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Response of *Dieffenbachia seguine* Plant to Some Organic and Mineral Fertilization Treatments

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ABSTRACT

This research was taken place in a glasshouse, at the Nursery of Ornamental plants, Fac. Agric., Minia Univ. during the two seasons 2022 and 2023 to study the impact of compost at 0.0, 170, 340 and 510 g/pot and mineral NPK fertilization (control, 3, 6 and 9 g/pot; 4:1:1) addition to their interactions on growing characters and chemical constituents of *Dieffenbachia seguine* plant.

Data showed that all examined traits of vegetative and root growth (plant height, stem diameter, leaves area and number/plant, aerial parts weights in addition to roots number and its fresh and dry weights) as well as some chemical compositions (chlorophyll a, b and carotenoids and NPK%) were statistically enhanced parallel with rising compost level relative to control. Sequence, the level of 510 g compost /pot was greater than other used two levels. Also, all mineral NPK fertilization significantly improved in all abovementioned traits. The best interaction treatments were supplying *Dieffenbachia seguine* plants with compost at 510 g/pot and fertilizing plants with 9 g mineral NPK (4:1:1) /pot.

KEYWORDS: compost, mineral fertilization, dieffenbachia

1. INTRODUCTION

Dieffenbachia commonly known as dumb cane (the English names) or leopard lily, is a genus of tropical plants in the family Araceae (Khomami, 2011 and Sarkar *et al.*, 2016). *Dieffenbachia* is a perennial herbaceous plant with straight stem, simple and alternate leaves containing white spots and flecks, making it attractive as indoor foliage because of their tolerance of shade (Sarkar *et al.*, 2016).

According to El-Hindi *et al.* (2006), compost is a valuable component that enhances plant growth and floral yield while lowering environmental pollution. Composting compounds are supplied to agricultural soils of various textures to enhance soils physiochemical and biological qualities, allowing the soil (particularly sandy soil) to store more water and be accessible for plant development (El-Sirafy *et al*., 1989 and Khudus *et al*., 2021).

Because they considered have a vital role in the formation of several plant components (enzymes, protein, hormones, amino acids, lipids, nucleic acids, addition to control of water interactions), minerals, in particular nitrogen, phosphorus and potassium elements are crucial to plant development. However, the heavy use of inorganic fertilizers has a negative impact on mankind health because environment pollution (Mengel and Kirkby, 2004).

Therefore, this work aimed to study the response of *Dieffenbachia seguine* to compost and mineral fertilization as well as their interactions on vegetative and root growth parameters and some chemical composition.

2. MATERIALS AND METHODS

In order to assess the impact of organic fertilizer (compost) and mineral fertilization as well as their interactions on growth parameters and some chemical composition of *Dieffenbachia seguine* plant, this investigation was conducted in a glasshouse at the farm of floriculture Plants, Faculty of Agriculture, Minia University in the two growing seasons of 2022 and 2023.

On February 15 of the two seasons of 2022 and 2023, terminal cuttings of *Dieffenbachia seguine* plants with an average height of 15 cm, a diameter of 2 cm, and three leaves were grown in plastic pots with a 30-cm diameter filled with 8.5 kg of sandy soil (one cutting/pot) and irrigated with an anti-fungal pesticide Rizolex - T 50% WP, 1.5 g/l, once. Three of the seven internodes on the terminal cuts' three buried nodes. According to the procedures outlined by Jackson (1973), the physical and chemical tests of the utilized soil were carried out and are shown in Table 1.

The experiment used a split plot in a RCBD with replicated three times and included 16 treatments (4 x 4). There were 4 pots (4 plants) in each treatment, so the total number of used plants was 192 plants. Four mineral fertilizer treatments [0, 3, 6 and 9 g/pot (4:1:1)] and four compost treatments (0, 170, 340, and 510 g/plot) were distributed among the sub-plots and the main plots, respectively.

Table 1. The physical and chemical analysis of the used soil in the study.

Character	**Value**		
Particle-Size Distribution%	**sand 89.75 %**	**Silt 7.60%**	**Clay 2.65%**
Soil type	Sand		
Filed capacity (%)	17.65		
Welting Point (%)	4.96		
Water Holding Capacity (%)	19.68		
Available (F.C.-PWP) %	12.69		
Available (WHC-PWP) %	14.72		
Bulk density g/cm^3	1.63		
Particle density g/cm^3	2.50		
pH (ratio 1:2.5 water)	7.79		
$CaCO_3$ (g/kg)	109		
CEC (cmol$_c$ /kg)	3.21		
EC (dS/m at 25 ^{0}C)	0.73		
OM (g/kg)	6.4		
Total N (g/kg)	0.57		
Total P (g/kg)	0.18		
Total K (g/kg)	3.18		

The compost was supplied from the farm of floriculture Plants, Faculty Agriculture. When the pots were filled throughout the two growth seasons, the compost was applied in accordance with the treatments. As indicated in Table (2), physical and chemical characteristics of the employed compost were assessed using the techniques outlined by ICARDA (2013).

Table 2. Physical and chemical analysis of the used compost in both seasons of 2022 and 2023.

Properties	Value	Properties	Value
Organic carbon (%)	27.9	**Total P (%)**	0.6
Humidity (%)	23	**Total K (%)**	1.11
Organic matter (%)	48	**Fe (ppm)**	610
C/N ratio	15.5	**Zn (ppm)**	53
pH (1:2.5)	8.2	**Mn (ppm)**	115
E.C. (mmhos/cm.)	5.2	**Cu (ppm)**	190
Total N (%)	1.8		

Ammonium sulfate (20.6% N), calcium super-phosphate (15.5% P_2O_5), and potassium sulfate (48% K_2O) were the three mineral fertilizers that were used. The total amount of mineral fertilizers utilized for the treatments was divided into five doses beginning on April 1st (45 days after planting) and repeated each month on May 1st, June 1st, July 1st, and August 1st. Other agricultural operations were conducted as usual.

By the end of the experiment (the first week of September, in both seasons), the following data were recorded vegetative and root growth parameter [plant height (cm), stem diameter (cm), leaves area (cm^2) and number/plant, aerial parts weights (g) in addition to roots number and its fresh and dry weights (g)] as well as some chemical constituents [photosynthetic pigments (chlorophyll a, b and carotenoids; mg/g f.w.) and NPK% in dry leaves].

Photosynthetic pigments determination:

The three pigment contents were colorimetrically measured in the *Dieffenbachia seguine* leaves samples (mg/g fresh weight) after three weeks of the last treatment in both seasons, method described by Fadl and Sari El-Deen (1978).

Macro-elements (NPK) determination:

Macro-elements (NPK) percentages in leaves (dry base) were determined according to the methods described by ICARDA (2013).

Statistical analysis

The obtained results were tabulated and statistically analyzed according to MSTAT–C (1986), and LSD test at 0.05 was followed to compare between the treatments means.

3. RESULTS

3.1. Vegetative growth parameters

Data shown in Tables (3 and 4) indicated that compost treatments (170, 340 and 510 g/pot) led to significantly increase in all vegetative growth parameters (plant height, stem diameter, number of leaves/plant, leaf area and areal plant parts fresh and dry weights) as facing to untreated plants (control) in the two growing seasons. The treatment of 510 g compost/pot produced the highest values in both seasons. Such superior treatment increased these parameters over the control by 14.03 and 15.39% for plant height, 6.43 and 6.61% for stem diameter, 38.39 and 35.67% for number of leaves/plant, 9.49 and 6.8% for leaf area, 11.12 and 11.08% for areal plant parts fresh weight, and 11.40 and 11.39% for areal plant parts dry weight in the first and second seasons, respectively.

Our findings are in harmony with those reported by Chen *et al*. (2002) on *Dieffenbachia maculata*, Karami *et al*. (2011), Nourani *et al*. (2013), Khomami and Moharam (2014), Olosunde *et al*. (2017), Khomami *et al*. (2019) and Khomami *et al*. (2021) on *Dieffenbachia amoena*; Sarkar *et al*. (2016) on *Dieffenbachia bowmannii*.

As for mineral NPK fertilization treatments, data listed in Tables (3 and 4) showed that the three concentrations of mineral NPK treatments (3, 6 and 9 g/pot) significantly increased all abovementioned parameters relative to control in both seasons. In all cases, the treatment of 9 g NPK/pot was more effective than other treatments in enhancing vegetative growth parameters.

Table 3. Response of plant height, stem diameter and leaves number/plant of *Dieffenbachia seguine* to compost, mineral fertilization and their interactions in the two growing seasons (2022 and 2023).

Mineral fertilization treatments	Compost levels treatments (g/pot) (A)									
	0.0	170	340	510	Mean (B)	0.0	170	340	510	Mean (B)
	The 1st season (2022)					The 2nd season (2023)				
Plant height (cm)										
Control ($N_0P_0K_0$)	72.5	78.3	82.2	84.7	79.4	73.2	82.9	84.3	85.8	80.8
$N_1P_1K_1$ (3 g/pot)	83.4	87.6	90.2	94.7	89.0	84.5	88.8	92.4	97.2	90.7
$N_2P_2K_2$ (6 g/pot)	86.7	90.2	93.8	96.6	91.8	87.9	90.7	96.3	99.2	93.5
$N_3P_3K_3$ (9 g/pot)	91.0	93.7	96.5	104.2	96.4	92.3	95.3	98.9	106.2	98.2
Mean (A)	83.4	87.5	90.7	95.1		84.5	88.7	92.9	97.5	
L.S.D. at 5 %	A: 4.10		B: 3.40		AB: 6.80	A: 4.2		B: 3.3		AB: 6.6
Stem diameter (mm)										
Control ($N_0P_0K_0$)	2.81	3.01	3.09	3.20	3.03	2.84	3.04	3.12	3.23	3.06
$N_1P_1K_1$ (3 g/pot)	3.56	3.61	3.68	3.71	3.64	3.63	3.68	3.75	3.78	3.71
$N_2P_2K_2$ (6 g/pot)	3.62	3.70	3.73	3.78	3.71	3.70	3.78	3.81	3.86	3.79
$N_3P_3K_3$ (9 g/pot)	3.67	3.72	3.76	3.85	3.75	3.76	3.81	3.83	3.95	3.84
Mean (A)	3.42	3.51	3.57	3.64		3.48	3.58	3.63	3.71	
L.S.D. at 5 %	A: 0.07		B: 0.04		AB: 0.08	A: 0.05		B: 0.03		AB: 0.06
Leaves number/plant										
Control ($N_0P_0K_0$)	6.50	7.25	8.75	9.25	7.94	6.57	7.32	8.84	9.34	8.02
$N_1P_1K_1$ (3 g/pot)	6.95	7.54	9.10	9.39	8.25	7.03	7.63	9.21	9.50	8.34
$N_2P_2K_2$ (6 g/pot)	7.35	7.89	9.45	9.65	8.59	7.45	8.00	9.58	9.79	8.71
$N_3P_3K_3$ (9 g/pot)	7.95	8.45	9.55	10.75	9.18	8.09	8.60	9.72	10.94	9.34
Mean (A)	7.19	7.78	9.21	9.76		7.29	7.89	9.34	9.89	
L.S.D. at 5 %	A: 0.54		B: 0.30		AB: 0.60	A: 0.55		B: 0.32		AB: 0.64

Our results are closed to those obtained by El-Khateeb et al. (2009) on Dieffenbachia maculate; Campos and Reed (1993) on Dieffenbachia 'Camille'; Abd El-Hady and Hegazy (2021) on *Dieffenbachia picta*; Divya *et al*. (2022) on *Dieffenbachia seguine*.

The interaction between compost levels and mineral fertilization treatments was significant for all vegetative growth parameters in both seasons. The highest values were found with the treatment of compost at 510 g/pot with 9 g/pot NPK in both seasons, in most cases.

Table 4. Response of leaf area, aerial parts fresh and dry weights of *Dieffenbachia seguine* to compost, mineral fertilization and their interactions in the two growing seasons (2022 and 2023).

Mineral fertilization treatments	Compost levels treatments (g/pot) (A)									
	0.0	170	340	510	Mean (B)	0.0	170	340	510	Mean (B)
	The 1st season (2022)					The 2nd season (2023)				
	Leaf area (cm^2)									
Control ($N_0P_0K_0$)	332.8	339.5	346.3	353.9	343.1	336.1	342.9	349.8	357.4	346.6
$N_1P_1K_1$ (3 g/pot)	346.9	353.8	360.9	368.1	357.4	351.1	358.0	365.2	372.5	361.7
$N_2P_2K_2$ (6 g/pot)	421.2	429.9	438.2	457.0	436.6	427.1	435.9	444.3	463.4	442.7
$N_3P_3K_3$ (9 g/pot)	437.4	446.2	455.1	464.2	441.4	444.4	453.3	462.4	471.6	457.9
Mean (A)	375.2	392.4	400.1	410.8		389.7	397.5	405.4	416.2	
L.S.D. at 5 %	A: 7.7	B: 3.6	AB: 7.2			A: 7.8	B: 4.1	AB: 8.2		
	Aerial parts fresh weight (g)									
Control ($N_0P_0K_0$)	322.8	332.5	342.4	355.1	338.2	326.4	336.2	346.2	359.0	341.9
$N_1P_1K_1$ (3 g/pot)	339.8	353.4	376.5	382.2	363.0	344.2	358.0	381.4	387.2	367.7
$N_2P_2K_2$ (6 g/pot)	350.3	361.1	371.9	383.1	366.6	355.6	366.5	377.5	388.8	372.1
$N_3P_3K_3$ (9 g/pot)	364.3	378.9	394.1	409.8	386.8	370.5	385.3	400.8	416.8	393.4
Mean (A)	344.3	356.5	371.2	382.6		349.2	361.5	376.5	387.9	
L.S.D. at 5 %	A: 10.4	B: 7.9	AB: 15.8			A: 11.4	B: 8.0	AB: 16.0		
	Aerial parts dry weight (g)									
Control ($N_0P_0K_0$)	54.87	56.52	58.38	60.36	57.53	55.42	57.09	58.96	60.96	58.11
$N_1P_1K_1$ (3 g/pot)	56.07	58.31	60.64	63.06	59.52	56.74	59.01	61.37	63.82	60.23
$N_2P_2K_2$ (6 g/pot)	57.45	59.22	60.99	63.55	60.30	58.25	60.05	61.84	64.44	61.15
$N_3P_3K_3$ (9 g/pot)	59.38	61.76	64.22	66.75	63.03	60.33	62.75	65.25	67.82	64.04
Mean (A)	56.94	58.95	61.06	63.43		57.69	59.72	61.86	64.26	
L.S.D. at 5 %	A: 1.99	B: 1.80	AB: 3.6			A: 2.01	B: 1.98	AB: 3.96		

3.2.Root growth traits

According to data shown in Table 5, providing plants with compost in contrast to the control treatment throughout both growing seasons significantly increased all root growth features that had been assessed (number of roots, root system fresh and dry weights). With a rise in compost level, ascending increased in all root growth characteristics. The highest compost level (510 g/pot), thus, yielded the highest results for all of the aforementioned traits.

The enhancement role of organic fertilizer on root growth traits was emphasized by Olosunde *et al*. (2017) and Khomami *et al*. (2021) on *Dieffenbachia amoena*;

Considering the role of inorganic NPK fertilization on root parameters, data listed in Table (5) pointed out that all abovementioned parameters of root growth were statistically improved as a result to the three mineral NPK

Table 5. Response of number of roots, root system fresh and dry weights of *Dieffenbachia seguine* to compost, mineral fertilization and their interactions in the two growing seasons (2022 and 2023).

Mineral fertilization treatments	Compost levels treatments (g/pot) (A)									
	0.0	170	340	510	Mean (B)	0.0	170	340	510	Mean (B)
	The 1st season (2022)					The 2nd season (2023)				
Number of roots/plant										
Control ($N_0P_0K_0$)	16.25	16.74	17.24	17.76	17.00	16.43	16.92	17.43	17.96	17.18
$N_1P_1K_1$ (3 g/pot)	17.11	17.63	18.15	18.70	17.90	17.33	17.86	18.39	18.94	18.13
$N_2P_2K_2$ (6 g/pot)	17.64	18.00	18.36	18.73	18.18	17.89	18.25	18.62	18.99	18.44
$N_3P_3K_3$ (9 g/pot)	17.99	18.73	19.09	19.66	18.87	18.17	18.92	19.28	19.86	19.06
Mean (A)	17.25	17.78	18.21	18.71		17.45	17.99	18.43	18.94	
L.S.D. at 5 %	A: 0.44		B: 0.31		AB: 0.62	A: 0.48		B: 0.33		AB: 0.66
Root system fresh weight (g)										
Control ($N_0P_0K_0$)	99.4	102.4	106.5	107.7	104.0	100.4	103.4	107.6	108.8	105.1
$N_1P_1K_1$ (3 g/pot)	104.7	108.9	113.2	117.7	111.1	105.9	110.2	114.6	119.2	112.5
$N_2P_2K_2$ (6 g/pot)	109.0	112.4	115.8	120.4	114.4	110.4	113.9	117.3	122.0	115.9
$N_3P_3K_3$ (9 g/pot)	113.4	117.9	122.6	128.7	120.7	114.9	119.5	124.3	130.5	122.3
Mean (A)	106.6	110.4	114.5	118.6		107.9	111.8	115.9	120.1	
L.S.D. at 5 %	A: 3.6		B: 3.0		AB: 6.0	A: 3.8		B: 3.4		AB: 6.8
Root system dry weight (g)										
Control ($N_0P_0K_0$)	22.33	25.20	26.20	26.99	25.18	22.55	25.45	26.46	27.26	25.43
$N_1P_1K_1$ (3 g/pot)	25.64	26.66	27.73	28.85	27.22	25.95	26.98	28.06	29.20	27.55
$N_2P_2K_2$ (6 g/pot)	27.25	28.10	28.94	30.13	28.61	27.60	28.47	29.32	30.52	28.98
$N_3P_3K_3$ (9 g/pot)	29.47	30.65	31.88	33.47	31.37	29.88	31.08	32.33	33.94	31.81
Mean (A)	26.17	27.65	28.69	29.86		26.50	27.99	29.04	30.23	
L.S.D. at 5 %	A: 1.16		B: 1.10		AB: 2.20	A: 1.19		B: 1.12		AB: 2.24

rates (3, 6 and 9 g/pot) relative to control in both seasons. It could be noticed that in all cases, the treatment of 9 g NPK/pot was more suitable in this concern.

The improvement role of mineral NPK fertilizers on root growth traits was emphasized by Jiménez and Lao (2005), Jiménez *et al*. (2007), Jiménez *et al*. (2008), El-Khateeb *et al*. (2009), Jiménez *et al*. (2009) and Abd El-Hady and Hegazy (2021) on *Dieffenbachia spp.*

The effect of the interaction between main and sub plots treatments was statistically for all tested root growth characters in the two experimental seasons. In all seasons, 510 or 340 g compost/pot + 9 g NPK/pot proved to be the most effective interaction treatments.

3.3. Chemical constituents

Data listed in Tables 6 and 7 showed that the three compost used treatments statistically enhanced chlorophyll a, b and carotenoids in the fresh leaves as well as NPK % in the dry leaves of *Dieffenbachia* in both seasons facing the control treatment. The high values were obtained from plants received 510 g compost/pot, followed by 340 and 170 g compost/pot.

Similarly, supplying plants with organic fertilization led to enhance photosynthetic pigments as mentioned by Olosunde *et al*. (2017) on *Dieffenbachia amoena*; Abdou *et al*. (2023a) on cineraria and Abdou *et al*. (2023b) on *Calendula officinalis* for photosynthetic pigments. Also, Khomami *et al*. (2019) on *Dieffebnbachia amoena*; Abdou *et al*. (2023a) on cineraria and Abdou *et al*. (2023b) on *Calendula officinalis* for enhancing NPK%.

Regarding the effect of mineral NPK fertilization treatments, data in Tables (6 and 7) pointed out that NPK fertilization gave statistical increase in the three measured pigments (in fresh leaves) as well as NPK% in dry leaves facing the check treatment in the two experimental seasons, with superiority for fertilization with 9 g NPK/pot than other two treatments (3 or 6 g/pot). It could be noticed that the increase in the abovementioned traits was parallel with the increase of NPK amount.

Many authors showed that positive improved of chlorophyll a, b and carotenoids addition to NPK% due to inorganic NPK fertilization such as Conover *et al*. (1982); Turner *et al*. (1987) and El-Khateeb *et al*. (2009) on *Dieffenbachia maculata*; Poole and Conover (1989) on *Dieffenbachia Aphelandra*; and Abd El-Hady and Hegazy (2021) on *Dieffenbachia picta*.

The interaction between the main and sub-plots treatments (A x B) was significant for chlorophyll a and carotenoids and NPK% in both seasons. In all cases, the highest values were produced from plants received 510 g compost/pot and fertilized by 9 g mineral NPK/pot, in both seasons. And in some cases, highest values were produced from plants received 510 g compost/pot and fertilized by 6 g mineral NPK/pot or from plants received 340 g compost/pot and fertilized by 9 g mineral NPK/pot.

4. DISCUSSION

Our findings led us to the conclusion that providing *Dieffenbachia* plants growing in sandy soil with compost as organic fertilizer enhanced all vegetative development, blooming, and several chemical parameters. According to Olosunde *et al*. (2017), Khomami *et al*. (2019), and Khomami *et al*. (2021), compost increased the content and composition of plant secondary metabolites, improved root dehydrogenase, ATP-ase, and microorganism activities and nutrient uptake, and improved growth characteristics.

Fertilization is one of the main cultural practices that influences how leafy plants develop and provide an aesthetic appeal. Mineral fertilizer is one of the most important variables affecting the development and appearance of ornamental plants. The NPK fertilization provided by commercial fertilizers promotes the vegetative development of foliage plants (Divya *et al*., 2022).

5. CONCLUSION

For the best growth of *Dieffenbachia* plants grown in sandy soil, it should be supplying plants with 510 g compost/pot (30-cm-diameter filled with 8.50 kg of sandy soil) and fertilizing plants with 9 g mineral NPK/pot (4:1:1).

Table 6. Response of photosynthetic pigments (chlorophyll a, b and carotenoids) of *Dieffenbachia seguine* to compost, mineral fertilization and their interactions in the two growing seasons (2022 and 2023).

Mineral fertilization treatments	Compost levels treatments (g/pot) (A)									
	0.0	170	340	510	Mean (B)	0.0	170	340	510	Mean (B)
	The 1st season (2022)					The 2nd season (2023)				
	Chlorophyll a (mg/g f.w.)									
Control ($N_0P_0K_0$)	2.077	2.181	2.290	2.404	2.238	2.139	2.246	2.359	2.476	2.305
$N_1P_1K_1$ (3 g/pot)	2.139	2.246	2.359	2.478	2.306	2.203	2.313	2.430	2.552	2.375
$N_2P_2K_2$ (6 g/pot)	2.267	2.381	2.499	2.625	2.443	2.335	2.452	2.574	2.704	2.516
$N_3P_3K_3$ (9 g/pot)	2.403	2.523	2.649	2.782	2.589	2.475	2.599	2.728	2.865	2.667
Mean (A)	2.222	2.333	2.449	2.572		2.288	2.403	2.523	2.649	
L.S.D. at 5 %	A: 0.109	B: 0.064	AB: 0.128			A: 0.112	B: 0.070	0.140		
	Chlorophyll b (mg/g f.w.)									
Control ($N_0P_0K_0$)	0.682	0.716	0.752	0.790	0.735	0.696	0.730	0.767	0.806	0.750
$N_1P_1K_1$ (3 g/pot)	0.712	0.748	0.785	0.824	0.767	0.726	0.763	0.801	0.840	0.783
$N_2P_2K_2$ (6 g/pot)	0.754	0.792	0.832	0.874	0.813	0.769	0.808	0.849	0.891	0.829
$N_3P_3K_3$ (9 g/pot)	0.801	0.841	0.883	0.927	0.863	0.817	0.858	0.901	0.946	0.880
Mean (A)	0.737	0.774	0.813	0.854		0.752	0.790	0.829	0.871	
L.S.D. at 5 %	A: 0.036	B: 0.030	AB: N.S.			A: 0.038	B: 0.030	AB: N.S.		
	Carotenoids (mg/g f.w.)									
Control ($N_0P_0K_0$)	0.772	0.759	0.796	0.836	0.791	0.795	0.782	0.820	0.861	0.814
$N_1P_1K_1$ (3 g/pot)	0.743	0.780	0.819	0.860	0.801	0.765	0.803	0.844	0.886	0.825
$N_2P_2K_2$ (6 g/pot)	0.789	0.828	0.870	0.913	0.850	0.813	0.853	0.896	0.940	0.876
$N_3P_3K_3$ (9 g/pot)	0.834	0.876	0.920	0.966	0.899	0.859	0.902	0.948	0.995	0.926
Mean (A)	0.785	0.811	0.851	0.894		0.808	0.835	0.877	0.921	
L.S.D. at 5 %	A: 0.024	B: 0.009	AB: 0.018			A: 0.026	B: 0.010	AB: 0.020		

Table 7. Response of nitrogen, phosphorus and potassium in dry leaves of *Dieffenbachia seguine* to compost, mineral fertilization and their interactions in the two growing seasons (2022 and 2023).

Mineral fertilization treatments	Compost levels treatments (g/pot) (A)									
	0.0	170	340	510	Mean (B)	0.0	170	340	510	Mean (B)
	The 1st season (2022)					The 2nd season (2023)				
Nitrogen (%)										
Control ($N_0P_0K_0$)	2.15	2.36	2.71	2.96	2.55	2.21	2.44	2.80	3.05	2.62
$N_1P_1K_1$ (3 g/pot)	2.26	2.48	2.81	3.06	2.65	2.36	2.60	2.95	3.22	2.78
$N_2P_2K_2$ (6 g/pot)	2.42	2.66	3.04	3.35	2.87	2.52	2.77	3.16	3.44	2.97
$N_3P_3K_3$ (9 g/pot)	2.68	2.94	3.31	3.53	3.11	2.78	3.06	3.36	3.67	3.22
Mean (A)	2.38	2.61	2.97	3.23		2.47	2.72	3.07	3.35	
L.S.D. at 5 %	A: 0.19		B: 0.09		AB: 0.18	A: 0.21		B: 0.11		AB: 0.22
Phosphorus (%)										
Control ($N_0P_0K_0$)	0.36	0.42	0.48	0.57	0.46	0.38	0.45	0.53	0.60	0.49
$N_1P_1K_1$ (3 g/pot)	0.44	0.56	0.63	0.68	0.57	0.47	0.60	0.65	0.74	0.61
$N_2P_2K_2$ (6 g/pot)	0.51	0.59	0.66	0.75	0.63	0.56	0.65	0.71	0.80	0.68
$N_3P_3K_3$ (9 g/pot)	0.66	0.75	0.84	0.89	0.78	0.69	0.81	0.83	0.92	0.81
Mean (A)	0.49	0.58	0.65	0.72		0.52	0.63	0.68	0.76	
L.S.D. at 5 %	A: 0.07		B: 0.04		AB: 0.08	A: 0.05		B: 0.04		AB: 0.08
Potassium (%)										
Control ($N_0P_0K_0$)	1.60	1.75	1.93	2.12	1.85	1.63	1.80	1.97	2.17	1.89
$N_1P_1K_1$ (3 g/pot)	1.68	1.85	2.02	2.21	1.94	1.73	1.91	2.09	2.28	2.00
$N_2P_2K_2$ (6 g/pot)	1.81	2.11	2.34	2.59	2.21	1.88	2.20	2.44	2.69	2.30
$N_3P_3K_3$ (9 g/pot)	1.98	2.22	2.48	2.65	2.33	2.06	2.33	2.60	2.78	2.45
Mean (A)	1.77	1.98	2.19	2.39		1.83	2.06	2.27	2.48	
L.S.D. at 5 %	A: 0.17		B: 0.04		AB: 0.08	A: 0.20		B: 0.06		AB: 0.12

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الملخص العربي

استجابة نبات الديفنباخيا سيجوين لبعض معاملات التسميد العضوي والمعدني

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أُجري هذا البحث بالصوبة الزجاجية بمشتل نباتات الزينة، قسم البساتين، كلية الزراعة، جامعة المنيا، خلال موسمي نمو متعاقبين ٢٠٢٢ و ٢٠٢٣، لتقييم تأثير مستويات الكمبوست (صفر – ١٧٠ – ٣٤٠ – ٥١٠ جم/أصيص) ومعاملات التسميد المعدني NPK (صفر – ٣ – ٦ – ٩ جم/أصيص)(٤:١:١) والتداخل بينهما علي صفات النمو وبعض المكونات الكيماوية لنبات الديفنباخيا سيجوين.

أظهرت النتائج أن جميع صفات النمو الخضري والجذري المدروسة (طول النبات – قطر الساق –عدد الأوراق – مساحة الورقة – الوزن الطازج والجاف للأجزاء الهوائية/النبات – عدد الجذور – وزن المجموع الجذري طازج وجاف/النبات) وبعض المكونات الكيماوية (صبغات البناء الضوئي – النسبة المئوية للنيتروجين والفوسفور والبوتاسيوم) قد زادت زيادة معنوية نتيجة لاستخدام جميع مستويات الكمبوست مقارنة بالكنترول. وكان المستوي العالي من الكمبوست (٥١٠جم/ اصيص) أكثر تفوقاً علي المستويات الأخرى المستخدمة. أيضاً، أدت جميع معاملات التسميد المعدني NPK إلي زيادة معنوية في صفات النمو الخضري والجذري المختبرة، وكذلك بعض المكونات الكيميائية.

كانت أحسن معاملة تفاعل للحصول علي أفضل نمو هي إمداد نبات الديفينباخيا بـ ٥١٠ جم كمبوست/أصيص وتسميد النباتات بـ ٩ جم NPK معدني/الأصيص (١:١:٤).