J.Agric.&Env.Sci.Alex.Univ.,Egypt Vol.7 (2)2008

RESPONSE OF POINSETTIA PLANTS GROWN IN SANDY DESERT SOILS TO SALINE IRRIGATION AND ORGANIC MANURES

SOHIER . G . EL-SAYED* AND ALY . H . EL-NAGGAR**
* Antoniades Research Branch, Horticultural Research Institute, Antoniades Garden, Alexandria, Egypt.
** Floriculture, Ornamental Horticulture and landscape Gardening Dept., Faculty of Agric., (EL-Shatby), Alexandria Univ. Egypt.

ABSTRACT

The present study was carried out at Antoniadas Research Branch .Alexandria, Egypt during two successive seasons (2005/06 – 2006/07) to study the effect of saline irrigation water at four levels of EC [0 (tap water), 3, 6 and 9 mmhos/cm] with different sources of organic manure (cattle, poultry and green manures) at the rate of 15g/pot and thier interaction on the vegetative growth, flowering and chemical composition of *Euphorbia pulchrrima*, Willd. Grown in sandy desert soils.

The obtained results can be summarized as follows: -

- Poinsettia transplants tolerated all used EC levels. Manure caused increasing in survival percantage under different level of 3 to 9 mmhos/cm. Meanwhile manure improved vegetative growth traits, especially at high level and had the most pronounced effect on growth of transplants .

- The data suggested that manure promoted salt stress avoidance in all plants by reducing the accumulation of harmful Na^+ and Cl^- ions in the leaves of plants and improved N, P and K uptake . For interaction, the treatment tap water combined with manure at 3 mmhos/cm gave the highest values of most vegetative, flowering parameters and N , P , K , % chlorophyll and total carbohydrates.

- The highest and lowest values of Ca, Na and proline resulted from the treatments EC 9 mmhos/cm and tap water combined with types of different manure. Also the highest

and lowest of relative water content_(R.W.C %) resulted from the treatments of EC 3 mmhos/cm combined with manure (cattle manure) and EC 9dsm^{-1} without manure during the two seasons .

- So, it can be recommended to use manure (cattle manure) for growing one year old poinsettia transplanting which will be irrigated by saline water of EC 3 mmhos/cm in sandy desert soils.

Key words: poinsettia , *Euphorbia pulchrrima* , Euphorbiaceae, saline water, organic manure, mineral content , relative water content(R.W.C.), proline.

INTRODUCTION

The need for maximizing agricultural especially those concerning with food crops has become urgent in order to meet the uprising requirements of rapidly increasing population under the Egyptian condition. However, expansion in newly lands in Egypt is becoming limited to areas characterized by unfavorable conditions either in soil or in water. The available soils are however sandy to sandy calcareous, which have poor properties and water have poor quality.

Establishing new communities in these desert areas is necessary to meet people requirements. One of these necessary requirements is the use of flower and ornamental plants. Poinsettia (*Euphorbia pulchrrima* Willd) plants are widely used as flowering shrubs in gardens in late fall and winter seasons, as flowering pot plants for internal and external designing especially in Christmas and as a cut flower. Also, a redish purple dye is extracted from its bracts .

Whereas, lee *et al.,* (1996) studied the effect of EC and physical properties in the mixed media made of organic materials on the growth of *Euphorbia pulcherrima*.They reported that EC decreased in all media with cultivation. Conte e Castro *et al.,* (2001) found that poultry manure, hog manure, bovine manure urban waste compost (all at 10 t/ha) substantially increased plant height and diameter, bulb diameter, number of floral buttons and dry weight of aerial parts and bulbs of gladiolus cv. Red Beauty. Kim Jnhyoug *et al.,* (2000) cleared that growth and development of poinsettia

(*Euphorbia pulcherrima* Wild) as affected by application of waste nutrient solution. Growth characteristics and nutrient uptake were produced the tallest plants with longest branches , higher leaf numbers and fresh and dry weights. Starkey and Nielson (2001) showed that reduced N and K application increase the uptake Ca and improves the quality of ponsettia (*Euphorbia Pulcherrima* Wild).

However, no research work has been done on the effect of the interaction between saline water irrigation and manure on poinsettia (*Euphorbia pulcherrima* Wild) production.

Therefore, the objectives of this study were to investigate the effects of water salinity , different types of manure (cattle manure , poultry manure , green manure) and their interaction on the vegetative growth, flowering parameters and chemical constituents of ponsettia (*Euphorbia Pulcherrima* Wild).

MATERIAL AND METHODS

This work was carried out at Antoniadis Garden; Ornamental plants Research Branch, Horticultural Research Institute, Alexandria, Egypt. The experiments were repeated for two successive seasons (2005/06 and 2006/07) plants were used in the study are poinsettia (*Euphorbia pluchrrima*, wild).

Sandy desert soils were collected from the surface layer (0 – 20 cm) from the 86km area west the Alexandria city (Table 1, 2).

Table 1 : chemical properties of studied soils :

Soil	Ec mmhos/ cm	Cations				Anions				$CaCO_3$	
		Ca	Mg	Na	K	CO_3	HCO_3	Cl	SO_4	%	pH
Sandy	1.2	0.6	0.35	0.6	0.05	-	0.1	0.35	0.35	1.5	7.2

Table2: physical properties of studied soils :

Soil	Particle size distribution, %					
	F.C	Course sand	Fine sand	Silt	Clay	texture
Sandy	7.5	14.5	79.4	4.3	1.8	Sandy

preparation of plant for experiments :

Uniform stem cuttings of a local variety of poinsettia (*Euphorbia pulchrrima* Wild) plant were taken on April 10for both seasons, with average length of 15cm and 4 leaves per cutting. The bases of the used cuttings were dipped in idol butyric acid (IBA) solution at 2500 ppm for 10 seconds (Mostafa 2002). Then, the cuttings were planted in seed pans (15 cuttings/seed pans) using a mixture of sand and peat at 3:1 (v/v).

The seed pans were set under the plastic house conditions and irrigated thoroughly. Seven weeks later (on May 29, 2005), the rooted cutting were transplanted to 10cm diameter pots (one rooted cutting/pot) containing 660 of sandy soil. These rooted cuttings were irrigated with normal (canal) water for one month, and then irrigated with different saline irrigation water. The plants were repotted again to pots 25cm diameter containing 3.75 kg sandy soil. One-week later after potting, all auxiliary shoots were removed except one on each plant

The soil was amended with three different types of manure, cattle manure (CM), poultry manure (PM) and green manure (GM) at the rate of 15g/pot

The chemical analysis of the different sources of manure used in present investigation is presented in Table (3)

Table 3 : chemical analysis of the different manure sources .

Manure	O.M%	N%	P%	K%	C:N ratio
Green manure	21.4	0.96	0.14	1.15	13 : 1
Poultry manure	8.44	0.73	0.05	0.91	7 : 1
Cattle manure	43.0	2.4	0.28	3.18	10 : 1

The plants were irrigated after one month of transplanting with salty water to soil field capacity. The sandy soil pots were irrigated with 300ml every two days. Four levels of salinity were used in irrigation water as follows: 0 (tap water),3,6,9mmhos/cm. A mixture of sodium chloride (NaCl with purity 95%) and calcium chloride (anhydrous Ca cl2 with purity 90%) were used the ratio of 2:1 (w/w) for producing salinity (Mostafa 2002) the salt was dissolved in normal irrigation water (0.6 mmhos/cm) to produce different levels of water salinity.

All the plants under the experiment received 2 g/ pot at one month intervals of a complete mineral fertilizer 19:19:19: (N: P_2O_5: K_2O) as dressing application. The fertilization started after one month from the final transplanting.

Experimental layout:

The experimental layout was split-plot design for arrangement of pots with three replicates. Ten plants were used for each treatment in the replicate (Snedecor cochran ,1974).Types of manure were arranged in the main treatments, While the water salinity concentrations were randomly distributed in the sub-treatments and all were treated under open field condition.

Determinations and measurements:

Measurements of plant height (cm) and dry weight of leaves (g)/ plant while, the flowering date were included inflorescence diameter (cm) at full opening (a distance between the two distal ends of the faced expanded bracts), bracts number / inflorescence, inflorescence duration in day (from the date of inflorescence showing colour in bracts to date of their fading) and dry weight of inflorescence(g) .

Also, roots length (cm) and dry weight (g)/plant were recorded then the percentage of relative water content (RWC%) wad determined by taken 5 discs of leaf tissue each in 1.0cm diameter, weighed fresh and then floated on distilled water for 4 hr to become fully turgid. Discs were weighed again, dried at 70C° and then weighed a find time. RWC% was calculated as maintained by Barrs (1968) as follows:

$$\text{RWC \%} = \frac{\text{(Fresh wt – dry wt.)}}{\text{(turgid wt – dry wt)}} \times 100$$

The first two expanded leaves beneath the basal bracts were collected at the stage of forests chlorophyll, K, Na, N, Ca and total carbohydrates (Cox and Seeley, 1984). The total chlorophyll in the leaves blades was determined using apparatus of chlorophyll meter, Minolta SPAD – 501 according to Yadava (1986).

While for K, Ca, Na determination, sample of 0.3(g) from the oven dried leaves was taken and digested with sulphuric acid by hydrogen peroxide according to Evenhuis and Deward (1980).

Potassium and sodium were determined using a flam photometer, while, the verse Nate method was used for Ca determination (Cheng and Bray 1951). A sample of 0.5g leaves a dry weight was taken for the determination of total carbohydrates were mathematically calculated as percentage (Dubios et al., 1956). The same steps and techniques of the first experimental year (2005-2006) were followed in the second one (2006-2007).

The among treatments of individual factors and their interaction were compared by L.S.D. at 5 %level of probability for both seasons according to Snedecor cochran (1974).

RESULTS AND DISCUSSION

Vegetative growth

1-Plant height

The data in Table (4) show that saline water of EC 6 mmhos/cm and 9 mmhos/cm significantly decreased plant height to 64.83 and 49.90 cm comparing with 72.50 cm for tap water , and to 70.33 and 58.00 cm comparing with 81.75 cm in the first and second seasons, respectively. Meanwhile, the contrary action was a result of receiving the plants 3EC treatment. It increased the values to 112.50 and 116.29 cm in both seasons, respectively.

Data of two experimental seasons cleared that adding cattle manure (CM) gave the maximum increase in plant height treatments . The values reached to 82.23 and 93.08 cm against to 66.92 and 72.25 cm resulted from the control treatment in the first and second seasons, respectively. Also it was noticed that applying poultry manure (PM) and green manure (GM) resulted in a significant increase in plant height as compared to control in both seasons. These results are in parallel line with those Starkey and Nielsen (2001) on poinsettia plant.

Concerning the interaction between water saline and different types of manure treatments it is evident from the data of Table (4), the great influence of receiving the plants EC 3 mmhos/cm combined with cattle manure in both experimental

field for increasing plant height. The values reached to 139.67 and 144.00 cm in both seasons, respectively.

2- Leaves dry weight

Data presented in Table (4) clearly indicated that leaves dry weight of poinsettia plants decreased significantly with increasing of EC concentration, except EC 3 mmhos/cm as compared to control (tap water)in the two seasons. The treatment of EC 3 mmhos/cm gave the heaviest leaves dry weight as 10.36 and 9.68g/plant in the first and second seasons, respectively.

Evidently, data in Table (4) reveal the significant increment of leaves dry weight in both seasons, resulting from growing the plants in cattle manure. It increased the values to 9.48 and 8.11 g in the first and second seasons, respectively.

The interaction between the water saline and types of manure revealed the great influence of receiving the plants saline water of EC 3 mmhos/cm with cattle manure for increasing leaves dry weight in both experimental fields. This treatment increased the values to 12.23 and 10.46 g in the first and second seasons, respectively.

Flowering characteristics

1. Inflorescence diameter

Data in Table (5), show the increment on the diameter of inflorescences due to using water saline at 3EC as the values reached to 24.67 and 24.88 cm g the first and second seasons, respectively. Meanwhile, applying the highest concentration of EC(9 mmhos/cm) recorded the lowest values in this respect as they reached to only 13.91 and 14.83 cm in both seasons, respectively.

While, no significant effects were recorded on inflorescence diameter resulting from using different types of manure (cattle manure, poultry manure and green manure) for plantation, in both experimental trials as seen in Table (5).

Table (4) Effect of water salinity , different types of manure (cattle manure , poultry manure , green manure) and their interaction on plant height (g) and leaves dry weight (g) of poinsettia plants in sandy desert soils during 2005/06 and 2006/07 .

water EC mmhos /cm	Manure									
	0.0	CM	PM	GM	Mean	0.0	CM	PM	GM	Mean
	Plant height (cm)									
	(1st) season					(2nd) season				
T.W	74.00	65.33	75.33	74.33	77.24	78.00	95.00	77.67	76.33	81.75
3	76.00	139.67	121.33	113.0	112.5	79.00	144.0	124.17	118.0	116.4
6	63.00	68.33	65.00	63.00	64.83	69.00	74.67	71.00	66.67	70.33
9	54.67	55.60	46.00	43.33	51.15	63.00	58.67	55.00	55.33	35.60
Mean	66.90	87.20	76.90	73.40		72.25	93.08	80.80	79.08	
Salinity LSD 5%	3.40					3.30				
Manure LSD 5%	3.00					3.21				
(S) × (M) LSD 5%	6.60					6.67				
	Leaves dry weight (g / plant)									
T.W	7.22	11.27	10.10	8.09	9.17	8.58	9.58	9.13	8.98	9.06
3	8.70	12.23	11.26	9.27	10.4	9.07	10.46	9.63	9.57	9.53
6	6.76	7.54	6.070	6.19	6.64	5.70	6.74	6.55	6.28	6.31
9	6.18	6.83	5.32	3.55	5.47	4.98	5.65	5.40	5.34	5.34
Mean	7.22	9.47	8.19	6.78		7.08	8.10	7.60	7.54	
Salinity LSD 5%	0.76					750				
Manure LSD 5%	0.59					0.60				
(S) × (M) LSD 5%	0.56					1.20				

For the interaction, data of the seasons in Table (5) clear that highest increase in the diameter of inflorescence (highest terminal bracts) was obtained of EC 3 mmhos/cm with adding cattle manure compared with the other treatments in both plantations . They reached to 26.37 and 27.30 cm in the first and second seasons, respectively. This result may be probably due to the influence of low of water salinity level and manure at suitable rates on increasing the length and / or width of the produced

terminal bracts, consequently the diameter of inflorescence could be increased. Similar trend of results was stated by Kageyama *et al.,* (1995) on chrysanthemum plant.

2. Number of bracts / in florescence

It is evident from the obtained data in Table (5) clear that number of bracts / inflorescence decreased with increasing of EC concentration, except EC 3 mmhos/cm in both seasons. The differences between treatments of tap water and 3EC were non significant in the first and second seasons. While the lowest ones resulted from applied water 9EC as gave 15.58 and 15.96 / plant in both seasons, respectively.

Insignificant effects were recorded on number bracts / inflorescence of due to different types manure compared with control in both seasons as indicated in Table (3).

Data presented in Table (5) show that the highest number of bracts / inflorescence was given by adding of EC 3 mmhos/cm of water salinity level plus cattle manure. Such treatment significantly increased the values comparing with that recorded from the other treatments (18.69 and 18.58) in both seasons, respectively. This treatment increased the produced bracts (per inflorescence) over the control (as average for two seasons). This result may be attributed to the influence of cattle manure in enhancing the biosynthesis and translocation of assimilates leading to initiation of more bracts primodias, consequently the produced number of bracts could be increased , similar trend of results was stated by Wissemeier and Marienfeld (1998) on poinsettia plants.

Table (5) Effect of water salinity , different types of manure (cattle manure , poultry manure , green manure) and their interaction on inflorescence diameter (cm) and number of bracts / inflorescence of poinsettia plants in sandy desert soils during 2005/6 and 2006/07 .

water EC mmhos /cm	Manure									
	0.0	**CM**	**PM**	**GM**	**Mean**	**0.0**	**CM**	**PM**	**GM**	**Mean**
	Inflorescence diameter (cm)									
	(1st) season					(2nd) season				
T.W	20.70	25.46	23.60	22.06	22.95	19.94	24.22	22.81	21.58	22.14
3	22.80	26.37	25.14	24.36	24.67	22.20	27.30	25.49	24.58	24.88
6	20.10	20.17	24.83	20.87	21.49	19.50	25.19	24.05	22.65	22.85
9	18.60	23.04	22.35	20.87	21.21	17.39	21.91	21.80	19.69	20.20
Mean	20.55	23.76	23.98	22.04		19.76	24.65	23.54	22.12	
Salinity LSD 5%		0.7				1.20				
Manure LSD 5%		NS				NS				
(S) × (M) LSD 5%		1.5				2.3				
	Number of bracts / inflorescence									
T.W	16.67	18.43	17.40	17.23	17.43	16.54	18.58	17.37	17.21	17.43
3	16.88	18.69	18.50	16.46	17.63	16.70	18.58	18.12	17.73	17.78
6	15.95	17.28	17.54	16.90	16.92	15.92	18.01	17.70	17.49	17.28
9	13.52	17.13	16.69	15.00	15.59	14.32	16.76	16.48	16.27	15.96
Mean	15.76	17.88	17.53	16.40		15.87	17.98	17.42	17.18	
Salinity LSD 5%		1.1				0.90				
Manure LSD 5%		NS				NS				
(S) × (M) LSD 5%		2.2				1.07				

3. Inflorescence duration

Data presented in Table (6) revealed that irrigation with saline water of EC6and/or9 mmhos/cm, significantly decreased inflorescence duration form 67.93 (control) to 62.21 day at (9 mmhos/cm) and from 66.78 to 61.41 day in the first and second seasons, respectively.

Negligible and insignificant effect, on the other hand, was detected on the obtained values in both plantations due to receiving the plants the different manure treatments as indicated in Table (6).

Data of the two experimental seasons in clear that the longest period of inflorescence (including bracts) duration on poinsettia plant was obtained by adding water salinity of EC 3 mmhos/cm combined with cattle manure (68.90 and 70.55 day) comparing with other treatment in both seasons, respectively ,Table (6). The previous result may be related to the influence of a suitable rate of manure with low water salinity level on enhancing turgor of bract cells with supplying it with sugars (Hartt, 1969). Besides, they influence water movement in bract cells (Bennett, 1993) thus, the inflorescence could be lasted for a longer period. Similar trend of results was found by Kageyama *et al.*, (1995) on Chrysanthemum plants.

4. Inflorescence dry weight

Effects of saline water on inflorescence dry weight were presented in Table (6). It is clear from the data that salinity significantly decreased inflorescence dry weight form 5.95 (control) to 5.46 g at (9 mmhos/cm) and from 5.98 to 5.82 g in the first and second seasons, respectively. The heaviest inflorescence dry weight was recorded for the plants irrigated by saline water of 3EC as gave 6.43 and 6.73g in the first the second season, respectively.

Data in Table (4) reveal the significant increment of inflorescence dry weight in both seasons, resulting from growing the plants in cattle manure. It increased the values to 6.52 and 6.62 g against to 5.63 and 5.71 g resulted from the control treatment in the first and second seasons, respectively.

Data of the two seasons presented in Table (6) show that the heaviest inflorescence (including bracts) dry matter was obtained by application of water salinity of EC 3 mmhos/cm combined with cattle manure as compared with the other treatments. This treatment increased the values to 7.36 and 7.37 g in the first and second seasons, respectively. This result may be probably due to the effect of water salinity of EC 3 mmhos/cm (low level of salinity) and types of different manure especially cattle manure on enhancing the accumulation of biosynthesizes and / or increasing the bracts number, consequently the

inflorescence dry matter could be increased. Similar trend of results was stated by Yelanich and Biernbaum(1990) on poinsettia plants.

Table (6) Effect of water salinity , different types of manure (cattle manure , poultry manure , green manure) and their interaction on inflorescence duration (days) and inflorescence dry weight (g / plant) of poinsettia plants in sandy desert soils during 2005/6 and 2006/07 .

water EC	**Manure**									
	0.0	**CM**	**PM**	**GM**	**Mean**	**0.0**	**CM**	**PM**	**GM**	**Mean**
mmhos	Inflorescence duration (days)									
/cm	(1st) season					(2nd) season				
T.W	67.50	68.90	67.60	67.70	67.93	63.80	69.30	67.19	67.19	66.87
3	67.50	68.00	68.20	67.30	67.75	66.33	70.55	68.63	66.22	67.93
6	65.34	67.77	67.27	66.10	66.62	65.61	66.51	67.00	65.73	66.21
9	58.24	64.61	63.60	62.37	62.21	61.46	62.15	61.41	60.60	61.41
Mean	64.65	67.32	66.67	65.87		64.30	67.13	66.06	64.94	
Salinity LSD 5%	0.80					0.80				
Manure LSD 5%	NS					NS				
(S) × (M) LSD 5%	NS					1.60				
	Inflorescence dry weight (g / plant)									
T.W	5.62	6.10	6.27	5.83	5.96	5.52	6.39	6.19	5.84	5.99
3	6.19	7.36	6.47	5.70	6.43	6.20	7.37	7.00	6.36	6.73
6	5.93	6.60	6.19	5.69	6.10	5.19	6.62	6.11	5.34	5.82
9	4.77	6.01	5.80	5.27	5.46	5.92	6.10	5.93	5.34	5.82
Mean	5.63	6.52	6.18	5.62		5.71	6.62	6.31	5.72	
Salinity LSD 5%	0.42					0.43				
Manure LSD 5%	0.40					0.43				
(S) × (M) LSD 5%	0.84					0.86				

J.Agric.&Env.Sci.Alex.Univ.,Egypt Vol.7 (2)2008

Roots characteristics

1. **Root length (cm)**

Data in Table (7) show the significant increment of root length resulting from 3EC saline water. Such treatment significantly increased the values comparing with that recorded from the other irrigation saline water treatments (40.90 and 40.17 cm) in both seasons, respectively. Whereas, the lowest values were obtained as a result from using saline water irrigation of EC 9 mmhos/cm. They decreased root length to only 18.16 and 14.33 cm in the first and second seasons, respectively.

Using the cattle manure treatment (CM) significantly increased root length compared with that obtained from the other manure (poultry manure and green manure) in both experimental trials, Table (7). These results may be attributed to the enhancement effect of manure on the synthesis and activation of RNA and various enzyme proteins in root cell, consequently cells division and elongation could be increased (Scott, 1972). Similar trend of result was found by Wang (1992) on *pittosporum tobira* .

Referring the interaction, it could be concluded that receiving the plants 3ECof irrigation saline water combined with cattle manure were the best treatments for increasing the root length in both experimental trials (45.67 and 43.67 cm , respectively) as seen in Table (7). These results may be attributed to the enhancement effect of cattle manure on the synthesis and activation of RNA and various enzyme proteins in root cell, consequently cells division and elongation could be increased . Whereas, the contrary action on the root length was observed on the obtained values resulting from receiving the plants 9EC irrigation saline water without manure, as the values were decreased to only 15.33 and 11.00 cm in the first and second seasons, respectively. These results may be due to the toxic effects of Na and Ca ions accumulated in the cytoplasm of root cells, besides the reduction of the total water uptake by rooted cuttings leading to a reduction in root cells division and elongation (Khan *et al.,* 2002).

Table (7) Effect of water salinity , different types of manure (cattle manure , poultry manure , green manure) and their interaction on root length (cm) and roots dry weight (g) of poinsettia plants in sandy desert soils during 2005/06 and2006/07 .

water EC mmhos /cm	Manure									
	0.0	CM	PM	GM	Mean	0.0	CM	PM	GM	Mean
	Root length (cm)									
	(1st) season					(2nd) season				
T.W	36.67	42.33	39.00	37.00	38.70	37.67	41.00	37.33	36.33	38.08
3	40.67	45.67	39.00	38.33	40.90	39.67	43.67	39.67	37.67	40.17
6	29.33	35.00	31.67	30.00	31.90	24.33	28.00	26.00	25.00	25.80
9	15.33	20.67	18.67	18.00	18.16	11.00	17.00	15.67	13.67	14.33
Mean	30.50	35.90	32.08	30.80		28.16	32.40	29.66	28.16	
Salinity LSD 5%	1.56					2.77				
Manure LSD 5%	1.35					2.49				
(S) × (M) LSD 5%	3.54					6.53				
	Roots dry weight (g / plant)									
T.W	7.08	7.94	8.25	5.37	7.16	6.74	8.60	7.53	7.72	7.65
3	8.58	10.17	9.92	9.58	9.56	7.59	9.94	9.16	8.44	8.78
6	6.98	7.46	7.33	7.14	7.22	6.24	7.70	6.31	6.07	6.73
9	5.17	5.55	5.14	4.94	5.20	5.73	7.43	5.94	4.77	5.96
Mean	6.95	7.78	7.66	6.75		6.57	8.42	7.23	6.74	
Salinity LSD 5%	0.48					0.57				
Manure LSD 5%	NS					0.57				
(S) × (M) LSD 5%	1.03					1.14				

2. Root dry weight (g)

Data in Table (7), revealed that EC levels affected on root dry weight, while higher EC level (9mmhos/cm) decreased it as compared to tap water (control) .The highest root dry weight resulted from the plants irrigated by saline water of EC 3 mmhos/cm as gave 9.56 and 8.78 g/ plant in both seasons , respectively. While the plants irrigated by saline water of 9EC recorded the lowest root dry weight as gave 5.20 and 5.96 g in the first and second seasons, respectively.

Growing the plants in cattle manure increased root dry weight than that obtained from the other manure used in cultivation compared with control treatment in both seasons as can be seen in Table (7).

The heaviest root dry weight was obtained by irrigation saline water at level of EC 3 mmhos/cm combined with cattle manure as compared with the other treatments as recorded 10.17 and 9.94 g in the two seasons, respectively. Table (7). This result may be attributed to the influence of manure on enhancing the length and /or thickness of roots, consequently root dry matter could be increased. Similar trend of results was cleared by Starkey and Nielsen (2001) on poinsettia plants.

Chemical analysis

1. Nitrogen percentage

Data in Table (8) mentioned that N% of poinsettia leaves decreased gradually with increasing salinity concentration in the irrigation water during the two successive seasons. The values recorded decline from 3.33 (control) to 2.46 , 2.63 and 2.46 % as treated with 3, 6 and 9 mmhos/cm in the first seasons, and from 3.43 to 3.55,2.65 and 2.43 in the second season, respectively .

Meanwhile, manure treatments increased N% of leaves in the two seasons. The highest N % was found in plants grown in cattle manure which recorded 3.97 and 3.11 % against 2.58 and 2.62 fore control in both seasons, respectively.

As for the interaction data in Table (8)showed that the plants irrigated by tap water combined with cattle manure gave highest N% in the leaves of poinsettia, as compared with other treatments. Such treatment increased the values to 3.79 and 3.70 % in both seasons, respectively. These results may be due to the effect of manure , consequently increasing the absorbed amount of N, especially under the lower values of salinity. On the other hand, the highest level of salinity may reduce the availability of elements and growth of roots, resulted in a lower N content. Similar trend of results was reported by Bertram(1992).

J.Agric.&Env.Sci.Alex.Univ.,Egypt Vol.7 (2)2008

2. Potassium percentage

The effect of saline water on K % presented in Table (8). The data showed that salinity negatively affected K %of leaves in the two seasons. As well as K% decreased gradually and continuously with the increasing of irrigation water salinity concentration. K content decline from 1.38 (control) to 1.35, 1.25 and 1.24% at EC3,6and 9 mmhos/cm, and from 1.44 to 1.42, 1.34 and 1.27% in the first and second seasons, respectively.

On the other side , the different types manure (cattle manure, poultry manure, green manure) increased leaves K% in the two seasons. The highest values of leaves k% was (1.40 and 1.46 %), which were observed in the plants grown in poultry manure in the two seasons, respectively

Data of the two season presented in Table (8) indicate that the highest percentage of potassium content (K%) in the leaves of poinsettia plant was obtained by tap water with different types of manure (cattle manure, poultry manure, green manure) comparing with the other treatments. The previous result may be due to the presence of high concentration of manure in the rooting medium, consequently the plant could absorb a high amount of it besides, the highly mobility and translocation of K in the plant tissue led to increase it (Kemmler *et al.,* 1977). Furthermore, the lower concentration of Ca may synergistic the uptake of K via regulation the cellular processes (Barwe *et al.,* 2001) thus, the absorbed amount of K would be increased, hence the content of K in the leaves could be increased . similar trend of results was stated by Wissemeier and Marinfeld (1998) on poinsettia plants.

3.Calcium percentage

Data presented in Table(8) reflected the influence of saline water on Ca % of poinsettia leaves , these data showed that the accumulation of Ca % tented to increasing the salinity concentration in the used water . The highest values of Ca % were 1.16 and 1.24 % as a resulted of treatment with EC 9 mmhos/cm of saline water comparing with 1.06 and 1.13% in control in the first and second seasons, respectively.

Evidently, data in table (8) show the superiority of planting in different types of manure for increasing Ca % of poinsettia leaves in both cultivations, it could be concluded that cattle manure was the best manure for increasing Ca % of poinsettia leaves in both plantations. It increased the values to 1.34 and 1.43 % comparing with 0.53 and 0.59 % in control in the first and second seasons, respectively as illustrated in Table (8).

Concerning the interaction, it could be concluded that receiving the plants the highest concentration of salinity treatment (9 mmhos/cm) with cattle manure was the best treatment for increasing Ca % of poinsettia leaves. Such treatment increased the values to 1.35 and 1.49 % leaves in the first and second seasons, respectively. These results are in agreement with these obtained Bierman *et al.,* (1989) on poinsettia plant and Khalafatta *et al.,* (1998) on *Thevetia nercifolia*.

4.Sodium percentage

According to data in Table (8) it is obvious that Na% of poinsettia leaves increased gradually with increasing of salinity concentration in irrigation water in the two seasons. The highest value was recorded in leaves in the treatment of EC 9 mmhos/cm which equal 0.47 and .0.51 % in the first and second seasons, respectively.

Also, data indicated that, different types manure (cattle manure, poultry manure, green manure) decreased leaves Na% in the two seasons. The lowest leaves Na% was (0.37%), which were observed in the plants grown in cattle manure in the two seasons.

Data in Table (8) indicated that, the highest leaves Na% of poinsettia was resulted by irrigation saline water of EC 9 mmhos/cm without adding manure as gave 0.49 and 0.54 % compared to 0.37 and 0.38% in control for both seasons, respectively. While leaves Na% decreased with treatment of tap water combined with types of different manure in the first and second seasons respectively. Similar findings were obtained by Singh (2000) on *Eucalypta hybrid*. These results may be due to the excess percentage of Na ion which has the ability to enter the root cells through several channels via plasma membrane ATP ase, hence translocated and accumulated in leaves tissues (B1umwuld *et al.,* 2000). Similar trend of results was found by Koyro (2000) and Mostafa. (2002).

5. Relative water content (%)

Applying saline water at the rate 6 and 9 EC reduced the relative water content (R.W.C) percentages as compared with the control. Whereas, the lowest values were obtained as a result of EC 9 mmhos/cm. This decreased relative water content (R.W.C) percentages to 52.15 and 51.06 (%) in the first and second seasons, respectively. The highest R.W.C(%) were 71.14 and 71.66 % for 3 EC against 69.99and 70.04% for tap water in both seasons, respectively as indicated in Table (9) . These results are somewhat looks like that observed by EL-sayed (2003) on *Murraya exotica* .

J.Agric.&Env.Sci.Alex.Univ.,Egypt Vol.7 (2)2008

Table (8) Effect of water salinity , different types of manure (cattle manure , poultry manure , green manure and their interaction on N, K, Ca and Na (%) in the leaves of poinsettia plants in sandy desert soils during 2005/06 and 2006/07 .

water EC mmhos /cm	Manure									
	0.0	CM	PM	GM	Mean	0.0	CM	PM	GM	Mean
	N %									
	(1st) season					(2nd) season				
	2005/06									
T.W	2.81	3.79	3.34	3.41	3.33	2.80	3.70	3.6	3.65	3.43
3	2.65	2.08	2.88	2.92	2.63	2.75	3.55	3.30	3.55	3.28
6	2.46	2.74	260	2.66	2.61	2.64	2.65	2.60	2.60	2.62
9	2.42	2.50	2.46	2.47	2.46	2.30	2.55	2.40	2.45	2.43
Mean	2.58	3.97	2.82	4.40		2.62	3.11	2.90	3.06	
K %										
T.W	1.25	1.45	1.40	1.40	1.38	1.31	1.50	1.52	1.44	1.44
3	1.20	1.40	1.39	1.40	1.35	1.30	1.45	1.49	1.44	1.42
6	0.99	1.35	1.37	1.35	1.25	1.20	1.37	1.42	1.37	1.34
9	0.98	1.30	1.35	1.34	1.24	1.00	1.32	1.41	1.35	1.27
Mean	1.09	1.37	1.40	1.37		1.20	1.40	1.46	1.40	
Ca %										
T.W	0.45	1.34	1.25	1.22	1.06	0.49	1.38	1.36	1.31	1.13
3	0.5	1.35	1.28	1.26	1.08	0.53	1.40	1.39	1.35	1.17
6	0.55	1.34	1.29	1.37	1.13	0.57	1.44	1.40	1.40	1.20
9	0.6	1.35	1.30	1.39	1.16	0.59	1.49	1.45	1.45	1.24
Mean	0.53	1.34	1.28	1.31		0.54	1.43	1.40	1.38	
Ca %										
T.W	0.37	0.28	0.21	0.28	0.28	0.38	0.25	0.30	0.30	0.31
3	0.40	0.32	0.32	0.38	0.35	0.48	0.33	0.35	0.39	0.39
6	0.45	0.44	0.4	0.44	0.43	0.47	0.40	0.43	0.46	0.44
9	0.49	0.45	0.46	0.49	0.47	0.54	0.49	0.49	0.50	0.51
Mean	0.43	0.37	0.35	0.39		0.48	0.37	0.39	0.41	
2006/07										
T.W	0.38	0.25	0.3	0.3	0.31	0.45	0.3	0.38	0.40	0.38
3	0.48	0.33	0.35	0.39	0.39	0.49	0.35	0.43	0.45	0.44
6	0.47	0.40	0.43	0.46	0.44	0.51	0.37	0.39	0.48	0.44
9	0.54	0.49	0.49	0.5	0.51	0.550	0.40	0.50	0.5	0.49
Mean	0.48	0.37	0.39	0.41		0.5	0.36	0.43	0.46	

In addition, the same data reflect that types of manure as cattle manure, poultry manure and green manure increased the relative water content (R.W.C) % from 56.52 (control) to 72.15 , 59.98 and 58.37 % in the first season, respectively and from 55.20 to 72.56 ,62.22 and 58.90 % in the second season, respectively.

Concerning the interaction, it could be concluded that receiving the plants saline water of EC 3 mmhos/cm water with plants grown in cattle manure were the best treatments for increasing the relative water content (R.W.C) % in both seasons. Such treatment increased the values to 82.60 and 83.40 % in the first and second seasons, respectively as seen in Table (9).

these results may be due to the effect of salinity stress on increasing the osmotic potential in the rooting medium and reducing the hydraulic conductivity of roots which led to a reduction in the flux of water into roots consequently reduced the turgidity of leaf cell, resulted in lower values of R.W.C% Flowers *et al.,* (1986) similar trend of results was found by Khan *et al.,* (2000).

6.Total chlorophyll content in leaves

It is evident from the obtained data the increment on total chlorophylls content of leaves due to receiving the plants saline water at level of EC 3 mmhos/cm. Such treatment increased the values to 48.40 and 48.53 in the first and second seasons, respectively as presented in Table (9).

growing the plants in different types of manure increased total chlorophyll content in leaves compared with the control for both seasons. the great influence of receiving the plants grown in cattle manure.. This treatment increased the values to 48.07 and 47.93 against to 44.85and 45.57 resulted from the control in the first and second seasons, respectively.

From the interaction, it could be concluded from the tabulated data, the great influence of receiving the plants grown under saline water of EC 3 mmhos/cm combined with cattle manure. Such treatment increased total chlorophylls content to 49.95 and 49.90 in the first and second seasons, respectively. The contrary action was detected as a result of receiving the plants 9EC with out manure (42.80 and 43.00) in both seasons, respectively as seen in Table (9). the previous result may be due to the influence of Ca on the synthesis of a bound calcium dependent protein kinase, which activates the cellular processes (Barwe et al, 2001). Besides, Ca may be enhance the uptake of N , and it is necessary for chlorophyll formation (Bennett, 1993) thus, the synthesis of the green pigment could be enhanced. Similar trend of results was stated by Bierman *et al.*, (1989) on poinsettia plants.

7.Total carbohydrates content in leaves (%)

Data in Table (9), revealed that EC levels affected on leaf carbohydrates content, while higher EC levels(6-9 mmhos/cm) notably decreased it as compared to tap water .The highest leaf carbohydrates contents resulted from the treatments of EC 3 mmhos/cm as gave 9.10 and 8.93 in both seasons , respectively. While the plants irrigated by water of 9EC recorded the lowest leaf carbohydrates contents (6.22 and 8.12 %)

Obviously data in table (9), indicate the superiority of using cattle manure in plantation in both seasons. It considerably increment total carbohydrates in leaves comparing with that recorded from the other treatments used in cultivation. The values reached to 8.65. and 9.52 % in the first and second seasons, respectively.

For the interaction , data in Table (9) cleared that leaf carbohydrate content differently affected by application the different treatments of salinity combined with manure . The highest carbohydrate content resulted from the salinity treatments of EC 3 mmhos/cm combined with cattle manure in the first season and T.W. with cattle manure in the second one as recorded 9.90 and 9.86 % respectively as compared to the other

treatments. This result may be attributed to influence of manure on increasing the concentrations of glucose-6-phosphates fructose-6-phosphate and raffinose. Besides, it promotes the synthesis of ATP, UTP, and UDP – glucose (Mengel and Haeder, 1977). Similarly, EC influences water movement in cells and counteracts the effect of alkali salts and organic acids within the plant (Bennett, 1993), thus the synthesis and accumulation of carbohydrates would be enhanced. Similar trend of results was stated by Wisemeier and Marienfeld (1998) on poinsettia plants.

8.Proline contents (µ molle / 100 g. fresh weight)

Data presented in Table (9) reflect clearly the influence of salinity on proline accumulation in the leaves of poinsettia . The data showed that increasing the salinity level in the irrigation water was associated with an obvious increase in proline contents in leaves. Higher levels of EC (9 mmhos/cm) caused a marked increase in proline contents (8.84 and 9.08 µ molle / 100 g. F.W.) in the first and second season , respectively . These results are in line with those reported by EL-sayed (2003) on murraya exotica .

Meanwhile, types of manure (cattle manure, poultry manure and green manure) markedly decreased leaves contents of proline in the two seasons. The lowest contents of proline were found in plants grown on sandy soil with cattle manure and reached 6.76 and 7.87 µ molle / 100 g. F.W. in the first and second season , respectively .

Regarding the interaction, date in Table (9) indicated that leaf proline contents differently affect by using different treatments of EC combined with manure (cattle manure, poultry manure and green manure). Under the same treatment of manure, proline content decreased as types of different manure. The highest proline content resulted from the treatment of EC 9 mmhos/cm without manure in the two seasons. On the other hand, the plants irrigated by tap water combined with cattle manure had the lowest proline contents (5.10 and 6.60 µ molle / 100 g. F.W.) for the both seasons, respectively. Similar results were reported

by Floweres *et al.,* (1977) on some plant spp, El khateeb (1993) and EL-sayed (2003) on murraya exotica .

able (9) Effect of water salinity , different types of manure (cattle manure , poultry manure , green manure) and their interaction on relative water content (R.W.C %), total chlorophyll (SPAD), total carbohydrates (mg / g. dry weight) and proline (µ molle / 100 g. fresh weight) of poinsettia plants in sandy desert soils during 2005/06 and 2006/07 .

water EC mmhos /cm	**Manure**									
	0.0	**CM**	**PM**	**GM**	**Mean**	**0.0**	**CM**	**PM**	**GM**	**Mean**
	R.W.C (%)									
	(1st) season					(2nd) season				
T.W	65.60	81	66.7	66.67	69.99	66.70	80.71	66.98	65.79	74.04
3	65.80	82.6	68.31	67.88	71.14	67.31	83.40	68.11	67.83	71.66
6	47.60	63.6	54.43	49.25	53.72	48.33	65.71	58.19	54.66	56.72
9	47.01	61.4	50.5	49.7	52.15	40.51	60.81	55.63	47.39	51.06
Mean	56.52	72.15	59.98	58.37		55.20	72.65	62.22	58.90	
	Total chlorophyll (SPAD)									
T.W	45.10	48.60	47.22	47.20	47.03	46.10	48.10	47.70	47.30	47.30
3	46.00	49.95	48.80	48.89	48.40	47.30	49.90	48.80	48.12	48.53
6	45.51	47.90	47.51	47.44	47.09	45.90	47.10	46.36	46.45	46.50
9	42.80	46.00	45.67	45.55	45.00	43.00	46.60	45.90	45.02	45.03
Mean	44.85	48.07	47.33	47.27		45.57	47.93	46.14	46.72	
Total carbohydrates (mg / g. dry weight)										
T.W	8.20	9.60	8.97	8.90	8.92	7.90	9.86	9.34	8.49	8.89
3	7.70	9.90	9.43	9.36	9.10	7.77	9.50	9.46	8.98	8.93
6	6.82	8.45	8.48	8.22	7.99	7.16	9.43	8.55	8.20	8.53
9	5.56	6.65	6.60	6.08	6.22	6.97	9.30	8.52	7.89	8.12
Mean	7.07	8.65	8.37	8.14		7.61	9.52	8.96	8.37	
Proline (µ molle / 100 g. fresh weight)										
2005/06										
T.W	6.35	5.10	6.50	6.50	6.10	8.31	6.60	7.63	7.41	7.49
3	7.80	6.65	7.17	7.15	7.19	8.44	7.75	7.77	7.68	7.90
6	9.30	7.10	8.02	7.16	7.89	9.01	8.11	8.13	8.23	8.37
9	10.04	8.20	8.50	8.62	8.84	9.15	9.01	9.03	9.12	9.07
Mean	8.37	6.76	7.55	7.36		8.72	7.86	8.14	8.11	

REFERENCES

Abd El-Rehim H.; H. EL-Bagoury and K.Nada (2002) . Effect of some growth regulators , pinching and some growth media on growth and chemical composition of *Nerium oleander* L. plants Ph.D thesis , fac. of agric ., Cairo univ , Egypt .

Abou El-Khashad , A.M.; A.F. EL-Samak ; A.A. El-Aidy and M.I. Salama (1997). paclobutrazol reduces some negative effects of salts stress in prach J. Amer . Soc . Hort . Sci , 122(1):43-46

Ahmed , S.S. (1997) . Effect of some growth regulators on growth and flowering of some ornamental plants Ph.D thesis , Fac . of Agric. Cairo univ .

Barrs , D.(1968) . Determination of water deficits in plant tissues vol. L,pp. 235-368. In water deficits and plant growth . T.T. Kozlowski (ed). Academic press, :london .

Barwe, S.; Sathiyabama and M. jayaskaran C.(2001). Induction of chitinase activity by exogenous cytokinins in excised dark grown cucamber cotyledons : involvement of Ca2+ and staurosporine –sensitive protein kinase (s) in cyokinin signaling . plant physiology , 158:1-7.

Bennett, W. (1993). Nutrient deficiencies and toxicities in crop plants MPS press , 1^{St} . Paul Minnesota .

Bernard . B.B. and J.M. Richard (1997) . High soluble salts effect water loss and bract necrosis of poinsettia . Hort Science, 32 (3): 333

Bierman, P.; Dole, J.; Rosen, C, and wilkins, H. (1989). Calcium deficiency on poinsettia stock plants. Minnesota florists bulletin, 38:1-4 .

Blumwald , E; Aharon. S. and P. Apes (2000). Sodium traspert in plant cell. Biochemica et biophysica acia biomernbraem . 1465:140-151 .

Cheng, L. and R. Bray (1951). Determination of Ca and Mg in the soil and plant material. Soil Sci., 72:449-458 .

Conte e Castro, A.M.; V. Ruppenthal ; D.C. Zigiotto ; M.I.F. Bianchini and C. Backes (2001). Organic fertilization in the culture of the gladiolus. Scientia Agraria Paranaensis. 1: 33.41.

Cox, A.. (1999). Growth and nutrient content of poinsetia (Euphorbia pulchrrima willd ex Kotzsch) in a soilless growth medium containing sewage sludge pellet ferilizer. Journal of plant Nutrition , 22:291-301 .

Cox, A.. and G. seeley, (1984). The effect of nitrogen and potassium fertilization and sample date on the macronutrients composition of poinsettia leaves. Hort . Abst. , 54 : 3845 .

Dubios , k; Gilles , k; Harnlton j ; P. Rebers and F .smith (1956) . Colourimetric method for determination of sugars and related substances analytical Chem., 25: 350-356 .

EL-Khateeb M.A..(1993). Response of *Murraya exotica* L. seedlings to saline water irrigation Bull, Fac Agric , Univ of Cairo , 45 (1): 139-149 .

El-Leithy and M.A.. El-Khateeb (1992) . Response of *Thevetia nereifolia* L. seedings to saline water irrigation . Bull . Fac agric . Cairo Univ . 43 (1) : 313-332 .

EL-Mahrouk : E.M ; B.A. Abdel – Maksoud and Y.M. Kandeel (1996). Effect os soil salinity on the growth and chemical analysis on *Thevetia nereifolia* proc . 1ST Egyptian Hungaian . Hort . Conf, Kafr El-Sheikh , Egypt, Vol 1 : 363-376 .

El-Sayed . S.G. (2003) .physiclogica studied on some oramental shrubs Ph . D . thesis , Faac of Agric El-Kafr El-Sherkn Tanta Univ , Egypt .

El-Shakhs, M.H. (1998). Studied on salinity tolerance of some ornamental palms plants . ph . D.Thesis , Fac . Agric Kafr El-Sheikh, Tanta Univ. Egypt .

El-Tarawy , M.A. (1992). Effect of irrigation with drainge water on the growth and folwering of Hibiscus rosa

sinesis L.Plants and some chemical properties of the Soil. J. Agric Res . Tanta Univ . 18(1):193-204 .

El-Tarawy , MA; F.A. Menesy and M.R. Khalifa (1991). Effect of soil typr and water qualities on growth and some elements composition of *Acalypha macrophylla* plants and chemical properties of growth soil media . Egypt . J.App. Sci . 6 (1) : 1-22 .

Evenhuis B. and P. Deward (1980). Principles and practices in plant analysis FAO soil bull , 38 152-163 .

Flowers, T.J.; P.F.Torke and A.R.Yeo (1977). The mechanism of salt tolerance in halophytes. Ann. Rev. Plant Physiol., 28:89-121.

Hartt, E. (1969). Effect of potassium deficiency upon translocation of C^{14} in attached blades and entire plants of sugar cane . plant physiology , 44:1461-1469 .

Jimenez M.S. and H.Gonzales (1997). Evaluation of choraphyll fluorescence as cool for satt stress detection in roses photosynthetice . 33,(2) : 291-301

Kandeel , Y.M.(1997) . Effect of soil salinity on the growth and chemical analysis of *Hibiscus rosa sienensis* L.J.Agric. Res. Tanta. Univ. 21 (1): 32-48

Kageyama, Y; K. Shima and K. Konishi (1995). Effect of calcium levels in culture solution on growth and cut flower quality of chrysanthemum journal of japanese society for Horticultural science 64 : 169-176 .

Kenmler G ; H. Fohara and M. Darke (1977). The effect of phosphorus and potassium on yield and composition of grass legume mixtures on sandy loam soil serived from volcanio ash in flokkaido japan potash Rev, Subj, 7,12rd Suite .

Khalafalla, M.M.; F.A. Menesi and Y.M.Kandeel (1998). Effect of CCC and GA_3 on growth and chemical composition of *Thevetia nereifolia* juss. And *koelreuteria paniculata* . Laxm under seline stress . J . Agric Res ., Tanta univ., 24 (4) : 217- 238 .

Khan, A; A. ungar, and M. showalter (2000). The effect of salinity on the growth,water status and ion content of a

leaf succulent perennial halophy suaeda fruticosa (L) forssk .J.Arid Environ , 45 : 73-84 .

Kim juttyoung ; kim Taejoug ; lee joungwon and Paek kee Yoeup (2000) . Growth and development of poinsettia (Euphorbia) nutrient solution. korean journal of Horticultural Science & technology vol. 18, No.4, pp.518 – 522.10 ref .

Koyro , w . (2000) . Effect of high Na Cl . salinity on plant growth , leaf tissues of beta vulgaris ssp. Mar tima angewandte , Botanik ., 74: 67-73 .

Lee J.and B. Y. Ryu (1996). Effect of PH,EC and physical properties in the mixed media made of organic material on growth of *Euphorbia pulcherrima* . Journal of the korean society for horticulture science vol.37, No.6,pp.810-814,16 ref.

Manoly, N.D. (1989). Some agricultural treatments affecting growth and flowering of Polianthes tuberose. M.Sc. Fac. Agric. El-Minia Univ.

Mengel , K and E. Haeder (1977). Effect of potassium supply on the rate of phloem sap exudaion and the composition of phloem sap of *Ricinus communis* . plant physiology, 59: 282-284 .

Mostafa, M.(2002) . Effectiveness of indol-3-butyric acid on the preopagation of some ornamental shrubs cuttings under salinity conditions . Alex . J. Agric Res. 47: 107-117 .

Nofal , E; M.A. El-Tarawy and E.M. Badawy (1983). Effect of sodium and calcium chlorides in soil on the growth and chemical analysis of *Adhatoda vasica* and *Thuja orientalis* J.Agric Res. Tanta Univ . 9(1):150-162 .

Poljaloff-Mayber , A . and J . Gale (1975). Plant in saline environments springer-vertag berlin heidelberg New York .

Singh . K . (2000). Seedling growth and mineral composition of Eucalyptus hybrid in light and heavy saline and sodic soils Indian forester . 126 : 376-381

Snedecor . G and W. Cochran (1974). Statistical method sixth Edition lowa state university press , Ames Iowa, USA .

Starkey R. and E. Nielsn (2001). Reduced N and K application increases the uptake of Ca and improves the quality of poinsettia (*Euphorbic pulchrrima* Willd Ex Klotzsch) .Ornamental Horticulture) crop physiology (C.F.CAB internationa) .

Venkatesen A. and K P.Chelleppan (1998). glycin belaine in Ipomea pes caprae induced by Na Cl .Biologia plantarum 41 (2) : 211-276

Wissemeier, H. and S. Marienfeld (1998). Poinsettia(Euphorbia pulchrrima willd ex klotzch) bracts disadvantaged organs with respect to calcium nutrition Angewandte Botanik, 72 : 1- 6 .

Yadava . L . (1986). Arapid and nondestructive method to determine chlorophyll in act leaves Hort . Science , 21 : 1449-1450 .

Yelanich, V.and A. Biernbaum (1990). Effect of fertilizer concentration and method of application of media nutrient content . nitrogen runoff and growth of *Euphorbia pulchrrima* V-14 Glory .Acta Horticulture . No. 181, 185-189 .

J.Agric.&Env.Sci.Alex.Univ.,Egypt Vol.7 (2)2008

الملخص العربي

استجابة نباتات بنت القنصل للري بالماء المالح والاسمدة العضوية النامية في الأراضى الرملية الصحراوية

***سهير جمعة السيد – **على حسن النجار**

* مركز البحوث الزراعية – معهد بحوث البساتين - فرع بحوث حدائق انطونيادس

** قسم الزهور زنياتات الزينة وتنسيق الحدائق – كلية الزراعة (الشاطبي) –جامعة الأسكندرية

أجرى البحث في حدائق انطونيادس فرع البحوث ونباتات الزينة بالإسكندرية – مصر خلال موسمي 2006/2005 و 2007/2006 لدراسة تأثير ملوحة الري بتركيزات صفر ، 3 ، 6 ، 9 ملليموز/ سم في الأرض الرملية المضاف لها مصادر مختلفة من السماد العضوي (سماد عضوي حيواني - داجني - نباتي) بمعدل إضافة 15 جرام للأصيص . والتفاعل بين كل سماد عضوي واثر ذلك على صفات النمو الخضري والزهري والجذري والتركيب الكيمائي في الرملية وكانت النتائج المتحصل عليها .

- زيادة تركيز الملوحة في مياه الري أدى إلى انخفاض معنوي في صفات النمو الخضري والزهري والجذري و التركيب الكيميائي ولكن استخدام السماد العضوي قلل من تأثير الملوحة المستخدمة .
- أدى استخدام الأسمدة العضوية إلى زيادة نسبة بقاء النباتات النامية تحت مستوى الملوحة من (3 – ملليموز/ سم 9) .
- ادى استعمال الأسمدة العضوية الى تحسين صفات النمو الخضري تحت تأثير المياه المالحة وكانت أفضل المعاملات مع التسميد الحيواني .
-أيضا المعاملة بمياه الصنبور والتسميد الحيواني أعطي أعلى القيم في الصفات الخضرية والزهرية والنسبة المئوية للفوسفور والكلوروفيل والكربوهيدات والبرولين .
- من النتائج يتضح من التسميد العضوى زاد من تحمل النباتات للملوحة في مياه الري بتقليل تراكم ايونات الصوديوم و الكلوريد الضارة في الأوراق كذلك زاد من امتصاص النيتروجين والفوسفور والبوتاسيوم .
- أعلى واقل القيم المئوية من Na ، Ca ، البرولين نتجت من المعاملة بتركيز9 ملليموز/ سم مع التسميد العضوي الحيواني وأعلى نسبة مئوية للمحتوى المائي نتجت من المعاملة بتركيز ملليموز/ سم 3 مع التسميد العضوي الحيواني وماء الصنبور .
- ولذلك نوصى بتسميد الشتلات بالتسميد العضوي الحيواني والري بماء نسبة الأملاح به 3 ملليموز/ سم وزراعتها في ارض رملية وذلك بعد 30 يوم من نقل الشتلات لتحسين الصفات الخضرية والزهرية والكيماوية وتخفيف ضرر الملوحة .

J.Agric.&Env.Sci.Alex.Univ.,Egypt Vol.7 (2)2008