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THE RESPONSE OF *Dendranthema grandiflora*, TZVELEV, CV. ICECAP PLANTS TO CALCIUM SILICATE SLAG AND DHT TREATMENTS

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ABSTRACT

This experiment was carried out at the Experimental Station and in the Laboratory of Vegetable and Floriculture Department, Faculty of Agriculture, Mansoura University during the two successive seasons of 2006/2007 and 2007/2008 to study the effect of calcium silicate slag and the growth regulator DHT treatments on growth, flowering and chemical composition of *Dendranthema grandiflora* cv. Icecap plants.

The obtained results exhibited that the application of calcium silicate slag at 2.5, 5.0 and 7.5 g/pot and DHT at 0.1, 0.2 and 0.3% significantly improved the studied vegetative growth characters, flowering aspects and chemical composition of plants compared to the non treated ones in both seasons.

Regarding the effect of calcium silicate slag, the obtained data showed that the maximum values for plant height, stem diameter, flower stem length and flower diameter were recorded on chrysanthemum plants treated with 5.0 g/pot. However, fertilizing the plants with 7.5 g/pot gave the highest values for number of branches/plant, herb dry weight/plant, number of flowers/plant, total flowers dry weight/plant, chlorophyll a, b and carotenoids content in the leaves, as well as, the uptake of phosphorus/plant.

The plants treated with DHT as a foliar spray at a concentration of 0.1% gave the best results in all investigated parameters in both seasons.

The combined treatment of 5.0 g/pot of calcium silicate slag plus spraying DHT at 0.1% gave the highest values of plant height, stem diameter, flower stem length and flower diameter. Similar effects on number of branches/plant, herb dry weight/plant, number of flowers/plant and total flowers dry weight/plant were recorded on chrysanthemum plants which received 7.5 g of slag material plus 0.1% DHT in both seasons. The great promotion on plant pigments and P uptake/plant was occurred on plants which received 7.5 g/pot calcium silicate slag plus 0.1% DHT.

From the previous results, it could be suggested to supply chrysanthemum cv. Icecap plants with 7.5 g/pot calcium silicate slag plus spraying them three times with 0.1% DHT for obtaining vigorous and healthy plants and for producing maximum flowering aspects.

INTRODUCTION

Chrysanthemum plant is one of the most important ornamental crops for cut flowers or as a pot plant. *Dendranthema grandiflora*, Tzvelev, formerly *Chrysanthemum morifolium*, Ramat (Fam: Astraceae) has many species and abundant rose shapes, sizes and colors.

Dendranthema grandiflora, Tzvelev, cv. Icecap is one of many other newly introduced varieties of chrysanthemum through Egypt-California Project for Agricultural Development. This cultivar blooms during December

under Mansoura Governorate conditions. One problem is that this species can face its ability to be infected with viral diseases.

Silicon is absorbed as monosilicic acid, Si $(OH)_4$ from soil in large amounts that are several fold higher than those of other essential macronutrients in certain plant species, it is considered a plant nutrient but not being essential for plant function (Mengel and Kirkby, 1978). The main role of silicon is increasing the resistance of plants to diseases, insects and tolerance to toxic elements, as well as, reduce frost damage. The positive action of silicate ion on crop yields was obtained by El-Beshbeshy (1990) and Abdel-Atti and El-Beshbeshy (1993) on cucumber and El-Beshbeshy (1994) on barley plants. It is now generally held that any beneficial action of silicates is due to reaction with phosphates of the soil rather than to any role within the plants (Obihara and Russell, 1972). The effect of silicates on phosphate nutrition of plant has been reported by Kundu *et al*. (1986) on wheat, El-Beshbeshy (1994) and Liang (1999) on barley, Keeping and Meyer (2002) on sugarcane and Chervonnyi *et al*. (2003) on aquatic plants.

DHT, 2,4-dioxohexahydro–1,3,5-triazine, is an auxin–like compound. It was first introduced by Schuster *et al*. (1979) as has an antiviral activity with the ability to reduce virus multiplication. Many investigators reported that DHT increased vegetative growth and many chemical constituents in plant parts (Frommhold *et al*., 1987; Hohne *et al*., 1987, Aly and Badran, 1988 and Moftah and Attia, 1992). Attia (1994) showed that the low and medium concentrations of DHT (0.1 and 0.2%) enhanced vegetative growth and flowers characters of chrysanthemum.

This study was designed to examine the response of *Dendranthema grandiflora*, Tzvelev, cv. Icecap to calcium silicate slag and DHT application.

MATERIALS AND METHODS

The present work was carried out at the Experimental Station and in the Laboratory of Vegetable and Floriculture Department, Faculty of Agriculture, Mansoura University during the two successive seasons of 2006/2007 and 2007/2008 to study the effect of calcium silicate slag and the growth regulator DHT treatments on growth characters, flowering aspects and chemical composition of chrysanthemum plants.

Uniform terminal cuttings of 8 cm long were planted in 10 cm pots on April 5th, 2006 and on April 8th, 2007 for the two experimental seasons, respectively. Two months later, the seedlings were transplanted into 25 cm pots filled with 4 kg loamy soil/pot. The physical and chemical analyses of the used soil in both seasons are shown in Table (a).

The plants were pinched out once to induce branching after three weeks from transplanting.

The treatments were randomized in a split plot design and replicated three times (five plants for each replicate). Calcium silicate slag levels (obtained from Egyptian Iron and Steel Company "EISCON") were assigned to the main plots and the growth regulator (DHT) concentration treatments to the sub plots. Calcium silicate slag levels were 0, 2.5, 5.0 and 7.5 g/pot and

were added as a soil dressing at one time on August 15th and August 18th in the two growing seasons, respectively. Each pot received 2 g urea (46% N) and 1 g potassium sulphate (48% K_2O). These fertilizers were divided and added as soil dressing three times, at one month interval, starting on Aug. 15th and 18th in the two growing seasons, respectively. DHT at concentrations of 0.0, 0.1, 0.2 and 0.3% was applied as a foliar spray to the point of run off using a small hand sprayer. Such treatments were applied 4 weeks after transplanting and repeated 3 times with 3 weeks interval.

Table (a): Physical and chemical properties of the used soil during the two seasons of 2006/2007 and 2007/2008

Soil properties	Seasons	
	First season (2006/2007)	Second season (2007/2008)
Coarse sand (%)	8.93	10.09
Fine sand (%)	46.38	47.45
Silt (%)	20.30	19.86
Clay (%)	24.39	22.60
Soil texture	loamy	loamy
E. C. (dS/m)	1.39	1.33
pH	7.87	7.65
O. M. (%)	0.91	0.79
Ca^{++} (meq/l)	21.60	19.90
Mg^{++} (meq/l)	5.68	6.81
K^{+} (meq/l)	0.64	1.19
Na^{+} (meq/l)	6.92	5.53
HCO_3^{-} (meq/l)	6.43	6.89
Cl^{-} (meq/l)	5.67	5.87
SO_4^{--} (meq/l)	17.05	16.74
N (mg/100 g soil)	85.00	82.00
P (mg/100 g soil)	6.90	7.10
K (mg/100 g soil)	371.00	340.00

*** O. M.= Organic matter * E. C. and soluble ions were determined in the soil paste extract**

The following data were recorded at the end of experiment: Plant height (cm), stem diameter (mm), number of branches/plant, herb dry weight (g/plant), flower stem length (cm), number of flowers/plant, flower diameter (cm) and total flower dry weight (g/plant). The photosynthetic pigments (chlorophyll a, b and carotenoids) were estimated in the fresh leaves according to Fadl and Sari El-Deen (1978). Phosphorus uptake in herb before flowering stage was also determined according to Page *et al*. (1982).

The recorded data were statistically analyzed (MSTAT, 1986) and the L.S.D. test at 5% was followed to compare between means of treatments.

RESULTS AND DISCUSSION

1- Effect of calcium silicate and DHT treatments on some vegetative growth characters of chrysanthemum plants

Data in Table (1) indicated that the application of calcium silicate slag at 2.5, 5.0 and 7.5 g/pot significantly stimulated vegetative growth criteria namely, plant height, stem diameter, number of branches/plant and herb dry weight/plant compared to control (0.0 g/pot).

Table (1): Effect of calcium silicate slag levels and DHT concentrations on some vegetative growth characters of chrysanthemum cv. Icecap during 2006/2007 and 2007/2008 seasons

Calcium silicate slag (g/pot) (A)	DHT concentration (%) (B)									
	First season (2006/2007)					Second season (2007/2008)				
	0.0	0.1	0.2	0.3	Mean (A)	0.0	0.1	0.2	0.3	Mean (A)
	Plant height (cm)									
0.0	57.5	62.7	59.7	56.1	59.0	58.3	64.3	60.7	56.8	60.0
2.5	59.1	65.9	62.0	58.9	61.5	60.6	67.8	63.5	59.0	62.7
5.0	64.4	70.5	65.0	61.2	65.2	65.7	72.3	66.7	61.2	66.5
7.5	59.9	66.5	62.2	58.4	61.8	60.9	68.8	64.4	59.2	63.3
Mean (B)	60.2	66.4	62.2	58.7	----	61.4	68.3	63.8	59.1	----
L.S.D. at 5%	A: 1.4	B: 1.2	AB: 2.4			A: 1.3	B: 1.5	AB: 3.0		
	Stem diameter (mm)									
0.0	4.96	5.35	5.20	4.82	5.07	5.05	5.55	5.36	5.08	5.26
2.5	5,15	5.38	5,22	4.92	5.16	5.22	5.68	5.49	5.15	5.39
5.0	5.44	5.71	5.58	5.29	5.50	5.98	6.55	6.35	6.06	6.24
7.5	5.19	5.69	5.51	5.26	5.41	5.45	6.05	5.83	5.30	5.56
Mean (B)	5.19	5.53	5.38	5.07	----	5.43	5.96	5.76	5.39	----
L.S.D. at 5%	A: 0.08	B: 0.12	AB: 0.24			A: 0.12	B: 0.08	AB: N. S.		
	Number of branches/plant									
0.0	3.94	5.44	4.62	4.45	4.61	4.09	5.57	4.68	4.56	4.73
2.5	4.96	5.59	4.79	4.64	5.00	5.12	5.61	4.71	4.62	5.02
5.0	5.29	6.29	6.07	5.92	5.89	5.51	7.11	6.17	5.96	6.19
7.5	5.61	6.43	5.63	5.95	5.91	5.86	7.56	6.59	6.45	6.62
Mean (B)	4.95	5.94	5.28	5.24	----	5.15	6.46	5.54	5.40	----
L.S.D. at 5%	A: 0.18	B: 0.21	AB: 0.42			A: 0.16	B: 0.16	AB: 0.32		
	Herb dry weight (g/plant)									
0.0	17.1	23.6	20.0	19.3	20.0	17.9	24.3	20.4	19.8	20.6
2.5	21.5	24.3	20.8	20.1	21.7	22.3	24.5	20.6	20.0	21.9
5.0	23.0	27.3	26.3	25.7	25.6	24.0	30.9	26.9	26.0	27.0
7.5	24.3	27.9	25.5	25.9	25.9	25.5	32.9	28.5	28.1	28.8
Mean (B)	21.5	25.8	23.2	22.8	----	22.4	28.2	24.1	23.5	----
L.S.D. at 5%	A: 0.3	B: 0.4	AB: 0.8			A: 0.5	B: 0.4	AB: 0.8		

The stimulation of vegetative growth characters was associated with the increase in calcium silicate slag levels except for plant height and thickness which were significantly reduced with increasing calcium silicate slag from 5.0 to 7.5 g/pot. So, the maximum values for plant height and stem diameter of chrysanthemum plants were recorded for plants which received 5.0 g/pot. However, fertilizing the plants with 7.5 g/pot gave the highest values for number of branches/plant and herb dry weight/plant. Meantime, the untreated plants recorded the minimum values for the four vegetative growth characters. These results were true in the two experimental seasons and are in harmony with those obtained by Haynes (1984) and Kundu *et al*. (1986) on wheat, Chervonnyi *et al*. (2003) on aquatic plants and El-Sayed (2005) on chrysanthemum plants.

Regarding the effect of DHT on growth aspects, data in Table (1) clearly showed that the lowest and medium concentrations of DHT significantly increased plant height and stem diameter over untreated plants, while all concentrations of DHT significantly increased number of branches per plant and herb dry weight over control plants. It was observed that DHT at 0.1% was the most effective in this respect than other concentrations (0.2 and 0.3%). These results are in agreement with those obtained by Frommhold *et al*. (1987) on *Necotiana tabacum*, Aly and Badran (1988) on *Borago officinalis* and Attia (1994) on chrysanthemum plants.

The combined treatment of 5.0 g/pot of calcium silicate slag plus spraying DHT at 0.1% gave satisfactory promotion of plant height and stem diameter. The same effect on both number of branches/plant and herb dry weight/plant was recorded on chrysanthemum plants which received 7.5 g of slag material plus 0.1% DHT, while the untreated plants recorded the minimum values. These results were true in both growing seasons as clearly shown in Table (1).

2- Effect of calcium silicate slag and DHT treatments on some flowering aspects

It is clear from data in Table (2) that the flower stem length, flower diameter, number of flowers/plant and total flowers dry weight per plant were positively affected by using calcium silicate slag at 2.5 to 7.5 g/plant compared to those of control plants. Significant differences on such flowering aspects were detected among treated and untreated plants. Flower stem length and flower diameter were gradually improved with increasing the level from 0.0 to 5.0 g/pot then tended to decrease with increasing the level to 7.5 g/pot. The promotion of number of flowers/plant and total flowers dry weight per plant was associated with increasing the levels of slag materials from 2.5 to 7.5 g/pot. The maximum values of flower stem length and flower diameter were recorded on plants treated with 5.0 g/pot, while increasing the level up to 7.5 g/pot resulted in a further increase in the number of flowers/plant and total flowers dry weight. A similar trend was observed in the second season. These results were in harmony with those obtained by El-Sayed (2005) on chrysanthemum.

The same Table indicated that all DHT treatments stimulated flower stem length, flower diameter, number and dry weight of flowers per plant except for the treatment of DHT at 0.3% for flower stem length in both

seasons. In this respect, the most effective concentration of DHT was the lowest one. Similar results were obtained by El-Dessouki (1988) and Attia (1994) on chrysanthemum.

The interactions between calcium silicate slag and DHT treatments were significant for the four flowering aspects in both seasons. The maximum values of stem length and diameter of flowers were recorded for plants which received 5.0 g/pot slag material plus 0.1% DHT, however treating with 7.5 g/pot calcium silicate slag plus 0.1% DHT gave the highest values for number of flowers/plant and total flowers dry weight/plant. For all flowering characters, the minimum values were produced from untreated plants.

Table (2): Effect of calcium silicate slag levels and DHT concentrations on some flowering aspects of chrysanthemum cv. Icecap during 2006/2007 and 2007/2008 seasons

Calcium silicate slag (g/pot) (A)	DHT concentration (B)									
	First season (2006/2007)					Second season (2007/2008)				
	0.0	0.1	0.2	0.3	Mean (A)	0.0	0.1	0.2	0.3	Mean (A)
	Flower stem length (cm)									
0.0	8.5	8.9	8.7	8.3	8.6	9.3	9.7	9.4	9.0	9.4
2.5	8.9	9.3	9.0	8.7	9.0	9.7	10.2	9.9	9.4	9.8
5.0	9.3	9.8	9.5	9.1	9.4	10.1	10.6	10.3	9.7	10.2
7.5	9.1	9.5	9.2	8.9	9.2	9.8	10.3	10.0	9.5	9.8
Mean (B)	9.0	9.4	9.1	8.8	----	9.7	10.2	9.9	9.4	----
L.S.D. at 5%	A: 0.4	B: 0.4	AB: 0.8			A: 0.3	B: 0.4	AB: 0.8		
	Flower diameter (cm)									
0.0	5.39	5.89	5.80	5.64	5.68	5.52	6.09	5.97	5.79	5.84
2.5	5.62	6.15	5.94	5.81	5.88	5.75	6.29	6.15	6.09	6.07
5.0	5.89	6.40	6.19	6.04	6.13	6.14	6.61	6.42	6.24	6.35
7.5	5.63	6.15	5.97	5.83	5.90	5.95	6.39	6.29	6,14	6.19
Mean (B)	5.63	6.15	5.98	5.83	----	5.84	6.35	6.21	6.07	----
L.S.D. at 5%	A: 0.11	B: 0.09	AB: 0.18			A: 0.18	B: 0.14	AB: 0.28		
	Number of flowers/plant									
0.0	14.40	18.60	17.80	16.51	16.83	15.40	19.90	18.71	17.25	17.82
2.5	15.40	20.50	19.60	18.55	18.51	17.00	22.30	21.25	20.15	20.18
5.0	16.80	22.80	21.80	20.60	20.50	18.30	24.40	23.51	22.50	22.18
7.5	18.20	24.30	23.40	22.71	22.15	19.90	25.50	24.31	23.10	23.20
Mean (B)	16.20	21.55	20.65	19.59	----	17.65	23.03	21.95	20.75	----
L.S.D. at 5%	A: 1.51	B: 0.91	AB: 1.82			A: 1.02	B: 1.01	AB: 2.02		
	Total flower dry weight (g/plant)									
0.0	6.50	8.33	7.98	7.42	7.56	7.41	9.48	8.93	8.26	8.52
2.5	8.20	10.85	10.38	9.83	9.82	9.42	12.27	11.71	11.11	11.13
5.0	9.90	13.37	12.79	12.10	12.04	11.43	14.16	13.59	12.98	13.04
7.5	10.80	14.36	13.81	13.40	13.09	12.04	14.86	14.14	13.42	13.62
Mean (B)	8.85	11.73	11.24	10.69	----	10.08	12.69	12.09	11.44	----
L.S.D. at 5%	A: 1.05	B: 0.55	AB: 1.10			A: 0.58	B: 0.65	AB: 1.30		

3- Effect of calcium silicate slag and DHT treatments on chemical composition

It is evident from data in Table (3) that increasing calcium silicate dose from 0.0 to 7.5 g/pot was followed by a gradual and significant stimulation of chlorophyll a, b and carotenoids, as well as, the uptake of phosphorus. The maximum values were recorded for plants fertilized with 7.5 g/pot of calcium silicate slag. These results were true in both seasons and are in agreement with those obtained by Chervonnyi *et al*. (2003) on aquatic plants and El-Sayed (2005) on chrysanthemum.

Table (3): Effect of calcium silicate slag levels and DHT concentrations on some chemical constituents in the leaves of chrysanthemum cv. Icecap during 2006/2007 and 2007/2008 seasons

Calcium silicate slag (g/pot) (A)	DHT concentration (B)									
	First season (2006/2007)					Second season (2007/2008)				
	0.0	0.1	0.2	0.3	Mean (A)	0.0	0.1	0.2	0.3	Mean (A)
	Chlorophyll a (mg/g fresh weight)									
0.0	1.241	3.856	3.563	3.366	3.499	3.477	4.061	3.853	3.658	3.762
2.5	3.429	3.944	3.770	3.621	3.691	3.662	4.154	3.983	3.792	3.898
5.0	3.626	4.029	3.826	3.724	3.801	3.858	4.219	4.032	3.843	3.982
7.5	3.729	4.086	3.880	3.766	3.865	3.943	4.254	4.119	4.048	4.092
Mean (B)	3.506	3.979	3.760	3.619	----	3.735	4.172	3.997	3.835	----
L.S.D. at 5%	A: 0.064 B: 0.055 AB: 0.110					A: 0.095 B: 0.045 AB: 0.090				
	Chlorophyll b (mg/g fresh weight)									
0.0	1.152	1.339	1.242	1.176	1.227	1.371	1.566	1.494	1.441	1.466
2.5	1.217	1.368	1.319	1.262	1.292	1.414	1.594	1.539	1.474	1.505
5.0	1.283	1.396	1.329	1.296	1.326	1.497	1.618	1.545	1.493	1.538
7.5	1.316	1.417	1.347	1.312	1.348	1.524	1.628	1.586	1.548	1.572
Mean (B)	1.242	1.380	1.309	1.262	----	1.452	1.602	1.541	1.489	----
L.S.D. at 5%	A: 0.022 B: 0.020 AB: 0.040					A: 0.034 B: 0.031 AB: 0.062				
	Carotenoids (mg/g fresh weight)									
0.0	1.162	1.376	1.276	1.216	1.258	1.391	1.587	1.517	1.451	1.487
2.5	1.229	1.402	1.340	1.301	1.318	1.452	1.617	1.560	1.498	1.532
5.0	1.300	1.417	1.365	1.332	1.354	1.519	1.634	1.577	1.514	1.621
7.5	1.329	1.452	1.389	1.360	1.383	1.556	1.650	1.608	1.582	1.599
Mean (B)	1.255	1.412	1.343	1.302	----	1.480	1.622	1.566	1.511	----
L.S.D. at 5%	A: 0.028 B: 0.023 AB: 0.046					A: 0.035 B: 0.025 AB: 0.50				
	P uptake (mg/plant)									
0.0	22.61	43.73	33.40	29.30	32.26	22.74	47.55	39.90	28.78	34.74
2.5	26.75	55.61	45.90	33.45	40.43	29.97	60.70	46.75	40.10	44.38
5.0	38.45	68.65	53.70	45.65	51.61	39.70	81.52	68.55	51.40	60.29
7.5	49.70	91.40	69.60	59.90	67.65	50.60	86.73	73.40	60.62	67.84
Mean (B)	34.38	64.85	50.65	42.08	----	24.50	69.13	57.15	45.23	----
L.S.D. at 5%	A: 3.88 B: 2.56 AB: 5.12					A: 3.65 B: 3.66 AB: 7.32				

The treatments of DHT caused a significant increase in photosynthetic pigments and uptake of P over untreated control treatment. The lowest concentration of DHT was the most effective one in this respect. So, spraying DHT at 0.1% gave the maximum values. Untreated plants were responsible for minimizing these characters. Similar trends were detected in both seasons.

The great promotion of plant pigments and P uptake/plant was occurred on plants which received 7.5 g/pot calcium silicate slag plus 0.1% DHT in both seasons.

The positive effect of calcium silicate slag on growth, flowering, plant pigments and P uptake was mainly attributed to its important role in enhancing the uptake of Fe and P, as well as, increasing the resistance of plants to diseases, insects, toxic elements and frost damage. The important role of DHT as has an antiviral activity with the ability to reduce virus multiplication could explain the present results.

Finally, it is suggested to supply chrysanthemum cv. Icecap plants with 7.5 g/pot calcium silicate slag plus spraying them three times with 0.1% DHT for obtaining vigorous and healthy plants and for producing maximum flowering aspects.

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أجري هذا البحث فى محطة تجارب ومعمل قسم الخضر والزينة بكلية الزراعة جامعة المنصورة خلال الموسمين ٢٠٠٧/٢٠٠٦ و٢٠٠٨/٢٠٠٧ لدراسة تأثير معاملات خبث سليكات الكالسيوم و منظم النمو DHT على النمو الخضرى، التزهير والتركيب الكيمائى لنباتات *Dendranthema grandiflora* صنف Icecap.

ولقد أوضحت النتائج المتحصل عليها أن استعمال خبث سليكات الكالسيوم بتركيز ٥, ٢، ٥,٠ و ٧,٥ جم/اصيص وDHT بتركيز ٠,١، ٠,٢ و٠,٣% أحدث تحسنا معنويا فى القياسات المدروسة للنمو الخضرى والتزهير والتركيب الكيمائى مقارنة بالنباتات غير المعاملة فى كلا الموسمين.

بالنسبة لتأثير خبث سليكات الكالسيوم، فلقد أوضحت النتائج المتحصل عليها أن أعلى القيم لإرتفاع النبات، سمك االساق، طول عنق النورة وقطر النورة قد سجلت لنباتات الأراولا التى عوملت بتركيز ٥,٠ جم/اصيص. ومع ذلك فلقد أعطى تسميد النباتات بتركيز ٧,٥ جم/اصيص أعلى القيم لكل من عدد الأفرع/نبات، الوزن الجاف للعشب/نبات، عدد النورات/نبات، الوزن الجاف للمجموع الكلى للنورات/نبات، محتوى الأوراق من كلوروفيللى أ، ب والكاروتينويدات وكذلك إمتصاص الفوسفور/نبات.

وقد أعطت النباتات التى عوملت بمنظم النمو DHT رشا على الأوراق عند تركيز ٠,١% أفضل النتائج فى القياسات المدروسة خلال الموسمين.

كما أعطت معاملة التفاعل ٥,٠ جم/اصيص خبث سليكات الكالسيوم مع الرش بمنظم النمو DHT عند تركيز ٠,١% أعلى القيم فى إرتفاع النبات، سمك الساق، طول عنق النورة وقطر النورة. ولقد تم تسجيل نفس التأثير على عدد الأفرع/نبات، الوزن الجاف للعشب/نبات، عدد النورات/نبات وكذلك الوزن الجاف للمجموع الكلى للنورات/نبات عندما استقبلت نباتات الأراولا ٧,٥ جم/اصيص خبث سليكات الكالسيوم ورشت بتركيز ٠,١% DHT خلال موسمى التجربة. وكذلك فلقد حدثت زيادة كبيرة للصبغات النباتية ومعدل إمتصاص الفوسفور للنباتات التى عوملت بتركيز ٧,٥ جم/اصيص سليكات الكالسيوم مع DHT بتركيز ٠,١%.

وبناءا على النتائج السابقة، فإنه يمكن التوصية بمعاملة نباتات الأراولا صنف Icecap بخبث سليكات الكالسيوم بتركيز ٧,٥ جم/اصيص مع رشها ثلاث مرات بمنظم النمو DHT عند تركيز ٠,١% للحصول على نباتات صحية وقوية وكذلك للحصول على أفضل صفات تزهير.