopart 2% SC 200 g / fed.	10.66	76.82	11.66	66.68	13.00	68.02	13.00	59.78	0.89	0.58
Hand weeding twice	17.33	62.32	14.66	58.10	17.66	56.56	14.33	55.67	1.31	0.86
Control	46.00	-	35.00	-	40.66	-	32.33	-	2.10	1.38
L.S.D at 1%	0.94		1.00		0.83		0.74			
at 5%	0.69		0.74		0.61		0.54			
herbicides x weeds at 1%=2.18										
at 5%=1.61										

Demosthenis Chachalis *et al*.(2001) found that two- to four-leaf stage of ivyleaf morningglory, Pitted morningglory, Palmleaf morningglory and Smallflower morningglory were susceptible to acifluorfen, bromoxynil, glufosinate and glyphosate.Howvere, at the five-to eight-leaf stage , these species were less susceptible and control was herbicide specific. Generally, data cleard that formulations of nitrile group seemed to be more effective in controlling weeds than formulations of sulfonylurea, and formulations of urea group, respectively.

Effect of weed control treatments on grain yield

Results shown in Tables 8 and 9 indicated that all the tested herbicides significantly increased wheat grain yield at 2 and 4-leaf stages during the two successive seasons compared to handweeding. Brominal gave the highest grain yield of wheat at 2 and 4-leaf stage in two seasons, followed by Granstar,Framinal , Granon , Proturon , Koril W and Tarok.

Table(8): Effect of herbicides and handweeding on wheat grain yield (kg / plot) during season 2004 - 2005 .

Treatments rate product/fed.	2-leaf stages		4-leaf stage	
	Grain yield (kg/plot)	% increase	Grain yield (kg/plot)	% increase
Brominal 24% EC 1 L/fed.	17.00	41.17	16.00	35.93
Framinal 24% EC 1 L/fed.	16.00	37.50	15.25	32.78
Koril W 24% EC 1 L/fed.	15.25	34.42	15.00	31.66
Pardner 22.5% EC 1 L/fed.	14.75	32.20	13.75	25.45
Proturon 50% SC 1.25 L/fed.	15.50	35.48	14.00	26.78
IPFlow 50% FL 1.25 L/fed.	14.50	31.03	13.50	24.07
Turinex 50% SC 1.25 L/fed.	13.50	25.92	12.75	19.60
Swat 50%SC 1.25 L/fed.	12.25	18.36	11.50	10.86
Tarok 71.4% WG 25 g/fed.	15.00	33.33	14.00	26.78
Tarok 71.4% WG 20 g/ fed.	14.00	28.57	12.75	19.60
Granstar 75% DF 8 g /fed.	16.00	37.50	15.25	32.78
Granon 75% DF 8 g/ fed.	15.25	34.42	14.50	29.31
Korestar 75% DF 8 g/fed.	14.50	31.03	14..0	26.78
Ecopart 2% SC 250 g /fed.	14.00	28.57	12.75	19.60
Ecopart 2% SC 200 g / fed.	13.00	23.07	12..0	14.58
Hand weeding twice	11.25	11.11	11.00	6.81
Control	10.00	-	10.25	-
L.S.D at 1%	0.80		0.77	
at 5%	0.59		0.57	
interaction at 1%=0.91				
at 5 = 0.67				

Table (9): Effect of herbicides and handweeding on wheat grain yield (kg / plot) at 2 and 4-leaf stages during 2005 - 2006 season .

Treatments rate product/fed.	2-leaf stages		4-leaf stage	
	Grain yield (kg/plot)	% increase	Grain yield (kg/plot)	% increase
Brominal 24% EC 1 L/fed.	17.00	41.17	15.75	38.09
Framinal 24% EC 1 L/fed.	15.75	36.50	15.00	35.00
Koril W 24% EC 1 L/fed.	15..0	33.33	14.25	31.57
Pardner 22.5% EC 1 L/fed.	14.50	31.03	14.00	30.35
Proturon 50% SC 1.25 L/fed.	15.50	35.48	14.25	31.57
IPFlow 50% FL 1.25 L/fed.	14.75	32.20	13.5.	27.77
Turinex 50% SC 1.25 L/fed.	13.50	25.92	12.75	23.52
Swat 50%SC 1.25 L/fed.	12..0	16.66	11.25	13.33
Tarok 71.4% WG 25 g/fed.	15.00	33.33	13.75	29.09
Tarok 71.4% WG 20 g/ fed.	14.25	29.82	13.00	25.00
Granstar 75% DF 8 g /fed.	16.25	38.46	15.50	37.09
Granon 75% DF 8 g/ fed.	15.50	35.48	14.50	32.75
Korestar 75% DF 8 g/fed.	15..0	33.33	14.25	31.57
Ecopart 2% SC 250 g /fed.	14.25	29.82	13.00	25.00
Ecopart 2% SC 200 g / fed.	13.25	24.52	12.00	18.75
Hand weeding twice	11.00	9.09	10.75	9.30
Control	10.00	-	9.75	-
L.S.D at 1%	0.85		0.90	
at 5%	0.63		0.66	
interaction at1% = 0.96				
at 5%= 0.71				

These treatments increased grain yield of wheat by 41.17, 37.5, 37.5, 34.42 , 35.4834.42 and 33.33 % , respectively, in season 2004-2005 at 2-leaf stage. However, the grain yield incresses were 35.93, 32.78, 32,78 , 29.31 , 26.78 , 31.66 and 26.78 %, respectively, at 4-leaf stage . The poor grain yield was found with Ecopart (200 g / fed) and Swat in two seasons. Results also showed that significant differences between bromoxynil-containing four treatments in wheat grain yield at 2-leaf stage in 2004-05 season.However, between brominal , Koril W and Pardner at 4-leaf stage . Additionally, significant differences were found between isoproturon-containing four product at 2-leaf stage,but between Proturon , Turinex and Swat at 4-leaf stage in season 2004/05.In tribnuron-methyl-containing three treatments ,significant differences were noted between Granstar and Korestar at 2 and 4-leaf stage in 2004/05 season.

Generally, formulations of bromoxynil including, Brominal, Framinal, Koril W and Pardner recorded highest grain yield of wheat than formulations of tribenuron-methyl(Granstar, Granon and Korestar) and different formulations of isoproturon (Proturon, IPFlow, Turinex and Swat). Different formulations of the tested herbicides significantly affected the grain yield of wheat at 2 and 4-leaf stages in two tested seasons. Application of herbicides at 2-leaf stage obviously increased grain yield of wheat more than the application at 4-leaf stage. These obtained results supported by Tag El-Din *et al.* (1989) who found that bromoxynil-containing treatments (Brominal plus, Buctril M, Pardner and Brominal), isoproturn and tribenuron-methyl improved wheat grain yield. Imitaz khan *et al.* (2003) reported that the lowest weed density and maximum grain yield was recorded with Buctril M 40 EC, Khan Bahdar Marwat *et al.* (2005) stated that isoproturon gave the highest grain yield of wheat. The increase in grain yield of wheat was due to the reduction in fresh weight of weeds caused by the herbicidal treatments. Reductions in wheat grain in the unweeded check may be due to the competition with weed plants for nutrients water, sunlight and space. Omar *et al.,* 1997; and Al-Marsafy *et al.,* 2001cited that the continued competition between wheat plants and wild oat decreased grain yield of wheat by 47% .

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تقييم بعص مبيدات الحشائش فى مكافحة الحشائش فى القمح

عماد الدين محمد أحمد مرزوق ، محمود فتح الله عبد اللطيف ، فؤاد أحمد فهمى على و شريف أحمد أبو دنيا

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تم اجراء التجارب الحقليه على محصول القمح صنف سخا 168 فى طور 2 ورقة و 4 ورقة خلال موسمى 2004/ 2005 و 2005/ 2006فى منطقة مطوبس – محافظة كفر الشيخ لتقييم كفاءة بعض مبيدات الحشائش التى تطبق بعد الإنبثاق فى مكافحة الحشائش فى محصول القمح صنف سخا 168 و قد أوضحت النتائج ان الحشلئش عريضة الاوراق هى السائدة عن الحشائش رفيعة الاوراق . و قد تم تعريف الحشائش عريضة الاوراق و هى الحندقوق، السلق و النفل و الرفيعة الاوراق و هى الخافور.

و قد أاوضحت النتائج أن جميع المبيدات المختبرة قد أنقصت الوزن الغض للحشائش معنوياً مقارنة بالنقاوة اليدوبة و أن تطبيق المبيدات فى مرحلة 2 ورقة قد أعطى نسبة مكافحة أعلى للحشائش عن تطبيقها فى مرحلة 4 ورقة و كذلك بالنسبة لكمية المحصول حيث كانت أعلى فى حالة تطبيق المبيدات فى مرحلة 2 ورقة .

و لقد أكدت النتائج وجود فرق معنوى بين مستحضرات مبيد البروموكسينيل و الايزوبروتيرون و الترايبينيرون ميثيل فى خفض الوزن الغض للحشائش و زيادة كمية الغض للحشائش و زيادة كمية المحصول . و قد بينت النتائج ان المستحضرات التى تنتمى الى مجموعة النيتريل كانت اثرفاعلية من التى تنتمى الى مجموعة السلفوبيل يوريا و اليوريا على الترتيب .

و عموما فقد أوضحت النتائج أن معاملة محصول القمح بهذه المبيدات ضرورى لمكافحة الحشائش الموجودة فى حقول القمح و تقليل منافستها لنباتات القمح مما يؤدى الى زيادة المحصول كماً و جوده .

Table (6): Effect of herbicides and hand weeding on weed fresh weight (gm/m2) at 2 and 4-leaf stage in wheat during 2004-2005 season.

Treatments rate product/fed.	2-leaf stage								4-leaf stage							
	Total broad-leaved		Total grasses		Total weeds		L.S.D		Total broad-laved		Total grasses		Total weeds		L.S.D of weeds	
	mean fresh wt.	% control	mean fresh wt.	% control	Mean fresh wt.	% control	at 1%	at 5%	mean fresh wt.	% control	mean fresh wt.	% control	mean fresh wt.	% control	at 1%	at 5%
Brominal 24% EC 1 L/fed.	5.00	91.93	2.33	87.94	7.33	90.98	1.00	0.65	14.33	86.13	5.66	83.82	20.00	85.54	2.00	1.31
Framinal 24% EC 1 L/fed.	7.00	88.70	4.33	77.59	11.33	86.06	1.13	0.74	16.66	83.87	8.66	75.25	25.32	81.69	2.45	1.61
Koril W 24% EC 1 L/fed.	8.66	86.03	5.66	70.71	14.33	82.39	1.20	0.79	20.00	80.64	11.33	67.62	31.33	77.35	2.60	1.71
Pardner 22.5% EC 1 L/fed.	10.00	83.87	7.00	63.78	17.00	79.09	1.50	0.98	23.00	77.74	14.00	60.00	37.00	73.25	1.98	1.30
Proturon 50% SC 1.25 L/fed.	10.00	83.87	5.00	74.13	15.00	81.55	1.71	1.12	24.00	76.77	10.66	69.54	34.66	74.94	2.11	1.38
IPFlow 50% FL 1.25 L/fed.	11.66	81.19	4.33	77.59	16.00	80.32	1.10	0.72	25.66	75.16	12.33	64.77	38.00	72.52	2.41	1.58
Turinex 50% SC 1.25 L/fed.	14.66	76.35	5.66	70.71	20.33	75.00	2.20	1.44	30.00	70.96	15.00	57.14	45.00	67.46	1.55	1.02
Swat 50%SC 1.25 L/fed.	21.00	66.12	7.33	62.07	28.33	65.16	3.00	1.97	39.33	61.93	16.66	52.40	56.00	59.51	2.10	1.38
Tarok 71.4% WG 25 g/fd.	10.66	82.80	4.00	79.30	14.66	81.97	2.17	1.42	21.00	79.67	8.66	75.25	29.66	78.55	1.90	1.25
Tarok 71.4% WG 20 g/ fed.	12.33	80.11	6.33	67.25	18.66	77.05	1.20	0.79	25.66	75.16	11.66	66.68	37.32	73.02	1.87	1.23
Granstar 75% DF 8 g /fed.	6.66	89.25	3.33	82.77	10.00	87.70	1.11	0.73	16.66	83.87	8.00	77.14	24.66	82.17	1.91	1.25
Granon 75% DF 8 g/ fed.	9.00	85.48	4.00	79.30	13.66	83.20	1.31	0.86	19.00	81.61	8.66	75.25	27.66	80.00	2.15	1.41
Korestar 75% DF 8 g/fed.	8.00	87.09	5.33	72.33	14.66	81.97	2.11	1.38	21.66	79.03	11.00	68.57	32.66	76.38	3.00	1.97
Ecopart 2% SC 250 g /fed.	13.00	79.03	5.66	70.71	19.33	76.23	2.16	1.42	30.00	70.96	10.33	70.48	40.33	70.84	2.56	1.68
Ecopart 2% SC 200 g / fed.	21.00	66.12	8.00	58.61	29.00	64.34	1.98	1.30	35.66	65.48	14.66	58.11	50.32	63.62	3.51	2.31
Hand weeding twice	26.66	57.00	8.66	55.19	31.66	61.07	2.10	1.38	44.33	57.09	17.66	49.54	62.00	55.17	4.11	2.70
Control	62.00	-	19.33	-	81.33	-	3.18	2.09	103.33	-	35.00	-	138.33	-		
L.S.D at 1%	1.89		1.46		2.67				2.25		1.06		3.51			
at 5%	1.40		1.08		1.98				1.66		0.78		2.60			
L.S.D.s	at 1%	at 5%								at 1%	at 5%					
two dates	5.11	3.79		interaction between broadlaved weeds at 2and4-laf stage						4.89	3.62					
herbicides x weeds	4.61	3.41		interaction betweengrassy weeds at 2and4-laf stage						2.67	1.98					
herbicides x dates	4.86	3.6		interaction between total weeds at 2and4-leaf stag						5.3	3.93					
weeds x dates	5	3.29														
herbicides x weeds x dates	7.28	5.4														