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Response of Red Globe Grapevines to Spraying Barley Seed Sprout and Silicon

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ABSTRACT

The effects of spraying barley seed sprout and/ or potassium silicate each at 0.025 to 0.1% on fruiting of Red Globe grapevines was examine during 2015 and 2016 seasons. The selected vines were sprayed three times with such two stimulants. Barley seed sprout and potassium silicate each at 0.025 to 0.1% single and combined applications improved growth aspects, leaf pigments, some nutrients, berry setting %, yield and fruit quality compared to the control treatment. Using combined applications was superior to using each alone.The effect on these parameters depended on increasing concentrations. Spraying a mixture of barley seed sprout and potassium silicate three times each at 0.05% improved yield and quality of Red Globe grapevines under Minia conditions.

Keywords: Barley seed sprout, silicon, yield, quality of the berries, Red Globe grape.

INTRODUCTION

Under Minia region conditions, Poor yield of Red Globe grapevines is considered a serious problem facing grape growers. The main reasons for the yield decline are unsuitable environmental conditions and malnutrition. Recently, the application of silicon and crop seed sprouts have been used for overcoming such problems and amending the trees with essential organic nutrients. Sprouting of seeds was accompanied by enhancing essential amino acids, vitamins nutrients, fatty acids, organic acids, antioxidants and natural hormones in the sprouts (Camacho *et al.,* 1992 and Cairney, 2005).

Silicon is useful for counteracting the adverse effects of biotic and abiotic stresses on fruit crops through controlling water uptake as well as enhancing photosynthesis and root development and reducing transpiration rate and oxygen reactive species (Epstein, 1990; Alvarez and Datnoff, 2001 and Aziz *et al.,* 2002).

Treating fruit crops with potassium silicate was effective in enhancing growth, yield and fruit quality (Gad El- Kareem, 2012; Ahmed *et al.,* (2013 a and 2013b) Abdelaal and Oraby – Mona, 2013; Al- Wasfy, 2013; Al- Wasfy, 2014, El-Khawaga, 2014; Gad El- Kareem *et al.,* 2014 ; Ibrahim and Al- Wasfy, 2014; Mohamed *et al.,* 2015; Nagy-Dena, 2015, Omar, 2015; Akl *et al.,* 2015 ; Abd El- Wahab , 2015; Mohamed, 2015 ; Noaman, 2015 and Samouni-Mona, 2017).

The results of Refaai (2014a and 2014b); El- Sayed-Faten(2014); Mohamed (2014); Ahmed and Habasy- Randa (2014); El- Khawaga and Mansour(2014) ; Ahmed and Gad El- Kareem (2014) and Abd El- Rahman (2015) studied the effects of using crop seed sprout extracts on various fruit crops.

This study aimed to study the effects of using barley seed sprout extract and/ or potassium silicate at various concentrations on fruiting of Red Globe grapevines.

MATERIALS AND METHODS

This study was excuted in 2015 and 2016 seasons on sixty uniform in vigour own rooted 12- year old Red Globe grapevines grown in clay soil at Matay district, Minia Governorate.The selected vines were planted at 2.0 x 3.0 meters apart and trained with cardon method using Gable supporting system. In the first week of Jan winter pruning was conducted. in both seasons leaving vine load namely 57 eyes (15 fruiting spurs x 3 eyes plus 6 replacement spurs x two eyes). Surface irrigation system was followed. Soil analysis was done according to Carter (1993)

Table 1. Soil analysis

Constituents	Values	Constituents	Values
Particle size distribution		N %	0.19
Sand %	15	Available P (Olsen method) ppm	0.05
Silt %	18.5	Available (ammonium acetate)ppm	5.2
Clay %	66.5	EDTA extractable micronutrients (ppm)	410.0
Texture	Clay	Fe	8.75
pH(1: 2.5 extract)	7.88	Mn	5.20
O.M. %	1.65	Zn	1.90
CaCO3total %	1.82	Cu	4.17

Table 2. Analysis barley seed sprout.

Constituent	Values (mg/ 100g F.W.)	Constituent	Values (mg/ 100g F.W.)
Asparatic acid	2.1	Pyridoxine(B6)	1.9
Arginine	3.5	Vitamin E	0.61
Alanine	2.9	K	600
Glutamic acid	4.8	P	510
Isoleucin	2.0	Mg	281
Lysine	1.8	Ca	280
Methionen	2.1	Fe	181
Thiamin (B1)	2.5	Ze	150
Riboflavine (B2)	3.0		

Except for those dealing with the present treatments, The selected vines divided into ten different treatments including the control as follow:

1- Control (spraying with water and Triton B).

Spraying barley seed sprout and potassium silicate each at 0.025 to 0.1% single and combined as follow:

2- Barley seed sprout extract at 0.025%.
3- Barley seed sprout extract at 0.05%.
4- Barley seed sprout extract at 0.1%.
5- Potassium silicate at 0.025%.
6- Potassium silicate at 0.05%.
7- Potassium silicate at 0.1%.

8-Barley seed sprout + Potassium silicate each at 0.025%
9-Barley seed sprout + Potassium silicate each at 0.05%
10- Barley seed sprout + Potassium silicate each at 0.1%

Each treatment was replicated three times, two vines per each. Barley seed sprout was prepared by sowing the seeds in open trays and left under shade conditions for ten days, then the sprouts were picked, homogenized with distilled water in an electric blender for five minutes, then filtrated and kept under 4°C in the refrigerator till use (Table2) . Barley seed sprout extract and potassium silicate (25% Si + 10% K_2O) were sprayed three times at growth start (1st week of Mar.), just after berry setting (2nd of Apr.) and at one month later (2nd of May). Triton B as a wetting agent was added to all solutions at 0.05 %. Spraying was done till runoff. Randomized complete block design (RCBD) was followed.

1-Measurements of vegetative growth characteristics:

All vegetative growth characters were measured in the middle of July.

2-Average leaf area (cm^2) and leaf pigments:

Twenty mature leaves per vine were picked form those leaves opposite to basal clusters on each shoot and the leaf area was estimated according to Ahmed and Morsy (1999).

Measurements of some plant pigments (mg/ 100g F.W.) according to Von-Wettstein, 1957 and Hiscox and Isralstam, 1979).

3- Determination of some nutrients in the leaves:

The nutrients were measured in the petioles from the same leaves taken for determining leaf pigments after drying according to (Chapman and Pratt, 1975; Evenhuis and Deward , 1980; Cottenie *et al.,* 1982 ; Summer, 1985 and Wilde *et al.,* 1985).

4- Measurements of berry set %:

Five clusters per each vine were caging in perforated white paper bags before bloom. After setting of all berries in each cluster, the bags were removed for counting:

$$\text{Berry set \%} = \frac{\text{No of berries/ cluster}}{\text{Total no.of flower/ cluster}} \times 100$$

5- Measurements of yield and berries characteristics:

1- Yield

Clusters were harvested when T.S.S/acid ratio in the berries juice reached at least 25: 1 at the last week of July in both seasons). The yield per vine was recorded in terms of weight (kg) and number of clusters per vine. Then the average weight of cluster (g).and clusters dimensions (length and shoulder in cm) were determined.

2- Berries quality:

Five clusters randomly were taken from each vine to determine the physical and chemical characteristics:

1-Average berry weight (g.).
2-Average berry dimensions (length and diameter, in cm)
3- Handy refractometer used to determine total soluble solids Percentage.
4-Total Sugars Percentage in the juice by Land and Eynon volumetric method as described in A.O.A.C. (2000).
5- Total acidity % (as tartaric acid / 100 ml juice) by titration against 0.1 NaOH using phenolphthaleins indicator (A.O.A.C., 2000).

All the obtained data were tabulated and analyzed according to Steel Torrie,(1982). using New L.S.D. at 5 % for distinguishing the significance differences between various treatments.

RESULTS AND DISCUSSION

1- Growth aspects:

Data in Tables (3, 4 & 5) showed that single and combined applications of barley seed sprout extract and potassium silicate each at 0.025 to 0.1% significantly enhanced main shoot length, number of leaves/ shoot, leaf area, leaf pigments and some nutrients in the leaves compared to untreated vines. The promotion was proportional to the increase in concentrations of barley seed sprout extract and potassium silicate from 0.0 to 0.1%. Using barley seed sprout was significantly superior to using potassium silicate in this respect.

Table 3. Effect of spraying barley seed sprout extract and potassium silicate on some growth aspects and leaf pigments (mg / 100 g F.W.) of Red Globe grapevines during 2015 and 2016 seasons.

Treatment	Main shoot length (cm)		No. of leaves /shoot		Leaf area (cm)		Chlorophyll a (mg/ 100 g F.W.)		Chlorophyll b (mg/ 100 g F.W.)		Total Chlorophylls (mg/ 100 g F.W.)		Total carotenoids (mg/ 100 g F.W.)	
	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016
1-control	95.3	96.0	19.9	20.0	118.8	120.9	6.1	5.9	1.9	1.9	8.0	7.8	2.0	1.9
2- Barley seed at 0.025%	101.9	102.6	24.0	24.1	124.9	127.0	8.0	7.9	3.4	3.4	11.4	11.3	3.5	3.7
3- Barley seed at 0.05%	103.3	104.0	25.5	25.6	127.0	129.0	8.9	8.8	4.0	4.0	12.9	12.8	4.0	4.2
4- Barley seed at 0.1%	103.7	104.5	25.6	25.7	127.3	129.1	9.0	8.9	4.1	4.1	13.1	13.0	4.1	4.3
5- Potassium silicate at 0.025%	97.0	97.8	20.9	21.0	120.9	123.	6.6	6.5	2.4	2.4	9.0	8.9	2.5	2.6
6- Potassium silicate at 0.05%	98.9	99.7	22.0	22.2	122.0	124.6	7.2	7.3	3.0	2.9	10.2	10.2	3.1	3.3
7- Potassium silicate at 0.1%	99.0	99.8	22.3	22.3	122.3	124.7	7.3	7.4	3.0	3.0	10.3	10.4	3.1	3.4
8- Both at 0.025%	108.9	110.3	28.0	29.0	130.0	133.3	10.0	9.9	4.5	4.3	14.5	14.2	3.8	4.3
9- Both at 0.05%	111.3	112.4	29.9	30.9	133.0	135.9	11.2	11.1	5.0	4.7	16.2	15.8	4.2	4.7
10- Both at 0.1%	111.9	112.5	30.0	31.0	133.3	136.1	11.3	11.3	5.0	4.8	16.3	16.1	4.3	5.1
New L.S.D. at 5%	1.1	1.1	0.8	0.9	1.0	1.1	0.4	0.4	0.3	0.3	0.5	0.4	0.3	0.3

Using both materials together was significantly more preferable in enhancing growth aspects than using each alone, leaf pigments and nutrients. Increasing concentrations of each material from 0.05to 0.1% significantly enhanced these parameters.The vines that received a mixture of barley seed sprout extract and potassium silicate each at 0.1% gave the highest values . while the untreated vines produced the lowest ones.

Table 4. Effect of spraying barley seed sprout extract and potassium silicate on some leaf nutrients of Red Globe grapevines during 2015 and 2016 seasons.

Treatment	Leaf N %		Leaf P %		Leaf K %		Leaf Mg %		Leaf Ca %		Leaf Zn (ppm)		Leaf Fe (ppm)	
	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016
1-control	1.57	1.55	0.14	0.13	1.25	1.23	0.51	0.47	2.66	2.59	51.0	51.7	48.9	50.0
2- Barley seed at 0.025%	1.85	1.89	0.25	0.25	1.49	1.51	0.67	0.70	2.97	3.00	58.0	58.9	57.8	58.9
3- Barley seed at 0.05%	1.94	1.98	0.31	0.30	1.55	1.57	0.72	0.74	3.11	3.15	60.0	60.7	60.0	61.1
4- Barley seed at 0.1%	1.95	1.99	0.32	0.30	1.56	1.57	0.73	0.75	3.12	3.16	60.6	61.3	60.1	61.2
5- Potassium silicate at 0.025%	1.66	1.71	0.17	0.16	1.32	1.35	0.56	0.57	2.75	2.80	53.3	54.0	51.9	53.0
6- Potassium silicate at 0.05%	1.74	1.79	0.21	0.22	1.40	1.43	0.60	0.61	2.89	2.92	55.0	55.8	53.6	54.7
7- Potassium silicate at 0.1%	1.75	1.80	0.22	0.23	1.41	1.44	0.61	0.62	2.87	2.93	55.3	56.0	54.0	55.0
8- Both at 0.025%	2.06	2.17	0.37	0.38	1.64	1.67	0.81	0.84	3.21	3.25	64.0	64.8	62.9	64.0
9- Both at 0.05%	2.16	2.25	0.40	0.41	1.71	1.74	0.87	0.89	3.31	3.35	67.0	67.7	66.0	67.1
10- Both at 0.1%	2.18	2.26	0.41	0.42	1.72	1.76	0.88	0.90	3.32	3.36	67.4	67.9	66.3	67.2
New L.S.D. at 5%	0.06	0.05	0.02	0.02	0.04	0.05	0.03	0.03	0.07	0.07	1.9	2.0	2.1	2.0

2- Berry setting %, yield and cluster characteristics:

Tables (5 & 6) cleared that application of barley seed sprout extract and/ or potassium silicate each at 0.025 to 0.1% significantly improved berry setting %, yield expressed in weight (kg.) and number of clusters/ vine and cluster weight and dimensions (height and shoulder) relative to the check treatment.Increasing concentrations of each material caused a gradual promotion on these parameters. Using barley seed sprout extract was significantly more preferable than using potassium silicate. Combined applications were significantly more favorable than using each material alone.From an economic point of view, using barley seed sprout extract at 0.05% plus potassium silicate at the same concentrations gave the best yield/vine (reached 34.0 & 40.2 kg) respectively while the control vines gave (25.6 and 25.7 kg)/vine during 2015 and 2016 seasons, respectively.

Table 5. Effect of spraying barley seed sprout extract and potassium silicate on the leaf content of Mn and Cu , berry setting %, yield as well as weight and length of clusters of Red Globe grapevines during 2015 and 2016 seasons.

Treatment	Leaf Mn (ppm)		Leaf Cu (ppm)		Berry setting %		No. of clusters / vine		Cluster weight (g)		Yield / vine (kg.)		Cluster length (cm)	
	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016
1-control	51.1	53.0	1.1	1.1	10.0	10.2	32.0	32.0	801.0	803.0	25.6	25.7	18.8	19.0
2- Barley seed at 0.025%	58.9	60.8	2.3	2.4	12.0	12.2	33.0	38.0	900.0	905.0	29.7	34.4	25.0	26.5
3- Barley seed at 0.05%	61.3	63.2	2.7	2.8	12.6	12.9	33.0	38.0	931.0	936.0	30.7	35.6	26.9	28.5
4- Barley seed at 0.1%	61.4	63.3	2.8	2.9	12.7	12.9	33.0	38.0	933.0	938.0	30.8	35.6	27.0	28.6
5- Potassium silicate at 0.025%	53.3	55.9	1.4	1.4	10.6	10.9	33.0	34.0	831.0	836.0	27.4	28.4	20.8	22.3
6- Potassium silicate at 0.05%	56.0	57.9	1.8	1.8	11.3	11.6	33.0	36.0	862.0	866.0	28.4	31.2	23.0	24.5
7- Potassium silicate at 0.1%	56.3	58.0	1.9	1.9	11.4	11.7	33.0	36.0	864.0	870.0	28.5	31.3	23.3	24.6
8- Both at 0.025%	65.0	66.6	3.3	3.3	13.3	13.6	34.0	40.0	964.0	971.0	32.8	38.8	28.9	30.9
9- Both at 0.05%	67.7	69.0	3.6	3.6	13.8	14.1	34.0	40.0	1000.0	1006.0	34.0	40.2	33.0	36.0
10- Both at 0.1%	67.8	69.4	3.7	3.7	13.9	14.2	34.0	40.0	1006.0	1010.0	34.2	40.4	33.6	36.3
New L.S.D. at 5%	1.8	1.7	0.3	0.3	0.5	0.5	NS	2.0	25.0	24.7	1.5	1.8	1.1	1.1

3- Berries quality:

Table (6) evident that single and combined applications of barley seed sprout extract and potassium silicate each at 0.025 to 0.1% was significantly effective in improving physical, chemical characteristics and quality of the berries compared to the control treatment. The effect was related to increasing each material concentrations. Using barley seed sprout extract significantly surpassed the application of potassium silicate in enhancing quality of the berries. Combined applications were significantly more favorable than using each material alone. Treating the vines three times with a mixture of barley seed sprout extract and potassium silicate each at 0.1% gave the best results from an economic point of view.

Table 6. Effect of spraying barley seed sprout extract and potassium silicate on cluster shoulder and some physical and chemical characteristics of the berries of Red Globe grapevines during 2015 and 2016 seasons.

Treatment	Cluster shoulder (cm)		Berry weight (g.)		Berry Length (cm)		Berry diameter (cm.)		T.S.S. %		Total acidity %		Reducing sugars %	
	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016
1-control	11.0	10.8	8.0	8.3	2.64	2.67	2.49	2.50	17.0	16.9	0.680	0.677	13.0	12.9
2- Barley seed at 0.025%	13.9	14.0	10.1	10.5	3.00	3.05	2.82	2.85	18.1	18.0	0.571	0.570	14.1	14.0
3- Barley seed at 0.05%	15.0	15.0	11.2	11.6	3.15	3.20	2.92	2.95	18.5	18.4	0.550	0.548	14.5	14.4
4- Barley seed at 0.1%	15.3	15.4	11.3	11.9	3.17	3.22	2.93	2.96	18.6	18.5	0.549	0.547	14.6	14.5
5- Potassium silicate at 0.025%	11.9	12.0	8.6	9.0	2.75	2.80	2.59	2.62	17.3	17.2	0.659	0.657	13.4	13.3
6- Potassium silicate at 0.05%	12.9	13.0	9.3	9.6	2.87	2.92	2.70	2.73	17.7	17.6	0.620	0.619	13.7	13.6
7- Potassium silicate at 0.1%	13.0	13.1	9.4	9.7	2.88	2.93	2.72	2.74	17.8	17.7	0.599	0.598	13.8	13.7
8- Both at 0.025%	17.0	17.3	14.0	13.6	3.41	3.46	3.06	3.10	19.0	18.9	0.521	0.520	15.0	14.9
9- Both at 0.05%	18.0	18.4	14.9	15.2	3.55	3.60	3.15	3.20	19.3	19.2	0.501	0.500	15.3	15.2
10- Both at 0.1%	18.1	18.5	15.0	15.3	3.57	3.62	3.16	3.21	19.4	19.3	0.500	0.500	15.4	15.3
New L.S.D. at 5%	0.7	0.8	0.5	0.5	0.08	0.10	0.07	0.08	0.3	0.3	0.20	0.019	0.3	0.3

Discussion:

The positive action of silicon on enhancing the tolerance of the vines to biotic and abiotic stresses, photosynthesis and the biosynthesis of organic foods (Epstein, 1999; Alvarez and Datnoff, 2001 and Aziz *et al.,* 2002) could result in improving growth, yield and fruit quality of Red Globe grapevines.

These results are in the sameline with those obtained by Al-Wasfy (2014); El- Khawaga (2014); Gad El- Kareem (2014); Mohamed *et al.,* (2015); Nagy-Dena (2015); Omar (2015) ; Mohamed (2015) ;Noaman (2015) and Samouni-Mona(2017)

The higher content of barley seed sprout from amino acids, vitamins, nutrients and hormones(Camacho *et al.,* 1992 and Cairney, 2005) was favorable in enhancing growth and fruiting of Red Globe grapevines.

The essential roles of barley seed sprout extract and potassium silicon on berry setting, cluster weight and number of clusters / vine were reflected on enhancing the yield.

These results are in harmony with those obtained by Refaai (2014a and 2014b); Mohamed (2014); El- Khawaga and Mansour (2014) and Abd – El- Rahman (2015).

CONCLUSION

Carrying out three sprays of a mixture of barley seed sprout extract and potassium silicate each at 0.05% gave the best yield and quality of Red Globe grapevines grown under Minia conditions.

REFERENCES

Abdelaal,A.A.M. and Oraby- Mona, M.M. (2013): Using silicon for increasing the tolerance of the mango cv. Ewaise transplants to drought. World Rural Observations 5(2): 36-40.

Abd El- Rahman, M.M.A. (2015): Yield and fruit quality of Washington Navel oranges as influenced by foliar application of fenugreek and rocket seed sprouts. World Rural Observations. 7 (2): 99-104.

Abd El- Wahab, H.A.M. (2015): Response of Succary mango trees to foliar application of silicon and boron. M.Sc. Thesis Fac. of Agric. Minia Univ. Egypt.

Ahmed, F.F. and Gad El- Kareem, M.R. (2014): Effect of spraying Wheat seed sprout and some nutrients on fruiting of wonderful pomegranate trees. World Rural Observations 6(4): 115-120.

Ahmed, F.F. and Habasy- Randa, E.Y. (2014): Productive performance of Washington navel orange trees in relation to foliar application of barley seed sprout and royal Jelly. World Rural Observations. 6(4): 109-114.

Ahmed, F.F. and Morsy, M.H. (1999): A new method for measuring leaf area in diffirnt fruit species. Minia J. of Agric. Res. & Develop. Vol. (19)pp. 97-105.

Ahmed , F.F.; Gad El- Kareem, M.R. and Oraby- Mona, M.M. (2013a): Response of Zaghloul date palms to spraying boron, silicon and glutation. Stem Cell 4(2): 29-34.

Ahmed , F.F. Mansour, A.E.M.; Mahmoud, A.Y.; Mostafa, E.A.M. and Ashour, N.E. (2013b): Using silicon and salicylic acid for promoting production of Hindy Besinnara mango trees grown under sandy soil. Middle East. J. of Agric. Res. 2(2): 51-55.

Akl, A.M.M.A.; Mohamed, M.A.; Ibrahim, H.I.M. and Mohamed, R.H.M. (2015): Productive capacity of Manfalouty pomegranate trees in relation to spraying of silicon and vitamins B. World Rural Observations. 7(1): 108-118.

Alvarez, J. and Datnoff, L.E. (2001): The economic potential of silicon for integrated management and sustainable rice production. Crop Prot. 20:43-48.

Al- Wasfy, M.M. (2013): Response of Sakkoti date palms to foliar application of royal jelly silicon and vitamins B. Nature of Sci. 9(5): 315-321.

Al-Wasfy, M.M. (2014): The synergistic effect of using silicon with some vitamins on growth and fruiting of Flame seedless grapevines. Stem Cell . 5(1): 8-13.

Association of Official Agricultural Chemists (2000): Official Methods of Analysis (A.O.A.C.) 17th Ed. A.O.A.C. Washington , D.C. (US.A.)pp, 490-510.

Aziz, R.; Gill, M.A. and Rahmatullah, R. (2002): Silicon nutrition and crop production : A review . Pak. H. Agric. Sci. 39(3): 181-188.

Cairney, E. (2005): The sprouters . handbook Argyll publishing Glendrangel . Ar 9411, PA 223- A223 AE Scotland pp. 41- 45.

Camacho, L.C.; Slerea, C.; Compos, R.; Guzman, E. and Marchus, I. (1992): Nutritional changes caused by the germination of legumes commonly eaten in china. Arch Latinoas Ch. Nutri, 42: 283-290.

Carter, M.R. (1993): Soil sampling and methods of Analysis Canadian soc. Soil sci. Lewis publishers, London, Tokyo, ISB N-1108 88718615.

Chapman, H.D. and Pratt, P.F. (1975): Methods of Analysis for Soil, Plant and Water. Univ. of Calif. Division of Agric. Sci. 172- 173.

Cottenie, A.; Veroo, M.; Velghe, M. and Camerlynck, R. (1982): Chemical Analysis of Plant and Soil. Ghent Belgium. Laboratory of Analytical and Agro-chemistry. State Univ. Pp. 200- 210.

El- Khawaga, A.S. (2014): Impact of vitamins B and C, glutamic acid and silicon on fruiting of Superior grapevines. World Rural Observations (4):58-62.

El- Khawaga, A.S. and Mansour, A.E.M. (2014): Promoting productivity of Washington Navel orange trees by using some crop seed sprout extracts, silicon and glutathione Middle East J. of Applied Sci. 4(3): 779-785.

El- Sayed- Faten, I.I. (2014): Effect of seed sprout extract of some crop species. M. Sc. Thesis Fac. of Agric. Ain Shams Univ. Egypt.

Epstein, E. (1999): Silicon, Annl, Rev. Plant Physiol, Plant Mol Biol. 50 : 461- 446.

Evenhuis, B. and Dewaard, P.W. (1980): Principles and Practices in Plant Analysis. F.A.O. Soil Bull. 38: 172-163.

Gad El- Kareem, M.R. (2012): Improving productivity of Taimour mango trees by using glutathione, silicon and vitamins B. Minia J. of Agric. Res. & Develop. Vol. 32 No. 2 pp, 161- 180.

Gad El- Kareem, M.R. ; Abdelaal, A.M.K. and Mohamed A,Y, (2014): The synergistic effect of using silicon and selenium on fruiting of Zaghloul date palm *(phoenix dectylifera L.*). World Academy of Engineering 8 (3): 959-964.

Hiscox, A. and Isralstam, B., (1979): A method for the extraction of chlorophyll from leaf tissue without maceratio. Cam J. Bot. 57: 1332-1334.

Ibrahim, M.I.M. and Al- Wasfy, M.M. (2014): The promotive impact of using silicon and selenium with potassium, and boron on fruiting of Valencia orange trees grown under Minia region conditions. World Rural Observations. 6(2): 28-36.

Lane, J.H. and Eynon, L (1965): Determination of reducing sugars by means of Fehlings solution with methylene blue as indicator A.O.A.C. Washington D.C. U.S.A. pp. 490-510.

Mohamed, A.Y.A. (2014): Effect of spraying fenugreek seed sprout and some nutrients on fruiting of Keitte mango trees grown under Aswan region conditions. World Rural Observations. 6(4): 103-108.

Mohamed, M.A. ; El- Sayed, M.A. and Abd El- Wahab, H.A.M. (2015): Response of Succary mango trees to foliar application of silicon and boron. World Rural Observations 7(2): 93-98.

Mohamed, R.H.M. (2015): Studies on the effect of spraying potassium silicate and vitamin B on fruiting of Manfalouty pomegranate trees. M. Sc. Thesis, Fac. of Agric. Minia Univ. Egypt.

Nagy- Dena, A.M. (2015): Response of Flame seedless grapevines to spraying silicon. M. Sc., Thesis Fac. of Agric. Minia Univ. Egypt.

Noaman, M.G.M. (2015): Effect of spraying seaweed extract and silicon on fruiting of Alphonse mango trees. M. Sci. Thesis Fac. of Agric. Minia Univ. Egypt.

Omar, A.I.A. (2015): Effect of spraying seaweed extract and potassium silicate on growth and fruiting of Al- Saidy date palms. M.Sc. Thesis Fac. of Agric. Minia Univ. Egypt.

Refaai, M.M. (2014a): Impact of spraying extracts of fenugreek and rocket seed sprouts on fruiting of Keitte mango trees. World Rural Observations. 6(4): 75-80.

Refaai, M.M. (2014b): Response of Zaghloul date palms grown under Minia region conditions to spraying wheat seed sprout extract and nano- boron. Stem Cell 5 (4): 22-28.

Samouni-Mona, T.M. (2017):Effect of some pollination ,thinning and potassium silicate treatments on fruiting of Saidy date palm under New Valley Conditions. Ph.D. Thesis ,Fac.Agric., Assiut Univ., Egypt p.114

Steel, R.G.D. and Torrie, J.H. (1982): Principles and Procedures of Statistics. Mc Grow- Hill Inter. Book Company, 3rd Ed., London, p, 633.

Summer, M.E. (1985): Diagnosis and Recommendation Integrated System (DRIS) as a guide to orchard fertilization Hort. Abst. 55(88): 7502.

Von- Wettstein, D.V. (1957): Chlorophyll Lethale under submroshpische fermilkchrof der plastiden cell prep trop. Re. Amer. Soc. Hort. Sci. 20pp, 427-433.

Wilde, S.A.; Corey, R.B.; Layer, J. and Voigt, G.K. (1985): Soils and Plant Analysis for Tree Culture 3rd Ed. Oxford and IBH publishing co., New Delhi. India, pp. 490- 510.

استجابة كرمات العنب الرد جلوب لرش مستخلص نبت بذور الشعير والسليكون

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أجريت هذه الدراسة خلال موسمى 2015، 2016 وذلك لاختبار تأثيرات رش مستخلص نبت بذور الشعير وسليكات البوتاسيوم اما بالصورة الفردية أو المشتركة بتركيز ما بين 0.025 الى 0.1% على نمو واثمار كرمات العنب الرد جلوب حيث تم رش الكرمات ثلاثة مرات بهاتين المادتين. أشارت نتائج الدراسة الى أن الاستخدام الفردى والمشترك لمستخلص نبت بذور الشعير وسليكات البوتاسيوم بتركيز ما بين 0.025 الى 0.1% أدى الى تحسين صفات النمو الخضرى وصبغات الورقة والعناصر الغذائية وهى النتروجين والفوسفور والبوتاسيوم والماغنسيوم والكالسيوم والزنك والمنجنيز والحديد والنحاس والنسبة المئوية لعقد الحبات وكمية المحصول للكرمة وخصائص الجودة للحبات وذلك بالمقارنة بمعاملة الكنترول وكان استخدام مستخلص نبت بذور الشعير جنباً الى جنب مع سليكات البوتاسيوم أفضل من استخدام أى منهما بمفرده وكان التحسن مرتبطا بزيادة التركيز المستخدم من كل مادة.لأجل تحسين كمية المحصول وجودة الحبات فى العنب الرد جلوب النامى تحت ظروف منطقة المنيا فانه يجب رش الكرمات ثلاثة مرات بمخلوط من مستخلص نبت بذور الشعير مع سليكات البوتاسيوم بتركيز 0.05 % لكل منهما.

الكلمات الدالة: نبت بذور الشعير- السليكون- كمية المحصول خصائص الجودة للحبات- العنب الرد جلوب