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Influence of Some Weed Control Treatments on The Yield and Quality of Cotton (*Gossypium barbadense* L.)

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ABSTRACT

Two field experiments were conducted during two successive summer seasons of 2018 and 2019 cotton crop (*Gossypium barbadense L.*) Giza 94 was planted. Eigh treatments + control were evaluated to demonstrate the effect of herbicides on the density of weeds and the morphological characteristics of weeds and cotton. Moreover, all weed control significantly decreased weeds parameters and increased yield components in both seasons. Also, gave ahighly significant increase in seed cotton yield (Kantar/Fadden). The highest values were obtained with stomp ®+ hand howing (45 DAP) and hand hoeing twice (30, 45 DAP) during two seasons (12.32a, 11.62a) and (11.9 a, 10.9 ab). From obtainingresults the highest effect on fresh and dry weight weeds decreased with the stomp ®+ hand howing (45 DAP) and hand howingtwice (30, 45 DAP). These practices gave the highest reduction in weeds density and increased cotton.

INTRODUCTION

Cotton (*Gossypium barbadense L.*) is the most important cash crop in Egypt and the world but it is also a source of many elements of daily use. During 2018-2019 The cultivated area was 336 thousand acres of long-staple cotton greater than 220 thousand acres in 2017.While the average yield per acre of cotton Giza (94) Haya was 10.71 k / f. according to the Central Agency for Public Mobilization and Statistics issued the quarterly bulletin for cotton the fourth quarter (June / August) for the 2018/2019 agricultural season. Cotton is used in many industries and provides rawmaterial for fiber, clothing, vegetable oils, and animal feed. Moreover, the crop residue of cotton plants can be used as fertilizer; Cotton was grown in the Indus Valley in Pakistan for more than 3000 BC (Iqbal, Reddy, El-Zik, & Pepper, 2001)**.** Cotton is a crop that is attacked by hundreds of pests such as viruses, pathogens, insect pests, and weeds which together can cause a yield loss of more than 80% in this crop (Oerke, 2006)**.** Weeding can severely reduce cotton yield and can negatively affect staple quality. (Capinera, 2005) found that weeds are an important plant resource for insects, although feeding by insects on weeds can have both positive and negative effects on crop productivity. Weeds also indirectly affect crops via their influence on beneficial insects,

and by harboring plant and insect diseases.Whereas, many cotton grasses create difficulty in harvesting the crop.Therefore, this research was necessary to:

1- Finding new research methods to find out the best and easiest ways to control weeds, to determinethe most appropriate mechanical and chemical treatments to control weeds in the cotton crop, and to classify the weeds associated with the crop under experimental conditions.
2- Increasing the productivity and quality of the cotton crop by eliminating weeds and thus increasing the efficiency of added fertilizers and irrigation water and reducing production costs by reducing the use of manpower by using alternative methods.

MATERIALS AND METHODS

Experimental Design:

During the two successive summer seasons of 2018 and 2019 cotton crop (*Gossypium barbadense L.*) Giza 94 was planted. The experiments were conducted at Sakha Agricultural Research Station, Kafer El-Sheikh Governorate. The data on weather conditions during the two seasons is furnished in Table 1 (A). The chemical and physical analyses of the experimental soil are presented in Table1 (B). Datasheet of the herbiciedes showed in Table 1(c). The local seed cotton was planted on May 3rd, and 5th, respectively, during the two seasons of this study. The experimental unit consisted of five rows, 0 .7 m wide and 6.00 m long, making an area of 21 m^2. Hills were at 25 cm apart and contained whole cold-stored locally produced cotton seeds. Each plot contained 120 plants per plot. Harvesting was accomplished 180 days from planting in both years. Each experiment soil was fertilized with organic manure (20m^3 / faddan); phosphorus fertilizer (calcium super phosphate 15% P_2O_5) was applied once in 30 unit P_2O_5 /faddan during planting. Nitrogen fertilizer was added in 60 N units/faddan on tow equal doses, the first one was added at planting in the form of ammonium sulphate 33% N, the other two doses were added 45 and 60 days after planting in the farm of urea 48% N, and potassium fertilizer (potassium sulphate 48%) was added in 50kg / faddan. All other agricultural practices for cotton production were carried out as common in this area.

Table1 (A) Air temperature and relative humidity during the two summer seasons of 2018 and 2019 according to Sakha Research Station.

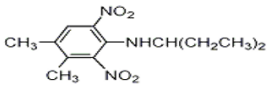
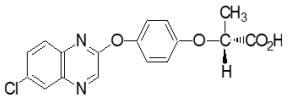
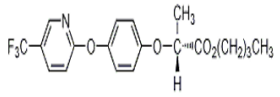
Month	Air Temperature		Relative Humidity	
	Max.	Min.	7:30	13:30
2018 summer season				
May	33.2	24.3	76.2	44.2
June	32.6	25.5	75.0	48.7
Juley	34.5	25.4	82.4	51.4
Agues	33.5	25.0	51.9	81.7
September	32.5	22.4	86.5	49.9
October	29.2	19.9	81.3	47.4
2019 summer season				
May	34.7	27.6	73.5	35.3
June	33.9	28.6	83.1	52.5
Juley	33.6	27.8	87.3	53.7
Agues	34.4	29.2	85.2	54.2
September	32.0	27.9	81.8	51.3
October	26.6	26.0	87.4	61.5

Table1 (B): Mechanical and chemical properties of the experimental soil at (30 cm) depth in2018 and 2019 seasons.

Characteristics	2018 season	2019 season
Physical Properties		
Clay %	49.24	50.93
Silt %	31.93	32.63
Sand %	19.83	16.44
Soil texture	Clay	Clay
Chemical Properties		
PH	8.14	8.11
EC (dSm^{-1})	2.90	3.20
$CaCO_{3\%}$	26.33	25.93
Organic matter %	0.53	0.55
Total nitrogen%	0.034	0.03
Soluble cations meq/100 g soil		
Ca^{++}	3.34	3.50
Mg^{++}	3.80	4.46
Na^{++}	7.66	8.00
K^{+}	0.44	0.66
Soluble anions meq/100 g soil		
HCO^{-}_{3}	6.83	7.50
Cl^{-}	6.60	7.46
SO^{--}_{4}	0.33	0.42

(Jackson, 1958). Soil Chemical Analysis Prentice-Hall Private, Ltd., New York.

Table 1(C): Tade name of herbicides, common name, chemical name, chemical structure, and mode of action

Trade name	Common name	Chemical name	Chemical formula	Mode of action
Stomp®	pendimethalin	*N*-(1-ethylpropyl)-3,4-dimethyl-2,6-dinitrobenzenamine		Selective herbicide, absorbed by the roots and leaves. Affected plants die shortly after germination or following emergence from the soil.
Pantera®	quizalofop-P	(*R*)-2-[4-[(6-chloro-2-quinoxalinyl) oxy] Phenoxy] propanoic acid		A systemic herbicide, absorbed from the leaf surface, with translocation throughout the plant, moving in both the xylem and phloem, and accumulating in the meristematic tissue.
Fusilade forty®	fluazifop-P-butyl	(*R*)-2-[4-[[5-(trifluoromethyl)-2-pyridinyl] oxy] phenoxy] propanoic acid		Fluazifop-P-butyl is quickly absorbed through the leaf surface, hydrolysed to fluazifop-P and translocated through the phloem and xylem, accumulating in the rhizomes and stolons of perennial grasses and the meristems of annual and perennial grasses.

Experimental Details:

The First Experiment:

This experiment was conducted to study theeffect of weeds competition on growth yield and its components of cotton. This experiment included nine treatments as follows:

Treatments:

1. Stomp® 50%EC(1.7Lf) pre-planting (after sowing before irrigation)
2. Stomp® 50%EC(1.7Lf) pre-planting (after sowing before irrigation) + hand howing after 45days after sowing.
3. Stomp® 50%EC(1.7Lf) pre-planting (after sowing before irrigation) + Fusiladeforti®: 12.5% (1L/f) after 30 day on sowing.
4. Pantera® 4%EC at arate of 500 cm^3 after 20 days on sowing.

5. Pantera® 4%EC at arate of 500 cm^3 after 20 days on sowing + hand howing 45 days on sowing.
6. Pantera® 4%EC at rate of 500 cm2 after 20 days on sowing + Fusilade Forti®: 12.5% (1L/f) after30day on sowing.
7. Scrabble After15 days after sowing + Fusilade forti:12.5% (1L/f) after30 day on sowing.
8. Hand howing twice 30, 45 days after sowing.
9. Untreated control.

Characters Studies:

i. Weed Characters:

1- Fresh weight of weeds (g /m^2).
2- Dry weight of weeds (g /m^2).

ii. Growth Characters:-

1- Plant height (PH): It was recorded in centimeters from the first cotyledonary node to the apical bud after 120 days when plants attained their maximum height.
2- Root dry weight/plant (gm): The roots of the sample of five plants were oven-dried at 70 ℃ tell constant weight.
3- Stem dry weight/plant (gm) (SDW): The stems with their different organs for the sample of four plants were oven-dried at 70 ℃ tell constant weight.
4- Leaves dry weight (gm) (LDW): The leaves of the sample of five plants were oven-dried at 70 ℃ tell constant weight.
5- Total dry weight / plant (gm) : includes root, stem & its organs and leaves. Were oven-dried at 70 ℃ tell constant weight.
6- Number of leaves per plant: It was determined by taking the average thenumber of leaves of the sample of five guarded plant.
7- Leaf area index.
8- Specific leaf weight.

$$\text{Specific Leaf Weight} = \frac{\text{Leaf dry weight (mg.)}}{\text{Leaf area (cm}^2\text{)}}$$

This measurement benefits us to study the photosynthesis rate in several crops.

iii.Yield and Yield Component Characters :

1- Seed cotton yield / fed. In kentars (SCYK /fed.): (one kentar seed cotton = 157.5 kg). It was determined from the total yield of the three central rows of each sub-plot.
2- seed cotton yield (gm), per plant (SCY / P): It was estimated by dividing the total yield collected from a sample of five guarded plants by their number.
3- Lint cotton yield / fed. In kentars (LCYK / fed.): one kentar lint cotton= 50 kg.
4- Lint cotton yield (gm.)/plant (L.C.Y./P.): The total yield collected from the five guarded plants after gining and dividing on their number of plants.
5- Lint percentage (L%): It was estimated as follows:

$$G.O.T\% = \frac{\text{Weight of lint sample}}{\text{Weight of seed cotton in the same sample}} \text{ X } 100.$$

6- Lint index grams (L.I. gm.): Estimated as the weight of lint born on 100 seeds in grams. It was calculated according to the formula.

$$\text{Lint index} = \frac{\text{Lint percentage \% x seed index}}{100 - \text{lint percentage}}$$

7- Boll weight grams (seed cotton wieght/B)SCW / B: It was calculated by dividing the average weight of seed cotton of 50 balls thatwere randomly harvested from each subplot.

8. Number of bolls/plant (No.B./P.). : was estimated by taking the average open bolls produced of five guarded plants at picking time.

$$\text{Number of bolls/plant} = \frac{\text{Seed cotton yield / plant}}{\text{Average of boll weight}}$$

Statistical Analysis:

The data were subjectedtoan analysis of variance using costatstatistic program according to(Snedecor & Cochran, 1990). The differences between the different treatments were tested using Duncans' Multiple Range methodoutlined by(Leclerg, (1962.)).

RESULTS AND DISCUSSION

Most of the broad leave and grassy weeds that found in the experimental field *physalisperuviana, ammaniaegyptica,corchorusolitorius*, *xanthium strumarium,* and *Dinebraretroflexa* were effected by all treatments during season 2018 and 2019

Efficacy of Herbicides on the Fresh and Dry Weight of Weeds:

The results obtained in Tables 2 and 3 significantly reduced the weed populations after using herbicides during thetwo seasons of 2018 and 2019. The results displayed the effect of different treatment against fresh and dry weed biomass. During season 2018, fresh and dry weight for physalisperuviana and ammaniaaegyptica were calculated after 50 and 70 days of planting to determine the effect of herbicide. There were significant differences between all treatments compared with untreated control. According to physalisperuviana the highest decreasein the fresh weight achieved after 30 and 45 days by stomp® + hand howing (126.36 h) followed by hand howingtowice (139.5 g). After 70 days from planting the highest decreased value of fresh weight biomass recorded by stomp® + hand howing (383.75 i) and hand howingtowice (425 h). On the other hand, when recorded the fresh weight biomass for ammaniaaegyptica the results explained significantly decreased after all treatments. While the highest effect on fresh weight biomass wasachieved by stomp® + hand howing(38.5 d and130.5 F) after 50 and 70 days, respectively. on the other hand the highest fresh weight of corchorusolitoriusachieved by stomp® + hand howing (39.5 c and 172.5) after 50 and 70 days, respectively. While the least effect wasrecorded by Stomp® (83.25 b and 416.25) after 50 and 70 days, respectively. During seeason 2018, the fresh weight of grassy weed was recorded whereas, the obtained results clear that the highest value for xanthium wasestablished by stomp® + hand howing (62.75 e and 215 e) after 50 and 70 days respectively. The results were repeated with Dinebraretroflre whereas, the fresh weight recorded 208 g and 420 b after 50 and 70 days, respectively.

During the second season of2019, the highest value of thefreshweight of broad-leaved weeds recorded 116.35 h and 373.75 I after 50 and 70 days for physalisperuviana By stomp and hand howing and twice hand howing (30and 45DAP), respectively. After 50 and 70 days the results for thefreshweight of broad-leaved weeds for *Ammania egyptica,Corchoruso litorius, Xanthium strumarium,* and *Dinebra retroflexa* were repeated according to stomp and hand howing and twice hand howing (30and 45DAP) by stomp and hand howing and twice hand howing (30and 45DAP).

Table 2: Effect of weed control treatments on fresh weight of broad-leaved and grasses during 2018 and 2019 seasons.

Treatment	rate/ fed.	2018									
		F. w of broad-leaved weeds								F. w of grassy weeds	
		Physalis peruviana		*Ammani aegyptica*		*Corchoruso litorius*		*Xanthium stramonium*		*Dinebra retroflexa*	
		50 DAP	70 DAP	50 DAP**	70 DAP	50 DAP	70 DAP	50 DAP	70 DAP	50 DAP	70 DAP
stomp®	1.7 L	307.28 b*	955.25 b	81.25 b	310.25 b	83.25 b	416.25 b	141.5 b	325 b	503.5 b	645 b
Stomp® + Hand Howing (45 DAP)	1.7 L	126.36 h	383.75 i	38.5 d	130.5 F	39.5 c	172.5 e	62.75 e	215 e	208 g	420 b
Stomp® + Fuzelade®	1.7 L + 1.4 L	244.25 e	763.75 e	67 c	251.25 c	68.75 b	335 d	114.75 d	220 de	215.25 fg	450 b
Pantira®	500 L	294.5 c	917.5 c	78.5 bc	299 b	80.5 b	400 bc	136 bc	320.5 bc	383.25 c	517.5 b
Pantira® + Hand Howing (45 DAP)	500 L	157.75 F	487. f	47 d	166.5 d	48.25 c	221.25 e	78.5 e	277.5 bcd	266 d	555 b
Pantira® + Fuzelade®	500L+1.4L	251 d	801.25 d	69.75 bc	262.75 c	71.75 b	351.25 cd	120 cd	240 de	269 d	557.5 b
Scrabble + Fuzilade®	1.4 L	152.5 f	463.75 g	44.25 d	154.25de	45.25 c	205 e	73.25 e	255 cde	247.75 e	515 b
Hand Howingtowice (30, 45 DAP)		139.5 g	425 h	41.25 d	143.25 ef	42.25 c	188.75 e	67.5 e	235 de	225.5 f	470 b
Control		1195.25 a	3785 a	295 a	1216.25a a aa	303.75 a	1635 a	535 a	1810 a	1985 a	3210 a
LSD at 5%		6.57	14.61	14.18	14.03	14.9	64.55	17.91	61.07	13.03	283.35
2019											
Stomp®		297.26 b*	945.25 b	71.25 b	300.25b b	73.25 b	406.25 b	131.5 b	231.5 b	493.5 b	635 b
Stomp® + Hand Howing (45 DAP)		116.35 h	373.75 i	28.5 c	120.5 f	29.5 c	162.5 e	52.75 e	152.75 e	198 g	310 d
Stomp® + Fuzelade®		234.25 e	753.75 e	57 c	241.25 c	58.75 n	325 d	104.75 d	204.75 d	205.25 fg	340 d
Pantira®		284.5 c	907.5 c	68.5 bc	289 b	70.5 b	390 bc	74 bc	26 bc	473.25 c	707.5 b
Pantira® + Hand Howing (45 DAP)		147.75 f	477 f	37 d	156.5 d	38.25 c	211.25 e	68.5 e	168.5 e	256 d	445 bcd
Pantira® + Fuzelade®		241 d	791.25 d	59.75 bc	252.75 c	61.75 b	341.25 cd	90 cd	10 cd	259 d	447.5 bcd
Scrabble + Fuzilade®		142.5 f	453.75 g	34.25 d	144.25 de	35.25 c	195 e	63.25 e	163.25 e	237.75 e	405 cd
Hand Howingtowice (30, 45 DAP)		129.5 g	415 h	31.25 d	133.25ef ef	32.25 c	178 e	57.5 e	157.5 e	215.5 f	360 cd
Control		1185.25 a	3775 a	285 a	120.5 a	293.75 a	1625 a	325 a	425 a	1975 a	3100 a
LSD at 5%	6.57	14.61	14.18	14.03	14.9	64.55	17.91	17.91	13.03	283.35	

*Means followed by the same letter(s) in each column are not significantly different at P ≤ 0.05 level.
**DAP= Days After Planting

Table 3: Effect of weed control treatments on dray weight of broad-leaved, grasses during 2018 and 2019 seasons.

Treatment	Rate/Fed.	2018									
		D. w of broad-leave weeds									
		Physalis peruviana		*Ammani aegyptica*		*Corchoruso litorius*		*Xanthium Stramonium*		*Dinebra retroflexa*	
		50 DAP	70 DAP	50 DAP**	70 DAP	50 DAP	70 DAP	50 DAP	70 DAP	50 DAP	70 DAP
Stomp®	1.7 L	59.72 b*	228 b	19.25 b	46.25 b	18.12 b	54.68 b	24.60 b	35.75 b	59.35 b	46.5 b
Stomp® + Hand Howing (45 DAP)	1.7 L	31 f	97.25 f	13.75 b	24.5 d	13.25 d	27.87 e	15.96 e	23.65 e	29.8 g	42 b
Stomp® + Fuzelade®	1.7 L + 1.4 L	50.5 c	185 c	17.5 b	39 bc	16.5 bcd	45.75 d	21.41 d	24.2 de	30.52 fg	45 b
Pantira®	500 L	58.45 b	219.5 b	19 b	44.75 b	17.75 b	52.9 bc	24.08 bc	33.27 bc	57.32 c	51.75 b
Pantira® + Hand Howing (45 DAP)	500 L	35.75 d	221.75 d	14.75 b	48.75 cd	14.75 cd	33.23 e	17.61 e	30.52 bcd	35.6 d	55.5 b
Pantira® + Fuzelade®	500L+1.4L	52.25 c	193.75 c	17.75 b	40.5 b	16.75 bc	47.53 cd	22.18 cd	26.4 de	35.9 d	55.75 b
Scrabble + Fuzilade®	1.4 L	34.25 de	116.25 de	14.5 b	27.25 d	13.87 cd	31.45 e	17.12 e	28.05 cde	33.77 e	51.5 b
Hand Howingtowice (30, 45 DAP)		32.5 f	105 ef	14 b	26 d	13.5 cd	29.66 e	1657 e	25.85 de	31.55 f	47 b
Control		209 a	885 a	47.5 a	155 a	42.62 a	18.75 a	66.1 a	199.1 a	207.5 a	321 a
LSD at 5%		2.23	12.97	5.69	10.26	3.46	7.1	1.91	6.71	1.3	28.33
2019											
Stomp®	1.7 L	49.72 b*	219 b	7.12 b	36.25 b	14.46 b	23.15 b	123.25 b	44.68 b	49.35 b	63.5 bc
Stomp® + Hand Howing (45 DAP)	1.7 L	21.75 e	88.25 e	2.85 d	14.5 d	5.80 e	15.27 e	79.5 c	17.87 e	19.8 g	31 d
Stomp® + Fuzelade®	1.7 L + 1.4 L	40 c	176.25 c	5.7 c	29 bc	11.52 d	20.47 d	108.75 b	35.75 d	20.52 fg	34 d
Pantira®	500 L	48.47 b	208.75 b	6.85 bc	34.75 b	13.86 bc	22.6 bc	120.5 b	42.9 bc	47.32 c	70.75 b
Pantira® + Hand Howing (45 DAP)	500 L	25.5 d	111.25 d	3.7 d	18.75 cd	7.53 e	16.85 e	88.25 c	23,23 e	25.6 d	44.5 bcd
Pantira® + Fuzelade®	500L+ 1.4L	42.35 c	186.25 c	5.97 bc	30.5 b	12.1 cd	21 cd	111.75 b	37.53 cd	25.9 d	44.75 bcd
Scrabble + Fuzilade®	1.4 L	23.75 de	108.75 d	3.42 d	17.25 d	6.95 e	16.32 e	85.25 c	41.45 e	23.77 e	40.5 cd
Hand Howingtowice (30, 45 DAP)		22.25 e	94.5 e	3.12 d	16 d	6.32 e	15.75 e	82.25 c	19.66 e	21.55 f	36 cd
Control		198.75 a	863.5 a	28.5 a	145 a	57.75 a	62.5 a	343.75 a	178.75 a	197.5 a	310 a
LSD at 5%		2.47	12.1	1.41	10.26	1.97	1.79	14.9	7.1	1.3	28.33

***Means followed by the same letter(s) in each column are not significantly different at P ≤ 0.05 level.**
****DAP= Days After Planting**

Effect of Treatments on the Dry Weight of Broad Leave and Grassy Weeds During Season 2018 and 2019:

Results showed in table 3 clear that the dry weight of weeds was affected by all treatments after 50 and 70 days from application. The highest values of dry weight recorded by stomp® + hand howing (45 DAP) and hand howingtowice (30, 45 DAP) for *physalisperuviana*,*ammaniaegyptica*, *corchorusolitorius*, *xanthium strumarium*, and *Dinebraretroflexa*after 50 and 70 days, respectively.Whereas, the same trend of effect against broad and grassy weeds were repeated during the second season 2019.The obtained results illustrated in table 4 showed that the effect of all treatments on the total fresh weight of weeds. While the highest value of thetotal fresh weight of weeds during the first season

wasachieved by stomp (1116.75b and 2651.75) after 50 70 days, respectively. on the other hand, the lowest value accrued by stomp® + hand howing (45 DAP) after 50 and 70 days (448.12 g and 1321.75 f).during the second season, the same trend achieved by all treatment when recorded the total fresh weight of weeds.The results showed in table 5 indicated that the effect of treatments on the total dry weight of weeds during two seasons. During the first season the highest effect on the total dry weight accured by stomp® + hand howing (45 DAP) (103.77 d and 215.3 f) followed by hand howingtowice (30, 45 DAP) (108.1 d and 233.54 ef) after 50 and 70 days from application.

Table 4: Effect of weed control treatments on total freash weight of broad-leaved , grasses during 2018 and 2019 seasons

Treatment	Rate/Fed.	2018					
		T.F.W of broad leave weeds		F.W of grassy weeds		T.F. W	
		50 DAP	70 DAP	50 DAP**	70 DAP	50 DAP	70 DAP
Stomp®	1.7 L	613.25 b*	2006.75 b	503.5 b	645 b	1116.75 b	2651.75 b
Stomp® + Hand Howing (45 DAP)	1.7 L	240.12 e	901.75 f	208 g	420 b	448.12 g	1321.75 f
Stomp® + Fuzelade®	1.7 L + 1.4 L	494.75 c	1570 c	215.25 fg	450 b	710 d	2020 d
Pantira	500 L	589.5 b	1919 b	383.25 c	517.5 b	972.75 b	2436.5 bc
Pantira® + Hand Howing (45 DAP)	500 L	311.5 d	1152.25 d	266 d	555 b	577.5 e	1707.25 e
Pantira® + Fuzelade®	500L+1.4L	512.5 c	1655.25 c	269 d	557.5 b	781.5 c	2212.75 cd
Scrabble + Fuzilade®	1.4 L	315.25 de	1078 de	247.75 e	515 b	563 ef	1593 ef
Hand Howingtowice (30, 45 DAP)		290.5 de	992 ef	225.5 f	470 b	516 fg	1462 ef
Control		2369 a	8446.25 a	1985 a	3210 a	4354 a	11656.25 a
LSD at 5%		61.18	152.93	13.03	283.35	73.009	384.33
		2019					
Stomp®	1.7 L	516.8 b*	2341 b	493.5 b	635 b	1010.3 b	2976 b
Stomp® + Hand Howing (45 DAP)	1.7 L	294.12 e	931.25 e	198 g	310 d	492.12 g	1241.25 e
Stomp® + Fuzelade®	1.7 L + 1.4 L	438.5 b	1870.5 d	205.25 fg	340 d	643.75 d	2210.5 d
Pantira®	500 L	500.5b	2248.5 bc	473.25 c	707.5 b	973.75 b	2956 bc
Pantira® + Hand Howing (45 DAP)	500 L	333.75 d	1203.5 e	256 d	445 bcd	589.75 e	1648.5 e
Pantira® + Fuzelade®	500L+ 1.4L	448.5 c	1962 cd	259 d	447.5 bcd	707.5 c	2409.5 cd
Scrabble + Fuzilade®	1.4 L	326 de	11625.75 e	237.75 e	405 cd	563.75 ef	12030.75 e
Hand Howingtowice (30, 45 DAP)		308.5 de	1029 e	215.5 f	360 cd	524 fg	1389 e
Control		2693.5 a	9361.25 a	1975 a	3100 a	4668.5 a	12461.25 a
LSD at 5%		61.18	311.2	13.03	283.35	73.009	575.04

*Means followed by the same letter(s) in each column are not significantly different at P ≤ 0.05 level.
**DAP= Days After Planting

Table 5: Effect of weed control treatments on total dray weight of broad-leaved, grasses during 2018 and 2019 seasons

Treatment	rate/fed.	2018					
		T.D. W of broad leave weeds		D.W of grassy weeds		T.D. W	
		50 DAP	70 DAP	50	70 DAP	50 DAP	70 DAP
Stomp®	1.7 L	121.7 b*	364.7 b	59.35 b	46.5 b	181.05 b	411.2 b
Stomp® + Hand Howing (45 DAP)	1.7 L	73.97 d	173.3 e	29.8 g	42 b	103.77 d	215.3 f
Stomp® + Fuzelade®	1.7 L + 1.4 L	105.67 c	293.98 c	30.52 fg	45 b	136.19 c	338.98 d
Pantira®	500 L	119.27 b	350.43 b	57.32 c	51.75 b	176.59 b	402.18 bc
Pantira® + Hand Howing (45 DAP)	500 L	82.35 d	214.27 d	35.6 d	55.5 b	117.95 d	269.77 e
Pantira® + Fuzelade®	500L+1.4L	108.92 bc	308.23 c	35.9 d	55.75 b	144.82 c	363.98 cd
Scrabble + Fuzilade®	1.4 L	79.75 d	203.02 de	33.77 e	51.5 b	113.52 d	254.52 ef
Hand Howingtowice (30, 45 DAP)		76.55 d	186.54 de	31.55 f	47 b	108.1 d	233.54 ef
Control		365.22 a	1427.85 a	207.5 a	321 a	572.72 a	1748.85 a
LSD at 5%		17	37.16	1.3	28.33	17.91	59.13
					2019		
Stomp®	1.7 L	88.1 b	356.33 b	49.35 b	63.5 bc	137.45 b	419.83 b
Stomp® + Hand Howing (45 DAP)	1.7 L	43.12 e	143.2 e	19.8 g	31 d	62.92 e	174.2 d
Stomp® + Fuzelade®	1.7 L + 1.4 L	72.67 d	286.22 c	20.52 fg	34 d	93.19 c	320.22 c
Pantira®	500 L	85.67 bc	340.67 b	47.32 c	70.75 b	132.99 b	411.42 b
Pantira® + Hand Howing (45 DAP)	500 L	50.3 e	182.67 d	25.6 d	44.5 bcd	75.9 d	227.17 d
Pantira® + Fuzelade®	500L+ 1.4L	76.07 cd	301.63 c	25.9 d	44.75 bcd	101.97 c	346.38 c
Scrabble + Fuzilade®	1.4 L	47.37 e	174.42 de	23.77 e	40.5 cd	71.14 de	214.92 d
Hand Howingtowice (30, 45 DAP)		44.62 e	154.94 de	21.55 f	36 cd	66.17 de	190.94 d
Control		322.37 a	1416.75 a	197.5 a	310 a	519.87 a	1726.75 a
LSD at 5%		13.19	47.07	1.3	28.33	14.13	72.21

*Means followed by the same letter(s) in each column are not significantly different at P ≤ 0.05 level.
**DAP= Days After Planting.

Effect of Herbicides on the Morphological Charecterctice of Cotton During Season 2018 and 2019:

Chlorophyll:

After 120 days from theapplication of herbicides, the chlorophyll was determined to evaluate the effect of herbicides on the cotton during season 2018 and 2019. The highest effect of treatment achieved by pantira®+ hand howing (45 DAP) (34.2 ab) followed by pantira® (35.75 ab), stomp® (35.87 ab), hand howingtowice(30, 45 DAP) (36.1 ab), scrabble + fuzilade® (37.45 a), stomp® + hand howing (45 DAP)(38.2 a), pantira® + fuzelade®(38.67 a) and stomp® + fuzelade® (38.85 a).During the second season the same trend of effect was repeated on chlorophyll.

Plant Height:

All treatments were effective on the plant height during two seasons whereas, the highest plant heightaccrued with stomp® + hand howing (45 DAP) (150 a and 209.75 a) during season 2018 and 2019 respectively. While the least effect achieved by stomp® (123.5 bc)during season 2018. On the other hand, during the second season pantira® recorded the least effect (148.25 c) on the plant height.

Plant Weight :

After using herbicdes the highest effect on the plant weight was evaluated while stomp® + hand howing (45 DAP) recorded 758.75 a followed by hand howingtowice(30, 45 DAP) 750.25 a during season 2018. When repeated the same trend during thesecond season the same results will be obtained.

Fresh Root Weight ;

Table (6) cleared that the effect of interaction between root weight of cotton with the herbicides whereas, stomp® + hand howing (45 DAP) recorded the highest weight of fresh root (42.5 a) followed by hand howingtowice(30, 45 DAP) (41.25 ab)during the first season. This result is owing to the sensitivity of weeds to stomp® + hand howingso that when repeat the same treatments during the second season we have the same effect.

Table 6: : Effect of herbicides on the morphological studies on the cotton plant during 2018 and 2019 season

2018										
Treatment	Rate / F	Chlorophyll After 120 Day	Plant Height (PH) After 120 Day	Plant(f) fresh Weight	Root (f) Fresh Weight	Root(D) (D) dry Weigh	Stem(f) Fresh Weight	Stem(D) dry Weight	Paper Surface area	Leaves dry Weight
Stomp®	1.7 L	35.87 ab*	123.5 bc	605.5 b	25.75 c	2.4 c	579.75 d	46.5 cd	17 f	28.75 f
Stomp® + Hand Howing (45	1.7 L	38.2 a	150 a	758.75 a	42.5 a	4.25 a	716.25 a	65.5 a	25.5 a	48.75 a
Stomp® + Fuzelade®	1.7 L +	38.85 a	134.25ab	718.75 a	36.25 b	3.62 b	665 abc	51.5 bc	20 cde	39.25 cd
Pantira®	500 L	35.75 ab	124.25bc	611.25b	26.25 c	2.62 c	585 cd	48.75 bc	18 ef	31.5 ef
Pantira®+ Hand Howing (45	500 L	34.2 ab	135.5 ab	725.75a	37.5 ab	3.75 ab	673.25 ab	53 b	21 bcd	41.5 bc
Pantira® + Fuzelade®	500L+	38.67 a	132.5 ab	626.25b	30 c	3 c	596.25bcd	50.75 bc	19 def	35.75 de
Scrabble + Fuzilade®	1.4 L	37.45 a	141.5 ab	727.25 a	40.75 ab	4.2 ab	687 a	55 b	22.5 bc	44.5 ab
Hand Howingtowice (30, 45 DAP)		36.1 ab	145.75 a	750.25 a	41.25 ab	4.12 ab	709 a	62 a	23.5 ab	47.75 a
Control		32.52 b	108.75 c	201.25 c	17.5 d	1.75 d	183.75 e	41.25 d	13.5 g	18.5 g
LSD at 5%		4.90	4.90	80.91	5.95	0.61	80.70	6.30	2.81	4.36
2019										
Stomp®	1.7 L	36.52 ab	145.25 c	777.5 c	30.25 d	2.15 f	747.25 c	55 e	16.3 ef	55 e
Stomp® + Hand Howing (45	1.7 L	38.37 a	209.75 a	1173.75a	57.5 a	6.5 a	1116.25 a	79 a	28.75 a	83 a
Stomp® + Fuzelade®	1.7 L +	38.77 a	154.5 c	849.75bc	35.5 bcd	3.12cde	814.25 bc	63.75 cd	19.5 de	66.5 cd
Pantira®	500 L	36.72 ab	148.25 c	797.5 c	31.25 cd	2.45 ef	766.25 c	57.75 e	17.25 e	57.5 e
Pantira®+ Hand Howing (45	500 L	34.92 ab	193.75 b	880 bc	37.25bcd	3.75bcd	842.75 bc	65.75 c	21 cd	69 bcd
Pantira® + Fuzelade®	500L+	38.37 a	150.75 c	840 bc	33.25bcd	2.7 def	806.75 bc	60.25de	18.25de	62 de
Scrabble + Fuzilade®	1.4 L	38.05 a	200 ab	912.5 bc	39.75 bc	3.55 bc	872.75 bc	72 b	23.25	71.25 bc
Hand Howingtowice (30, 45 DAP)		36.8 ab	207.5 ab	1002 ab	42 b	4.2 b	960 ab	75.75ab	26.75ab	75.25 b
Control		33.25 b	112.5 d	267 d	31.75 cd	3.17cde	235.25 d	63.75 cd	13.5 f	32.5 f
LSD at 5%		4.35	13.99	186.40	9.30	0.83	182.61	5.33	3.61	7.52

*Means followed by the same letter(s) in each column are not significantly different at P ≤ 0.05 level

Dry Root Weight :

Concerning the effect of interaction between the herbicides treatment and morphological study of cotton on dry root weight of cotton. The highest dry root weight of

cotton achieved with stomp® + hand howing (45 DAP)(4.25 a) and hand howingtowice(30, 45 DAP) (4.12 ab) during the first season .while, during the second season the same effect by the stomp® + hand howing (45 DAP)(6.5 a) was repeated.

Fresh and Dry Stem Weight:

Data presented in Table (6) indicate that the effect of different weed control on the fresh and dry stem weight of cotton during thesuccessive two seasons. Whereas, Paper surface area and Leaves weight still gives us the highest effect on the Fresh and Dry stem weigh of cotton. All treatment showed in table 6 effect on the Paper surface area and Leaves weight while the highest effect during the successive two seasons achieved by Paper surface areaand Leaves weight.

Effect of Weeding Management on the Quantity and Quality of the Cotton Number of Bolls/Plant and Boll Weight:

Table 7 shows the results for the numberof bolls/plant during season 2018.while the most remarkable result to emerge from the data is that achieved by stomp ®+ hand howing (45 DAP) (12.25a) and hand howing twice (30, 45 DAP) (11.75ab).

On the other hand the less value recorded by stomp® (7.75 d). Our study provides additional support for the weeding management on the boll weight while the highest mean value reported after using stomp ®+ hand howing (45 DAP) (3.62a) and hand howingtowice(30, 45 DAP)() The obtain results according to check the number of bolls/plant and boll weights was repeating again during season 2019. The most intriguing correlation is with the effect of pantira® + hand howing (45 DAP) (9.5 ab) and hand howingtwice(30, 45 DAP)(9.75a) on the number of bolls/plant. Boll weight estimated the highest record with stomp® + hand howing (45 DAP) (4.75 a) and hand howingtowice(30, 45 DAP) (4.02 b).

Table 7: Impact of herbicides on the number of bolls/plant, boll weight, the weight of lint cotton, the weight of 100 seeds and cotton yield during two seasons20018 and 2019

2018						
Treatment	Rate / F	Number of bolls/ plant	Boll weight (g)	Weight of lint cotton (g)	Weight of 100 seeds (g)	Cotton yield (kantar/F)
Stomp®	1.7 L	7.75 d	2.93d	108 f	7.07 g	6.15ef
Stomp ®+ Hand Howing (45 DAP)	1.7 L	12.25a	3.6 2a	287.5 a	13.45a	12.32a
Stomp® + Fuzelade®	1.7 L + 1.4 L	10.5abc	3.17bcd	162.5 d	10 d	9.2 c
Pantira®	500 L	8.75 cd	3.02 d	116.25 ef	8.02 f	7.5 de
Pantira + Hand Howing (45 DAP)	500 L	10.5abc	3.27 bc	185 c	11.22c	9.52bc
Pantira® + Fuzelade®	500L+ 1.4L	10.25bc	3.1 cd	136 e	9.07 e	8.95cd
Scrabble + Fuzilade®	1.4 L	11.25ab	3.4 ab	202.5 bc	12.27b	10.85ab
Hand Howing Twice (30, 45 DAP)		11.75ab	3.52 a	222.5 b	13.02 a	11.62a
Control		7.25 d	2.67 e	294.17 a	12.17b	5.4 f
LSD at 5%		1.95	0.24	22.35	0.44	1.51
2019						
Stomp®	1.7 L	8.25 ab	3.3 cd	112 d	5.5 g	7.77 f
Stomp® + Hand Howing (45 DAP)	1.7 L	9 ab	4.75 a	343 a	13.15 a	11.9 a
Stomp + Fuzelade®	1.7 L + 1.4 L	9.25 ab	3.35 cd	193.75bc	8.67 d	8.75 de
Pantira®	500 L	8.25 b	3.35 cd	125.5 d	6.5 f	7.85 e
Pantira® + Hand Howing (45 DAP)	500 L	9.5 ab	3.57 cd	207.5 bc	9.5 d	9.37 cd
Pantira® + Fuzelade®	500L+ 1.4L	9 ab	3.37 cd	165.02cd	7.67 e	8.32 de
Scrabble + Fuzilade®	1.4 L	9.75 a	3.62 bc	243.4 b	10.55 c	9.95 bc
Hand Howing Towice (30, 45 DAP)		9.75 a	4.02 b	303.75 a	11.52 b	10.9 ab
Control		6.25 c	3.17 d	200.37bc	12.35ab	5.32 f
LSD at 5%		1.7	1215.09	37.79	135.51	55.16

*Means followed by the same letter(s) in each column are not significantly different at $P \leq 0.05$ level.

Weight of Lint Cotton:

The analysis shows (Tables 7) confirm significant differences between all treatments and weight of lint cotton during two seasons. The estimated data showed the highest value evaluated by stomp ®+ hand howing (45 DAP) (287.5 a)andhand howingtowice(30, 45 DAP)(222.5 b)during season 2018. The same results were repeated again whereas the highest value was estimated by stomp® + hand howing (45 DAP)(343 a) and hand howingtowice(30, 45 DAP) (303.75 a) during season 2019.

Weight of 100 seeds:

The results displayed in Table 7 cleared the significant difference between all treatments on the weight of 100 seeds. The highest value of the weight of 100 seeds achieved by stomp ®+ hand howing (45 DAP) (13.45a) and hand howing twice(30, 45 DAP) (11.62a) during season 2018. While during the second season thestomp® + hand howing (45 DAP) and hand hoeing twice(30, 45 DAP)achieved (13.15 and 11.52 b).

Cotton yield:

The effect of weeding management reflected on the quantity of yield. While the highest cotton yield during the first season was estimated by stomp ®+ hand howing (45 DAP) (12.32a) and hand howing twice(30, 45 DAP) (11.62a). While during the second season the same effect by all treatments was repeated again. The best effective achieved by thestomp® + hand howing (45 DAP) (11.9 a) and hand howing twice(30, 45 DAP) (10.9 ab).

Effect of the Herbicides on the Fiber Quality:

Table 8 cleared that the results for upper half mean length (mm) , short fiber index (%) ,uniformity index (%) , strength (g.tex, elongation (%) ,micronaire value ,maturity ratio ,reflectance degree and yellowness degreeafter all treatments during second season .No differences were recorded for any treatment for all technological characteristics were estimated.

Fiber Strength estimated value by Stomp® and hand howing(45DAP) (40.72ab) and pantira® + fuzilade® (40.42abc). Whereas, fiber elongation recorded 5.05 ab and 4.77 b by pantira® + fuzilade® and pantira® respectively. Overall, only small effects were found on fiber quality Changes in micronaire score can cost producers financiallyif they are above 5.0 or below 3.4, which would result in discounted market value (Buol et al., 2019). Fiber length uniformityis a key property for manufacturing efficiency, as reductions of approximately 1.5% in fiber length uniformity arepotentially problematic.

Table 8: Effect of herbicides on some technological characteristics of cotton during season 2019.

Treatment	Rate / F	Sci	Trash (Area)	Trash (Cnt)	Leng (Uhm)	Leng (Unf)	Stre (Str)	Stre (Elg)	MIC	Color (Rd)	Color (+B)	S F I	Mat. R
Stomp®	1.7	201.5a	0.25 a	29 a	33.79 a	88.35 ab	39.9abc	4.7 b	4.43ab	75.87 a	9.1 ab	6.55 ab	0.7 b
Stomp®+ Hand Howing (45 DAP)	1.7	209.75a	0.18 a	23 a	34.20 a	76.62 b	40.72ab	4.75 b	4.50ab	77.37 a	9.07 ab	5.35 bcd	0.92ab
Stomp®+ Fuzelade®	1.7 + 1.4 L	205.75a	0.25 a	26 a	34.67 a	88.8 a	39.67abc	4.72 b	4.22 b	76.67 a	9.4 a	5.42 bcd	0.91ab
Pantira®	500 L	204.75a	0.19 a	22.75a	34.08 a	89.35 a	39.77abc	4.77 b	4.55 b	75.95 a	8.7 b	6.15abcd	0.93 a
Pantira®+ Hand Howing (45 DAP)	500 L	201.5 a	0.20 a	24.75a	33.45 a	88.77 a	39.1 ab	4.12 b	4.34ab	77.17 a	8.87 ab	5.65 bcd	0.92ab
Pantira®+ Fuzelade®	500L+1.4L	205.25a	0.19 a	28.75a	33.99 a	88.2 ab	40.42abc	5.05 ab	4.39ab	76.72 a	8.77 b	4.77 d	0.91ab
Scrabble+Fuzilade®	1.4 L	198.75a	0.23 a	26.5 a	33.69 a	88.47 a	38.92 c	4.12 b	4.39ab	76.92 a	8.97 ab	6.3 abc	0.92ab
Hand Howingtowice (30, 45 DAP)		204.5 a	0.19 a	26.5 a	33.79 a	88.2 ab	41.02 a	4.35 b	4.36ab	76.87 a	9.17 ab	7.12 a	0.93a
Control		209.75a	0.2 a	28.5 a	33.64 a	88.65 a	40.7 ab	6.02 a	4.35ab	75.37 a	9.07 ab	5.12 cd	0.9ab
LSD at 5%		11.33	0.17	15.09	1.35	11.73	1.78	1.21	0.28	2.31	0.59	1.4	0.22

Means followed by the same letter(s) in each column are not significantly different at $P \leq 0.05$ level

-U.H.M: Upper Half Mean Length (mm) -SFI: Short Fiber Index (%) -UNF: Uniformity Index (%) -Str: Strength (g.tex) -ELG: Elongation (%) -Mic:Micronaire value -MR:Maturity Ratio -Rd%: Reflectance degree -+b: yellowness degree

These our study agree with many researchers whereas, (Nabil, 1983.) estimated that the application of Stomp before planting gave the highest lint percentage, micronaire value, and oil percentage. Whereas, (El- Shaer, 1985) reported that seed cotton yield per plant and per faddan as well as the number of opened bolls per plant were increased. While, (Fayed, 1983)cleared that applying one supplementary hoeing in cotton herbicidal treatments was necessary to eliminate the weed plants which survived or escaped from the herbicides and to achieve promising weed control along the growing season of cotton plants. On the other hand, (Dilbaugh, 2009) indicated that pendimelthalin gave 82% control of broad-leaf weeds and 84.1% of the narrow leaf. Also, (Nadeem, 2013)found that to obtain maximum seed cotton yield and net returns in cotton, pendimethalin + prometryne @ 875 g ha(-1) applied to control weeds and cotton should be sown on ridges under agro-ecological conditions of Faisalabad, Pakistan. Whereas, (Usman, Khan, Khan, ur Rehman, & Ghulam, 2013) found that Broad-spectrum herbicides ×conventional tillage produced the highest number of bolls/plant, boll weight, and seed cotton yield. (Hameed, Ajum, & Afzal, 2017)found that the highest significant yield, total number of bolls per plant, fresh weed biomass, dry weed biomass, plant height, and weed control were obtained by using herbicide (Glyphosate). (Dadari & Kuchinda, 2004)reported that seed cotton yield was consistently higher (but not statistically higher) with metolachlor plus diuron, metolachlor plus fluometuron at 1.0 + 1.0 kg, and metolachlor plus terbutryne at 1.14 + 0.86 kgai. /ha than the weedy check.

Conclusion:

The major points we have obtained from this study are as follows:

-Density of weeds will be reduced after using stomp® + hand howing (45 DAP and hand howingtowice (30, 45 DAP).

-Fresh and dry weight weed were significantly reduced by stomp® + hand howing (45 DAP and hand howingtowice (30, 45 DAP).

- The highest mean value of yield and yield components were increased with stomp® + hand howing (45 DAP and hand howingtowice (30, 45 DAP).

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ARABIC SUMMARY

تاثير بعض معاملات مكافحة الحشائش على انتاجية وجودة محصول القطن

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1–قسم وقاية النبات– كلية الزراعة ساباباشا– جامعة الاسكندرية

2–قسم بحوث حصر وبيئة وفسيولوجيا الحشائش– مركز البحوث الزراعية

تم اجراء التجربة البحثية على محصول القطن جيزة 94 خلال موسمي 2018 ، 2019وذلك من اجل دراسة تأثير بعض معاملات مكافحة الحشائشعلىمحصول القطنجيزة 94 (*Gossypiumbarbadense* L.). حيث تم تقييم ثمانية معاملات + الكنترول (بدون معاملة) لتوضيح تأثير مبيدات الحشائش على مكافحة الحشائش والخصائص المورفولوجية لكل من الحشائش و محصول القطن ،حيث أدت جميع معاملات مكافحة الحشائش إلى انخفاض معنوي في صفات الحشائش وزيادة مكونات المحصول في كلا الموسمين، كما أعطت زيادة معنوية عالية في محصول القطن (قنطار / فدان) حيث اظهرت النتائج المتحصل عليها ان افضل تاثير تم الحصول عليه بعد استخداممعاملةاستومب + العزيق بعد 45 يوم من الزراعةبالاضافة الى العزق اليدوي مرتين بعد الزراعة بـ 30 ، 45 يوم وذلك خلال موسمى الزراعة(12.32، 11.62) و(11.9، 10.9) على التوالى.كذلك اظهرت النتائجانأعلى انخفاض للوزن الغض والجاف للحشائش كان بعد إستخدام معاملة استومب + العزيق بعد الزراعة بـ 45 يوم ومعاملة العزيق مرتين بعد الزراعة بـ30، 45 يوم حيث اعطت هذه المعاملات أعلى انخفاض في كثافة الحشائش وزيادة محصول القطن.