Scientific J. Flowers & Ornamental Plants
www.ssfop.com/journal
ISSN: 2356-7864

EFFECT OF SOME FERTILIZATION TREATMENTS ON GROWTH AND CHEMICAL COMPOSITION OF *OCHNA SERRULATA* (HOCHST.) WALP. SHRUBS

Amal S. El-Fouly

Ornamental Plants and Landscape Gardening Res. Dept., Hort. Res. Inst., ARC, Giza Egypt

ABSTRACT: A set of pot experiments were conducted under saran house conditions (65% shade) at the Experimental Farm of the Hort. Res. Inst., ARC, Giza Egypt during 2013 and 2014 seasons in order to study the influence of two commercial liquid products, Vege Grow (V.G.) and Phos Root-X (P. R-X.) at the rates of 1, 2 and 4 ml/l of irrigation water for each, as well as the 3 combinations between V.G. and P. R-X. at the rates of 0.5, 1 and 2 ml/l for each on growth and chemical composition of one-year-old seedlings of Mickey Mouse plant (*Ochna serrulata* (Hochst.) Walp.) cultivated in 16-cm-diameter plastic pots filled with about 1.5 kg of sand + clay + peatmoss mixture (1:1:1, v/v/v). The control seedlings received no treatment.

The obtained results indicated that means of all vegetative and root growth parameters improved greatly as a result of applying the various treatments used in this study. However, the dominance was for fertilization with V.G. at 2 ml/l treatment which gave the highest means in most measurements of vegetative and root growth in the two seasons. Similarly were those results of leaf content of photosynthetic pigments, total soluble sugars, N, P, K, Fe, Zn, Cu, Mn and protein, as content of these constituents increased in the leaves with various significant differences compared to control. Also,V.G. at 2 ml/l treatment recorded the utmost high content of most constituents above mentioned. Combining between V. G. and P. R-X. products did not induce any additional improvement neither in vegetative and root growth nor in chemical constituent contents, except for few cases.

From the above results, it is recommended to fertilize one-year-old seedlings of Mickey Mouse shrubby plants, planted in 16-cm-diameter plastic pots with Vege Grow liquid commercial product at 2 ml/l two times/month during the growing season to get better growth and quality.

Key words: *Ochna serrulata*, shrub, fertilization,Vege Grow, Phos Root-X.

Scientific J. Flowers & Ornamental Plants, 2(2):175-182 (2015).

Received:
11/8/2015

Revised by:
Prof. Dr. A.Z. Sarhan, Cairo Univ.

Prof. Dr. F.M. Saadawy, Hort. Res. Inst., ARC.

INTRODUCTION

Ochna serrulata (Hochst.) Walp. (Syn. *O. multiflora*), Mickey Mouse plant or Bird's Eye Bush, native to the coast of southern Africa and belongs to Fam. Ochnaceae. It is a slow growing semi-evergreen small shrub to 1.5-2.5 m tall with a slender dark brown smooth-barked stem and elliptical glossy green leaves have finely toothed wavy margins. It has beautiful fragrant yellow flowers in spring, forming at branch tips and very attractive fruits which are shiny black and berry-like, suspended below bright-red sepals in a way that resembles the face of Mickey Mouse. The flowers are attractive to

bees and butterflies. The ripe fruits are eaten by birds (Huxley *et al*., 1992).The plant tolerates wet and heavy soils, and very dry conditions when planted in shade. It also tolerates wind and seaside conditions and takes well to regular hedging and pruning, making it an ideal candidate for a formal or informal small hedge. It can also be used as a feature plant or in the mixed border. It looks good and does well growing amongst rocks, as a container plant and has great potential as a bonsai one. It is excellent plant to grow if you want to attract birds to your garden (Hattatt, 2001).

Bandi *et al*. (2012) mentioned that *Ochna* has long been used in folk medicine for treatment of various ailments, such as asthma, dysentery, epilepsy, gastric disorders, lumbago, menstrual complaints, ulcers, as an abortifacient and as antidote against snake bites. Up to now, about 111 constituents, including flavonoids, anthranoids, triterpens, steroids, fatty acids and some others have been identified in the oil. These information were documented by Makhafola and Eloff (2012), Voegele (2013) and Fidelis *et al*. (2014) as they stated that seeds of *Ochna serrulata* contain about 31% oil.

Nowadays, the commercial products which contain several components from natural sources, such as amino acids, minerals and cytokinin and auxin-like substances are commonly used in order to improve growth and quality of the different crops. Indeed these products have proved their effectiveness in achieving this goal. In this concern, Abdel Aziz *et al*. (2009) on *Antirrhinum majus*, showed that increasing phenylalanine and tryptophan concentration (each from 50 to 100 ppm as foliar spray) gradually increased plant height, number of branches, fresh and dry weights of plant, length of inflorescence, number of inflorescences/plant, fresh and dry weights of inflorescences, as well as the contents of photosynthetic pigments, total soluble sugars and total free amino acids in the leaves. On potted gerbera, Khosa *et al*. (2011) found that foliar spray of macro (NPK) and micro nutrients (Zn, B, Fe and Mn) progressively increased plant height, number of branches/plant, length of branches, number of leaves/plant, leaf area, stock length, days to first flower emergence, flower diameter and flower quality with increasing fertilization level.

Similar observations were also gotten by Hanafy *et al*. (2012) on *Schefflera arboricola*, Mohamadipoor *et al*. (2013) on *Spathyphyllum* Illusion, Ahmed *et al*. (2013) on gladiolus, Youssef and Abdel-Aal (2014) on *Hippeastrum vittatum*. Youssef (2014) revealed that spraying *Echinacea purpurea* plants with tryptophan or glutamic acid, each at 200 ppm as well as Fe or Zn, each at 150 ppm and their combinations are the best for enhancing growth and chemical constituents of this plant.

The purpose of such work was to investigate the response of Mickey Mouse bush to the individual or combined application of some commercial products commonly used for enhancing growth and quality of various ornamentals.

MATERIALS AND METHODS

A pot experiment was consummated under saran house conditions (65% shade) at the Experimental Farm of Hort. Res. Inst., ARC, Giza, Egypt during the two consecutive seasons of 2013 an 2014 to study either the sole or combined effect of two commercial products on growth, quality and chemical composition of Mickey Mouse plant.

In order to achieve the goal of such study, homogenous, one-year-old seedlings of Micky Mouse plant were carefully transplanted on May 1st for the two seasons in 16-cm-diameter plastic pots filled with about 1.5 kg of mixture of equal amounts of sand + clay + peatmoss by volume. The physical and chemical properties of the used sand and clay in both seasons were determined and illustrated in Table (1), while those of the used peatmoss are shown in Table (2).

Table 1. Physical and chemical analysis of the used sand and clay in the two seasons.

Soil type	Particle size distribution (%)				S.P.	E.C. (ds/m)	pH	Cations (meq/l)				Anions (meq/l)		
	Coarse sand	Fine sand	Silt	Clay				Ca^{++}	Mg^{++}	Na^{+}	K^{+}	HCO_3^{-}	Cl^{-}	SO_4^{--}
Clay	7.46	16.75	34.53	40.89	41.76	2.18	8.33	16.93	9.33	20.44	0.37	3.82	1.46	41.79
Sand	18.72	71.28	4.76	5.34	21.83	1.58	8.20	2.65	2.48	21.87	0.78	3.85	13.00	10.93

Table 2. Physical and chemical analysis of the used peatmoss in the two seasons.

Organic matter	90-95%	**N**	1.09
Ash	5-10%	**P**	0.23%
Density (Vol. Dry)	80-90	**K**	1.77
pH value	3.4	**Fe**	421
Water relation capacity	60-75%	**Mn**	27
Salinity	0.3 g/l	**Zn**	41

Two weeks after transplanting (on May, 15th), the seedlings received the following fertilization treatments:

1- No fertilization, as control.

2- The two liquid commercial products, Vege Grow and Phos Root-X at the rates of 1, 2 and 4 ml/l for each, were applied after well solubility in irrigation water (300 ml of the solution/pot), two times/month till the end of the experiment on October, 30th. The chemical components of both Vege Grow and Phos Root-X were determined by the producing Co. and listed in Tables (3) and (4), respectively.

Table 3. Chemical components of the Vege Grow commercial product used in the two seasons.

Free amino acids	Cytokinins and auxins carried on activated zinc element	Active N
80 g/l of the product	60 g/l of the product	10 g/l

- Carried out by the producing company (UAD).

Table 4. Chemical components of the Phos Root-X commercial product used in the two seasons.

Free amino acids	Polyethylene glycol (PEG)	P_2O_5	Organic N	Cu
1500 ppm	0.01%	20%	3%	0.3%

- Carried out by the producing company (UAD).

3- Three combined treatments were created as follows:

- Vege Grow + Phos Root-X at 0.5 ml/l each.
- Vege Grow + Phos Root-X at 1.0 ml/l each.
- Vege Grow + Phos Root-X at 2.0 ml/l each.

Furthermore, all plants under various treatments received the usual necessary agricultural practices whenever needed. Treatments were arranged in a completely randomized design, replicated thrice as each replicate contained 3 plants (Mead *et al*., 1993).

At the end of each season, data recorded were plant length (cm), stem diameter at the base (cm), number of both branches and leaves/plant, root length (cm), as well as top and root fresh and dry weights (g). Fresh leaf samples taken only in the second season. Photosynthetic pigments (chlorophyll a, b and carotenoids, mg/g f.w.) and total soluble sugars (mg/100 g f.w.) were determined by the methods described by Moran (1982) and Dubois *et al*. (1966), respectively. In dry leaf samples, the percentages of nitrogen (Pregl, 1945), Phosphorus (Wide *et al*., 1985) and potassium (Jackson, 1973), as well as iron, zinc, cupper and manganese as ppm (Jackson, 1973) were evaluated. Moreover, the percent of protein was calculated using the method of A.O.A.C (1985).

Data were tabulated and were statistically analysed using SAS Program (2009) and the differences among treatment means were compared according to Duncan's New Nultiple Range Test. (Steel and Torrie, 1980).

RESULTS AND DISCUSSION

Effect of fertilization treatments on:

1-Vegetative and root growth parameters:

It is obvious from data averaged in Tables (5 and 6) that means of all vegetative and root growth characters, expressed as plant length (cm), stem diameter (cm), number of branches and leaves/plant, root length (cm) and fresh and dry weights of top growth and roots (g) improved clearly by the various treatments employed in this work with significant differences relative to control in most cases of both seasons. However, the mastership in the two seasons was for fertigation with Vege Grow product at 2 ml/l which recorded the best means in most traits mentioned above. As for Phos Root-X product, it gave higher records for less traits such as number of leaves/plant in the first season, as well as for root length and roots fresh and dry weights in both seasons when used at 4 ml/l level. The combining between the two products scored the highest means only for number of branches and leaves/plant and top growth dry weight in the two seasons when they were applied at the rate of 1 ml/l for each.

Improvement of Ochna seedlings growth by the commercial products used in this study may be attributed to the beneficial effects of their components, such as amino acids which play the major role in the formation of proteins and can serve as a chelating agent for micronutrients. Additionally, they can be oxidized to urea and carbon dioxide as an energy source (Meister, 1999). Since amino acids can be oxidized into urea, they are used as a nitrogen source in some fertilizers. They can directly or indirectly influence the physiological activities of the plant. When incorporating them into the soil, they help in improving the microflora of the soil, thereby facilitating the assimilation of nutrients (Danneberger, 2010). In addition, presence of cytokinin and auxin–like substances play a vital role in promoting cell division, while the presence of some minerals supply the new formed organs with their requirements of nutrients necessary for healthy growth. Zinc is essential for metabolism of carbohydrates, proteins, phosphates, RNA synthesis, tryptophan formation and act as a co-factor for several enzymes which act on phosphorylated substances (Mohr and Schopter, 1995).

The aforestated findings are in accordance with those revealed by Abedl-Aziz *et al*. (2009) on snapdragon, Khosa *et al*. (2011) on gerbera, Mohamadipoor *et al*. (2013) on spathyphyllum and Youssef (2014) on *Echinacea purpurea*.

2- Chemical composition:

Data in Table (7) exhibited that all used treatments markedly increased pigments content (mg/g f.w.) in the leaves of fertigated plants with the superiority of Phos Root-X at 2 ml/l treatment and the combination of Vege Grow + Phos Root-X at either 1 or 2 ml each/l, whereas total soluble sugars content (mg/100 g f.w.) reached the maximal value only by Vege Grow + Phos Root-X at 1 ml/l each, in the combined treatment. On the same line, were the percentages of nitrogen, phosphorus and potassium which rose to the maximum by Vege Grow at 2 ml/l treatment. Moreover, content of iron, zinc, cupper and manganese as ppm and the percent of protein increased also in response to the used fertigation treatments with the prevalence of Vege Grow at 2 ml/l treatment, which gave the utmost high means combining the two used commercial products did not cause additional significant improvement in content of the above named constituents.

The previous results could be interpreted and discussed as the authors done before in case of vegetative and root growth parameters. Similarly, were those findings obtained by Khosa *et al*. (2011) on gerbera, Hanafy *et al*. (2012) on *Schefflera arboricola* and Youssef and Abdel-Aal (2014) on *Hippeastrum vittatum*.

Accordingly, it can be concluded that fertigating one-year-old seedlings of Mickey

Table 5. Effect of fertilization treatments on some vegetative and root growth traits of *Ochna serrulata* plants during 2013 and 2014 seasons.

Treatments	Plant length (cm)		Stem diameter (mm)		No. branches per plant		No. leaves per plant		Root length (cm)	
	2013	2014	2013	2014	2013	2014	2013	2014	2013	2014
Control	18.33e	18.67f	2.73f	2.73f	3.00f	3.00h	26.00e	27.00e	25.17f	25.50f
V. G. (1 ml/l)	32.00b	31.83c	3.73cd	3.53de	12.00ab	10.33d-f	103.67b	88.33c	32.50d	29.00e
V.G. (2 ml/l)	34.17a	34.33b	4.17ab	4.18ab	13.00a	13.33ab	106.67ab	108.00ab	34.33d	35.17d
V.G. (4 ml/l)	31.33bc	32.67c	3.52d	3.74cd	10.33bc	12.00b-d	87.00c	104.67b	28.67e	32.83d
P. Rx. (1 ml/l)	26.83d	27.67e	3.51d	3.52de	7.00e	7.33g	62.67d	64.00d	38.00c	39.17c
P. Rx. (2 ml/l)	31.17bc	32.17c	4.27a	4.28a	12.00ab	12.33a-c	113.67ab	113.67ab	39.67bc	39.83bc
P. Rx. (4 ml/l)	30.00c	32.00c	3.91bc	3.93bc	10.00c	10.67c-e	89.67c	90.33c	54.17a	55.17a
V.G.+P.Rx. (0.5 ml for each/l)	29.83c	30.33d	3.15e	3.17e	8.00de	8.67fg	63.33d	65.00d	33.83d	34.50d
V. G.+ P.Rx. (1 ml for each/l)	32.50b	33.17bc	3.73cd	3.74cd	13.67a	14.00a	119.67a	121.00a	34.00d	35.33d
V. G. + P.Rx. (2 ml for each/l)	35.17a	36.50a	3.39de	3.40de	9.67cd	10.00ef	85.00c	86.00c	42.00b	42.83b

*** V. G. = Vege Grow and P. Rx = Phos Root-X .**

***Means within a column having the same letters are not significantly different according to Duncan's Multiple Range Test at 5% level .**

Table 6. Effect of fertilization treatments on top growth and roots fresh and dry weights of *Ochna serrulata* plants during 2013 and 2014 seasons.

Treatments	Top growth				Roots			
	Fresh weight (g)		Dry weight (g)		Fresh weight (g)		Dry weight (g)	
	2013	2014	2013	2014	2013	2014	2013	2014
Control	2.36f	2.37f	0.94f	0.95g	3.96d	3.98e	1.75f	1.76f
V. G. (1 ml/l)	7.56bc	7.58bc	3.53bc	2.96d-f	5.45cd	5.46de	2.97e	2.98e
V.G. (2 ml/l)	9.13a	9.14a	4.12a	4.13a	6.50bc	6.30cd	3.48c-e	3.49de
V.G. (4 ml/l)	8.58ab	8.59a	3.62b	3.63b	6.03bc	6.04cd	3.34de	3.34e
P. Rx (1 ml/l)	6.63cd	6.55d	2.87de	2.88ef	7.49b	7.50c	4.02c	4.03c
P. Rx (2 ml/l)	8.37ab	8.47ab	3.36b-d	3.37b-d	9.72a	9.74b	5.06b	5.07b
P. Rx (4 ml/l)	7.66bc	7.67bc	3.11cd	3.12c-e	12.01a	12.02a	6.02a	6.03a
V.G.+P. Rx (0.5 ml for each/l)	5.32e	5.32e	2.52e	2.52f	5.94bc	5.94cd	3.31e	3.32e
V. G.+ P. Rx (1 ml for each/l)	6.20de	6.21d	3.76ab	3.76ab	6.29bc	6.51cd	3.40de	3.41de
V. G. + P. Rx (2 ml for each/l)	6.86cd	6.87cd	2.94de	3.54bc	7.18bc	7.18cd	3.90cd	3.91cd

*** V. G. = Vege Grow and P. Rx = Phos Root-X .**

***Means within a column having the same letters are not significantly different according to Duncan's Multiple Range Test at 5% level .**

Table 7. Effect of fertilization treatments on chemical composition of *Ochna serrulata* leaves during 2014 season.

Treatments	Pigment content (mg/g f.w.)			Total soluble sugars (mg/100 g f.w.)	N %	P`%
	Chlo. a	Chlo. b	Carotenoids			
Control	0.592	0.180	0.376	4.358	**0.11**	**0.10**
V. G. (1 ml/l)	0.636	0.194	0.377	4.502	0.13	0.13
V.G. (2 ml/l)	0.927	0.295	0.530	4.587	0.49	**0.29**
V.G. (4 ml/l)	0.832	0.288	0.481	4.565	0.18	0.14
P. Rx (1 ml/l)	0.809	0.252	0.485	4.482	0.29	0.13
P. Rx (2 ml/l)	1.059	0.376	0.570	4.543	0.41	**0.26**
P. Rx (4 ml/l)	0.968	0.350	0.560	4.523	0.36	0.17
V.G.+P. Rx (0.5 ml for each/l)	0.672	0.249	0.454	4.609	**0.12**	0.16
V. G.+ P. Rx (1 ml for each/l)	1.031	0.375	0.591	4.633	0.19	0.18
V. G. + P. Rx (2 ml for each/l)	1.046	0.356	0.585	4.609	0.19	0.19

	K %	Fe (ppm)	Zn (ppm)	Cu (ppm)	Mn(ppm)	Protein %
Control	0.62	14	30.6	8.40	16.20	0.633
V. G. (1 ml/l)	0.66	176	41.6	15	17.2	0.748
V.G. (2 ml/l)	0.80	958	62	15.6	31.6	2.818
V.G. (4 ml/l)	0.66	330	55	11.6	20.20	1.035
P. Rx (1 ml/l)	0.75	26	31.4	10.4	23.4	1.668
P. Rx (2 ml/l)	0.82	906	41.6	11.6	31.4	2.358
P. Rx (4 ml/l)	0.77	164	31.8	11.2	29.4	2.070
V.G.+P. Rx (0.5 ml for each/l)	0.67	44	30.8	10.20	18.80	0.690
V. G.+ P. Rx (1 ml for each/l)	0.72	22	39	11	19.20	1.093
V. G. + P. Rx (2 ml for each/l)	0.74	30	54	13.20	25.40	1.093

*** V. G. = Vege Grow and P. Rx = Phos Root-X .**

Mouse plant with Vege Grow liquid commercial product at the rate of 2 ml/l is an applied approaches to improve growth and quality of this shrubby plant, photo (1).

Photo 1. Effect of different Vege Grow levels on growth of *Ochna* seedlings .

REFERENCES

Abdel-Aziz, Nahed G.; Mahgoub, Mona H. and Mazher, Azza A.M. (2009). Physiological effect of phenylalanine and tryptophane on the growth and chemical constituents of *Antirrhinum majus* plants. Ozean J. Appl. Sci., 2(4):19-24.

Ahmed, I.; Saquib, Rana U.; Qasim, M.; Saleem, M.; Khan, A.S. and Yaseen, M. (2013). Humic acid and cultivar effects on growth, yield, vase life and corm characteristics of gladiolus. Chilean J. Agric. Res., 73(4):10-18.

A.O.A.C. (1985). Association of Official Agricultural Chemists. Official Methods Analysis, 12th Ed., Washington, D.C.

Bandi, A.K.; Lee, D.U.; Tih, R.G.; Gunasekar, D. and Bodo, B. (2012). Phytochemical and biological studies of *Ochna* species. Chem. Biodivers., 9(2):251-271.

Danneberger, K. (2010). Amino acids as a nitrogen source. Issue of Colorado`s STMA Newsletter and Rocky Mountain GCSA Spring Newsletter.

Dubois, M.; Smith, F.; Illes, K.A.; Hamilton, J.K. and Rebers, P.A. (1966). Colorimetric mehod for determination of sugars and related substances. Ann. Chem., 28(3):350-356.

Fidelis, Q.C.; Ribeiro, T.A.N.; Araujo, M.F. and de Carvalho, M.G. (2014). *Ochna* genus: Chemical and pharmacological aspects. Rev. Bras. Farmacogn., 24(1):10-15.

Hanafy, M.S.; Saadawy, F. M.; Milad, S.M.N. and Ali, R.M. (2012). Effect of some natural extracts on growth and chemical constituents of *Schefflera arboricola* plants. J. of Hort. Sci. & Ornam. Plants, 4(1):26-33.

Hattatt, L. (2001). Encyclopedia of Garden Plants and Flowers. Parragon Queen Street House, 4 Queen St., Bath BAIIHE, UK., pp.256 .

Huxley, A.; Griffiths, M. and Levy, M. (1992). The New Royal Hort. Society Dictionary of Gardening. The Stockton Press, 257 Park Avenue South, New York, N. Y. 10010, USA, vol. 3, pp.790.

Jackson, M.H. (1973). Soil Chemical Analysis. Prentice Hall of India Private Limited M-97, New Delhi, India, pp.498.

Khosa, S.S.; Younis, A.; Rayit, A.; Yasmeen, S. and Riaz, A. (2011). Effect of foliar application of macro and micro nutrients on growth and flowering of *Gerbera jamesonii* L. American – Eurasian J. Agric. & Environ. Sci., 11(5):736-757.

Makhafola, T.J. and Eloff, J.N. (2012). Five *Ochna* species have high antibacterial activity and more than ten antibacterial compounds. South African J. Sci., 108(1/2):1.

Mead, R.; Curnow, R.N. and Harted, A.M. (1993). Statistical Methods in Agriculture and Experimental Biology. 2nd Ed., Chapman & Hall Ltd., London, pp.335.

Meister, R. T. (1999). Farm Chemicals Handbook, vol. 85, Willoughby, OH: Meister Publishing Co., pp.5-429.

Mohamadipoor, R.; Sedaghathoor, S. and Khomami, A.M. (2013). Effect of application of iron fertilizers in two methods on growth characteristics of *Spathyphyllum* Illusion. European J. Experi. Biol., 3(1):232-240.

Mohr, M. and Schopter, P. (1995). Plant Physiology, 3rd Ed. Springer-Verlag., New York, pp. 112-114.

Moran, R. (1982). Formula for determination of chlorophyllous pigment extracted with N, N-dimethyl formamide. Plant Physiol., 69:1376-81

Pregl, F. (1945). Quantitative Organic Micro-Analysis 4th Ed., J & A., Churchill, Ltd., London, pp. 203-209.

SAS Institute. (2009). SAS/SAT User`s Guide Statistics.,Vers. 9, SAS. Institute Inc. Cary, N.C., USA.

Steel, R.G.D. and Torrie, J.H. (1980). Principles and Procedures of Statistics. McGraw Hill Book Co., Inc., New York, pp. 377-400.

Voegele, E. (2013). Australian study assesses biodiesel feedstocks. National Advanced Biofuels Conf. & Expo., Sept. 10-12, Omaha, Nebraska, BBI International.

Wide, S.A.; Corey, R.B.; Lyer, J.G. and Vioget, G. (1985). Soil and Plant Analysis for Tree Culture, 3rd Ed.,

Oxford, IBH Publishing Co., New Delhi, pp. 93-116.

Youssef, A.S.M. (2014). Influence of some amino acids and micronutrients treatments on growth and chemical constituents of *Echinacea purpurea* plant. J. Plant Prod., Mansoura Univ., 5(4):527-543.

Youssef, A.S.M. and Abdel-Aal, M.M. (2014). Effect of Kinetin and mineral fertilization on growth, flowering, bulb productivity, chemical composition and histological features of *Hippeastrum vittatum* plant. J. Plant Prod., Mansoura Univ., 5(3):357-381.

تأثير بعض معاملات التسميد على النمو والتركيب الكيماوى لنباتات شجيرة ميكى ماوس (*Ochna* (*serrulata* (Hochst.) Walp.

أمل صلاح الفولى
قسم بحوث الزينة، معهد بحوث البساتين، مركز البحوث الزراعية، الجيزة، مصر.

أجريت مجموعة من تجارب الأصص بأحدى صوبات الساران (٦٥ % ظل) بالمزرعة التجريبية لمعهد بحوث البساتين، مركز البحوث الزراعية، الجيزة، مصر خلال موسمى ٢٠١٣، ٢٠١٤ لدراسة تأثير إثنين من المنتجات التجارية السائلة فيجى جرو (Vege Grow) ، فوس روت إكس (Phos Root-X) عند إضافتها مع مياه الرى بمعدلات: ١، ٢، ٤ مل/لتر ماء لكل منهما على حدة، وكذلك لثلاثة توليفات من هذين المنتجين عند إضافتهما بمعدلات ٠,٥ ، ١، ٢ مل/لتر لكل منهما على حدة على النمو والتركيب الكيماوى لشتلات عمر سنة من نبات شجيرة ميكى ماوس (الأوكنا) المنزرعة فى أصص بلاستيك قطرها ١٦ سم مملوءة بـ ١,٥ كجم من مخلوط من كميات متساوية من الرمل + الطين + البيتموس (١:١:١ بالحجم). شتلات المقارنة لم تعامل بأى من المنتجين المذكورين.

أوضحت النتائج المتحصل عليها أن متوسطات جميع قياسات النمو الخضرى والجذرى قد تحسنت نتيجة لإضافة مختلف المعاملات المستخدمة بهذه الدراسة. إلا أن السيادة كانت للمعاملة بالفيجى جرو (V.G.) بمعدل ٢ مل/لتر والتى أعطت أعلى المتوسطات فى معظم قياسات النمو الخضرى والجذرى بكلا الموسمين. بالمثل، كانت نتائج محتوى الأوراق من صبغات البناء الضوئى (كلورفيللى أ، ب والكاروتينويدات)، السكريات الكلية الذائبة، النتروجين، الفوسفور، البوتاسيوم، الحديد، الزنك، المنجنيز، النحاس والبروتين، حيث زاد محتوى هذه المكونات فى أوراق النباتات المعاملة، حيث سجلت أيضاً المعاملة بالفيجى جرو بمعدل ٢ مل/لتر أعلى القيم فى معظم المكونات الكيميائية سابقة الذكر مقارنة بالمعاملات الأخرى. لم يسبب الجمع بين الفيجى جرو والفوس روت إكس أى تحسناً إضافياً فى أى من قياسات النمو الخضرى والجذرى ولا فى محتوى الأوراق من المكونات الكيميائية، باستثناء بعض الحالات القليلة.

من هذه النتائج، يمكن التوصية بتسميد شتلات ميكى ماوس *Ochna serrulata* المنزرعة فى أصص بلاستيك قطرها ١٦ سم بمنتج الفيجى جرو بمعدل ٢ مل/لتر مع ماء الرى بمعدل مرتين/شهر خلال موسم النمو للحصول على أفضل نمو وأعلى جودة.