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EFFECT OF COMPOST AND SOME NATURAL STIMULANT TREATMENTS ON: I. VEGETATIVE GROWTH AND FLOWERING ASPECTS OF (*GLADIOLUS GRANDIFLORUS* CV. PETER PEARS) PLANTS

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ABSTRACT: Two field experiments were carried out during the two successive seasons of 2014/2015 and 2015/2016 at the Nursery and the Laboratory of Ornamental plants, Faculty of Agriculture, Minia University. The aim of this study was to figure out the effect of organic fertilization and natural stimulants, as well as, their interaction on vegetative growth, flowering aspects of *Gladiolus grandiflorus* cv. Peter Pears plants.

Results showed that vegetative growth (leaf length, number of leaves/plant and dry weight of leaves/plant) and flowering aspects (length of spike, number of florets/spike and lower floret diameter) were gradually increased by increasing the level of compost fertilizer.

All natural stimulant treatments significantly increased all vegetative growth characters and flowering parameters in comparison with the control. Seaweeds extract at 3 cm^3/l or active dry yeast at 5 g/l seemed to be more effective than other treatments in this concern.

The use of high level of compost (7.5 ton/fed) in combination with seaweeds extract at 3 cm^3/l or active dry yeast at 5 g/l noticeably improved the different vegetative growth characters and flowering parameters of gladiolus.

Key words: *Gladiolus grandiflorus*, compost, seaweeds extract, active dry yeast, moringa leaves extract, green tea extract, vegetative growth, flowering parameters.

INTRODUCTION

Gladiolus grandiflorus, L. plants are considered one of the most important flowering bulbs grown in Egypt. Gladiolus belongs to Family Iridaceae and is propagated by corms. It has a decorative spike which carries numerous florets. There are fast expands in areas planted with gladiolus in Egypt in order to meet the increase demand for gladiolus flowers for local market and export.

All natural stimulants are among the important agricultural treatments which have been proved to improve the vegetative growth and flowering aspects of gladiolus plants.

Many investigators revealed the importance of organic fertilization on the growth and flowering quality of gladiolus. Gangadharan and Gopinath (2000), Conte *et al.* (2001), Khan *et al.* (2002), Atta-Alla *et al.* (2003), Dongardive *et al.* (2007), Leonardo and Barbara (2011), Chandar *et al.* (2012), Hassan (2016), Khanam *et al.* (2017) and Abdel-Mola (2017) reported that treated gladiolus plants with organic fertilization resulted in significant increase in leaf length, number of leaves and dry weight of leaves, as well as, spike length, number of

florets/spike and lower floret diameter in comparison with untreated plants.

Concerning the effect of natural stimulants, Al-Rashedy (2010), Ahmed (2013), Abdou *et al.* (2013), Abdou and Ibrahim (2015), Alma'thedee and Bairam (2014), Hassan (2016), Khattab *et al.* (2016) and Abdel-Mola (2017) found that natural stimulant treatments improved vegetative growth and flowering characters of gladiolus.

The aim of the present study was to investigate the effect of compost as organic fertilizer and natural stimulant treatments on the vegetative growth and flowering productivity of gladiolus cv. Peter Pears.

MATERIALS AND METHODS

The corms of gladiolus were obtained from Holland by Basiouny Nurseries, Cairo, Egypt. Average corm diameter was 2.7 and 3.0 cm and average corm weight was 9.7 and 10.2 g for the two seasons, respectively, all corms were soaked in Pinlate at the concentration of 1 g/l for one minute before planting in the two experimental seasons. Corms were planted on October 1st for both seasons in hills, 20 cm apart, on the lower third of one side of each ridge (10 corms/ridge). Physical and chemical properties of the soil used are listed in Table (1). The split plot design with three replicates was followed in this experiment.

The four levels of compost fertilization treatments were considered as main plots and the seven natural stimulant treatments (control, green tea extract at 5 g/l, moringa leaves extract at 300 mg/l, garlic extract at 300 mg/l, licorice roots extract at 5 g/l, active dry yeast at 5 g/l and seaweeds extract at 3 cm^3/l) were set in the sub-plots. The four levels of compost treatments were 0.0, 2.5, 5.0 and 7.5 ton/fed. The compost was added before planting during the soil preparation. Compost analysis is shown in Table (2).

The plants were foliar sprayed three times, one month and two months after planting and after flower cut. All agricultural practices were performed as usual in the region.

Preparation of the natural stimulants:

Garlic plant extract:

One kilogram fresh mature cloves were blended in the presence of distilled water (1 kg/l), then frozen (24 hours) and thawed two times then filtered. The filter extract (100 %) was used for preparation (300 ml/l = 30 %) according to El-Desouky *et al.* (1998).

Some chemical constituents of garlic according cloves to Arid Land Agricultural Research Unit are listed in Table (3).

Moringa leaves extract:

Aqueous extract of moringa at (300 ml/l) was prepared by mixing 30 g of plant leaf material with one liter of distilled water in a household blender for 15 min at 50 ℃. The solution was filtered through filtered paper (Phiri and Mbewe, 2010). Nutrient information and amino acids of moringa leaves were shown in Table (4).

Table 1. Physical and chemical properties of the experimental soil.

Character	Value		Character		Value	
	2014/2015	2015/2016			2014/2015	2015/2016
Sand (%)	28.98	28.90	**Total N (%)**		0.08	0.06
Silt (%)	29.87	30.64	**Available P (%)**		15.67	15.58
Clay (%)	41.15	40.46	**Exch. K^+ (mg/100 g)**		2.85	2.64
Soil type	Clay loam	Clay loam	**Exch. Ca^{++} (mg/100 g)**		31.12	31.43
Organic matter (%)	1.54	1.59	**Exch. Na^+ (mg/100 g)**		2.51	2.50
$CaCO_3$ (%)	2.11	2.10	**DPTA Ext. (ppm)**	**Fe**	8.23	8.11
pH	7.75	7.71		**Cu**	2.01	2.00
E.C. (mmhos /cm)	1.08	1.06		**Zn**	2.87	2.89
				Mn	8.11	8.15

Table 2. The chemical analysis of compost.

Content	Value	Content	Value
Organic carbon (%)	25.1	**Total P (%)**	0.5
Humidity (%)	25	**Total K (%)**	1.0
Organic matter	44	**Fe (ppm)**	1750
C/N ratio	16.7	**Zn (ppm)**	60
pH (1:2.5)	8.0	**Mn (ppm)**	125
E.C. (mmhos/cm)	5	**Cu (ppm)**	200
Total N (%)	2.2		

Table 3. Some chemical constituents of garlic according cloves to Arid Land Agricultural Research Unit:

Components	GA_3	IAA	ABA	Ca^{+2}	Mg^{+2}	SO_4^{-2}	Zn^{+2}	Mn^{+2}
Concentration	16.33 (mg/100 g f.w.)	Trace	Trace	1.363 %	1.230 %	0.181 %	66.5 ppm	94.4 ppm

Table 4. Nutrients information and amino acids of moringa leaves.

Nutrient information	Leaves	Nutrient information	Leaves	Amino acids	Leaves
Calories	92	**Sulfur (mg)**	137	**Arginine**	402
Protein (g)	6.7	**Selenium (mg)**	0	**Histidine**	141
Fat (g)	1.7	**Zinc (mg)**	0	**Isoleucine**	422
Carbohydrate (g)	13.4	**Oxalic Acid (mg)**	101	**Leucine**	623
Fiber (g)	0.9	**Vitamin A (mg)**	6.8	**Lysine**	288
Calcium (mg)	440	**Vitamin B (mg)**	423	**Methionine**	134
Copper (mg)	1.1	**Vitamin B_1 (mg)**	0.21	**Phenylalanine**	429
Iron (mg)	7	**Vitamin B_2 (mg)**	0.05	**Threonine**	328
Potassium (mg)	259	**Vitamin B_3 (mg)**	0.8	**Tryptophan**	127
Magnesium (mg)	24	**Vitamin C (mg)**	220		
Phosphorus (mg)	70	**Vitamin E (mg)**	0		

Green tea extract:

The aqueous extract is prepared in ratio 1:10 with the consideration of the absorption coefficient of green tea leaves. Technology of preparation – 5 g of tea leaves of diameter lower than 5 mm are poured with 60 ml of boiling water. Time is given for the extraction to cool down and the quality of these extracts has been evaluated after 10, 20 and 30 min according to Armoskaite *et al.* (2011).

Active dry yeast:

The dry matter of active dry yeast (*Saccharomyces cerevisiae*), was 95 % and live cells were 11.6×10^9/g. The yeast suspension was prepared by dissolving dry yeast and sugar together (1:1) w/w in warm water (38 ℃) and let it stand for two hours before spraying to enhance yeast activity (Skoog and Miller, 1957). Chemical analysis of the dry yeast is presented in Table (5).

Licorice roots extract:

Preparation of licorice extract soaked grinded dry licorice roots (5 g) in distilled water (1 liter) for 24 hours and then filtered using filter paper. The active components in licorice roots extract contains of volatile oils, tannins, carbohydrates, saponins, phenols, glycosides, flavonoids and fixed oils. The elements analysis in licorice roots extract contains of K, Ca, Fe, P, Mg, SO_4, N, Na, Mn, Zn and Co. Abd El-Azim *et al.* (2016).

Table 5. Chemical composition of the used active dry yeast.

Component	Value	Component	Value	Component	Value
Cu (mg/g)	8.0	**Fe (mg/g)**	0.02	**Niacin**	300-500 mg/g
Se (mg/g)	0.1	**Mg (mg/g)**	1.65	**Pyrodoxin**	28.0 mg/g
Mn (mg/g)	0.02	**K (mg/g)**	21.0	**Pantathenate**	70.0 mg/g
Cr (mg/g)	2.2	**P (mg/g)**	13.50	**Bioton**	1.3 mg/g
Ni (mg/g)	3.0	**S (mg/g)**	3.90	**Cholin**	40.0 mg/g
Va (mg/g)	0.04	**Zn (mg/g)**	0.17	**Folic acid**	5.13 mg/g
Mo (mg/g)	0.4	**Si (mg/g)**	0.03	**Vit B12**	0.001 mg/g
Sn (mg/g)	3.0	**Proteins**	47%	**Thiamine**	60-100 ml/g
Li (mg/g)	0.17	**Carbohydrates**	33.0%	**Riboflavin**	35-50 ml/g
Na (mg/g)	0.12	**Minerals**	8.0%	**Lipids**	4.0%
Ca (mg/g)	0.75	**Nucleic acids**	8.0%		

The elements of licorice analysis roots extract listed in Table (6).

Seaweeds extract:

Algeser product contains seaweed extract from (Shoura Chemicals Company, Cairo Alex Desert RD., Giza Governorate). The chemical properties of the seaweeds extract shown in Table (7).

Agricultural practices were performed as usual, in the region. The following data were recorded:

1. Vegetative growth characters just before flowering: leaf length (cm), number of leaves/plant and dry weight of leaves (g/plant).
2. Flowering characters: spike length (cm), number of florets/spike and lower floret diameter (cm).

All of the obtained data were subjected to the statistical analysis of variance using MSTAT-C (1986). L.S.D. test at 0.05 was used to compare the average means of treatments.

Table 6. The elements of licorice analysis roots extract.

Elements	K^{+1}	Ca^{+2}	Fe^{+3}	P^{-3}	Mg^{+2}	$SO4^{-2}$	N^{-3}	Na^{+1}	Mn^{+2}	Zn^{+2}	Co^{+2}
ppm	1230	500	1400	520	5	900	16500	700	1700	35000	0.07

Table 7. The chemical properties of the seaweeds extract.

Character	Values	Character	Values	Character	Values
Moisture %	6.0	**K %**	1.0-1.2	**Cu ppm**	1.0-6.0
Organic matter %	45-60	**Mg %**	0.5-0.9	**Mn ppm**	5-12
Inorganic matter %	45-60	**P %**	0.02-0.09	**Zn ppm**	10-100
Protein %	6-8	**S %**	3-9	**Cytokinins %**	0.02
Carbohydrate %	35-50	**Ca %**	0.2-1.5	**IAA %**	0.03
Aliginic acid %	10-20	**B ppm**	20-100	**ABA %**	0.01
Mannitol %	4-7	**Mo ppm**	1-5		
Total N %	1.0-1.5	**Fe ppm**	50-200		

RESULTS AND DISCUSSION

Vegetative growth characters:

Data presented in Table (8) showed that leaf length, number of leaves/plant and leaves dry weight/plant of gladiolus were significantly increased in both seasons due to the use of compost at 2.5, 5.0 and 7.5 ton/fed in comparison with control. The highest values were obtained from compost at high

Table 8. Effect of compost and natural stimulants, as well as, their combination treatments on vegetative growth [leaf length (cm), number of leaves/plant & leaves dry weight/plant (g)] of *Gladiolus grandiflorus* cv. Peter Pears plants during 2014/2015 and 2015/2016 seasons.

Natural stimulants treatments (B)	Compost levels (ton/fed) (A)									
	1st season (2014/2015)					2nd season (2015/2016)				
	0.0	2.5	5.0	7.5	Mean (B)	0.0	2.5	5.0	7.5	Mean (B)
Leaf length (cm)										
Control	37.25	42.05	49.10	51.24	44.91	38.35	43.16	50.21	52.35	46.02
Green tea extr. 5 g/l	46.40	50.03	54.03	56.41	51.72	47.04	51.24	55.24	57.61	52.78
Moringa extr. 300 mg/l	48.30	50.13	54.18	56.32	52.23	49.50	51.43	55.49	57.61	53.51
Garlic extr. 300 mg/l	48.36	52.24	56.22	59.11	53.98	49.57	53.52	57.51	60.20	55.20
Licorice extr. 5 g/l	50.10	55.11	57.14	63.44	56.45	51.40	56.32	58.43	64.74	57.72
Active yeast 5 g/l	51.20	55.52	59.08	64.30	57.53	52.49	56.81	60.37	65.59	58.82
Seaweeds extr. 3 cm^3/l	51.82	55.03	59.11	64.88	57.71	53.13	56.34	60.42	66.19	59.02
Mean (A)	47.63	51.44	55.55	59.39		48.78	52.69	56.81	60.61	
L.S.D. at 5 %	A: 3.43		B: 6.12		AB: 12.24	A: 3.30		B: 6.04		AB: 12.08
Number of leaves/plant										
Control	6.75	7.33	8.60	9.24	7.98	7.65	8.24	9.62	10.18	8.92
Green tea extr. 5 g/l	8.41	8.49	9.01	9.47	8.85	9.37	9.45	10.10	10.46	9.85
Moringa extr. 300 mg/l	8.44	8.94	8.97	9.95	9.08	9.52	9.90	10.06	10.95	10.11
Garlic extr. 300 mg/l	8.72	9.05	9.63	9.99	9.35	9.69	10.02	10.14	11.00	10.21
Licorice extr. 5 g/l	9.00	9.81	9.54	10.11	9.62	9.98	10.79	10.65	11.03	10.61
Active yeast 5 g/l	10.24	10.54	10.86	11.71	10.84	11.22	11.52	11.99	12.73	11.87
Seaweeds extr. 3 cm^3/l	10.66	10.92	10.96	11.87	11.10	11.65	11.93	12.10	12.91	12.15
Mean (A)	8.89	9.30	9.65	10.33		9.87	10.26	10.67	11.32	
L.S.D. at 5 %	A: 0.38		B: 0.80		AB: 1.60	A: 0.35		B: 0.86		AB: 1.72
Leaves dry weight/plant (g)										
Control	3.00	3.66	4.63	5.01	4.08	3.22	4.16	5.15	5.50	4.51
Green tea extr. 5 g/l	3.44	3.99	4.62	4.96	4.25	3.94	4.50	5.19	5.57	4.80
Moringa extr. 300 mg/l	3.42	4.07	4.70	5.10	4.32	3.92	4.60	5.28	5.64	4.86
Garlic extr. 300 mg/l	3.57	4.40	4.98	5.38	4.58	4.07	4.93	5.54	5.97	5.13
Licorice extr. 5 g/l	3.76	4.43	4.94	5.45	4.65	4.26	4.96	5.53	5.95	5.18
Active yeast 5 g/l	3.78	4.81	5.06	5.64	4.82	4.21	5.25	5.56	6.05	5.27
Seaweeds extr. 3 cm^3/l	3.82	4.91	5.10	5.81	4.91	4.23	5.35	5.57	6.24	5.35
Mean (A)	3.54	4.32	4.86	5.34		3.98	4.82	5.40	5.85	
L.S.D. at 5 %	A: 0.45		B: 0.15		AB: 0.30	A: 0.42		B: 0.25		AB: 0.50

level (7.5 ton/fed). The increase of vegetative growth resulting from using compost as organic fertilization treatments might be due to the fact that organic matter is considered as an important factor for improving physical, chemical and biological properties of the soil and consequently, increased plant growth (Maynard, 1991). Similar results were obtained by Ahmed (2013), Pandey *et al.* (2013), Khalil (2015), Sankari *et al.* (2015), Hassan (2016) and Khanam *et al.* (2017) on gladiolus.

Data presented in Table (8) indicated that, leaf length, number of leaves/plant and leaves dry weight were significantly increased, in both seasons, due to the use of the six treatments of natural stimulants (green tea extract at 5g/l, moringa leaves extract at 300 mg/l, garlic extract at 300 mg/l, licorice roots extract at 5 g/l, active dry yeast at 5 g/l and seaweeds extract at 3 cm^3/l) in comparison with untreated control. Seaweeds extract at 3 cm^3/l or active dry yeast at 5 g/l seemed to be more effective than either natural stimulants.

The role of seaweeds extracts in promoting vegetative growth might be attributed to the presence of phyto-hormones such as auxins and cytokinns. Seaweed extracts also stimulated mineral nutrient uptake in plants with increased accumulation of both macro and micro-nutrients (Crouch and Van Staden, 1992). In regard to the active dry yeast, its positive effects could be attributed to its active role in the hydrolysis of pectic substances. It is known that vitamins, enzymes and coenzymes are important components of the yeast. Also, yeast increases the release of carbon dioxide through fermentation process which effectively activates photosynthesis and accelerates biosynthesis of carbohydrates and proteins. Moreover, it increases the synthesis of plant growth promoters especially GA_3, IAA and cytokinins which led to improve in cell division and cell enlargement (Moore, 1979). In addition, yeast contains different nutrients, amino acids and vitamins which promote the uptake of different nutrient elements through the modification of the pH value of soil solution towards acidity medium (Subba Rao, 1984).

The interaction between the two factors was significant in the two seasons for leaf length, leaf number and leaves dry weight. The maximum leaf length, number of leaves/plant and leaves dry weight/plant, were obtained due to supplying the soil with 7.5 ton/fed compost in combination with seaweeds extract at 3 cm^3/l followed by active dry yeast at 5 g/l.

Flowering parameters:

Data presented in Table (9) show that all compost level treatments caused significant increase in length of spike, number of florets/spike and lower floret diameter, in the two seasons, in comparison with that of untreated plants. The flowering parameters were gradually increased due to the increase in the levels of compost fertilizer.

These results are in close agreement with those obtained by Khan *et al.* (2002); Dongardive *et al.* (2007); Ahmed *et al.* (2013), Pandey *et al.* (2013), Pradeep *et al.* (2014), Pereira *et al.* (2016) and Abdel-Mola (2017) on gladiolus.

A possible explanation to the positive effect of compost fertilizer treatments might be attributed to its simulative effect on the different vegetative growth traits (Table, 8). Better vegetative growth is directly reflected on various flowering aspects.

Regarding natural stimulants (green tea extract at 5 g/l, moringa leaves extract at 300 mg/l, garlic extract at 300 mg/l, licorice roots extract at 5 g/l, active dry yeast at 5g/l and seaweeds extract at 3 cm^3/l) data presented in Table (9) revealed that all six used treatments significantly increased length of spike, number of florets/spike and lower florets diameter compared with untreated plants. The highest values were obtained due to the treatments of active dry yeast at 5 g/l followed by seaweeds extract at 3 cm^3/l without significant differences except in case of lower florets diameter.

These findings were similar to those obtained by Ahmed (2013), Alma'thedee and Bairam (2014), Hassan (2016) and Abdou

Table 9. Effect of compost and natural stimulants, as well as, their combination treatments on flowering aspects [spike length (cm), number of florets/spike & lower floret diameter (cm)] of *Gladiolus grandiflorus* cv. Peter Pears plants during 2014/2015 and 2015/2016 seasons.

Natural stimulants treatments (B)	Compost levels (ton/fed) (A)									
	1st season (2014/2015)					2nd season (2015/2016)				
	0.0	2.5	5.0	7.5	Mean (B)	0.0	2.5	5.0	7.5	Mean (B)
Spike length (cm)										
Control	51.08	53.34	55.21	60.03	54.92	52.100	54.54	56.51	61.33	56.12
Green tea extr. 5 g/l	53.09	61.31	61.88	66.34	60.66	54.69	63.01	63.88	68.44	62.51
Moringa extr. 300 mg/l	55.23	60.44	63.61	67.22	61.63	56.73	62.64	66.01	69.52	63.73
Garlic extr. 300 mg/l	61.81	64.25	66.14	69.50	65.43	63.51	66.55	68.94	72.30	67.83
Licorice extr. 5 g/l	66.15	68.04	68.15	72.31	68.66	68.55	71.94	72.75	80.01	73.31
Active yeast 5 g/l	69.03	70.36	71.13	73.66	71.05	72.53	75.36	78.03	81.04	76.74
Seaweeds extr. 3 cm^3/l	68.24	69.13	70.00	73.52	70.22	71.54	74.03	76.80	80.71	75.77
Mean (A)	60.66	63.84	65.16	68.94		62.81	66.87	68.99	73.34	
L.S.D. at 5 %	A: 1.24		B: 5.08		AB: 10.16	A: 2.08		B: 5.94		AB: 11.88
Number of florets/spike										
Control	7.00	8.33	9.00	9.67	8.50	8.00	9.33	10.00	10.67	9.50
Green tea extr. 5 g/l	7.67	8.67	10.00	10.00	9.09	8.67	9.67	11.00	11.00	10.09
Moringa extr. 300 mg/l	8.00	9.00	10.00	10.67	9.42	9.00	10.00	11.00	11.67	10.42
Garlic extr. 300 mg/l	8.33	9.00	10.33	10.67	9.58	9.33	10.00	11.33	11.67	10.58
Licorice extr. 5 g/l	8.67	9.33	10.67	11.00	9.92	9.67	10.33	11.67	12.00	10.92
Active yeast 5 g/l	9.67	10.33	11.00	12.33	10.83	10.67	11.33	12.00	13.00	11.75
Seaweeds extr. 3 cm^3/l	9.00	10.00	10.67	11.67	10.34	10.00	10.67	11.67	12.67	11.25
Mean (A)	8.33	9.24	10.24	10.86		9.33	10.19	11.24	11.81	
L.S.D. at 5 %	A: 0.61		B: 0.51		AB: 1.02	A: 0.56		B: 0.52		AB: 1.04
Lower floret diameter (cm)										
Control	6.54	7.82	7.89	7.94	7.55	6.81	7.86	7.92	7.99	7.65
Green tea extr. 5 g/l	7.03	7.93	8.03	8.15	7.79	7.12	8.07	8.15	8.27	7.90
Moringa extr. 300 mg/l	7.18	7.97	8.14	8.33	7.91	7.25	8.14	8.28	8.45	8.03
Garlic extr. 300 mg/l	7.24	8.13	8.41	8.49	8.07	7.31	8.31	8.55	8.63	8.20
Licorice extr. 5 g/l	7.95	8.20	8.73	8.81	8.42	8.02	8.39	8.88	9.01	8.58
Active yeast 5 g/l	8.23	8.72	9.13	9.29	8.84	8.28	8.90	9.22	9.44	8.96
Seaweeds extr. 3 cm^3/l	7.98	8.21	8.94	9.04	8.54	8.04	8.47	9.05	9.16	8.68
Mean (A)	7.45	8.14	8.47	8.58		7.55	8.31	8.58	8.71	
L.S.D. at 5 %	A: 0.64		B: 0.20		AB: 0.40	A: 0.68		B: 0.22		AB: 0.44

and Ibrahim (2015) on gladiolus; Emam (2010) and Karim *et al.* (2017) on tuberose and Al-Sahaf *et al.* (2017) on *Mathiola incana*.

These results might be attributed to the direct and/or indirect role of substances (nutrients, amino acids, vitamins, auxin, cytokinin and gibberellins) (Nagodawithana, 1991 and Sperenat, 1997), all those have better effects on the plant growth, consequently improving enzymatic system that reflected on the flowering of gladiolus.

The interaction between compost and natural stimulants was significant in the two seasons for the three studied flowering characters. The best overall results were obtained due to the use of compost at the high level (7.5 ton/fed) in combination with active dry yeast at 5 g/l or seaweeds extract at 3 cm^3/l

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تأثير معاملات الكمبوست وبعض المنشطات الطبيعية على: ١. النمو الخضري والصفات الزهرية لنبات الجلاديولس جراندفلورس صنف بيتر بيرس

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تم إجراء تجربتان حقليتان خلال موسمين متعاقبين هما ٢٠١٥/٢٠١٤ و٢٠١٦/٢٠١٥ في مشتل ومعمل نباتات الزينة بكلية الزراعة جامعة المنيا وذلك لدراسة تأثير التسميد العضوي بالكمبوست وبعض المنشطات الطبيعية (مستخلص الشاى الاخضر٥ جم/لتر، مستخلص اوراق المورينجا ٣٠٠ مجم/لتر، مستلص الثوم ٣٠٠ مجم/لتر، مستخلص جذور العرقسوس ٥ جم/لتر، الخميرة الجافة النشطة ٥جم/لتر، مستخلص الاعشاب البحرية ٣سم^{٣}/لتر) بالإضافة إلى معاملات التداخل على النمو الخضري والصفات الزهرية لنبات الجلاديولس جراندفلورس صنف بيتر بيرس.

أظهرت النتائج أن صفات النمو الخضري (طول الورقة وعدد الأوراق للنبات والوزن الجاف للأوراق) وصفات التزهير(طول الشمراخ الزهري وعدد الزهيرات على الشمراخ الزهري و قطر اسفل زهيرة) ازداد تدريجياً بزيادة مستوي التسميد بالكمبوست. حدثت زيادة معنوية عند استخدام المنشطات الطبيعية لكل صفات النمو الخضري وقياسات التزهير مقارنة بمعاملة الكنترول. ووجد أن استخدام مستخلص الأعشاب البحرية عند تركيز ٣ سم^{٣}/لتر أواستخدام الخميرة النشطة بتركيز ٥ جرام/لتر تكون أكثر فاعلية بالمقارنة بباقي الصفات.

وعليه يمكن التوصية بإضافة ٧,٥ طن/فدان كمبوست مع رش النباتات بمستخلص الأعشاب البحرية عند تركيز ٣ سم^{٣}/لتر أو استخدام الخميرة النشطة بتركيز ٥ جرام/لتر لتحسين النمو الخضري والصفات الزهرية لنبات الجلاديولس جراندفلورس صنف بيتر بيرس.