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PERFORMANCE OF SOME WHEAT CULTIVARS AND ASSOCIATED WEEDS TO SOME WEED CONTROL TREATMENTS.

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ABSTRACT: Two field experiments were conducted during 1999/2000 and 2000/2001 seasons at the Agricultural Experimental Station of the National Research Centre at Shalakan, Kalubia Governorate, Egypt. The objective of this investigation was to study the performance of some wheat cultivars (Sakha 61, Sids 1 and Sakha 69) and associated weeds to some weed control treatments (Metosulam, Pyridate, Tralkoxydium, Imazamethabenz, Isoproturon, Metosulam + Tralkoxydium, Metosulam + Imazamethabenz, Pyridate + Tralkoxydium, Pyridate + Imazamethabenz, hand weeding and unweeded).

Great reduction in fresh and dry weight of broad-leaved, grasses and total weeds after 60 and 90 days from sowing was noticed in the plots cultivated with Sakha 69 cultivar as compared with Sids 1 and Sakha 61 cultivars in both seasons. Also, Sakha 69 markedly produced greater number of spikes/m^2, number of spikletes/spike,1000-grain weight, grain and straw yields, crude protein %, P% and K% as compared with other cultivars. Whereas, Sids 1 was significantly superior to Sakha 69 and Sakha 61 in flag leaf area, plant height, spike length, number of grains/spike and grain weight/spike in both seasons. Sakha 61 cultivar recorded the highest fresh and dry weight of weeds and the lowest growth, yield and yield attributes as well as chemical composition of wheat pants.

All weed control treatments significantly reduced fresh and dry weight of weeds after 60 and 90 days from sowing when compared with the unweeded treatment. The most effective treatments in decreasing fresh and dry weight of broad-leaved weeds

in wheat were: Metosulam + Tralkoxydium followed by Metosulam. While, the most effective treatments in decreasing fresh and dry weight of grass weeds in wheat were: Tralkoxydium and Metosulam + Imazamethabenz. Also, the highest decrease in fresh and dry weight of total weeds were obtained by Metosulam + Imazamethabenz followed by that of Metosulam + Tralkoxydium and Pyridate + Imazamethabenz. Metosulam + Imazamethabenz as post emergence herbicides significantly increased growth, yield, yield attributes and chemical composition of wheat followed by that of Metosulam + Tralkoxydium herbicides as compared with the other treatments.

The interaction between wheat cultivars and weed control treatments had significant effect on some studied traits. Using Metosulam + Imazamethabenz treatment in Sakha 69 cultivar produced the lowest fresh and dry weight of total weeds after 90 days from sowing as well as produced the highest number of spikes/m^2 and grain yield ardab/fed in both seasons.

INTRODUCTION

Wheat is one of the most important crops in respect to value and area. In Egypt, wheat had a special importance because the local production is not sufficient to supply the annual demand to face the increase of population and accordingly growing gab between production and consumption. Increasing wheat production to overcome the gab between total production and consumption could be achieved by maximizing the production per unit area (vertical expansion) and/or horizontal expanding through increasing the cultivated area. The vertical expansion could be possible via developing high-yielding cultivars and simultan-eously implementing cultural practices.

Weeds are the most important in wheat production, which cause a highly loss in wheat yield. The reduction of wheat yield due to weed infestation reached 30.7% (Nisha *et al.*, 1999). Weed control is one of the essential cultural practices for raising wheat yield and improving its quality. Chemical weed control in wheat became of great importance due to the high cost of farm labours at the present circumstances. The best weed control and highest grain

yield of wheat were achieved by application of Isoproturon (Metwally *et al.*, 1999; Abou El-Defan and El-Desoki, 2000 and Abd El-Samie, 2001), Metosulam (Butcher *et al.*, 1996; Al-Ashkar, 1998 and El-Metwally, 1998) and pyridate (Swed, 1991; Vouzounis and Americanos, 1995 and Moerkerk, 1999).

Hassanein *et al.* (1995), Subhash *et al.* (1997), Atalla *et al.* (1998) and Fayed *et al.* (1998) reported that Tralkoxydium (grasp) was highly effective herbicide against annual grassy weeds in wheat. Al-Ashkar (1998) and El-Metwally (1998) recorded that application of Metosulam significantly decreased the density as well as fresh and dry weight of broad-leaved weeds in wheat fields as compared with weed check. Many investigators found that chemical weed control treatments by Pyridate herbicide caused significant decrease in fresh and dry weight of the common weeds grown in wheat fields as compared to unweeded treatment (Swed, 1991; Vouzounis and Americanos, 1995 and Moerkerk, 1999). Improving wheat growth, yield and its attributes due to application of Isoproturon was achieved by Sultan *et al.* (1995), Arya-Dr *et al.* (1996) and Metwally and Hassan (2001). El-Desoki (1990), Singh and Singh (1996) and Atalla *et al.* (1998) showed that the mixture of Brominal and Tralkoxydium gave better weed control for fresh weight of broad-leaved and grassy weeds than Isoproturon and significantly increased the growth, yield and yield attributes of wheat.

This investigation was carried out to study the effect of some weed control treatments on growth characters, yield and yield attributes of three wheat cultivars as well as their associated weeds growth.

MATERIALS AND METHODS

Two field experiments were carried out during 1999/2000 and 2000/2001 growing seasons at the Agricultural Experimental Station of the National Research Centre at Shalakan, Kalubia Governorate, Egypt to study the effect of some weed control treatments on growth, yield, yield attributes and chemical composition of three wheat cultivars as well as associated weeds. The experiments were laid-out in a split-plot design with four replicates. The main plots were occupied by three wheat cultivars namely, Sakha 61, Sids 1 and Sakha 69. The sub-plots included eleven weed control treatments (nine of them were done by using different herbicides beside hand

weeding treatment and the unweeded control) as follows:

1. Metosulam herbicide (Sinal 10 Sc): (N-2,6-dichloro-3-methyl phenyl)-5,7-dimethoxy-[1,2,4] Triazolo [1,5a] pyrimidine -2-sulphona mide) at the rate of 0.04 L/fed.
2. Pyridate herbicide (Lentagran 600 EC): (O(6chloro-3-phenyl-4-pyridazinyl) – S - Octyl carbonothioate) at the rate of 0.7 L/fed.
3. Tralkoydium herbicide (Grasp 10% EC): (2[1-(ethoximino) propyl]-3-hydroxyl - 5 (2,4,6 trimethyl 1 phenyl 1) (cylohox - 2- enone) at the rate of 1 L/fed.
4. Imazamethabenz herbicide (Assert 250 Sc): (±) -2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1 H- imidazol - 2- yl) 4 (and 5) - methyl - benzoic acid (3:2) at the rate of 0.8 L/fed.
5. Isoproturon herbicide (Arelon 50% WP): (3-(4-Isopropyl phenyl)-1,1-dimethyl urea) at the rate of 1.25 L/fed
6. Metosulam at the rate of 0.026 L/fed + Tralkoydium at the rate of 0.670 L/fed.
7. Metosulam at the rate of 0.026 L/fed + Imazamethabenz at the rate of 0.530 L/fed.
8. Pyridate at the rate of 0.470 L/fed + Tralkoydium at the rate of 0.670 L/fed.
9. Pyridate at the rate of 0.470 L/fed + Imazamethabenz at the rate of 0.530 L/fed.
10. Hand weeding (after 35 days from sowing)
11. Unweeded (control)

Pyridate, Tralkoxydium, Imazamethabenz and Isoproturon herbicides were applied after 30 days from sowing. Whereas, Metosulam was applied after 20 days from sowing using volume rate of 200 liters water/fed. The experimental unit area was 10.5 m^2 (1/400 fed). The experiments were preceded by corn in both seasons. The soil texture was a clay loam with 1.73% organic matter and pH 8.12.

The grains of three wheat cultivars were handly broadcasted in 15 and 19 November in the first and second seasons, respectively at a rate of 60 kg/fed. Nitrogen fertilization at the rate of 75 kg N/fed in the form of ammonium nitrate (33.5%) was added to plots in two equal doses before the first and second irrigation. Calcium

superphosphate (15.5% P_2O_5) was applied during land preparation at a rate of 150 kg superphosphate/fed. The other cultural practices were applied as usual. Harvesting was performed in 23 and 20 of May in the first and second seasons, respectively.

After 60 and 90 days from sowing in both seasons, weed samples from one square meter were randomly taken from each plot. Weeds were identified and classified into broad-leaved and grasses. Fresh weight of weeds was recorded and the dry weight of weeds was determined after drying in a forced draft oven at 70°C to constant weight.

After heading stage, samples of ten plants were taken at random from each plot to determine flag leaf area (cm^2). At the end of growing season, samples of ten wheat tillers were randomly taken from each plot to measure : plant height (cm), spike length (cm), number of spikletes/spike, number of grains/spike, grains weight/spike (g) and 1000 – grain weight (g). At harvest, samples of one square meter were taken from the mid-plot and the following measurements were recorded: number of spikes/m^2, grain yield (ardab/fed) and straw yield (ton/fed).

Crude protein percentage was determined according to A.O.A.C (1980). While, phosphorus and potassium percentages in wheat grains were determined according to Cottenie *et al.* (1982).

Data obtained during the two growing seasons were subjected to statistical analysis by the technique of analysis of variance (ANOVA) as published by Gomez and Gomez (1984).

RESULTS AND DISCUSSION

I- Varietal performance

A- Wheat weeds:

The dominant weeds in the experimental field in the two seasons were: broad-leaved weeds; *Beta vulgaris*, L.; *Melilotus indicus*, L.; *Chinopodium album*, L.; *Ammi majus*, L. and *Rumex dentatus*, L. While, the major grass weeds were *Avena fatua*, L. and *Lolium temulentum*, L. The results of three cultivars presented in Tables (1 and 2) showed significant effect on fresh and dry weight of broad-leaved, grasses and total weeds after 60 and 90 days from sowing. On the other hand, Sakha 61 cultivar recorded the highest values. Reduction of weeds growth in Sakha 69 fields may be due to produced the highest number of tillers/plant and , in turn, great competition of weeds compared with other

cultivars in both seasons. Similar results were reported by Shams El-Din and El-Habbak (1992), Sultan *et al.* (1995) and Atalla *et al.* (1998).

B: Wheat study:

1- Growth characteristics:

Average of flag leaf area (cm^2) and plant height as affected by wheat cultivars are shown in Table (3). The three tested cultivars significantly differed in their flag leaf area and plant height in the two seasons. The results indicated that Sids 1 had the greatest flag leaf area and the tallest plant height if compared with Sakha 69 as well as Sakha 61 cultivars. While, Sakha 61 gave the lowest flag leaf area and plant height when compared with the other cultivars. These results were clearly in line with those obtained by Shams El-Din and El-Habbak (1992) and Sultan *et al.* (1994).

2- Yield and yield attributes of wheat:

Data presented in Tables (3 and 4) show that the agronomic parameters of the three wheat cultivars were significantly differed. Sakha 69 markedly produced the greatest number of spike/m^2, number of spikelets/ spike, 1000-grain weight, grain yield (ardab/fed) and straw yield (ton/fed) as compared with Sids 1 and Sakha 61 cultivars in both seasons. While, Sids 1 was significantly superior to Sakha 69 and Sakha 61 in spike length (cm), number of grains/spike and grain weight/spike (g) in the first and second seasons. Sakha 61 gave the lowest yield and yield attributes of wheat compared with Sakha 69 and Sids 1 in both seasons. The variation among wheat cultivars in yield and yield attributes may be due to the genetical variation between them. The same view was expressed by Atalla *et al.* (1998) and Sadek (2001).

3- Chemical composition of wheat grains:

Data in Table (4) show that wheat cultivars had no significant effect on protein %, phosphorus % and potassium % in both seasons. Sakha 69 cultivar produced the highest N, P and K% in the first and second seasons. On the other hand, Sakha 61 cultivar produced the lowest N, P and K% as compared with other cultivars. Similar trend was reported by Sadek (2001).

II – Effect of weed control treatments:

A – On weeds:

1- Broad – leaved weeds:

Data In Tables (1 and 2) reveal that all weed control treatments except Tralkoxydium decreased significantly the fresh

Table (1): Averages of fresh and dry weight of weeds (g/m^2) after 60 days from sowing as affected by some wheat cultivars and some weed control treatments during 1999/2000 and 2000/2001 seasons.

Character / Treatment	Fresh weight of weeds (g/m^2)						Dry weight of weeds (g/m^2)					
	Broad-leaved		Grasses		Total		Broad-leaved		Grasses		Total	
	99/2000	2000/2001	99/2000	2000/2001	99/2000	2000/2001	99/2000	2000/2001	99/2000	2000/2001	99/2000	2000/2001
Cultivars:												
Sakha 61	156.44	179.21	293.01	336.67	449.45	515.88	24.44	27.97	73.26	84.17	97.70	112.01
Sids 1	140.20	154.15	232.88	255.88	373.08	410.03	21.97	24.08	57.66	64.31	79.62	88.37
Sakha 69	135.10	145.89	215.25	229.49	350.35	375.38	21.06	22.80	53.84	57.38	74.91	80.17
F-Test	**	**	**	**	**	**	**	**	**	**	**	**
LSD 5%	10.20	8.08	3.75	9.74	13.30	14.69	1.55	1.41	1.93	2.36	2.52	3.13
1%	15.45	12.24	5.68	14.76	20.15	22.24	2.34	2.13	2.93	3.58	3.81	4.75
Weed control treatments:												
Metosulam	21.40	23.73	390.30	434.57	411.70	458.30	3.57	3.71	97.58	108.65	101.15	112.36
Pyridate	36.50	40.77	459.23	512.20	495.73	552.97	5.70	6.37	112.73	128.05	118.43	134.42
Tralkoxidum	527.33	585.33	21.27	23.40	548.60	608.73	82.40	91.56	5.32	5.85	87.72	97.31
Imazamethabenz	127.37	142.80	179.67	199.77	307.03	342.57	19.90	22.31	45.02	49.94	64.93	72.15
Isoproturon	32.53	35.80	200.00	224.03	232.53	259.83	5.08	5.59	49.99	57.26	55.08	62.85
Metosulam + Tralkoxidum	21.20	23.63	129.37	142.60	150.57	166.23	3.31	3.69	32.34	35.65	35.66	39.34
Metosulam + Imazamethabenz	29.87	32.87	114.00	125.33	143.87	158.20	4.67	5.14	28.50	31.34	33.17	35.98
Pyridate + Tralkoxidum	24.97	27.70	237.67	265.00	262.63	292.70	3.90	4.33	59.42	66.25	63.32	70.58
Pyridate + Imazamethabenz	32.53	36.23	174.57	195.13	207.10	231.37	5.08	5.66	43.65	48.79	48.73	54.45
Hand weeding	187.43	208.20	304.30	337.97	491.73	546.17	29.12	32.53	76.08	84.49	105.20	117.03
Unweeded (control)	541.90	600.17	507.13	554.17	1049.03	1154.33	84.67	93.66	126.79	138.55	211.46	232.21
F-Test	**	**	**	**	**	**	**	**	**	**	**	**
LSD 5%	14.94	13.43	11.36	13.73	20.29	27.82	1.89	2.08	2.98	3.39	3.40	4.10
1%	20.36	18.30	15.48	18.70	27.65	37.91	2.58	2.83	4.06	4.62	4.63	5.58

Table (2): Averages of fresh and dry weight of weeds (g/m^2) after 90 days from sowing as affected by some wheat cultivars and some weed control treatments during 1999/2000 and 2000/2001 seasons.

Character / Treatment	Fresh weight of weeds (g/m^2)						Dry weight of weeds (g/m^2)					
	Broad-leaved		Grasses		Total		Broad-leaved		Grasses		Total	
	99/2000	2000/2001	99/2000	2000/2001	99/2000	2000/2001	99/2000	2000/2001	99/2000	2000/2001	99/2000	2000/2001
Cultivars:												
Sakha 61	256.95	282.65	452.94	498.25	709.89	780.90	40.15	44.17	113.24	125.56	153.39	168.73
Sids 1	230.48	246.60	360.07	385.28	590.55	631.88	36.01	38.53	90.02	96.27	126.41	134.80
Sakha 69	221.87	232.95	323.82	340.02	545.69	572.97	34.67	36.40	80.96	85.01	115.63	121.41
F-Test	**	**	**	**	**	**	**	**	**	**	**	**
LSD 5%	1.19	3.62	5.18	8.83	12.02	8.18	0.19	0.56	1.30	2.20	1.87	2.77
1%	1.80	5.47	7.85	13.37	18.21	12.39	0.28	0.85	1.96	3.33	2.83	4.19
Weed control treatments:												
Metosulam	35.80	38.50	656.23	704.83	692.03	743.33	5.59	6.02	164.06	176.00	169.65	182.02
Pyridate	59.37	64.23	626.00	676.67	685.37	740.90	9.28	10.04	156.50	169.17	167.17	179.22
Tralkoxidum	867.10	932.37	30.77	33.03	897.87	965.40	135.49	145.68	7.69	8.26	143.18	153.94
Imazamethabenz	210.57	227.77	277.93	298.73	488.50	526.50	32.90	35.59	69.49	74.69	102.39	110.28
Isoproturon	52.77	56.23	309.03	334.43	361.80	390.67	8.25	8.79	77.26	83.61	85.50	92.40
Metosulam + Tralkoxidum	34.00	36.57	199.43	213.47	233.43	250.03	5.31	5.73	49.86	53.37	55.17	59.09
Metosulam + Imazamethabenz	48.40	52.00	175.70	187.67	224.10	239.67	7.56	8.13	43.93	46.92	51.49	55.05
Pyridate + Tralkoxidum	40.70	43.77	366.47	394.50	407.17	438.27	6.36	6.84	91.62	98.63	97.98	105.47
Pyridate + Imazamethabenz	52.80	56.77	269.87	291.23	322.67	348.00	8.25	8.87	67.47	72.81	75.72	81.68
Hand weeding	308.00	331.17	471.43	506.30	779.43	837.47	48.13	51.75	117.86	126.58	165.99	178.33
Unweeded (control)	891.30	955.40	785.50	845.47	1676.80	1800.87	139.27	149.28	196.38	211.37	335.65	360.65
F-Test	**	**	**	**	**	**	**	**	**	**	**	**
LSD 5%	9.94	12.21	18.41	13.08	15.97	17.68	1.55	1.91	4.60	3.27	5.20	3.93
1%	13.55	16.63	25.09	17.82	21.76	24.09	2.11	2.60	6.27	4.46	7.09	5.35

and dry weight of broad – leaved weeds as compared to the unweeded check after 60 and 90 days from sowing in both seasons. The highest efficiency in decreasing fresh and dry weight of broad-leaved weeds was obtained by Metosulam + Tralkoxydium followed by Metosulam, Pyridate + Tralkoxydium, Metosulam + Imazamethabenz and Isoproturn, respectively. These results obtained herein indicated that the use of Metosulam as post-emergence herbicide produced a promising effect against weeds prevailing in wheat fields in comparison with other weed control treatments. On the other side, the highest fresh and dry weight of broad-leaved weeds were recorded when wheat plots were unweeded. The same conclusion was mentioned by EL-Metwally (1998), Ahmed (2001) and Metwally and Hassan (2001).

2- Grassy weeds:

Relevant data show that fresh and dry weight of grass weeds after 60 and 90 days from sowing were markedly decreased by different weed control treatments (Tables 1 and 2). Tralkoxydium, Metosulam + Imazamethabenz, Metosulam + Tralkoxydium, Pyridate + Imazamethabenz and Imazamethabenz treatments were very effective in controlling most grassy weeds at 60 and 90 days from sowing. On the contrary, the highest fresh and dry weight of grass weeds after 60 and 90 days from sowing were observed with unweeded treatment followed by that of Pyridate and Metosulam treatments in both seasons as shown in Tables 1 and 2. These results may be due to the inhibition effect of herbicidal treatments on growth of weeds. These findings are in general agreement with those obtained by Subhash *et al.* (1997), Atalla *et al.* (1998) and Fayed *et al.* (1998).

3- Total Weeds:

The results of weed control treatments presented in Table (1 and 2) show significant effect on fresh and dry weight of total weeds after 60 and 90 days from sowing. The highest decrease in fresh and dry weight of total weeds after 60 and 90 days from sowing were obtained by Metosulam + Imazamethabenz followed by that of Metosulam + Tralkoxydium, Pyridate + Imazamethabenz, Isoproturon and Pyridate + Tralkoxydium treatments. The superior treatments decreased the average of dry weight of total weeds after 60 days from sowing than the unweeded treatment by about 84.31, 83.14, 76.96, 73.95 and 70.06 in the first season and

84.51, 83.06, 76.55, 72.29 and 69.61 in the second one, respectively. At 90 days from sowing, the previous treatments reduced dry weight of total weeds by 84.66, 83.56, 77.44, 74.53 and 70.81 in the first season and by 84.74, 83.62, 77.35, 74.38 and 70.76 in the second one, successively when compared with the unweeded check. While, the unweeded treatment resulted the highest values of fresh and dry weight of total weeds in both seasons. The decrease in fresh and dry weight of total weeds may be due to good effectiveness of Metosulam + Imazamethabenz and Metosulam + Tralkoxydium as a post-emergence herbicides on many different weed species. The results were coincided with those obtained by Singh and Singh (1996) and Atalla *et al.* (1998).

B- Wheat study:

1- Growth characteristics:

Data recorded in Table (3) indicate that flag leaf area (cm^2) and plant height (cm) were markedly increased as a result of controlling weeds by different weed control treatments as compared to the unweeded treatment. Maximum values were obtained by Metosulam + Imazamethabenz followed by Metosulam + Tralkoxydium, Pyridate + Imazamethabenz, Isoproturon and Pyridate + Tralkoxydium treatments, respectively. In contrast, the lowest values were observed in the unweeded check. Application of the previous treatments was effective in controlling weeds and consequ-ently the competition was limited and more light, water and nutrients were available to promote wheat growth if compared with other treatments. These results are in general agreement with those recorded by El-Metwally (1998), Abd El-Samie (2001) and Ahmed (2001).

2- Yield and yield attributes of wheat:

Weed control treatments had significant effects on yield attributes of wheat in both seasons, Tables (3 and 4). Application of Metosulam + Imazamethabenz statistically increased spike length (cm), number of spikletes/spike, number of spikes/m^2, number of grains/spike, grain weight/spike (g) and 1000-grain weight (g) in both seasons as compared with the unweeded treatment. Metosulam + Tralkoxydium came in the second rank followed by that of Pyridate + Imazamethabenz, Isoproturon and Pyridate + Tralkoxydium treatments, respectively. In contrast, the lowest values of previous characters were recorded with the unweeded plots. The

Table (3): Averages of flag leaf area (cm^2), plant height (cm), number of spikes/m^2, spike length (cm), number of spikelets/spike and number of grains/spike of the studied some wheat cultivars as affected by some weed control treatments during 1999/2000 and 2000/2001 seasons.

Character / Treatment	Flag leaf area (cm^2)		Plant height (cm)		Number of spikes/m^2		Spike length (cm)		Number of spikelets/spike		Number of grains/spike	
	99/2000	2000/2001	99/2000	2000/2001	99/2000	2000/2001	99/2000	2000/2001	99/2000	2000/2001	99/2000	2000/2001
Cultivars:												
Sakha 61	42.68	38.95	83.30	87.05	358.91	334.91	10.27	10.70	17.43	18.27	42.18	43.64
Sids 1	53.91	54.55	110.66	114.95	378.36	366.82	12.57	12.27	20.14	19.91	61.36	59.80
Sakha 69	49.55	47.73	106.59	107.70	393.52	398.91	11.18	11.27	20.91	20.45	49.86	48.84
F-Test	**	**	**	**	**	**	**	**	**	**	**	**
LSD 5%	1.43	2.20	2.01	3.58	8.62	6.53	0.30	0.21	0.44	0.61	0.56	0.88
1%	2.16	3.32	3.05	5.42	13.06	9.88	0.46	0.32	0.67	0.92	0.84	1.33
Weed control treatments:												
Metosulam	47.00	46.50	97.58	102.33	365.67	325.33	11.33	11.41	19.78	19.44	50.50	49.58
Pyridate	46.00	44.60	97.00	101.25	341.30	314.00	11.25	11.33	19.33	19.40	49.58	48.67
Tralkoxidum	42.67	43.97	95.92	99.00	319.70	310.00	10.92	11.08	18.92	18.50	45.50	46.60
Imazamethabenz	48.50	46.84	100.25	104.25	318.00	367.03	11.56	11.50	19.55	19.75	51.67	52.49
Isoproturon	51.74	49.67	102.17	105.67	413.33	405.30	11.63	11.58	19.92	20.10	53.83	53.06
Metosulam + Tralkoxidum	52.84	51.67	107.42	106.00	438.67	430.74	11.83	11.75	20.42	20.33	55.92	56.50
Metosulam + Imazamethabenz	53.50	52.24	108.08	107.50	465.99	438.60	11.92	12.42	20.50	20.42	57.08	58.17
Pyridate + Tralkoxidum	51.33	48.50	101.08	105.17	398.01	393.36	11.60	11.50	19.83	19.90	53.33	53.00
Pyridate + Imazamethabenz	52.00	50.13	104.00	105.83	418.70	413.33	11.71	11.67	20.00	20.25	54.67	54.25
Hand weeding	44.60	45.33	96.00	100.75	383.30	342.97	11.17	11.25	19.17	19.25	48.25	45.42
Unweeded (control)	41.00	39.00	92.50	97.00	298.67	295.00	9.83	10.08	17.00	17.67	42.17	40.67
F-Test	**	**	**	**	**	**	**	**	**	**	**	**
LSD 5%	1.67	3.42	3.90	3.45	10.41	6.85	0.55	0.62	0.94	0.91	0.91	1.38
1%	2.28	4.67	5.32	4.70	14.18	9.34	0.75	0.85	1.28	1.25	2.03	1.88

Table (4): Averages of grain weight/spike (g), 1000-grain weight, grain yield (ardab/fed), straw yield (ton/fed), crude protein (%), phosphorus (%) and potassium (%) of the three wheat cultivars as impacted by some weed control treatments during 1999/2000 and 2000/2001 seasons.

Character / Treatment	Grain weight/spike (g)		1000-grain weight (g)		Grain yield (ardab/fed)		Straw yield (ton/fed)		Crude protein %		P %		K %	
	99/2000	2000/2001	99/2000	2000/2001	99/2000	2000/2001	99/2000	2000/2001	99/2000	2000/2001	99/2000	2000/2001	99/2000	2000/2001
Cultivars:														
Sakha 61	1.92	2.00	34.04	36.50	20.21	18.52	4244.10	3889.77	11.05	11.12	0.203	0.216	0.680	0.644
Sids 1	2.42	2.30	33.75	34.83	22.02	21.62	4624.58	4539.44	11.16	11.22	0.219	0.233	0.687	0.651
Sakha 69	2.06	2.14	36.71	37.43	23.33	22.72	4900.25	4770.82	11.36	11.43	0.212	0.224	0.697	0.661
F-Test	**	**	NS	NS	**	**	**	**	NS	NS	NS	NS	NS	NS
LSD 5%	0.04	0.06	---	---	0.57	0.48	119.76	94.84	---	---	---	---	---	---
1%	0.06	0.09	---	---	0.86	0.72	181.34	143.61	---	---	---	---	---	---
Weed control treatments:														
Metosulam	2.12	2.07	34.20	36.06	20.42	19.76	4241.30	4070.50	11.02	11.08	0.204	0.217	0.673	0.632
Pyridate	2.18	2.06	33.54	35.08	20.40	18.66	4200.90	3919.30	10.89	10.95	0.201	0.212	0.658	0.625
Tralkoxidum	1.85	1.93	32.59	33.21	19.33	17.48	4069.00	3775.80	10.72	10.76	0.199	0.209	0.647	0.614
Imazamethabenz	2.25	2.13	34.58	36.43	21.70	20.79	4557.70	4366.60	11.07	11.27	0.208	0.222	0.699	0.657
Isoproturon	2.39	2.29	35.15	37.99	23.69	23.08	4959.50	4846.80	11.57	11.65	0.220	0.236	0.730	0.687
Metosulam + Tralkoxidum	2.47	2.34	38.46	39.16	25.10	24.40	5271.70	5124.0	11.90	11.99	0.230	0.250	0.752	0.712
Metosulam + Imazamethabenz	2.73	2.61	38.85	39.82	25.28	24.95	5309.50	5240.20	12.02	12.12	0.233	0.254	0.760	0.730
Pyridate + Tralkoxidum	2.34	2.25	35.02	37.15	23.00	22.34	4886.70	4692.10	11.40	11.47	0.215	0.230	0.715	0.676
Pyridate + Imazamethabenz	2.42	2.31	36.78	38.05	24.41	23.59	5083.40	4954.60	11.76	11.84	0.226	0.244	0.743	0.698
Hand weeding	1.96	1.90	33.91	34.07	20.00	19.38	4287.50	4148.90	10.52	10.56	0.195	0.203	0.614	0.593
Unweeded (control)	1.75	1.71	30.09	31.78	17.09	16.53	3588.90	3261.30	10.09	10.15	0.191	0.193	0.579	0.552
F-Test	**	**	**	**	**	**	**	**	**	**	**	**	**	**
LSD 5%	0.066	0.071	0.11	0.29	0.64	0.68	133.66	140.65	0.068	0.108	0.012	0.011	0.010	0.009
1%	0.091	0.097	0.15	0.40	0.87	0.92	182.14	193.88	0.092	0.148	0.017	0.015	0.014	0.012

increase in yield attributes by different weed control treatments may be due to good control of wheat weeds and minimizing weed competition which gave good chance of wheat growth and improved the tillering capacity as well as number of spikes/m^2. These results are in coincide with those detected by Atalla *et al.* (1998), Metwally *et al.* (1999), Moerkerk (1999) and Abd El-Samie (2001).

Data in Table (4) show significant differences in yield of wheat in both seasons. All herbicidal and hand weeding treatments markedly produced higher grain and straw yields than the unweeded plots. Metosulam + Imazamethabenz followed by Metosulam + Tralkoxydium, Pyridate + Imazamethabenz, Isoproturon and Pyridate + Tralko-xydium treatments, respectively recorded the highest values of the previous characters. On the other side, the lowest values of both grain and straw yields were obtained when wheat plots were unweeded. In both seasons, the highest increase in grain yield (ardab/fed) was obtained by Metosulam + Imazamethabenz followed by that of Metosulam + Tralkoxydium, Pyridate + Imazamethabenz, Isoproturon and Pyridate + Tralko-xydium treatments, respectively. These superior treatments increased the average of grain yield than unweeded treatment by about 47.92, 46.87, 42.83, 38.62 and 34.58% in the first season and by 50.94, 47.61, 42.27, 39.62 and 35.15% in the second one, respectively. The results obtained herein indicate that the use of previous treatments produced a promising effect against weeds prevailing in wheat fields and in turn exhibited better increases in wheat yield in comparison with other treatments. Similar observation were reported by other investigators among them Atalla *et al.* (1998), Abou El-Defan and El-Desoki (2000), EL-Kholi and Metwally (2001) and Metwally and Hassan (2001).

3- Chemical composition of wheat grains:

Results in Table (4) reveal that all weed control treatments significantly increased crude protein percentage, phosphorus percentage and potassium percentage as shown in Table (4). The highest values of crude protein percentage, phosphorus percentage and potassium percentage were obtained by treatments of Metosulam + Imazamethabenz, Metosulam + Tralkoxydium, Pyridate + Imazamethabenz, Pyridate + Tralkoxydium and Isoproturon, respectively. The

lowest crude protein, phosphorus percentage and potassium percentage were obtained from the unweeded check. These results may be due to the less competition for nutrients, water and light through limiting weeds infestation with herbicidal treatments due to increasing the uptake of different nutrients. Similar results were obtained by Sultan *et al.* (1995), EL-Metwally (1998) and Ahmed (2001).

C: Interaction effects:

Data in Figs 1 and 2 show that there was significant effect of the interaction between weed control treatments and wheat cultivars on fresh and dry weight of total weeds after 90 days from sowing. The cultivation of Sakha 69 and using Metosulam + Imazamethabenz as post-emergence herbicide produced the lowest fresh and dry weight of total weeds after 90 days from sowing in both seasons. While, the highest fresh and dry weight of total weeds were observed in the plots cultivated with Sakha 61 and the unweeded control in the two seasons.

Also, there was significant effect of the interaction between weed control treatments and wheat cultivars on number of spikes/m^2 and grain yield (ardab/fed) as shown in Figs. 3 and 4. The cultivation of Sakha 69 and using Metosulam + Imazamethabenz as a post-emergence herbicide produced the highest number of spikes/m^2 and grain yield (ardab/fed). On the contrary, Sakha 61 and the unweeded treatment showed the lowest number of spikes/m^2 and grain yield (ardab/fed). These results are in agreement with those presented by Sultan *et al.* (1995) and Atalla *et al.* (1998).

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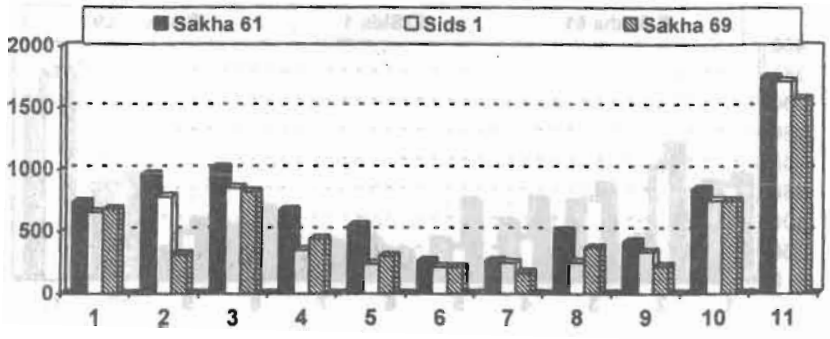

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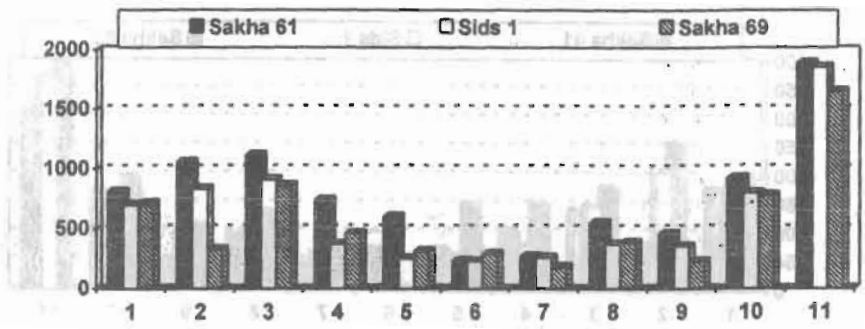
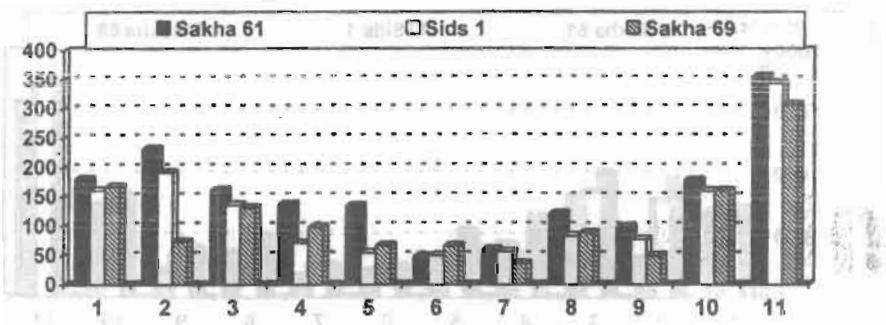


2000/2001

Fig. (1): Means of fresh weight of weeds (g/m^2) after 90 days from sowing as affected by the interaction between wheat cultivars and weed control treatments during 1999/2000 and 2000/2001 seasons.

1 Metosulam	2 Pyridate	3 Tralkoxidum
4 Imazamethabenz	5 Isoproturon	6 Metosulam + Tralkoxidum
7 Metosulam + Imazamethabenz	8 Pyridate + Tralkoxidum	
9 Pyridate + Imazamethabenz	10 Hand weeding	11 Unweeded



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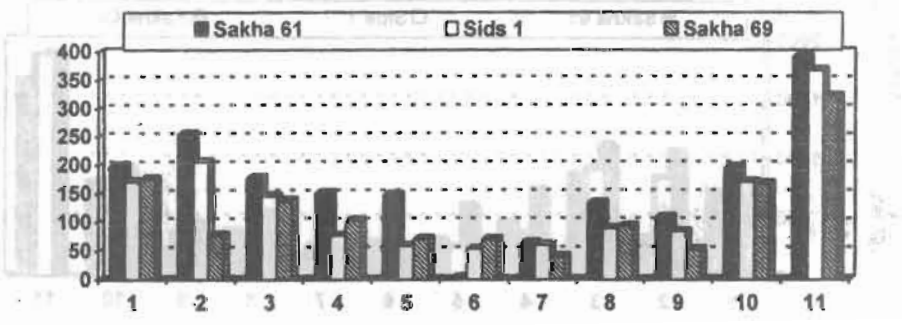
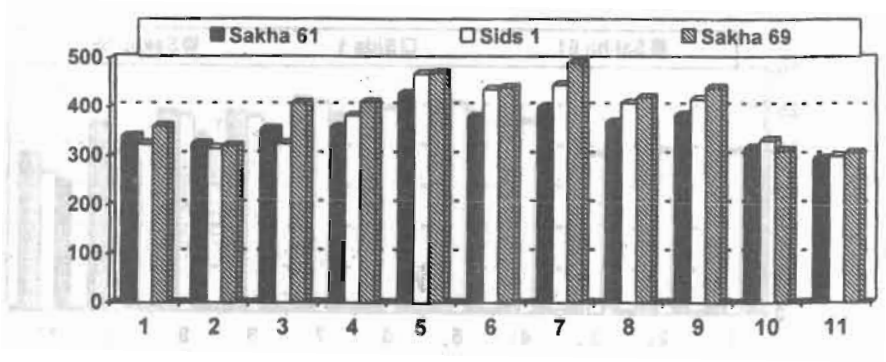


2000/2001

Fig. (2): Means of dry weight of weeds (g/m^2) after 90 days from sowing as affected by the interaction between wheat cultivars and weed control treatments during 1999/2000 and 2000/2001 seasons.

1 Metosulam 2 Pyridate 3 Tralkoxidum
4 Imazamethabenz 5 Isoproturon 6 Metosulam + Tralkoxidum
7 Metosulam + Imazamethabenz 8 Pyridate + Tralkoxidum
9 Pyridate + Imazamethabenz 10 Hand weeding 11 Unweeded



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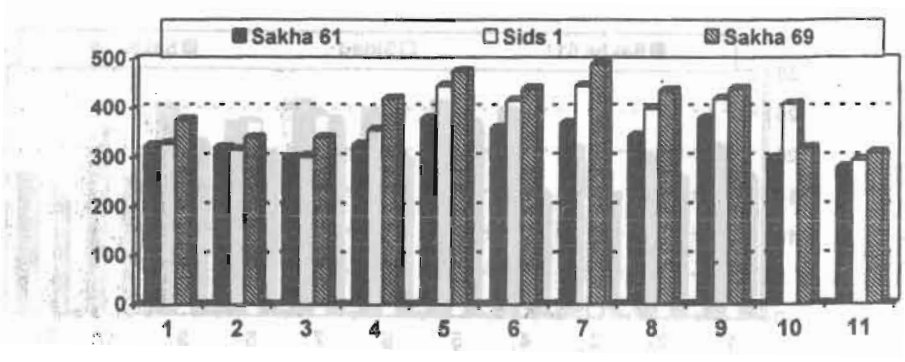
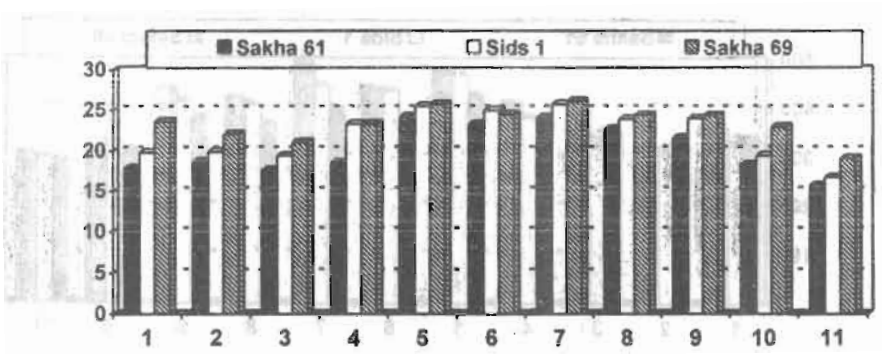


2000/2001

Fig. (3): Means of number of spikes/m^2 as affected by the interaction between wheat cultivars and weed control treatments during 1999/2000 and 2000/2001 seasons.

1 Metosulam	2 Pyridate	3 Tralkoxidum
4 Imazamethabenz	5 Isoproturon	6 Metosulam + Tralkoxidum
7 Metosulam + Imazamethabenz	8 Pyridate + Tralkoxidum	
9 Pyridate + Imazamethabenz	10 Hand weeding	11 Unweeded



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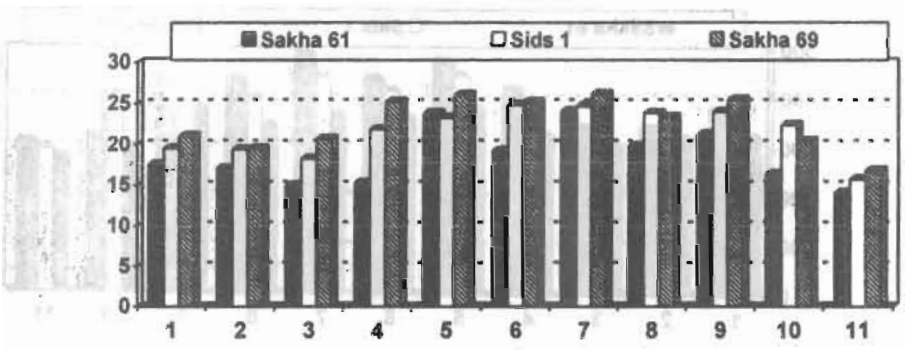

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Fig. (4): Means of grain yield (ardab/fed) as affected by the interaction between wheat cultivars and weed control treatments during 1999/2000 and 2000/2001 seasons

1 Metosulam 2 Pyridate 3 Tralkoxidum
4 Imazamethabenz 5 Isoproturon 6 Metosulam + Tralkoxidum
7 Metosulam + Imazamethabenz 8 Pyridate + Tralkoxidum
9 Pyridate + Imazamethabenz 10 Hand weeding 11 Unweeded

سلوك بعض أصناف القمح والحشائش المصاحبة لها لبعض معاملات مكافحة الحشائش

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أجريت تجربتان حقليتان بمزرعة المركز القومى للبحوث بشلقان محافظة القليوبية خلال موسمى ١٩٩٩/٢٠٠٠ و ٢٠٠٠/٢٠٠١ لدراسة سلوك بعض أصناف القمح (سخا ٦١ ، سدس ١ و سخا ٦٩) والحشائش المصاحبة لها لبعض معاملات مكافحة الحشائش وهى الميتوسولام ، البيرديت ، التراكوسيديم ، إيمازاميثابنز ، الأيزوبرتيورون و الميتوسولام + التراكوسيديم ، الميتوسولام + إيمازاميثابنز ، البيرديت + التراكوسيديم ، البيرديت + إيمازاميثابنز والنقاوة اليدوية ثم الكنترول (بدون مقاومة).

أظهرت النتائج أن أقل وزن غض وجاف للحشائش بأنواعها المختلفة كان واضحاً فى القطع التجريبية المنزرعة بالصنف سخا ٦٩ بالمقارنة بالصنف سدس ١ والصنف سخا ٦١ كذلك تفوق الصنف ٦٩ على بقية الأصناف فى صفات عدد السنابل/م^2 ، عدد السنيبلات بالسنبلة ، وزن الألف حبة ومحصول الحبوب والقش والنسبة المئوية للبروتين والفوسفور والبوتاسيوم. وتفوق الصنف سدس ١ على بقية الأصناف فى صفات مساحة ورقة العلم ، طول النبات ، طول السنبلة ، عدد حبوب السنبلة ووزن حبوب السنبلة بينما سجل الصنف سخا ٦١ أقل القيم لمعظم الصفات تحت الدراسة.

أدت جميع معاملات مكافحة الحشائش إلى نقص معنوى فى الوزن الغض والجاف للحشائش بعد ٦٠ و ٩٠ يوم من الزراعة وذلك بالمقارنة بمعاملة الكنترول. وأظهرت معاملة الميتوسولام + التراكوسيديم ، الميتوسولام + إيمازاميثابنز تفوقاً واضحاً فى مقاومة الحشائش عريضة الأوراق مقارنة بالمعاملات الأخرى . بينما أظهرت معاملة التراكوسيديم ، الميتوسولام + إيمازاميثابنز تفوقاً واضحاً فى مقاومة الحشائش ضيقة الأوراق. وقد أظهرت معاملة الميتوسولام + إيمازاميثابنز تفوقاً واضحاً فى مقاومة الحشائش الكلية تلتها معاملة الميتوسولام + التراكوسيديم و البيرديت + إيمازاميثانيز.

أظهرت جميع معاملات مكافحة الحشائش (مبيدات الحشائش و النقاوة اليدوية) تأثير فعال فى زيادة صفات النمو والمحصول ومكوناته لنباتات القمح. وقد أدى استخدام معاملة الميتوسولام + إيمازاميثابنز زيادة معنوية فى صفات النمو والمحصول ومكوناته والتركيب الكيماوى للحبوب تلتها معاملة الميتوسولام + التراكوسيديم بالمقارنة ببقية المعاملات. يوجد تأثير معنوى للتفاعل بين الأصناف ومعاملات مقارنة الحشائش. حيث أدى استخدام الميتوسولام + إيمازاميثابنز كمبيدات حشائش والصنف سخا ٦٩ إلى الحصول على أقل وزن غض وجاف للحشائش ، أعلى قيمة لعدد السنابل/م^2 وأعلى محصول من الحبوب (أردب/فدان) فى كلا الموسمين.