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EFFECT OF COMPOST AND SOME STIMULTORY SUBSTANCES ON GLADIOLUS PLANT
A. VEGETATIVE GROWTH AND FLOWERING CHARACTERS

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ABSTRACT: The present study was conducted in 2017/2018 and 2018/2019 seasons in the Nursery and Laboratory of Ornamental Plants, Faculty of Agriculture, Minia University to study the effect of compost (7.5, 10.0 and 12.5 ton/fed) and seven treatments of stimulants i.e. control, seaweeds extract (300 ppm), amino acids (200 ppm), ascorbic acid (100 ppm), salicylic acid (50 ppm), active yeast (5 g/l) and Minia azotein (50 ml/plant), as well as their interaction on vegetative growth and flowering parameters of gladiolus plants. Data resulted that all compost levels increased vegetative growth parameters (leaf length, number of leaves/plant and leaves dry weight), flowering aspects (spike length, spike diameter, spike fresh weight, number of florets/plant, lower floret diameter and single floret fresh weight) comparing with control. Compost at 12.5 ton/fed was the most effective in this concern. All six used treatments of stimulant substances led to significant increase in all previous characters as compared to control, the maximum values were obtained by amino acids, followed by active yeast. The interaction treatments were significant with, the highest values recorded due to compost (12.5 ton/fed) in combination with either amino acids or active yeast.

Key words: Gladiolus, compost, seaweeds extract, amino acids, ascorbic, salicylic, yeast and Minia azotein.

INTRODUCTION

Gladiolus is one of the most important ornamental bulbs. It belongs to the Family Iridaceae, it has decorative spike which carries numerous florets. Its flowers are excellent attractive cut flowers, which are needed for local markets in winter and spring, as well as, for export to foreign ones.

Compost as organic fertilizer improves soil texture, increases ion exchange capacity of the soil, increases buffering capacity and adsorbs essential nutrients against leaching and increases microorganisms (McHoy, 2000; Paulin and Omalley, 2008). Many authors concluded that compost as an organic fertilizer increased vegetative growth traits, flowering characters and corms and cormels productivity of gladiolus plant such as Ahmed (2013), Abdou and Ibrahim (2015), Khalil (2015), Abdou *et al*. (2018) and Hassan and Abd El-Azeim (2020).

The effect of stimulatory substances on improving plant growth, flowering was emphasized by De lunica and Vecchietti (2012) and Hassan (2016) on gladiolus plants Regarding seaweeds extract; Abd El-Aziz *et al.* (2009), Sewedan *et al*. (2012) and Hashish *et al*. (2015) on gladiolus plants and regarding amino acids; Abdou *et al*. (2004), El-Sayed (2004) and El-Deeb (2016) on gladiolus plants.

Concerning N-fixing bacteria; moreover, Sajjad *et al*. (2014), Khalil (2015), Pal *et al*. (2015), Pansuriya *et al.* (2018) and Hassan

and Abd El-Azeim (2020) cleared that salicylic acid treatment increased growth of gladiolus plants. Also, Abd El-Aziz *et al.* (2009), Abo Leila and Eid (2011) and Abdou *et al*. (2019), on gladiolus, showed that all vegetative growth traits were increased due to ascorbic acid treatment.

Therefore, the present work aimed to study the effect of compost and some stimulatory substances on vegetative growth parameters and flowering traits of gladiolus cv. Eurovisin.

MATERIALS AND METHODS

This field experiment was carried out during the two successive seasons of 2017/2018 and 2018/2019 at the Nursery of Ornamental plants, Faculty of Agriculture, Minia University to investigate the effect of compost, and some stimulatory substances, as well as, their interactions on the vegetative growth and flowering of gladiolus (*Gladiolus grandiflorus*, cv. Eurovision) plants.

The corms of *Gladiolus grandiflorus*, cv. Eurovision were obtained from Holland by Basiouny Nurseries, Cairo, Egypt. Average corm's diameter was 3.0 and 3.3 cm and average corm's weight was 9.9 and 10.4 g for both seasons, respectively, corms were soaked in Pinlate at 1.0 g/l for one minute before planting in both seasons. The experiment was arranged in a randomized complete block design in a split plot design with three replicates. The main plot (A) included four levels of compost 0.0, 7.5, 10.0 and 12.5 ton/fed), while seven treatments of stimulants occupied the sub-plot (B), namely, control, seaweeds extract (300 ppm), amino acids (200 ppm), ascorbic acid (100 ppm), salicylic acid (50 ppm), active yeast (5 g/l) and Minia azotein (50 ml/plant). Therefore, the interaction treatments (A x B) were 28 treatments. The experimental unit (plot) was 1.5 x 1.8 m. containing 3 ridges, 50 cm apart. Corms were planted on September 1st for both seasons in hills, 15 cm apart (12 corms/ridge). The physical and chemical analysis of the used soil in both seasons were determined according to Page *et al.* (1982) and shown in Table (a).

Compost (plant residues) was obtained from Egypt Company for Circulate Solid Residues at El-Minia New City and added during preparing the soil to cultivation in both seasons. The chemical analysis of compost is shown in Table (b).

Minia azotein (containing N-fixing bacteria) was obtained from the Laboratory of Bio-fertilizers, Genetic Department, Faculty of Agriculture, Minia University. It was applied at 50 ml/plant three times to the soil around each plant, one month and two months from planting date, and after flowers cut.

The dry matter of yeast (Saccharomyces cerevisia), was 95% and live cells were 11.6 x 109/g. The yeast suspension was prepared by dissolving dry yeast and sugar together (ratio of 1:1, w/w basic) in warm water (38 Co) and let it to stand for two hours before spraying to enhance yeast activity (Skoog and Miller, 1957), chemical analysis of the dry yeast is presented in Table (c).

Algeser product contains seaweeds extract, which was obtained from Shoura Chemical Company, Cairo-Alexandria Desert Road, Giza Governorate, Egypt. The chemical properties of the used seaweeds extract were listed in Table (d).

Aminoactal product contains a mixture of three amino acids (treptophan, methionine and cysteine), which was obtained from Shoura Chemical Company, Cairo-Alexandria Desert Road, Giza Governorate, Egypt.

The seaweeds extract, amino acids, ascorbic acid, salicylic acid and yeast were applied by hand spraying till run off, three times on the same schedule of Minia azotein bio-fertilizer. The agricultural practices were performed as usual in the cultivation region.

Table a. Physical and chemical properties of the used soil during the two seasons of 2017/2018 and 2018/2019.

Soil character	Values		Soil character	Values	
	2017/2018	2018/2019		2017/2018	2018/2019
Physical properties			**Exchangeable nutrients**		
Sand (%)	28.98	28.90	Ca^{++} (mg/100 g soil)	31.12	31.43
Silt (%)	29.87	30.64	Mg^{++} (mg/100 g soil)	3.51	3.56
Clay (%)	41.15	40.46	Na^{+} (mg/100 g soil)	2.51	2.50
Soil type	Clay loam	Clay loam	K^{+} (mg/100 g soil)	2.85	2.64
Chemical properties			**DTPA-Extractable nutrients**		
pH (1:2.5)	7.75	7.71	Fe (ppm)	8.23	8.11
E.C. (dS/m)	1.08	1.06	Cu (ppm)	2.01	2.00
O.M.	1.54	1.59	Zn (ppm)	2.87	2.89
$CaCO_3$	2.11	2.10	Mn (ppm)	8.11	8.15

Table b. Chemical analysis of the used compost in both seasons of 2017/2018 and 2018/2019.

Properties	Values	Properties	Values
Organic carbon (%)	25.1	Total P (%)	0.5
Humidity (%)	25.0	Total K (%)	1.0
Organic matter	44.0	Fe (ppm)	1750
C/N ratio	17.5	Zn (ppm)	60
pH (1:2.5)	8.0	Mn (ppm)	125
E.C. (m. mhos/cm.)	5.0	Cu (ppm)	200
Total N (%)	1.5		

Table c. Chemical analysis of the used active dry yeast in both seasons of 2017/2018 and 2018/2019.

Protein (%)	Ash (%)	Glycogen (%)	Fat (%)	Cellulose (%)
34.87	7.55	6.54	2.09	4.92

Table d. Chemical properties of the used seaweeds extract in both seasons of 2017/2018 and 2018/2019.

Character	Value	Character	Value	Character	Value
Moisture %	6.0	P %	0.02-0.09	Zn ppm	10-00
Organic matter %	45-60	K %	1.0-1.2	B ppm	20-100
Inorganic matter %	45-60	Ca %	0.2-1.5	Mo ppm	1-5
Protein %	6-8	S %	3-9	Cytokinins %	0.02
Carbohydrate %	35-50	Mg %	0.5-0.9	IAA %	0.03
Aliginic acids %	10-20	Cu ppm	1.0-6.0	ABA %	0.01
Mannitol %	4-7	Fe ppm	50-200		
Total N %	1.0-1.5	Mn ppm	5-12		

The following data were recorded:

1. Vegetative growth characters were recorded just before flowering such as, leaf length (cm), number of leaves/plant, and dry weight of leaves/plant (g).
2. Flowering characters were recorded spike length (cm), spike diameter (mm) "under the lower floret", spike fresh weight (g), number of florets/spike, lower floret diameter (cm) and lower floret fresh weight (g).

Statistical analysis:

Data of the experiment were subjected to the statistically analyzed of variance using MSTAT–C (1986) and LSD test at 5% was followed to compare between the means of treatments.

RESULTS AND DISCUSSION

1. Vegetative growth parameters:

Data presented in Table (1) indicated that the leaf length, leaf number and leaves dry weight per plant were significantly increased due to fertilizing plants with 7.5, 10.0 and 12.5 ton/fed compost comparing with control. The increase in such three characters was parallel to the increase in the compost level. The highest values were obtained with fertilizing gladiolus by compost at 12.5 ton/fed. The increase in vegetative growth resulting from using compost may be due to improving soil physical, chemical and biological properties including water retention capacity, drainage, pH, availability of nutrients from compost (Zheljazk and Warman, 2004 and Griffin and Hutchinson, 2007). Similar results were recorded by Ahmed (2013), Abdou and Ibrahim (2015), Khalil (2015), Hassan (2016), and Hassan and Abd El-Azeim (2020) on gladiolus plants.

Regarding the effect of stimulatory substances, data present in Table (1) showed that all six used treatments (seaweeds extract, amino acids, salicylic acid, ascorbic acid, active yeast and Minia azotein) significantly increased all vegetative growth traits (leaf length, number of leaves/plant and dry weight of leaves/plant) as compared to control. Amino acids followed by active yeast treatments were the most effective than other treatments in this concern. Amino acids can affect plant growth and development through their influence on IAA biosynthesis, protein assimilation which are necessary for cell formation and consequently increase in plant growth (Phillips, 1971; Russel, 1982 and Walter and Nawacki, 1987).

The interaction between the experimental factors (A x B) was significant for all plant growth traits i.e. leaf length, number of leaves/plant and dry weight of leaves/plant, in both seasons. The highest values were obtained due to supplying the soil of gladiolus plants with 12.5 ton/fed compost in combination with amino acids followed by 12.5 ton/fed compost with active yeast.

Similarly, Ahmed (2019) on gladiolus, regarding the best interaction between compost and amino acid, and Ahmed (2013) on gladiolus, concerning the effect of interaction between compost and active yeast.

2. Flowering parameters:

Data presented in Tables (2 and 3) revealed that all compost level treatments led to significant increases in spike length, spike diameter, spike fresh weight, number of florets/spike, lower floret diameter and lower floret fresh weight as compared to unfertilized plants in both seasons. The maximum values were obtained by using 12.5 ton/fed compost.

These results are in harmony with the findings of Ahmed (2013), Abdou and Ibrahim (2015), Khalil (2015), Hassan (2016), and Hassan and Abd El-Azeim (2020) on gladiolus plants. Compost treatments (Table, 1) simulative the different vegetative growth, that directly reflected on various flowering aspects (Niazian and Nalousi, 2020).

Concerning sub plots treatments, data presented in Tables (2 and 3) showed that all used six treatments considerably enhanced flowering parameters i.e. spike length, spike diameter, spike fresh weight, number of florets/spike, lower florets diameter and lower floret fresh weight as compared to control plants. The highest values were obtained by using amino acids followed by active yeast.

In harmony with these results concerning amino acids, those were obtained by Sewedan *et al.* (2012), Ahmed (2013), Abdou and Ibrahim (2015), Hashish *et al.* (2015), Hassan (2016) and Khattab *et al.* (2016) on gladiolus plants. Moreover, El-Naggar and Sweedan (2009) on *Hippeastrum vittatum* and Afifipour and Kosh-Khui (2015) on *Pulianthes tuberose*, who

Table 1. Effect of compost, some stimulatory substances and their combination on leaf length, leaf number and leaves dry weight/plant of gladiolus cv. Eurovisin during 2017/2018 and 2018/2019 seasons.

Stimulatory substances treatment (B)	Compost levels (ton/feddan) (A)									
	0	7.5	10.0	12.5	Mean (B)	0	7.5	10.0	12/5	Mean (B)
	The 1st season (2017/2018)					The 2nd season (2018/2019)				
	Leaf length (cm)									
Control	33.1	35.2	35.4	35.7	34.9	33.5	34.0	35.0	36.3	34.7
Seaweed extract, 300 ppm	33.7	36.5	36.8	37.3	36.1	33.5	36.8	36.8	37.4	36.1
Amino acids, 200 ppm	34.0	37.1	37.4	37.8	36.6	34.4	37.3	37.8	38.2	36.9
Ascorbic acids, 100 ppm	33.5	35.8	36.0	36.4	35.4	33.4	35.8	36.4	36.8	35.6
Salicylic acids, 100 ppm	33.4	35.9	36.3	36.8	35.6	33.5	36.0	36.5	36.9	35.7
Active yeast, 5 g/l	33.9	36.8	37.1	37.4	36.3	33.6	37.0	37.1	37.6	36.3
Minia azotein, 50 ml	33.6	36.4	36.7	37.2	36.0	33.5	36.6	36.7	37.3	36.0
Mean (A)	33.6	36.2	36.5	36.9		33.7	36.2	36.6	37.2	
L.S.D. at 5 %	A: 0.3		B: 0.2		AB: 0.4	A: 0.4		B: 0.2		AB: 0.6
	Leaf number/plant									
Control	8.1	8.3	8.7	8.9	8.5	7.8	8.3	8.8	9.0	8.5
Seaweed extract, 300 ppm	8.6	8.8	8.9	9.5	9.0	8.1	9.0	9.4	10.0	9.1
Amino acids, 200 ppm	9.0	9.2	9.7	10.0	9.5	8.1	9.5	9.8	10.4	9.5
Ascorbic acids, 100 ppm	8.4	8.6	8.9	9.0	8.4	7.9	8.6	8.9	9.4	8.7
Salicylic acids, 100 ppm	8.6	8.8	9.0	9.1	8.9	8.0	8.7	9.0	9.6	8.9
Active yeast, 5 g/l	8.4	9.2	9.3	9.7	9.2	8.0	9.2	9.6	10.2	9.3
Minia azotein, 50 ml	8.7	8.9	9.1	9.2	9.0	8.0	8.9	9.2	9.8	8.0
Mean (A)	8.5	8.8	9.1	9.3		8.0	8.9	9.2	9.8	
L.S.D. at 5 %	A: 0.1		B: 0.2		AB: 0.4	A: 0.3		B: 0.2		AB: 0.4
	Leaves dry weight/plant (g)									
Control	3.69	3.78	3.96	4.14	3.85	3.75	3.99	4.23	4.34	4.08
Seaweed extract, 300 ppm	4.41	4.51	4.56	4.87	4.59	4.55	5.05	5.28	5.61	5.13
Amino acids, 200 ppm	5.15	5.18	5.48	5.75	5.39	5.19	6.11	6.29	6.71	6.08
Ascorbic acids, 100 ppm	3.84	3.93	4.07	4.12	3.99	3.78	4.12	4.26	4.50	4.17
Salicylic acids, 100 ppm	3.94	4.03	4.13	4.19	4.07	3.85	4.19	4.34	4.62	4.25
Active yeast, 5 g/l	4.52	4.94	5.04	5.23	4.93	4.90	5.63	5.88	6.24	4.66
Minia azotein, 50 ml	4.06	4.13	4.72	4.29	4.18	4.31	4.78	4.94	5.26	4.82
Mean (A)	4.23	4.35	4.49	4.66		4.33	4.84	4.97	5.33	
L.S.D. at 5 %	A: 0.11		B: 0.14		AB: 0.28	A: 0.12		B: 0.09		AB: 0.70

Table 2. Effect of compost, some stimulatory substances and their combination on spike length, spike diameter and spike fresh weight of gladiolus cv. Eurovisin during 2017/2018 and 2018/2019 seasons.

Stimulatory substances treatment (B)	Compost levels (ton/feddan) (A)									
	0	7.5	10.0	12.5	Mean (B)	0	7.5	10.0	12/5	Mean (B)
	The 1st season (2017/2018)					The 2nd season (2018/2019)				
	Spike length (cm)									
Control	55.30	61.00	62.60	65.20	61.02	58.41	61.91	62.88	66.41	63.40
Seaweed extract, 300 ppm	63.56	70.41	73.35	76.81	71.03	66.90	71.55	73.46	77.70	72.40
Amino acids, 200 ppm	66.63	72.55	78.35	82.98	75.13	69.71	75.55	78.44	83.55	76.81
Ascorbic acids, 100 ppm	59.61	65.82	67.55	69.91	65.72	62.92	66.42	67.38	70.96	66.92
Salicylic acids, 100 ppm	60.73	67.71	70.45	73.88	68.21	63.95	68.53	70.45	74.68	69.40
Active yeast, 5 g/l	65.55	70.45	75.23	78.91	72.54	68.80	73.41	75.33	79.50	74.26
Minia azotein, 50 ml	61.95	68.91	71.95	71.38	69.55	65.44	70.04	71.95	76.18	70.90
Mean (A)	61.91	68.12	71.36	74.72		65.16	69.63	71.41	75.57	
L.S.D. at 5 %	A: 2.80		B: 2.04	AB: 4.04		A: 1.78		B: 2.03	AB: 4.06	
	Spike diameter (mm)									
Control	7.8	8.6	9.5	10.4	9.1	7.9	8.7	9.6	10.6	9.2
Seaweed extract, 300 ppm	10.6	12.4	13.3	16.4	13.2	10.5	12.5	14.9	16.9	13.7
Amino acids, 200 ppm	11.8	13.7	14.7	17.9	14.5	11.7	13.7	15.4	18.4	14.8
Ascorbic acids, 100 ppm	8.9	10.6	12.4	14.3	11.6	8.9	10.6	12.5	14.5	11.6
Salicylic acids, 100 ppm	9.5	11.3	13.2	15.2	12.3	9.5	11.4	13.6	15.6	12.5
Active yeast, 5 g/l	11.3	13.1	14.0	17.1	13.9	11.5	13.1	15.7	17.6	14.4
Minia azotein, 50 ml	10.0	11.8	13.7	15.8	12.8	10.1	11.9	14.3	16.2	13.1
Mean (A)	10.0	10.4	13.0	14.4		10.0	11.7	13.7	15.7	
L.S.D. at 5 %	A: 0.4		B: 0.6	AB: 1.2		A: 0.8		B: 0.4	AB: 0.8	
	Spike fresh weight (g)									
Control	16.65	18.46	18.84	19.63	18.37	18.17	19.25	19.56	20.65	19.41
Seaweed extract, 300 ppm	19.39	21.48	22.37	23.43	21.67	21.21	22.68	23.29	24.63	22.95
Amino acids, 200 ppm	20.40	22.20	23.98	25.39	22.99	22.17	24.02	24.94	26.65	24.42
Ascorbic acids, 100 ppm	18.12	20.01	20.54	21.25	19.98	19.88	20.99	21.29	22.42	21.15
Salicylic acids, 100 ppm	20.05	20.65	21.49	22.51	21.18	20.27	21.72	22.33	23.67	22.00
Active yeast, 5 g/l	20.06	21.56	23.03	24.15	22.20	21.88	23.34	23.96	25.30	23.62
Minia azotein, 50 ml	18.90	20.95	21.95	22.99	21.20	20.74	22.20	22.81	24.15	22.39
Mean (A)	19.08	20.75	21.74	22.76		20.62	22.03	22.60	23.91	
L.S.D. at 5 %	A: 0.89		B: 0.64	AB: 0.28		A: 0.65		B: 0.65	AB: 1.30	

Table 3. Effect of compost, some stimulatory substances and their combination on number of florets/spike, lower florets diameter and lower floret fresh weight of gladiolus cv. Eurovisin during 2017/2018 and 2018/2019 seasons.

Stimulant substances treatments (B)	Compost levels (ton/feddan) (A)									
	0	7.5	10.0	12.5	Mean (B)	0	7.5	10.0	12/5	Mean (B)
	The 1st season (2017/2018)					The 2nd season (2018/2019)				
	Number of florets/spike									
Control	9.33	11.35	11.75	12.50	11.24	11.17	11.33	12.17	12.33	11.75
Seaweed extract, 300 ppm	11.85	13.00	13.25	13.43	12.88	12.80	13.35	13.59	13.98	13.43
Amino acids, 200 ppm	12.25	13.11	13.17	14.50	13.26	13.25	13.77	13.95	14.21	13.79
Ascorbic acids, 100 ppm	11.61	11.64	12.44	12.89	12.15	12.00	12.19	12.50	12.50	12.30
Salicylic acids, 100 ppm	11.53	11.83	12.45	13.19	12.25	12.06	12.20	12.80	13.17	12.56
Active yeast, 5 g/l	11.88	13.10	13.23	13.45	12.92	13.00	13.55	13.79	14.10	13.61
Minia azotein, 50 ml	11.60	11.86	12.72	13.50	12.42	12.10	12.65	12.89	13.27	12.73
Mean (A)	11.44	12.27	12.72	13.34		12.34	12.72	13.10	13.37	
L.S.D. at 5 %	A: 0.32		B: 0.30		AB: 0.60	A: 0.36		B: 0.25		AB: 0.50
	Lower floret diameter (mm)									
Control	6.25	6.76	7.04	7.63	6.82	6.18	6.53	7.39	7.77	6.97
Seaweed extract, 300 ppm	6.65	7.15	7.44	8.04	7.32	6.62	6.98	7.79	8.20	7.40
Amino acids, 200 ppm	6.77	7.29	7.50	8.39	7.47	6.76	7.14	7.93	8.48	7.58
Ascorbic acids, 100 ppm	6.46	6.95	7.24	7.83	7.12	6.39	6.74	7.59	7.99	7.19
Salicylic acids, 100 ppm	6.57	7.05	7.35	7.94	7.23	6.50	6.85	7.70	8.10	7.29
Active yeast, 5 g/l	6.71	7.21	7.50	8.11	7.18	6.68	7.04	7.85	8.28	7.46
Minia azotein, 50 ml	6.59	7.05	7.38	7.98	7.26	6.55	6.90	7.73	8.14	7.33
Mean (A)	6.57	7.07	7.35	7.99		6.53	6.88	7.71	8.14	
L.S.D. at 5 %	A: 0.17		B: 0.14		AB: 0.28	A: 0.20		B: 0.11		AB: 0.22
	Lower floret fresh weight (g)									
Control	2.75	2.97	3.10	3.36	3.05	2.72	2.80	3.25	3.42	3.05
Seaweed extract, 300 ppm	3.05	3.28	3.43	3.70	3.37	3.00	3.21	3.62	3.88	3.43
Amino acids, 200 ppm	3.21	3.36	3.63	3.92	3.53	3.18	3.41	3.85	4.12	3.64
Ascorbic acids, 100 ppm	2.87	3.09	3.23	3.48	3.17	2.88	3.03	3.42	3.60	3.23
Salicylic acids, 100 ppm	2.92	3.14	3.27	3.53	3.22	2.97	3.10	3.49	3.75	3.32
Active yeast, 5 g/l	3.11	3.35	3.51	3.79	3.44	3.06	3.28	3.71	3.98	3.50
Minia azotein, 50 ml	2.98	3.20	3.35	3.61	3.29	2.95	3.15	3.33	3.80	3.36
Mean (A)	2.98	3.20	3.36	3.63		2.96	3.14	3.56	3.79	
L.S.D. at 5 %	A: 0.16		B: 0.11		AB: 0.22	A: 0.17		B: 0.15		AB: 0.32

concluded that active yeast had positive effect on flowering aspects.

The interaction between compost and stimulatory substances treatments was significant for all flowering parameters measurement in both seasons. The best interaction treatments were obtained by fertilizing gladiolus with 12.5 ton/fed compost and spraying plants with amino acids or active yeast.

CONCLUSION

From our results, fertilizing gladiolus with 12.5 ton/fed compost with combination with amino acids led to better vegetative growth along with high quality and quantity of flowering production of Gladiolus grandiflorus, cv. Eurovision plants.

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تأثير الكمبوست وبعض المواد المنشطة على نبات الجلاديولس

أ. صفات النمو الخضري والزهري

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أُجرِيَ هذا البحث في موسمي ٢٠١٨/٢٠١٧ و ٢٠١٩/٢٠١٨ بمشتل الزينة، كلية الزراعة، جامعة المنيا لدراسة تأثير الكمبوست (٠,٠، ٧,٥، ١٠,٠ و ١٢,٥ طن/فدان) والمواد المنشطة للنمو (مستخلص أعشاب البحر [٣٠٠ جزء في المليون]، الأحماض الأمينية [٢٠٠ جزء في المليون]، حمض الأسكوربيك [١٠٠ جزء في المليون]، حمض السالسيلك [٥٠ جزء في المليون]، الخميرة النشطة [٥ جم/لتر]، المنيا أزوتين [٥٠ مل/نبات] ثم الكنترول)، وكذلك التفاعل بينهما علي صفات النمو الخضري والزهري لنبات الجلاديولس. أعطت كل مستويات الكمبوست زيادة معنوية في صفات النمو الخضري (طول الورقة، عدد الأوراق للنبات، الوزن الجاف للأوراق) والصفات الزهرية (طول وقُطر الشمراخ، وزن الشمراخ الطازج، عدد الزهيرات/شمراخ، قطر الزهيرة والوزن الطازج للزهيرة). وكانت أفضل النتائج عند استخدام معدل ١٢,٥ طن/فدان من الكمبوست. كل المعاملات السِتة المستخدمة من المواد المنشطة أدت إلي زيادة معنوية في كل الصفات السابقة مقارنة بالكنترول. أعلى القيم نتجت من معاملة الأحماض الأمينية تليها الخميرة النشطة. التفاعل كان معنوياً لكل الصفات المدروسة، مع الحصول على أعلى القيم نتيجة استخدام الكمبوست (١٢,٥ طن/فدان) مع الأحماض الأمينية أو مع الخميرة النشطة.