

EFFECT OF SOWING METHODS AND WEED CONTROL TREATMENTS ON YIELD AND YIELD COMPONENTS OF WHEAT

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ABSTRACT

Two field experiments were conducted during 2004/05 and 2005/06 seasons at Shandaweel agriculture research station, Sohag governorate, Egypt to study the effect of four sowing methods (broadcasting, afir drilling, Herati and Afir in ridges) and three weed control treatments (Brominal & Topik herbicide, hand weeding and unweeded control) on growth, yield and yield components of wheat cultivar Giza 168. Split plot design with three replications was used. The results indicated that sowing methods had no significant affects on dry weight of annual weeds in both seasons except narrow and total weeds in second season. Herati and Afir drill methods reduced dry weight of narrow and total weeds by 27.6, 24.9, 25.8 and 20.0 %, respectively in second season, as compared to Afir broadcast method. Weed control treatments had significant affect on dry weight of annual weeds in both seasons, as compared to weedy check. Hand weeding twice and Brominal + Topik reduced dry weight of annual broad, narrow and total weeds by (92.9 & 94.8), (91.4 & 93.1) and (93.0 & 91.9%), respectively in the first season and by (99.3 & 97.4), (98.8 & 99.2) and (98.9 & 98.7%),, respectively in second season, compared to untreated treatment. Sowing methods had no significant influence on yield and its component in both seasons except plant height , spike length and straw yield (ton/fed.) in second season and number of spikes/m² and grain yield (ard./fed) in both seasons. For grain yield (ard./fed), the highest values were obtained from Herati method by 11.3 and 14.2 ard./fed compared with Afir broadcast and Afir in ridges methods by 6.8 and 7.0 ard./fed, respectively, in both seasons. All weed control treatments exerted a significant influence on yield and its component in both seasons except spike length and grain weight/ spike in second season. The highest values of wheat grain yield (ard./fed) was from application hand weeding twice and Brominal plus Topik by 11.4, 10.3, 12.1 and 11.7 ard./fed. compared with weedy check (6.5 and 7.7 ard./fed), respectively, in both seasons. All interactions between sowing methods and weed control treatments had no significant effects on all studied characters in both seasons except dry weight of narrow and total weeds (g/m²) in second season, number of spikes/m² in both seasons and wheat grain yield (ard./fed) in first season. From this investigation can concluded that using herati or afir drill sowing methods with hand weeding or brominal +Topik gave the highest reduction of weeds and increase wheat grain yield.

INTRODUCTION

Wheat (*Triticum aestivum*) is one of the most important cereal crops in Egypt. Egypt imports large amounts of wheat to cover the gap between production and consumption. Area under wheat reached to 3.06 million feddan with average grain yield 18.00 ardab/fed.* in 2005/06 season. Productivity of wheat is affected by several factors including cultural practices

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and environmental conditions. Among cultural practices, sowing methods and weed control treatments which are the main factor for affecting of yield and yield components.

In Egypt, sowing wheat crop by broadcasting and Herati methods are common practices. Recently, sowing wheat grains by Afir in ridges (farmer method) consider new method. Farmers used this method, which made weed control by hand hoeing more easily than hand weeding. Eissa *et al.* (1993) found that seed drilling gave the highest yield compared to wet methods (Herati) in wheat fields. So, broadcasting method decreased plant height and increased spike length, number of grains/ spike and grains weight/ spike. The highest grain yield/fed. was obtained from seeded plant in rows at 15 cm part. Seeding methods had no significant effect on 1000-grain weight. Salem *et al.* (1993) reported that Herati (wet methods) significantly decreased the number and weight of wild oat in wheat. Salem *et al.* (1993), found that dry method (Afir drill) increased significantly wheat grain yield compared to wet (Herati) or dry (Afir broadcast) methods. El-Far and Allam (1995) found that sowing by drilling method increased significantly the 1000-grain weight and grain yield/fed. as compared to broadcasting method. Al- Marsafy *et al.* (1997), found that wet method (Herati) was better than dry method (Afir drilling) in increasing wheat grain yield. Nassar (1998), noted that sowing methods (No-tillage, Herati, Afir drill and broadcast) had significant effect on dry weight of annual total weeds, number of spikes/m², 1000-grain weight and grain yield (ardab/fed.). Fakkar (1999), found that Herati method had significant effect on the dry weight of grassy weeds (g/m²) by 35.3 % compared to Afir drill method in second season only. Also, he reports that sowing methods (Herati and afir drilling) had no significant effect on yield, yield component and grain quality except plant height in second season. Anaam (2003) reported that drill method decrease significantly the dry weight of grass, broad and total weeds. Also, drill method increased significantly plant height, number of spikes/m², 1000-grain weight, grain and straw yields/fed. compared to broadcast method. Great losses in wheat yield are attributed to weeds and the problem of weeds in Egyptian wheat fields has been mostly appeared in upper Egypt where grassy weeds (wild oats) are the predominate amongst all other weed species. So, weed control is one of the essential agricultural practices for raising the yield and quality of wheat and hand weeding as the traditional practice can not solve this problem. Several reports in Canada and USA indicated that reduction in wheat productivity due to weeds competition ranged from 10 - 64% depending on weed type and infestation intensity (Appleby *et al.*, 1976; Ralif and Peeper, 1987; Balyan *et al.*, 1991; Black *et al.*, 1994). Weed control in wheat includes the use of cultural practices and application of suitable herbicides. Thompson and Thill (1992) reported that application of herbicides increased wheat grain yield by 22.0%. Satao *et al.* (1993), found that hand weeding twice at 20 and 40 days after sowing resulted greatest weed control and yield compared to unweeded treatment. Abd El-Hamid *et al.* (1998), found that the efficiency of Grasp 10 %, Topik 15% and puma super 7.5 % for controlling wild oat and other grassy weed in wheat. Yehia *et al.* (1998), reported that application of Topik EC at 0.24 L/ha. gave the best control of wild oat in wheat. Nassar (1998), noted that chemical

(tralkoxydim at 100g, flumetralin at 250g, Clodinafop-propargyl at 21 g/fed.) and mechanical (hand weeding at 30 and 45 DAS) reduced significantly the dry weight of annual narrow-leaved weeds, number of grain/plant, grain weight/plant, 1000-grain weight and grain yield compared to Untreated treatment. On the other hand, Grey *et al.* (1993) and Thomas and Doll (1993), found that combination of cultural methods and herbicides application gave the best weed control and significantly increased grain yield of wheat and improved yield components. Singh and Singh (1996) illustrated that weed dry weight was reduced by 45.7, 14.9, 26.9 and 74.6% by broadcast, close normal and cross sowing, respectively. The present investigation was carried out to study the performance of Giza 168 wheat variety under different sowing methods and weed control treatments.

MATERIALS AND METHODS

Two field experiments were conducted at Shandaweel Agriculture Research Station, Sohag governorate during the two successive seasons of 2004/05 and 2005/06 to study the effect of sowing methods and weed control treatments on growth, yield and its components of wheat.

The experimental design followed was split-plot with three replications. The main plots were allocated for four sowing methods:

1. Herati (wet sowing method) : dry seed in wet soil
2. Afir drill (dry sowing method): dry seed in rows with 15 cm apart rows in dry soil
3. Afir broadcast (dry sowing method): dry seed in dry soil
4. Afir in ridges (farmer method): dry seed in ridges with 60 cm apart ridge and sowing on both sides and the top of ridge. The rate of seeds were 50 kg/ feddan for each sowing method.

The sub plots were occupied with three weed control treatments as follow:

1. Bromoxynil {3, 5-dibromo-4-hydroxy-benzonitrile} known commercially as Brominal (24 EC) at 1.0 L/ fed at 35 days after sowing + Clodinafop-propargyl {2-propnyl (2-[4-(5-chloro-3-fluoro-2-pyridinyloxy) phenoxy]-propionate} known commercially as Topik (15 % WP) at 140 g/ fed at 45days after sowing.
2. Hand weeding twice at 30-45 days after sowing.
3. Untreated treatment (control).

Plot area was (10.5 m²) 3.5 m length and 3 m width. The spray volume was 200 litres per feddan by using knapsack sprayer (CP3).The experiments were sown on 1st. December in both seasons. Variety Giza168 was grown at rate 50 Kg/fed. to all sowing methods in both seasons. Nitrogen fertilization in the form of Urea (46.5%N) at rate of 70 Kg N/fed. was applied in tow equal portion before the first and second irrigations. Phosphorus fertilizer was applied as Calcium super phosphate (15.5 P₂O₅) during preparation of soil at the rate of 150 Kg/fed. Soil texture of the experimental plots in both seasons was sandy loam. All other cultural practices were applied as recommended for wheat production. The following data were recorded as follows:

A- Weed survey.

Weed were hand pulled from one square meter of each plot after month from late treatment. Weeds were identified and classified into the following group: (1) Dry weight of narrow leaf weeds (g/m²). (2) Dry weight of broadleaf weeds (g/m²). (3) Dry weight of total narrow-and broadleaf weeds (g/m²).weeds were air dried for 2 days and then dried in an oven at 70° C for 48 hours then weighed. The dominant weed species counted in the experimental plots in both seasons were shown in Table (1).

Table 1: Family, scientific name and common name of accompanied weeds of wheat crop during 2004/05 and 2005/06 seasons.

No	Family	Scientific name	Common name
1	Gramineae (Poeceae)	<i>Avena spp.</i>	Wild oat
2	Gramineae (Poeceae)	<i>Phalaris spp.</i>	Canary grass
3	Chenopodiaceae	<i>Chenopodium sp.</i>	Lamb squarters
4	Polygonaceae	<i>Emex spinosus L.</i>	Spiny emex
5	Polygonaceae	<i>Rumex dentatus L.</i>	Sheep sorrel
6	Umbelliferae	<i>Ammi majus</i>	Common bishop
7	Cruciferae	<i>Brassica sp.</i>	Kabar mustrad
8	Compositae	<i>Sonchus oleraceus L.</i>	Annual sowthistle
9	Leguminosae (Fabaceae)	<i>Melilotus indica L.</i>	Sweet clover
10	Leguminosae (Fabaceae)	<i>Medicago polymorpha</i>	Toothed medik

B-Yield and yield components.

At harvest the following characters were recorded: Plant height (cm), spike length (cm.), number of spikelets/spike, number of grains/spike, grain weight (g)/spike, 1000-grain weight (g), number of spikes/m², spike weight (g), grain yield (ardab/fed.) and straw yield_(ton./fed.).

C-Economic analysis.

Economic evaluation for the results by estimating the average of seed yield (ard./fed.), total variable cost, Gross Income (GI), Gross Margin (GM), Benefit/cost ratio (B/C) and profitability according to Heady and Dillon (1961).

Where: Gross Income (GI) =165 L.E × Yield (Ardab or ton/fed.)

Gross Margin (GM) = Gross Income- Total cost.

Benefit/cost ratio (B/C) = Gross Income/ Total cost.

Profitability = 100x Gross Margin/ Total cost.

The collected data were statistically analyzed according to the method of Snedecor and Cochran (1981). Least significant differences (LSD) test was used for treatments mean separation.

RESULTS AND DISCUSSION

A-Effect of sowing methods and weed control treatments on annual weeds.

I- Effect of sowing methods

Data shown in Table 2 revealed that sowing methods had no significant affects on dry weight of annual weeds in both seasons except with narrow and total weeds in the second season. Herati and Afir drill methods reduced dry weight of narrow and total weeds by 27.6, 24.9, 25.8 and 20.0 %,

respectively in the second season, as compared to Afir broadcast method. These results are in line with those obtained by Salem *et al* (1993), Nassar (1998) and Fakkar (1999).

Table 2: Effect of sowing methods on dry weight of broad, grassy and total weeds (g/m²) in 2004/2005 and 2005/2006 seasons.

Sowing methods	2004/05 season			2005/06 season		
	Broad weeds (g/m ²)	Narrow weeds (g/m ²)	Total weeds (g/m ²)	Broad weeds (g/m ²)	Narrow weeds (g/m ²)	Total weeds (g/m ²)
1. Herati	42.2	227.3	269.5	89.3	226.0	315.3
2. Afir drill	44.7	232.5	276.2	105.5	234.6	340.1
3. Afir in ridges	36.2	221.8	258.0	104.7	282.7	387.4
4. Afir broadcast	40.4	258.0	298.4	112.7	312.2	424.9
L.S.D _{0.05}	NS	NS	NS	NS	34.6	35.5

II- Effect of weed control treatments:

The obtained results in Table 3 indicated that the use of weed control treatments had significant affects on dry weight of annual weeds in both seasons, as compared to weedy check. Brominal + Topik and Hand weeding twice reduced dry weight of annual broad, narrow and total weeds by (92.9 & 94.8), (91.4 & 93.1) and (93.0 & 91.9%), respectively in the first season and by (99.3 & 97.4), (98.8 & 99.2) and (98.9 & 98.7%),, respectively in the second season, compared to untreated treatment. These results are in agreement with those of Satao *et al.* (1993).

Table 3 : Effect of weed control treatments on dry weight of broad, grassy and total weeds (g/m²) in 2004/05 and 2005/06 seasons.

weed control treatments	2004/05 season			2005/06 season		
	Broad weeds (g/m ²)	Narrow weeds (g/m ²)	Total weeds (g/m ²)	Broad weeds (g/m ²)	Narrow weeds (g/m ²)	Total weeds (g/m ²)
1. Brominal + Topik	7.7	42.3	50.0	2.2	9.1	11.3
2. Hand weeding	5.7	52.5	58.2	7.8	5.9	13.7
3. Untreated	109.2	609.9	719.1	299.1	776.7	1075.8
L.S.D _{0.05}	10.2	31.4	35.4	17.7	41.3	37.9

B- Effect of sowing methods and weed control treatments on yield and yield components:

I-Effect of sowing methods

The data in Table 4 revealed that sowing methods had no significant influence on yield and its component in both seasons except with plant height , spike length and straw yield (ton/fed.) in second season and number of spikes/m² and grain yield (ard./fed) in both seasons. In second season the tallest plants (91.6 cm) were obtained when Afir in ridges method was used as compared to Herati method (84.7 cm). On the other hand, the highest values of spike length (cm) were obtained from Afir in ridges method (10.1 cm) treatment compared to Afir drill method (8.4 cm). The effect of sowing methods was significant on number of spikes/m² where the highest value was obtained from Afir in ridges method (323.6) compared with Afir drill method

(281.8) in first season and Afir broadcast method (269.3) compared to Afir in ridges method (204.2) in second season. For grain yield (ard./fed.), The highest values were obtained from Herati method by 11.3 and 14.2 ard./fed compared with Afir broadcast and Afir in ridges methods by 6.8 and 7.0 ard./fed, respectively, in 2004/05 and 2005/06 seasons. For straw yield (ton/fed.), The highest values were obtained from Afir drill method by 5.5 (ton/fed.) compared with Afir in ridges methods by 4.7(ton/fed.) in second season. These results are in agreement with those of Salim et al. (1993), El-far and Allam (1995) and Al-Marsafy et al.(1997)

Table 4 : Effect of sowing methods on yield and yield component in 2004/05 and 2005/06 seasons.

Treatments	2004/05 season									
	1. Herati	97.1	9.9	19.9	39.4	1.9	2.9	36.4	302.7	11.3
2. Afir drill	99.2	9.1	20.3	37.3	1.8	2.7	36.1	281.8	10.1	5.5
3. Afir in ridges	99.7	9.7	19.7	39.0	1.9	2.8	37.8	323.6	9.3	5.1
4. Afir broadcast	97.1	9.1	19.7	37.7	1.8	2.7	36.2	315.8	6.8	4.9
L.S.D _{0.05}	NS	NS	NS	NS	NS	NS	NS	11.6	1.1	NS
Treatments	2005/06 season									
	1. Herati	84.7	8.7	18.4	36.6	1.4	2.3	41.4	249.8	14.2
2. Afir drill	84.8	8.4	18.2	36.3	1.5	2.5	42.1	251.1	11.6	5.3
3. Afir in ridges	91.6	10.1	19.1	33.9	1.7	2.6	43.4	204.2	7.0	4.7
4. Afir broadcast	86.8	8.7	18.4	36.0	1.6	2.7	42.4	269.3	9.2	5.0
L.S.D _{0.05}	2.7	0.6	NS	NS	NS	NS	NS	23.6	2.4	0.35

II- Effect of weed control treatments:

Data in Table 5 showed that all weed control treatments exerted a significant influence on yield and its component in both seasons except spike length and grain weight/ spike in second season. Brominal plus Topik increased number of spikes/m² by 352 and 270.7 compared with weedy check (255.7 and 212.8), respectively, in both seasons. The highest wheat grain yield (ard./fed.) was obtained by application hand weeding twice and Brominal plus Topik by 11.4, 10.3, 12.1 and 11.7 ard./fed. compared with weedy check (6.5 and 7.7 ard./fed.), respectively, in both seasons. The highest wheat straw yield (ton/fed.) was obtained by application Brominal plus Topik and hand weeding twice by 5.5, 5.2, 5.4 and 5.0 ton/fed. compared with weedy check (4.9 and 4.9 ton/fed.), respectively, in both seasons. That may be attributed to the role of weed control methods in providing wheat plants with better growth conditions in absence of weed competition at critical growth stages. Appleby *et al.* (1976) indicated that weed control decreases the removal of nutrients from soil by weeds, thus stimulating crop growth, and that depends on the competitive ability of the crop species which is determined by time of emergence, rate of growth and ability to obtain growth requirements. Similar findings were reported by Thompson and Thill (1992).

Table 5: Effect of weed control treatments on yield and yield component in 2004/05 and 2005/06 seasons.

Weed control treatments	2004/05 season									
	Plant height (cm)	spike length (cm)	spikelets / spike	No of grains/ spike	grain weight /spike	spike weight	1000- grain weight	No of spikes / m ²	grain yield (ard./fed)	straw yield (ton./fed)
1. Brominal + Topik	98.0	9.6	20.5	39.7	2.0	2.9	36.8	352.0	11.4	5.5
2. Hand weeding	102.8	10.4	21.0	42.7	2.2	3.1	37.6	310.2	10.3	5.2
3. Untreated	94.0	8.4	18.2	32.8	1.4	2.3	35.4	255.7	6.5	4.9
L.S.D _{0.05}	2.0	0.5	1.3	2.0	0.2	0.2	1.3	13.6	0.7	0.30
2005/06 season										
1. Brominal + Topik	85.9	9.0	18.4	37.9	1.5	2.5	42.0	270.7	12.1	5.4
2. Hand weeding	92.1	9.6	19.2	38.3	1.7	2.8	44.5	247.3	11.7	5.0
3. Untreated	82.8	8.4	17.8	30.9	1.4	2.3	40.6	212.8	7.7	4.9
L.S.D _{0.05}	4.3	NS	0.7	1.9	NS	0.3	2.1	12.6	1.1	0.27

III- Effect of the interaction between sowing methods and weed control treatments on annual weeds and yield and yield component:-

Data in Table 6 revealed that the interactions between sowing methods and weed control treatments were significant in second season for dry weight of narrow and total weeds (g/m²) only. The lowest values of dry weight of narrow weed (g/m²) were recorded by Herati or Afir in ridges with application of Brominal plus Topik and Afir in ridges with hand weeding twice by 99.5, 99.5 and 99.4%, respectively, compared to Afir broadcast with untreated treatment. For dry weight of total (g/m²), the interactions between Afir drill with hand weeding twice and Afir in ridges with Brominal plus Topik gave the highest values by 99.6 and 99.6% compared to Afir broadcast with untreated treatment. These results are in agreement with those of Thomas and Doll (1993) who concluded that combination of cultural methods with herbicide application gave more efficient weed control than the use of each method alone.

All interactions between sowing methods and weed control treatments had no significant effects on yield and its component in both seasons except number of spikes/m² in both seasons, wheat grain yield (ard./fed.) and straw yield (ton./fed) in first season. Interaction between Herati and Brominal plus Topik gave the highest value of number of spikes/m² (378.7) compared with Herati method and untreated treatment (233.3) in first season. In second season, interaction between Afir broadcast method and Brominal plus Topik gave the highest value of number of spikes/m² (314.0) compared with Afir in ridges methods and untreated treatment (164.0). For grain yield (ard./fed.), the highest values were obtained from Afir drill with Brominal plus Topik and hand weeding twice and Herati method with Brominal plus Topik by 13.3, 12.1 and 11.9 ard./fed, respectively, in 2004/2005 season compared with Afir broadcast and weedy check (3.7 ard./fed.). In first season, straw yield (ton./fed), the highest values were obtained from Herati with Brominal plus Topik (6.0 ton./fed) compared with

Afir broadcast and hand weeding twice (4.4 ton./fed). These results are in agreement with those of Grey *et al.*(1993) and Thomas and Doll (1993)

Table (6): Effect of the interaction between sowing methods and weed control treatments on dry weight of annual weeds (g/m²), yield and yield component in 2004/05 and 2005/06 seasons

Treatments		2004 / 05 season			2005 / 06 season		
		No. of spikes/m ²	Grain yield ard/ fed.	Straw yield (ton/fed)	Narrow weeds	Total weeds	No. of spikes/ m ²
Hera ti	Brominal+topic	378.7	11.9	6.0	4.4	6.3	250.0
	H.W.twice	296.0	11.7	5.5	5.9	12.8	274.7
	Untreated	233.3	10.3	4.7	667.6	926.7	224.7
Afir drill	Brominal+topic	313.3	13.3	5.7	11.5	11.5	277.3
	H.W.twice	280.0	12.1	5.7	5.2	5.2	230.7
	Untreated	252.0	4.9	5.0	687.2	1003.7	245.3
in ridg	Brominal+topic	345.3	10.9	5.3	4.4	5.4	240.7
	H.W.twice	362.0	10.1	5.0	5.4	19.0	208.0
	Untreated	263.3	6.9	5.0	838.4	1137.8	164.0
broa d -	Brominal+topic	370.7	9.6	5.1	16.0	22.0	314.0
	H.W.twice	302.7	7.1	4.4	7.1	17.8	276.0
	Untreated	274.0	3.7	5.0	913.6	1234.9	217.3
L.S.D _{0.05}		27.1	1.4	0.59	82.6	75.8	25.1

Correlation analysis:-

The results in Table (7) indicated that grain yield /fed. was positively and significantly correlated with plant height (cm), spike length (cm.), number of spikelets/spike, number of grains/spike, grain weight/spike, 1000-grain weight, number of spikes/m², spike weight and straw yield (ton./fed). Moreover, it was negatively highly significantly correlated with broad, narrow and total dry weight of weeds in 2004 / 05 season. In 2005 / 06 season, grain yield /fed. was positively and significantly correlated with number of grains/spike, number of spikes/m² and straw yield (ton./fed)only. Also, it was negatively highly significantly correlated with broad, narrow and total dry weight of weeds

Table (7): Correlation coefficients among grain yield and yield attributes and of wheat in 2004/05 and 2005 / 06 seasons.

Characters	Broad weed	Narrow weed	Total weed	Plant height	Spike length	No of spikelets /spike	No of grains / spike	grain weight /spike	spike weight	1000-grain weight	No of spikes / m ²	straw yield (ton./fed)
2004 / 05 season												
Grain yield (ard./fed.)	-0.67**	-0.72**	-0.71**	0.46**	0.49**	0.48**	0.52**	0.48**	0.54**	0.34*	0.39*	0.65*
2005 / 06 season												
Grain yield (ard./fed.)	-0.56**	-0.59**	-0.58**	-0.07NS	-0.12NS	-0.03NS	0.56**	-0.05NS	-0.03NS	0.002NS	0.52**	0.61*

Economic analysis:

In Table (8) show that the total cost, which calculated as 2135 L.E./fed fixed cost (land preparation, sowing, post sowing activities, fertilization, irrigation, insect control, harvesting and rental per fedden) and random cost weed control about 54 L.E./fed for one hand weeding. The average of gross income for the fedden of wheat yield ranged from about 2285.63 L.E. to about 3942.25 L.E. with interaction between afir in ridges and untreated and with interaction between herati method and Brominal + topic herbicide as lower and higher values. The average of gross margin of wheat yield/fed. reached about 1512.25 L.E./fed. with using herati method and Brominal + topic herbicide. While, the lowest values with using afir in ridges and untreated about 80.63 L.E./fed. The average benefit/cost ratio for wheat yield/fed. reached about 1.62 with applying herati or afir drill methods and Brominal + topic herbicide and 1.04 with interaction between afir in ridges and untreated. Also the trend of profitability is the same.

Table (8): Effect of the interaction between sowing methods and weed control treatments on wheat yield and economic analysis in 2004/ 05 and 2005/ 06 seasons

Treatments		Grain Yield (ard/fed)	Straw yield (ton/fed)	Total Cost L.E	Gross Income L.E	Gross Margin L.E	B/C	profitability
Herati	Brominal+topic	14.1	5.8	2430	3942.25	1512.25	1.62	62.2
	H.W.twice	13.9	5.3	2348	3778.63	1430.63	1.61	60.9
	Untreated	10.4	4.8	2240	3056.51	816.51	1.36	36.5
Afir Drill	Brominal+topic	13.4	5.7	2355	3807.00	1452.00	1.62	61.7
	H.W.twice	12.4	5.6	2273	3596.37	1323.37	1.58	58.2
	Untreated	6.9	4.9	2165	2511.49	346.49	1.16	16.0
Afir in ridges	Brominal+topic	9.5	5.3	2395	3029.25	634.25	1.26	26.5
	H.W.twice	9.3	4.7	2313	2841.12	528.12	1.23	22.8
	Untreated	5.7	4.8	2205	2285.63	80.63	1.04	3.7
Afir Broad cast	Brominal+topic	10.1	5.2	2225	3104.87	879.87	1.40	39.5
	H.W.twice	8.4	4.7	2243	2702.00	459.00	1.20	20.5
	Untreated	5.6	5.0	2135	2315.75	180.75	1.08	8.5

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تأثير طرق الزراعة و معاملات مقاومة الحشائش على المحصول ومكوناته في القمح

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أقيمت تجربتان حقليةتان بمحطة البحوث الزراعية بشندويل محافظة سوهاج خلال موسمي الزراعة ٢٠٠٥/٢٠٠٤ و ٢٠٠٦/٢٠٠٥ لدراسة تأثير أربع طرق زراعة (عفير بدار، عفير تسطير، حراتي وعفير في خطوط) وثلاث معاملات مقاومة حشائش (برومينال + توبيك ، نقاوة يدوية مرتين وبدون معاملة) على النمو و المحصول و مكوناته في صنف القمح جيزة ١٦٨. استخدم تصميم القطع المنشقة مرة واحدة مع ثلاث مكررات. لقد أشارت النتائج إلى أن تأثير طرق الزراعة كان غير معنوي على الوزن الجاف للحشائش الحولية في الموسمين فيما عدا الحشائش الضيقة و الكلية في الموسم الثاني حيث خفضت طريقتي الزراعة الحراتي والتسطير الوزن الجاف للحشائش الضيقة والكلية بمقدار ٢٧,٦ ، ٢٤,٩ ، ٢٥,٨ و ٢٠,٠% على التوالي في الموسم الثاني مقارنة بطريقة الزراعة البدار.

أثرت معاملات الحشائش تأثيرا معنويا على الوزن الجاف للحشائش الحولية في الموسمين مقارنة بمعاملة الكنترول حيث خفضت معاملة النقاوة اليدوية مرتين و البرومينال مع التوبيك الوزن الجاف للحشائش الحولية العريضة والضيقة والكلية بمقدار (٩٢,٩ ، ٩٤,٨ ، ٩١,٤ ، ٩٣,١) و (٩٣,٠ ، ٩١,٩) % على التوالي في الموسم الأول وبمقدار (٩٩,٣ ، ٩٤,٨ ، ٩٨,٨ ، ٩٩,٢) و (٩٨,٧ ، ٩٨,٩) % على التوالي في الموسم الثاني مقارنة بمعاملة الكنترول.

أثرت طرق الزراعة تأثيرا معنويا على المحصول ومكوناته في الموسمين فيما عدا ، طول النبات ، طول السنبل و وزن القش (طن/ فدان) في الموسم الثاني وعدد السنابل / م^٢ ومحصول الحبوب أردب/ فدان في الموسمين. وكانت أعلى قيم لمحصول الحبوب أردب/ فدان أمكن تحقيقها من طريقة الزراعة الحراتي بمقدار ١١,٤ ، ١٠,٣ ، ١٢,١ و ١١,٧ أردب/ فدان مقارنة بطريقتي الزراعة عفير بدار وعفير على خطوط بمقدار ٦,٨ و ٧,٠ أردب على التوالي في الموسمين.

أثرت جميع معاملات الحشائش تأثيرا معنويا على المحصول ومكوناته في الموسمين فيما عدا طول السنبل ووزن السنبل في الموسم الثاني. وكانت أعلى القيم لمحصول الحبوب أردب/ فدان عند استخدام النقاوة اليدوية مرتين و البرومينال مع التوبيك بمقدار ١٤,٣ و ١٢,١ أردب/ فدان مقارنة بمعاملة الكنترول (٦,٥ و ٧,٧ أردب/ فدان) على التوالي في الموسمين. وكان التفاعل بين طرق الزراعة ومعاملات مقاومة الحشائش غير معنوي لجميع الصفات تحت الدراسة في الموسمين فيما عدا الوزن الجاف للحشائش الضيقة والكلية (جم/م^٢) في الموسم الثاني ، عدد السنابل /م^٢ في الموسمين ومحصول الحبوب (أردب/ فدان) في الموسم الأول. نستنتج من هذه الدراسة، استخدام طريقتي الزراعة الحراتي أو العفير مع النقاوة اليدوية مرتين أو مبيد البرومينال + التوبيك تخفض انتشار الحشائش و تزيد من محصول القمح.

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