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5 Broadleaf Weed Control with Some Recent Post-emergence Herbicides in Bread Wheat (*Triticum aestivum* L.) in Egypt

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BROADLEAF weeds cause severe competition with wheat crop in Egypt and its highly reduce yield. Two field experiments during two winter seasons were conducted in the Experimental Research Station of the Faculty of Agriculture, Cairo University, Giza Governorate, Egypt during winter seasons of 2014/2015 and 2015/2016. The aim of this work was to control broadleaf weeds in wheat and evaluate of 17 broadleaf weed herbicides in wheat (*Triticum aestivum* L.) CV. Gemeza- 11.Weed control treatments were hand pulling and applying 17 experimental post-emergence herbicides, were applied bromoxynil-octaneoate 24%, DICAMBA 48%, Tribenuron-Methyl 16 % + Carfentrazone-Ethyl 12%, MCPA-sodium 20%+Bromixanil 20%, Florasulam 0.25%+ Mesosulfuron-Methyl 0.75%, MCPA-sodium 36%+ Florasulam 1% , Florasulam 05%+ Clodinafop-propagyl 6.5%, Tribenuron-Methyl 2.7%+ Fluroxypyr 13.7%, Tribenuron-Methyl 5%+ Clodinafop-propagyl 10%, bromoxynil-octanoate 25%, Triasulfuron 4.1% + Dicamba 65.9 %, Tribenuron-Methyl 8%+ Fenoxaprop-p-Ethyl45%+ Thifensulfuron-Methyl 12%, Bromoxynil octaneoate, Florasulam 1.42%+ Pyroxsulam 7.08%,Florasulam 1.42%+ Pyroxsulam 7.08%+ Ecosurf, Tribenuron-Methyl and Fluroxypyr 10% + Florasulam .025% + Clopyralid 8%. Application of herbicides was after 25 days from sowing date in both seasons, and hand pulling twice after 25 and 45 days. Presented data showed that all weed control treatments (herbicides and hand weeding twice) reduced broadleaved weed density and weight. These treatments, increased wheat yield and yield components significantly compared to weedy check, except Florasulam 1.42%+ Pyroxsulam 7.08%, which recorded reduction in wheat yield. Triasulfuron 4.1% + Dicamba 65.9 %, gave the highest number of grains/ spikelet and spike per plant and straw yield t/ ha , and the best treatment in grain yield was Tribenuron-Methyl 2.7%+ Fluroxypyr 13.7% herbicide compared with weedy check..

Keywords: Wheat (*Triticum aestivum)*, Broadloeaf weeds, Post-emergence herbicides.

INTRODUCTION

Wheat (*Triticum aestivum* L.) is the most important cereal crop in Egypt and in the world, since it is stable food for humans. Wheat grains, in Egypt represents almost 10 percent of the total value of agricultural production and about 20 percent of all agricultural imports. (Egypt wheat Sector Review, FAO, 2016)

Wheat is very improtant ceral crops was supplies more than 70% of the calories and protein . wheat is annual winter crop, belongs to family Greamineae, self pollinated and photo periodically long day plant. There is a gap between the local wheat production and the pepole consumption, so, it is very important to investigate the optimum crop practices, such as weed management , fertilization and sowing methods, …etc. to increase wheat grain production.

Weeds are define as undesirable plants and infest most crops and reduce crop yields. There are many reports on the inhibitory effects of weeds on crop yields (Javaid *et al.,* 2007).Weeds are consider the important factor which adversely reduce yield of wheat. Weeds compete with crop plants for the important crop growth requirements and reduce quality and yields of the crop, also increase the cost for harvesting and cleaning. Weed management is very important component of management practices recommended to increase crop production. Herbicides are most important tools for weed management to improve yield and quality. Chemical weed control is quick, more effective and cheaper so it is promote over other weed control methods.

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Various investigators have evaluated the efficacy of different herbicides for control of weeds in wheat crop. Ali & Shams El-Din (1997) recorded that the yield and yield attributes of wheat were higher under bromoxynil-actanoate [Brominal] application at rate 2.38 L/ha than hand weeding twice. Hassanein *et al.* (2000) stated that wheat yield losses due to weed competition were amounted to 20 %. The loss in wheat yield at 50 weeds /m^2 was 19 %, and at 100 weeds / m^2 the loss was 38.8 %. Jitendra *et al.* (2002) showed that the weed resulted in significant decrease in wheat plant height, productive tillers/m^2, grains / spike and 1000 grain weight as well as reduction in crop yield by 27.2 %.

Shah *et al.* (2004) found that Isoproturon gave the highest wheat yield. Malik *et al.* (2004) indicated that the maximum number of spikes/m^2 and wheat yield were achieved by using Diclofop-methyl at 700 g ha, after first irrigation. Zand *et al.* (2007) reported that weeds infestation caused 30% grain yield losses of wheat. Khan *et al.* (2008) recorded that the maximum number of tillers, weight of 1000-grain, biological and grain yield by Isoproturon 50 % WP 1 kg/ha followed by Buctril super 60 % EC at 045 kg/ha as compared to the weedy check, respectively.

Hossain *et al.* (2009) stated that weed dry weights and numbers were low by Affinity @ 1.5 kg/ha after 25 DAS (days after sowing) compared with control tretment. Affinity @1.5 kg/ha after 25 DAS showed high efficiency of weed control (77.4%) compared with hand pulling (78.2%). The optimum wheat grain yield (4.28 t/ha) was obtained by Affinity @ 1.5 kg/ha after 25 DAS and hand pulling (4.35t/ha), higher absorption of nutrients and sufficient interception of sunlight as well as air circulation, might be due to less weed-wheat competition resulting in higher grain yield .Increase of weed populations gradually decreased wheat yield. Shahram *et al.* (2011) indicated that increase wild oat (*Avena fatua*) density had a significant effect on wheat grain yield. Reductions in wheat grain yield 25, 50 and 75 wild oat plants/m^2 were about 12%, 25.7% and 35.4%, respectively compared to the weedy check treatment. Muhammad *et al.* (2012) revealed that post-emergence herbicides application of Isoproturon (1080 g a.i ha) proved to, the best for obtaining maximum wheat grain and straw yield.

Khalil *et al.* (2013) stated that in weedy check were recorded maximum number of weeds 117 weeds m^2. Similarly the high grain yield 4.072 t ha was recorded by affinity herbicides followed by hand pulling of Buctril Super + Puma Super with grain yield 3.773 t/ha and 3.483 t/ha , respectively. While the lowest grain yield of 1.603 t/ha was recorded in weedy check treatments. Application of affinity herbicides also proved to be effective in other wheat yield components like spikes m^{-2}, number of grains $spike^{-1}$ and 1000 grain weight. Tesfay *et al.* (2014) reported that hand pulling followed by Isoproturon herbicides at 1.50 kg/ha significantly reduced weed densites and dry weights. Among herbicides, Isoproturon provided the best broadleaved weed control and total weeds, as well as; Clodinafop- propargyl in controlling grass weeds species. Hand pulling and hoeing at tillering resulted in lowest weed dry weights. The high grain yield (2289.4 kg/ha) was recorded by hand pulling followed by Isoproturon at 1.5kg ha The highest straw yield was recorded in hand pulling followed by Isoproturon 1.50 kg/ha, and harvest index was also maximum with hand pulling. Post emergence herbicides, hoeing and hand pulling at tillering can further enhance the weed suppressive effect of the wheat crop. Raza *et al.* (2015) reported that wheat grain yield was achieved with Buctril Super 750 ml/ha was application.

Under the changing of socio-economic conditions, availability of the agricultural labors is reducing day by day that hampered agricultural operations seriously. Grain yield of wheat can be increased through proper weed management. Application of herbicides may be an effective and alternative option for proper weed management to boost up the wheat grain yield. Under this circumstance, this work was designed to study the activity of 17 post-emergence herbicides in controlling wheat associated weeds and enhancing yield and its components.

MATERIALS AND METHODS

Two field experiments were conducted during the two successive growing winter seasons 2014/15 and 2015/16 at the Experimental Station of the Faculty of Agriculture, Cairo University, Giza Governorate, Egypt. Each field experiment included: 19 weed control treatments as follows 17 post-emergence herbicides shown in Table 1, hand pulling twice and untreated plots check weed control treatment.

The treatments were arranged in a randomized complete blocks design with four replicates in both seasons. The plot area was 10.5 m^2 (3.5 m length

and 3.0 m width). Each plot included 15 rows. Wheat (*Triticum aestivum* L.) cultivar Gemeza-11 was sown by drill sowing method on 20th and 25th November in both seasons. Herbicides were applied post emergence after four weeks from sowing. A knapsack sprayer equipped with one nozzle boom was used and the water volume was 476 L/ha. All agricultural practices *i.e.* fertilizer, irrigation, pest and disease control were carried out according to the local recommendations. The soil texture of the experimental field was clay loam in both seasons. Harvest was done on 15th and 30th May in both seasons, respectively.

Data recorded: During the growing seasons, the following data were recorded:

Weed survey was carried out at 60 Days after sowing. Weeds were hand pulled from one square meter of each plot. Samples of weeds were identified according to Tackholm (1974) and classified into the following group annual broad - leaved weeds. The fresh weight and number of annual broad - leaved weeds was estimated. Weed control efficiency (WCE) was calculated as follows:

$$WCE\% = \{(FWC-FWT) \div FWC\} \times 100$$

where, FWC = Fresh weight of weeds in unweeded or checky treatment and FWT = Fresh weight of weeds in weed control.

Yield and its components: number of spikes/m^2; number of spikes per square meter was measured before harvest as the number of spikes per one square meter chosen randomly from each plot. At harvest, ten wheat plants chosen randomly

TABLE 1. Herbicide trade names, common names, chemical names, rate/ha, and time of application from sowing date.

Trade names	Rate /ha.		Common name	Time
Brominal 24 %	2.38 L	EC	Bromoxynil-octaneoate	25
Dimo Up 48%	595 cm^3	SL	DICAMBA	25
Gastin 28%	83.3 g	WP	Tribenuron-Methyl 16 % + Carfentrazone-Ethyl 12%	25
Rondu 40%	1428 g	SP	MCPA-sodium 20%+Bromixanil 20%	25
Dolphic 1%	1785cm^3	OD	Florasulam 0.25%+ Mesosulfuron-Methyl 0.75%	25
Trigos 36%	595 cm^3	OD	MCPA-sodium 36%+ Florasulam 1%	25
Arina 7%	1198 cm^3	OD	Florasulam 05%+ Clodinafop-propagyl 6.5%	25
Aldol 20%	285.6 g	WP	Tribenuron-Methyl 2.7%+ Fluroxypyr 13.7%	20
Patchi 15%	476 g	WP	Tribenuron-Methyl 5%+ Clodinafop-propagyl 10%	20
Rabido 25%	2.38 L	EC	bromoxynil-octanoate	25
Lintor 70%	142.8 g	WG	Triasulfuron 4.1% +Dicamba 65.9 %	20
Moar 55%	238 g	WP	Tribenuron-Methyl 8%+ Fenoxaprop-p-Ethyl45%+ Thifensulfuron-Methyl 12%	25
Bromoplus 24%	2.38 L	EC	Bromoxyniloctaneoate	25
Braod way star 8.5%	90 cm3	WG	Florasulam 1.42%+ Pyroxsulam 7.08%	25
Braod way star 8.5%+ Adjuvant	214.2cm^3 + 476 cm^3	WG	Florasulam 1.42%+ Pyroxsulam 7.08%+ Ecosurf	25
Kash cool 75%	19.04 g	WG	Tribenuron-Methyl	25
Floromix 18.25%	1547 g	EC	Fluroxypyr 10% +Florasulam .025%+ Clopyralid 8%	25

EC=Emulsifiable Concentrate, SL=Soluble concentrate, WP= Wettablepowder, WG= Water dispersible granules, OD= Dusts.

from the central rows of each plot was taken to determine the following characteristics: plant height (cm); number of spikeletes/spike, number of grains/spikelet's number of grains/spike, grain weight/spike (g) and 1000- grain weight (seed index). The grains weight/spike (g) was calculated as an average of ten main spikes chosen randomly.

Grain yield was recorded as t/ha from the whole area for each plot, Straw yield (t/ha) was determined by weighing the biological yield in each plot then substrating the grain weight for the biological yield. Expressed as t/ha. Harvest index (HI) was calculated by using following formula: HI (%) = (Grain yield/ha ÷ Biological yield/ha) × 100.

Statistical analysis

Collected data were statistically analyzed using MSTAT-C computer package program and mean differences among treatments were evaluated by Least Significance Difference (LSD) test at 5% level of significance (Gomez & Gomez, 1984).

RESULTS AND DISCUSSION

Weed flora distribution at the experimental site

Scientific, common and local names of dominant weed species associated with wheat at the experimental site through 2014/2015 and 2015/2016 seasons were listed in Table 2 according to the composite list of weeds by Weed Sci. Soc. of Am. online http://wssa.net/wssa/weed/weed-identification/ and also weed were identified according to Tackholm (1974).

Weed growth characters

Weed count/m^2, fresh weigh /m^2 and percent of weed control are important parameters for studying weed management methods. Weed growth characters regarding weed control treatments presented in Table 3 showed that all broadleaf weeds post-emergence herbicides significantly reduced number of broadleaf weeds per m^2 and fresh weight/ m^2 compared to weedy check (unweeded control).

However, the minimum weed count/m^2 was recorded with Rowndo and Dolphik at 15 weed plants/m^2 followed in the second rank by Trigous, Cash cool , Arina and Patchi. The highest weed control percent (more than 90 %) was recorded with the nine herbicides Rowndo, Dolphic, Trigous, Arina, Rapido, Gastin, Florumix, Cash cool and Broad way star with adjuvant. These treatments decreased the fresh weight/m^2 of broad leaved weeds, respectively. These outcomes are in conformity with those acquired by Shaban & El-Deek (1986), Fayed *et al.* (1993), Barhoma *et al.* (1996), Atalla (1998), Hossain *et al.* (2009) and Tesfay *et al.* (2014).

Wheat yield components

Different weed control treatments showed a significant effect on plant height, number of spikes/m^2, grain weight/spikelet and grain weight/spike (Table 4). Data arranged in Table 4 showed that plant height differed significantly among various weed control treatments. In addition, many weed control treatments increased plant height significantly, as Rapido (107 cm), Dolphik equal Dimo up (105 cm), Boradway star + Adjuvant (103 cm) and Hand pulling (103 cm). Such findings perhaps due to the role of efficacy of treatments of weed control in controlling weeds, which resulted in decreasing weed-wheat competition on light and there factors of the environmental conditions. These outcomes are not in alignment with the previous findings of Muhammad *et al.* (2012) who found that the highest plant height (98.30 cm) was acquired from weedy check, while the minimum plant height (88.60 cm) was attained with Isoproturon + Diflufenican (1080 g a.i /ha). Khalil *et al.* (2000) and Marwat *et al.* (2005) declared that there was no significant increase in the plant height with the application of herbicides.

All the herbicides used has significantly influenced on number of spikes/m^2.The maximum number of spikes/m^2 (578) was obtained with the application of Aldoal, as well as, hand pulling (547), Rowndo (524) and Bromoplus (507) (Table 4). While, the minimum number of spikes/m^2 was recorded with Broad way star plus adjuvant (352) and weedy check 414 spikes /m^2. Herbicides Aldoal, Rowndo and Bromoplus performed the superior in order to efficient weed control, lower fresh weight of weeds, which resulted in minimum competition. These results are in harmony with Fenni *et al.* (2002).

In addition, grain weight/spikelet and spike was significantly affected by weed control treatments presented in Table 4. All control treatments of broadleaved weeds increased grain weight/spikelet and spike and all treatments had exhibited a significant effect compared to weedy check treatment. The maximum grain weight per

TABLE 2. Dominant annual broadleaf weed species in wheat trials during 2014/2015 and 2015/2016 winter seasons.

Scientific name	English name	Local name	Family
Ammi majus L.	Common bishop	Khela	Umbelliferae
Anagillus arvensis L	Scarlet Pimpernel	Ain El-gamal	Primulaceae
Beta vulgaris L.	Sea beet	Salk	Chenopodiaceae
Brassica nigra L.	Mustrad	Kaber	Cruciferae
Medicago polymorpha L.	Toothed medik	Nafal	Fabaceae
Rumex dentatus L.	Sheep sorrel	Hommeid	Polygonaceae
Sonchus oleraceus L.	Annual sowthistle	Godeid	Asteraceae
Malva parviflor	Cheeseweed mallow	Khobiza	*Malvaceae*

TABLE 3. Number of weeds/m^2,fresh weight after 20 days of herbicides application and weed control efficacy % in combined data across seasons.

Treatments	**Rate / ha**	**No. of weeds/m^2**	**Fresh weight (g/m^2)**	**Control efficiency %**
Brominal	2.38 L	32	136	85
Kash cool	19.04 g	18	63	93
Broad w. s .+ Adj.	214.2 g+476 cm	21	68	92
Broad way star	214.2 g	23	87	90
Bromoplus	2.38 L	30	100	89
Moar	238 g	26	117	87
Dimo up	595 cm3	41	110	88
Gastin	83.2 g	20	53	94
Rondu	1428 g	15	47	95
Dolphic	1785 cm3	15	40	95
Trigos	595 cm3	17	40	95
Arina	1190 cm3	18	39	95
Aldol	285.6 g	21	99	89
Patchi	200 g	42	95	90
Rabido	2.38 L	19	43	95
Floromix	1547 cm3	20	48	94
Lintor	142.8g	29	128	86
Hand pulling		35	171	82
Untreated (control)		111	963	
$LSD_{0.05}$		4.5	74.6	
CV %		13.52	15.40	

LSD= Least Significant Difference, CV=Coefficient of Variation

TABLE 4. Plant height (cm), number of spikes/m², grain weight/spikelet and grain weight/spike as affected by weed control treatments for combined data across seasons.

Treatments	Rate / ha	Plant height, (cm)	No. of spikes/m²	Grain weight/ Spike (g)	Grain weight/ Spikelet (mg)
Brominal	2.38 L	102	473	3.05	129.9
Kash cool	19.04 g	99	468	2.99	134.8
Broad way star + Adjuvant	214.2 g+476cm³	103	352	3.10	136.1
Broad way star	214.2 g	97	372	3.23	146.4
Bromoplus	2.38 L	100	507	3.09	150.4
Moar	238 g	103	362	3.07	140.8
Dimo up	595 cm³	100	426	3.18	143.2
Gastin	83.2 g	105	451	2.92	140.3
Rondu	1428 g	102	524	3.35	141.2
Dolphic	1785 cm³	105	484	3.12	146.6
Trigos	595 cm³	98	403	2.53	112.7
Arina	1190 cm³	96	469	2.87	126.2
Aldol	285.6 g	105	578	2.79	123.3
Patchi	200 g	102	464	3.01	140.5
Rabido	2.38 L	102	451	2.86	126.4
Floromix	1547 cm³	107	518	2.68	125.5
Lintor	142.8g	103	424	3.33	146.4
Hand weeding twice	—	103	547	2.69	123.3
Untreated	—	94	414	1.74	95.0
$LSD_{0.05}$	—	4.5	41.1	0.29	14.5
CV %	—	3.82	7.80	8.50	9.44

LSD= Least Significant Difference, CV=Coefficient of Variation

spike (3.35 g) was obtained with the application of Rondu, as well as, Lintor (3.33 g), Broad way star (3.23 g) and Dimo up (3.18g) (Table 4). While, the minimum grain weight per spike was recorded by weedy check (1.74 g). The highest weight of grains/spikelet (150.4 mg) was obtained by applying Bromoplus, which was statistically at par with Dolphic (146.6 mg) and Lintor (146.4 mg). This effect may be due to a lower of competition between weeds and wheat plants as a result of weed control, increase the rate of photosynthesis and the accumulation of dry matter in the grains, as well as increased grains weight. The lower grains weight / spikelet was recorded in weedy check (14.5 mg). These results are in concord with the findings of Fayed *et al.* (1998) and Hussain *et al.* (2003), who registered that a similar increase in these yield components in their weed control experiments.

Data presented in Fig.1 and 2 showed the effect of weed control treatments on some yield attributes, *i.e.*- spike length, number of spikelets/spike, number of grains/spike and number of grains/ spikelet. Dolphik and Aldoal, showed the highest increase in spike length (11 cm), while the rest of herbicides and hand pulling produced spike length around (8-10 cm) compared to weedy check (7 cm) (Fig.1). Shahid (1994) reported that herbicides application did not affect significantly reduction in wheat spike length. Data presented in Fig. 2 showed that increased number of spikelets and grains per spike were recorded with the herbicides Lintor, Dolphik, Dimo up and Moar. This increase may be due to increasing the number of fertile flowers in each spikelet.

On the other hand, number of grains per spikelet is an important parameter in wheat yield (Fig. 2). The highest number of grains/spike was recorded with Lintor, Dimo up, Fluromix, but did not differ significantly with treatments Dolphik, Rowndo, Gastin, Moar, Bromoplus, Hoeing and Braod way star, compared to the rest of broadleaved weed control treatments and weedy check, which recorded the lower number of grains/spike (Fig. 2). Herbicides performed better in order to effective weed control and maximum utilization of environmental resources for growth and development. These data agreed with those reported by Fayed (1992), Nassar (1998) and Gupta (2004).

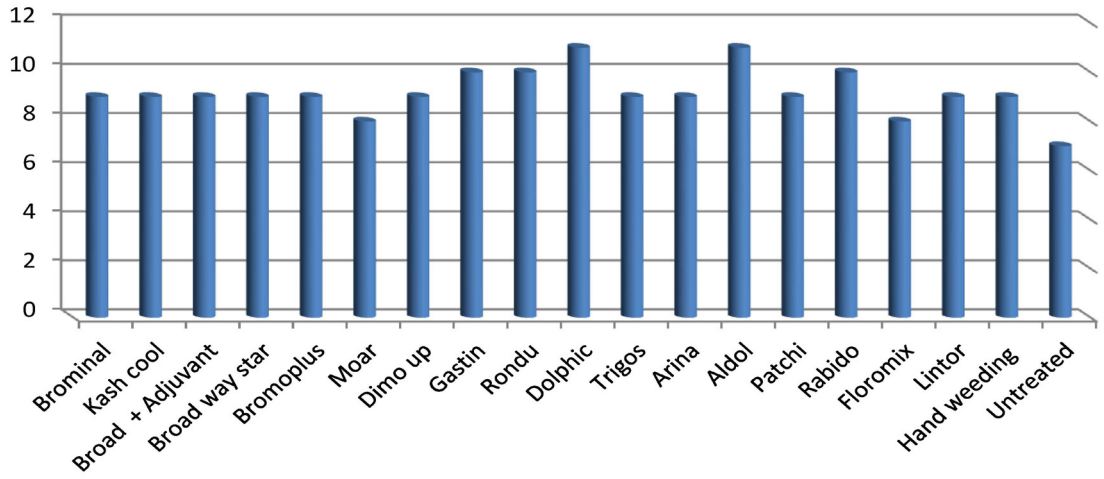

Fig. 1. Effect of weed control treatments on wheat spike length (cm) .

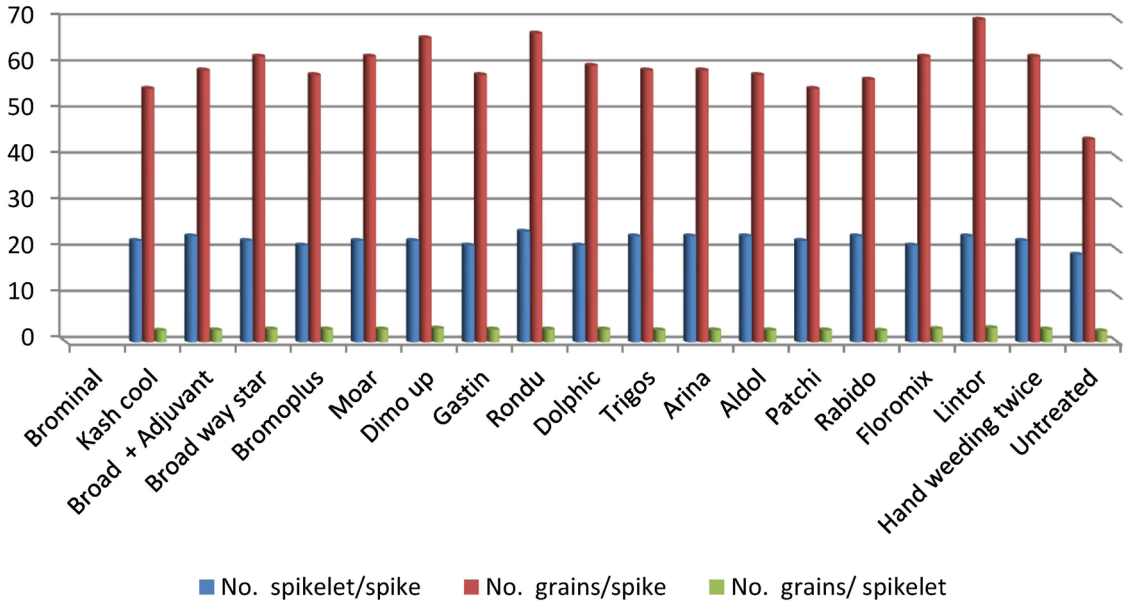

Fig. 2. Effect of weed control treatments on spikelet/ splke, no. grains/ spiklet and no. grains / spike.

Data presented in Table 5 showed that wheat 1000-grain weight, grain yield/ha, straw yield/ ha and harvest index were significantly affected by all treatments. The maximum weight of 1000-grains (56.62 g) was obtained by applying Brominal (Table 5), which was statistically at par with Broad way star, Gastin, Dolphic and Arina. Whereas, the lowest number of 1000-grain weight was recorded in weedy check (42.76 g). Brominal herbicide record preference in the 1000- grain weight due to increased weed control resulting in increased net photosynthesis and dry matter accumulation in the grain. Similar findings were obtained by Fayed (1992), Khalil *et al.* (1993), Metwally *et al.* (1999) and Gupta (2004).

The highest value of grain yield (14.191 t/ha) was obtained when the herbicide Aldol was used (Table 5), followed by Arina (13.692 t/ha), which was statistically at par with Bromoplus and Gastin (12.399 t/ha). Rondu was statistically at par with Dolphic. Weedy check gave significantly the lowest (7.782 t/ha) grain yield. Also, the grain yield increased by weed control treatments due to increase number of spikes/m^2, number of grains/spike, grain weight/spike and 1000-grain weight. Similar findings were reported by Fenni *et al.* (2001), Turk &Tawaha (2003), Nassar (2003), Deep *et al.* (2005), Zand *et al.* (2007) and Khan *et al.* (2008). They reported that the increase in grain yield was due to highest values obtained those from yield components by the application of

TABLE 5. Seed index, grain yield t/ha, straw yield t/ha and harvest index as affected by some weed herbicides for combined data across seasons.

Treatments	Rate/ ha	Seed index	Grain yield	Straw yield	Harvest index %
Brominal	2.38 L	56.62	10.305	24.725	29.71
Kash cool	19.04 g	51.00	10.995	22.705	32.86
Broad way star + Adjuvant	214.2 g+476 cm^3	49.34	8.092	14.280	36.29
Broad way star	214.2 g	55.93	10.614	14.894	41.95
Bromoplus	2.38 L	51.28	13.692	24.297	36.11
Moar	238 g	51.17	7.694	19.089	29.13
Dimo up	595 cm^3	52.46	11.495	28.867	28.5
Gastin	83.2 g	55.07	12.399	22.467	37.94
Rondu	1428 g	46.77	13.097	27.303	32.44
Dolphic	1785 cm^3	55.72	13.297	24.090	35.61
Trigos	595 cm^3	47.17	11.495	21.558	34.92
Arina	1190 cm^3	55.35	13.692	22.598	37.78
Aldol	285.6 g	46.45	14.191	28.600	33.20
Patchi	200 g	52.31	11.797	23.957	33.46
Rabido	2.38 L	46.91	11.090	19.558	36.21
Floromix	1547 cm^3	44.39	11.995	29.069	29.41
Lintor	142.8 g	47.11	8.901	42.966	19.31
Hand weeding twice		49.13	11.804	26.913	30.34
Untreated		42.76	7.782	18.078	30.22
LSD 0.05		1.29	2.137	6.802	6.64
CV %		2.23	39.174	58.619	17.52

herbicides in treatments. Hossain *et al.* (2009) found that wheat yield was gradually decreased with the increase of weed densities. This higher yield under weed control might be due to the decrease on weed-crop competition resulting in higher absorption of nutrients and sufficient interception of sunlight as well as air circulation.

Results showed that the highest straw yield / ha was recorded with Lintor (42.966 t/ha) and in the second hand Aldoal, Floromix, then Dimo up, Gastin and hand pulling. The minimum straw yield produced was recorded with Broadway star+ Adjuvant (14.280 t/ha). Although, weedy check produced straw yield better than Broadway star. The increases in straw yield may be due to minimizing the weed-wheat competition and giving wheat plants the more space without weeds to grew and teller. The results agreed with those obtained by Metwally *et al.* (1999).

Data concerned with the effect of broadleaved weed control treatments on harvest index are expressed in Table 5. Most herbicide treatments increased harvest index %. Herbicides Broadway star, Gastin, Arina, were significantly the best in increasing in harvest index compared to all other treatments. While, Brominal, Moar, Dimo-up, Florumix and Lintor decreased harvest index. These outcomes agree with the findings of Fayed *et al* (1998), and Hussain *et al.* (2003) who registered a comparable increase in yield components in their weed control trials.

CONCLUSION

The most important results are: the highest weed control percent more than 90 % were recorded with nine herbicides Rowndo, Dolphic, Trigous, Arina, Rapido, Gastin, Florumix, Cash cool and Broad way star plus adjuvant. These treatments decreased the fresh weight per m^2 of broad leaved weeds. For wheat maximum number of spikes/ m^2 (578) was obtained with the application of Aldoal, as well as, hand pulling (547) , Rowndo

(524) and Bromoplus (507). While, minimum number of spikes per m^2 was recorded with Broad way star with adjuvant (352) and weedy check recorded 414 spikes per m^2. The maximum grain weight per spike (3.35 g) was obtained with the application of Rondu, as well as, Lintor (3.33 g), Broad way star (3.23 g) and Dimo up (3.18 g). While, minimum grain weight/spike was recorded by weedy check (1.74 g). The higher number of grains/spike was obtained with Lintor, Dimo up, Fluromix. The highest 1000-grain weight (56.62 g) was gained by adding Brominal, which was statistically at par with Broad way star, Gastin, Dolphic and Arina, while the lower value of 1000-grain weight was registered in weedy check (42.76 g). The maximum grain yield (14.191 t/ ha) was achieved by application of Aldol (Table 5), followed by Arina (13.692 t/ha), which was statistically at par with Bromoplus. Rondu was statistically at par with Dolphic. Weedy check significantly gave the lowest (7.782 t/ha) grain yield. The highest straw yield /ha was recorded with Lintor (42.966 t/ha) and in the second hand Aldoal, Floromix, then Dimo up, Gastin and hand pulling. The lowest straw yield produced was recorded with Broadway star+ Adjuvant (14288 t/ha). Herbicides Broadway star, Gastin, Arina, significantly increased harvest index compared to all treatments. The results showed that all herbicides increased wheat yield, yield components and reduced weed density number of weeds per square meter. Broadleaved weed control treatments increase control efficacy compared to weedy check.

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مقاومة الحشائش عريضة الاوراق في القمح باستخدام بعض المبيدات الحدثية بين الانبات فى مصر

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تسبب الحشائش عريضة الاوراق نقص شديد فى محصول القمح فى مصر ، اجريت تجرتين حقليتن خلال موسمى 2014/2015 و 2015/2016 على التوالى فى محطة التجارب والبحوث الزراعية بكلية الزراعة – جامعة القاهرة بالجيزة . بهدف مقاومة الحشائش عريضة الاوراق فى محصول القمح وكانت المعاملات هي 17 مبيد بعد الانبات Post-emergence بالاضافة الى معاملة النقاوة اليدوية مرتين ومعاملة المقارنه " الكنترول " وكان صنف القمح جميزة 11 و المبيدات المستخدمة هى : : bromoxynil-octaneoate 24%, DICAMBA 48%, Tribenuron-Methyl 16 % + Carfentrazone-Ethyl 12%, MCPA-sodium 20%+ Bromixanil 20%, Florasulam 0.25%+ Mesosulfuron-Methyl 0.75%, MCPA-sodium 36%+ Florasulam 1% , Florasulam 05%+ Clodinafop-propagyl 6.5%, Tribenuron-Methyl 2.7%+ Fluroxypyr 13.7%, Tribenuron-Methyl 5%+ Clodinafop-propagyl 10%, bromoxynil-octanoate25% , Triasulfuron 4.1% + Dicamba 65.9 %, Tribenuron-Methyl 8%+ Fenoxaprop-p-Ethyl45%+ Thifensulfuron-Methyl 12%, Bromoxynil octaneoate, Florasulam 1.42%+ Pyroxsulam 7.08%,Florasulam 1.42%+ Pyroxsulam 7.08%+ Ecosurf, Tribenuron-Methyl 20-25 and Fluroxypyr 10% + Florasulam .025% + Clopyralid 8%. وتم رش جميع المبيدات بعد يوم من بعد انبات القمح ، وتم اجراء معاملات النقاوة اليدوية مرتين الاولى بعد 25 يوم والثانية بعد 45 يوم من زراعة القمح . اوضحت النتائج ان جميع المبيدات وكذا النقاوة اليدوية ادت إلى خفض اعداد واوزان الحشائش ، وكذلك ادت إلي زيادة معنوية لمحصول حبوب القمح ومكوناته مقارنة بمعاملة المقارنة فيما عدا مبيد Florasulam 1.42%+ Pyroxsulam 7.08% والاسم التجاري برواد واي ستار. وكان مبيد Triasulfuron 4.1% + Dicamba 65.9 % والاسم التجاري لينتور الاعلي فى عدد الحبوب فى السنبلة وكذلك عدد السنابل للنبات الواحد وايضا محصول القش للفدان ، وكان مبيد Tribenuron-Methyl 2.7%+ Fluroxypyr 13.7%, الاسم التجاري الدول الافضل.