Assiut J. Agric. Sci., (48) No. (6) 2017 (63-71) *ISSN: 1110-0486*
Website: http://www.aun.edu.eg/faculty_agriculture *E-mail: ajas@aun.edu.eg*

Effect of some Organic and Bio-Fertilizers on" Thompson Seedless" Grapevines Under New Reclaimed Sandy Soil

EL-Mahdy, T.K.[1]; Asmaa A. Mohamed[2] and M.A.F. Badran[3]
[1]Pomology Department, Fac. Agric, Assiut University
[2]Viticulture Dept., Hort. Res. Inst., Agric. Res. Center, Giza, Egypt.
E-mail: Ticcuie-culture@yahoo.com
[3]Central Laboratory of Organic Agriculture, Hort. Res. Inst., Agric. Res. Center, Giza.
Received on: 27/11/2017 **Accepted for publication on:** 14/12/2017

Abstract

During 2015 and 2016 seasons, Thompson Seedless grapevines were fertilized with organic fertilizer, compost, humic acid and bio fertilizer (*Ascophyliumnodosum*) algae. These fertilizers were used as a partial replacement for inorganic N fertilizer improving yield, lowering pollution and enhancing the efficiency of exportation to foreign markets. The obtained results indicated that application of N as 50% inorganic N plus50% organic N and algae 5ml / vine was the best management system for ensuring the best yield, number of clusters /vine and cluster weight, leaf mineral content and improving the chemical characteristics of berries as total soluble solids (TSS), total acidity (TA) and Tss /acid ratio and decreasing nitrate and nitrite content in the berries.

Keywords: *Thompson seedless grapevines, humic acid, organic and biofertilizer.*

Introduction

The grapes are considered the first economic crop in the world and the second crop in Egypt. Several species of grape and their hybrids are currently cultivated. *VitisVinifera* L., The world or European bunch grape of antiquity and is native to southern Europe and the vicinity of the Black and Caspian seas .Most of grape cultivars planted in Egypt belong to the table grape and all of them are of the European grape cultivars (*VitisVinifera* L.) Grapes and other genera of the family vitaceae are widely distributed in the tropics and subtropics with ranges extending into the temperate regions (Einset and Pratt, 1975). Due to its high net return, the fruiting area has grown rapidly in Egypt in the last two decades reaching 278523feddans, (Annual Reports, Ministry of Agric, Egypt 2012). A principal goal of organic farming is producing healthy fruits without the use of chemical fertilizers well as protecting our environment from pollution. Achieving of this target was conducted through the use of organic and bio fertilizers. These fertilizers have great advantages such as promoting soil fertility, availability of nutrients, the release of most nutrients and fixation of N (Dalbo, 1992 and Kannaiyan, 2002). Organic fertilizers instead of mineral fertilizers has become potentially attractive because of the harmful effect and high cost of mineral fertilizers (Darwish, *et al.,* 1995). Organic fertilization increased growth and improved nutritional status of grapevines (Omar, 2005). Fertilizing various grapevine cultivars with organic manures beside the inorganic nitrogen source was accompanied by improving growth and leaf mineral content as well asyield and berry quality than using nitrogen as an inorganic source only (El-Rawy, 2007 and Mostafa, 2008). Bio fertilizers are the most important for plant production and soil as they play an important role in improving fruit quality and yield grapevines (Akl, *et* *al*., 1997). Supplying the vines with N as 25 to 75% inorganic N plus organic manures enriched with algae was preferable in improving quality of the berries in terms of increasing berry weight and dimensions, TSS, Tss/acid ratio and reducing sugars and decreasing total acidity% and both nitrate and nitrite in the juice rather than application of N via inorganic N fertilization alone (Mohamed *et al.,* 2014). Humic acid is the active constituents of organic humus, which can play a very important role in soil conditioning and plant growth and they have different effects on plants (Ferrara and Brunetti, 2010). Humic acid play an important role directly and indirectly in nutrition of the plants (Lobartini *et al*., 1997). Humic substances affect the ion exchange of plant nutrients that are useful in microbial activity by increasing conversions directly as well as result of the stimulating plant growth hormones (Vaughan. D and I.R. Mc Donald 1976). This investigation was done to evaluate organic, bio fertilization and humic acid treatments on leaf mineral content, yield, fruit quality and the residual minerals in Thompson Seedless grapevine.

Materials and Methods

This study was carried out during 2015 and 2016 seasons on 15 grapevines13- years old Thompson Seedless grown on sandy soil at Assiut Agriculture Research Station ARC, Assiut Governorate. The selected vines were uniform in vigor and planted at 1.75×2.75m apart. Pruning was done on the first week of January during both seasons using cane pruning method with the assistance of double T supporting system, leaving 72 eyes/ vine (six fruiting canes with twelve eyes and six renewal spurs with two eyes)and irrigated by flooding irrigation system. Soil analysis was carried out according to the data are shown in Table (1). This study consisted from the following five treatments:

T_1-100% mineral N 60g/vine as (175gammonium nitrate 33.5%) control.

T_2-50%mineral N (30g N/vine) +50% organic N as 6.5kg compost (plant and animal residues).

T_3-50% mineral N (30g N/vine) +50% organic N as 6.5kg compost/vine and 1 liter humic acid 1%/vine (prepared by water at the rate 1L /100L water.

T_4- 50% mineral N(30g N/ vine) plus50% organic N as (6.5kg compost / vine) and 5 ml algae (*Ascophyliumnodosum)*/ vine.

T_5- 100% organic N fertilization as (13kg compost / vine) plus1 literhumic acid 1% /vine and5 ml algae (*Ascophyliumnodosum)*/ vine. Each treatment was replicated three times (one vine per each) and the complete randomized design was conducted. As for mineral fertilization treatment, 60 gm. N as ammonium nitrate (33.5% N) was added per each vine and placed 10 cm under the soil surface on both sides of the vine rows (50 cm from the trunk) at three equal doses (at bud burst, after fruit set and after harvest). While the organic, bio fertilizers and humic acid were added once a year during first week of January, The other cultural practices were the same for all treatments.

Table (1). Physical and chemical characteristics of used soil.

Character	Value
Sand(%)	89.9
Silt	7.1
Clay	3.0
Soil texture	Sandy
Total $CaCO_3$ (g Kg^{-1})	300
Ph.(1:1 Water suspension)	8.46
Organic matter (g kg^{-1} soil)	2.4
Total nitrogen (mg kg^{-1})	130
Available Phosphorus(mg kg^{-1})	10.75
Available Potassium(mg kg^{-1})	54.6

Table (2). Mechanical, physical and chemical analysis of compost.

Sample	Ca%	Mg	N	P	K%	Ph. Value (1:2:5)	TDS (mg)
compost	3.19	0.48	0.47	0.5	0.57	7.16	4000

Some yield parameters and chemical properties of grapes were measured as follows:

A-Yield components:

1-Total Yield (kg): was carried out at the normal commercial harvesting date (last week of June) when total soluble solids percentage reached over18% in the berries of control vine.

2-The number of clusters per vine was recorded.

3-The average weight of cluster (g) was estimated by multiplying yield weight in cluster number/vine.

B- Chemical properties:

Five clusters from each tested vine were taken at random for determining the following chemical characteristics of the berries:

1-Total soluble solids% (TSS%) was determined by using hand refractometer.

2-Total acidity: total acidity (as g tartaric acid/100 ml juice): was determined by titration against NaOH at 0.1n using phenolphthalein as an indicator (A.O.A.C., 1995).

3-Tss/acid ratio were calculated.

4-Nitrate and Nitrite. Also, nitrate and nitrite content in the berry juice was determined according the methods outlined by (Ridnour- Lisa *et al.*, 2000).

5-Total N, P and K contents on leaf: Leaf mineral contents (total N, P and K %) were determined in petioles from mature leaves (5-7th leaves from shoot top) opposite to basal clusters (Nijjar 1985) according to the methods described in (Wilde *et al.* 1985).

Statistical Analysis

The obtained data were tabulated and subjected to the proper statistical analysis of variance according to the complete randomized design. Statistical analysis was done using New L.S.D. at 5% parameter (Mead *et al.*, 1993).

Results and Dissection

Yield components:

Data presented in Table (3) showed the effect of organic N, humic acid and bio fertilizers on number of clusters, cluster weight and total yield of Thompson Seedless grapevines during 2015 and 2016 seasons. It is obvious from the data that the results took similar trend during the two studied seasons. Data indicated that T_2 (50% mineral N plus50% organic N) insignificantly increased the number of clusters, cluster weight and yield compared to control. Whereas, T_3(50% mineral plus 50% Org (compost) and HA1%),T_4(50% mineral N plus 50% Org compost and bio algae) and T_5(100%Org (compost) plus HA 1% and Bio (Algae)) significantly increased the number of clusters, cluster weight and yield compared to control in both seasons. The highest values of clusters number (20.00, 22.66), cluster weight (440.00, 445.73gm) and total yield (8.76,10.10 kg) were obtained underT_4 (50% inorganic N plus50% compost and 5ml algae) fertilization treatment during 2015 and 2016 seasons respectively. Likewise, a positive relationship was found between number of clusters per vine, cluster weight and total yield, so increasing number of clusters and cluster weight was parallel with increasing the total yield.

Table 3. Effect of compost, humic acid and bio fertilizer on No. of cluster, cluster weight (gm.) and yield (kg) of Thompson seedless grapevine during 2015 and 2016 seasons.

Properties / Treatment	No .of Cluster/ vine		Cluster weight (gm.)		Yield /vine (kg.)	
	2015	2016	2015	2016	2015	2016
T_1-100 % mineral N (control)	18.33	20.00	372.67	387.33	6.83	7.56
T_2-50% mineral N +50% Org(compost)	18.66	20.67	398.67	401.33	7.44	8.29
T_3-50% mineral +50% Org(compost) and HA1%	19.67	22.33	405.00	415.00	7.97	9.26
T_4-50% mineral N +50%Org(compost) and Bio(Algae)	20.00	22.66	440.00	445.73	8.76	10.10
T_5-100%Org(compost) +HA 1% and Bio (Algae)	19.33	22.30	433.33	443.33	8.37	9.89
L.S.D at 5%	0.89	0.77	28.00	24.41	0.88	0.98

These result are in partial agreement with those reported by El-Sawy(2005), Gamal (2006), Abada (2009), Abd El- Aziz (2011), Refaai, (2011), El-Khawaga (2012) Farouk *et al*., (2014), Mohamed, *et al*. (2014) and Faissal *et al*. (2015).

Chemical Characteristics

1-Total soluble solids, Total Acidity and Tss/acidratio:

It is evident from the data in Table (4) that supplying the vines with N as inorganic form besides organic N (compost) and humic acid/ vine) significantly was very effective in improving TSS %, Tss/acid ratio- and decreasing total acidity %, comparedto using N as inorganic fertilization alone. The best results were obtained when the vines were fertilized with (50% inorganic N plus 50% compost and algae) which recorded the highest values for TSS (19.67, 20.69), lowest acidity TA (0.427, 0.401) and Tss/acid ratio (46.13, 51.63) in both studied seasons respectively. These results are in harmony with those obtained by EL-Sawy (2005), Gamal (2006), Mouftah (2007), Eman, *etal.* (2008), Uwakiem (2011) El-Khawaga (2012), Masoud (2012), Farouk *et al.* (2014) and Mohamed, *et al*. (2014).

Table 4. Effect of compost, humic acid and bio fertilizer on thepercentage of Total soluble solids (TSS), acidity (TA) and TSS/acid ratio of Thompson Seedless grapevine during 2015 and 2016 seasons.

Treatment \ Properties	T.S.S%		Acidity% (TA)		TSS /TA	
	2015	2016	2015	2016	2015	2016
T_1-100 % mineral N (control)	18.40	19.55	0.551	0.541	33.39	36.14
T_2-50% mineral N +50% Org(compost)	19.51	19.89	0.472	0.452	41.39	44.05
T_3-50% mineral +50% Org (compost) and HA 1%	18.52	20.35	0.532	0.500	34.82	40.70
T_4- 50%mineral+50%Org(compost) and Bio (Algae)	19.67	20.69	0.427	0.401	46.13	51.63
T_5- 100%Org (compost) and HA 1% and Bio (Algae)	19.35	19.77	0.488	0.432	39.66	45.77
L.S.D at 5%	0.11	0.21	0.01	0.02	1.01	2.09

2-Percentage of N, P and K in the leaves

As shown in Table (5) regarding nitrogen percentage in the leaf, it is clear that T_5 (100% organic N plus algae and humic acid 1%) significantly decreased N value than the other treatments (1.82,1.89) during 2015 and 2016 seasons, respectively. Concerning p and k percentages, it observed that T_4 (50% inorganic N plus 50% compost and algae) significantly increased P% and K%(0.149, 0.159) and (1.31,1.38) than all other treatments in both studied seasons, respectively. The abovementioned results were in accordance with those obtained by Tatini, *et al*.(1991) Saleh, *et al* (2006), Eman *et al*. (2008), El-Khawaga (2012), Farouk *etal*. (2014) and Faissal *etal.* (2015).

Table 5. Effect of compost, humic acid and bio fertilizer on the leaf mineral content N, P and K of Thompson Seedless grapevine during 2015 and 2016 seasons.

Treatment \ Properties	N%		P%		K%	
	2015	2016	2015	2016	2015	2016
T_1-100 % mineral N (control)	1.84	1.97	0.129	0.139	1.13	1.16
T_2-50% mineral N +50% Org(compost)	1.98	1.93	0.145	0.147	1.15	1.19
T_3-50% mineral +50% Org(compost) and HA 1%	2.10	2.00	0.142	0.151	1.19	1.22
$T_4$50%mineralN+50%Org(compost) and Bio (Algae)	2.21	2.25	0.149	0.159	1.31	1.38
T_5-100%Org(compost) and HA 1% and Bio (Algae)	1.82	1.89	0.136	0.143	1.20	1.21
L.S.D at 5%	0.02	0.03	0.04	0.03	0.01	0.02

3-Nitrate and Nitrite content:

As shown in Table (6) It is apparent that all treatments significantly decreased both parameters than the control (100% inorganic N) which recorded the highest values of NO_3 (22.19, 22.93) and NO_2 (1.76, 1.43) during both tested season, respectively. Similar trend was observed during 2015 and 2016 seasons. It is clear that T_4 (50% mineral N plus 50%Org and algae) gave the minimum values of NO_3 and NO_2 (15.11, 13.98) and (0.82, 0.77) in both studied seasons, respectively. These results are in harmony with those obtained by El-Sawy (2005), El Shenawy and Fayed (2005), Eman *et al*. (2008), Mohmed *et al* (2014) and Faissal *et al*. (2015).

Table 6. Effect of compost, humic acid and bio fertilizer on nitrate and nitrite content of Thompson Seedless grapevine during 2015 and 2016 seasons.

Treatment \ Properties	Nitrate (NO_3) ppm		Nitrite(NO_2) ppm	
	2015	2016	2015	2016
T_1 -100 % mineral N (control)	22.19	22.93	1.76	1.43
T_2 -50% mineral N +50% Org (compost)	20.21	19.32	1.32	1.23
T_3 -50% mineral +50% Org (compost) and HA 1%	17.33	19.35	0.85	1.04
T_4 -50% mineral N +50%Org (compost) and Bio (Algae)	15.11	13.98	0.82	0.77
T_5 -100%Org(compost) and HA 1% and Bio (Algae)	18.51	16.82	0.93	0.88
L.S.D at 5%	0.77	0.87	0.31	0.22

Discussion

The previous positive action of organic N(compost), biofertilization with (*Ascophyliumnodosum*) algae and humic acid on growth, vine nutritional status, yield and berries quality was attributed mainly to the beneficial effects of these fertilizers in reducing soil salinity, soil pH, leaching process and soil erosion and enhancing the production of natural hormones and cytokinins, root development, nutrient availability, soil organic matter, microbial activity; soil aggregation and aeration, permeability of soil, water holding capacity, nutrient transport, photosynthesis process, fixation of N, water use efficiency, solubility of most nutrients soil workability, (Dalbo, 1992 and Davis and Ghabbour, 1998).

Conclusion

The previous results showed that, using organic, bio fertilizer and humic acid may be useful for reducing the amount of inorganic fertilization in Thompson Seedless grapevine, which led to reducing the soil pollution. Moreover, it is necessary to fertilize Thompson Seedless grapevine with (50%inorganic N plus50% compost and algae (*Ascophyliumnodosum*) at 5ml/vine/year for improving quality, quantity and reducing nitrate and nitrite content.

Reference

Abada, M.A.M.(2009). Reducing the amount of inorganic N fertilizers in Superior grape vineyard by using organic and biofertilizers and humic acid. Egypt. J. Agric. Res., 87(1): 17-344.

Abd El- Aziz, Y.Z.(2011). Response of Thompson seedless grapevines to application of organic fertilizer humic acid and some bio fertilizers. Ph. D. Thesis Fac. of Agric. Minia Univ. Egypt.

Akl, A.M.; F.F. Ahmed; F.M. El-Morsy and M.A. Ragab (1997). The effect of soil and foliar application of nitrogen, phosphorus and potassium on some vegetative and fruiting characteristics in White Banaty seedless grapevines. II Bud behavioryield and fruit quality. Minia. First. Conf. For Hort.,Crops. (19-21 Oct.), pp: 453-476.

Annual Reports of Staistics Institute and Agricultural Economic Dept., (2012). Ministry of Agric., Egypt.

Association of Official Agricultural Chemists,(1995). Official Methods of Analysis (A.O.A.C) 14th Ed, Benjamin Franklin Station, Washington, D.C, U.S.A. pp: 490-510.

Dalbo,M.A(1992). Nutrition and fertilization of grapevine. A grapcuaria Catarineness 5(4):32-35. Brazil.

Darwish, O.H.; N. Persaud and P.C. Martens(1995). Effect of long term application of animal manure onphysical properties of three soils. Plant and Soil.175:289-295.

Davis, G. and E.A. Ghabbour (1998). Humic substances, structure properties and uses. Royal Soc. of Chemistry, Cambridge pp. 10 - 15.

Einset, J. and C. Pratt (1975). Grapes in Janick,J.an J. N. Moore (Eds) Advances in Fruit Breeding pur.due University Press, west Lafayette, U.S.A. PP.130-150.

El- Khawaga, A.S. (2012). Effect of compost enriched with actinomyces and Bacillus polymyxa Algae as a Partial Substitute for Mineral N in Ewaise Mango Orchards. Research Journal of Agriculture and Biological Sciences, 8(2): 191-196.

El-Rawy, H. A.(2007). Physiological studies on fertilization of King Ruby grapevines Ph.D. Thesis, Fac. Agric, Assiut Univ., pp: 162.

El-Sawy,Y.A.E (2005). Studies on the effect of some organic fertilizers, ammonium nitrate and biofertilizer (algae extract) on growth and productivity of Williams banana (Musa Cavendishii L). M.Sc. Thesis Fac. of agric. Minia Univ. Egypt.

El-Shenawy, F.E. and T.A. Fayed(2005). Evaluation of the convential to organic and bio-fertilizers on Crimson Seedless grapevine in comparison with chemical fertilization 2-Yield and fruit quality Egypt J. Appl. Sci.,20(1);212-225.

Eman,A.A.Abd-Monem; M.M.S., Salah and E.A.M.Mostafa (2008). Minimizing the quantity of mineral nitrogen fertilizers on grapevine by using humicacid, organic and biofertilizers. Research Journal of Agriculture and Biological Sciences, 4(1);46-50.

Faissal, F.A., H.A. Ahmed, M.A.EL-Masry and Sherif M.M. Hassan (2015). Using Organic Manures and EMAsa partial Replacement of Mineral N Fertilizers in Superior Vine yards. World Rural Observations, 7(3) ;76-84.

Farouk H. Abdelaziz; I.M. Ibrahim; M.A Mohamed; M.A. Abadaand S.A. Hasan(2014). Using Plant Compost Enriched With Spirulina Plantensis Algae as a Substitute for Mineral N Fertilizer in Flame Seedless Vineyards. World Rural Observations, 6(4);43-49.

Ferrara, G. and G. Brunetti(2010). Effects of the times of application of a soil humic acid on berry quality of table grape (Vitisvinifera L.) cv. Italia. Spanish J. Agric. Res., 8: 817-822.

Gamal.A.F.(2006). Response of Washington Navel orange trees to some antioxidants and biofertilizationtreatments. M.Sc.Thesis, Fac. of agric. Minia Univ .Egypt.

Kannaiyan, S. (2002). Biotechnology of Biofertilizers. Alpha Science International Ltd.Pangabourne England.P.1-275.

Lobartini, J.C.; G.A. Orioli and K.H. Tan, (1997). Characteristics of soil humic acid fractions separated by ultrafiltration. Commun. Soil Sci. Plant Anal., 28: 787-796.

Masoud, A.A.B. (2012). Effect of Organic and Bio Nitrogen fertilization on growth, nutrient status and fruiting of Flame Seedless and Ruby Seedless Grapevine. Research Journal of Agriculture and Biological Sciences,8(2):83-91.

Mead, R.; R. N. Currnow, and A.M. Harted (1993). Statistics Methods in Agricultural. Biology. 2nd Ed. Chapman & Hall. London. pp.50-70.

Mohamed M.A.; A.H. Ali; A.A Gobara and M.A.Abd El- Razik (2014). Reducing Inorganic N Partially In Superior Vineyards By Using Organic Manures Enriched With Spirulina Plantensis. Stem Cell; 5(3) :16-21.

Mohamed, W.S. and F.F. Ahmed (2008). Selecting the best sources of mineral nitrogen applied with organic and biofertilization for Superior grapevines. Minia J. of agric. Res. & Develop., 28(3): 409-428.

Mostafa,R.A.A.(2008). Effect of bio and organic nitrogen fertilization and elemental sulpher application on growth, yield and fruit quality of Flame seedless grapevines Assiut J. Agric. Sci., 39(1):79-96.

Mouftah, R.T.(2007). Response of Taimour and Zebba mango trees to application of organic and biofertilization along with seaweed extract Phd. Thesis Fac. Minia Univ.Egypt.

Nijjar,G.S.(1985). Nutrition of fruit trees. MrsUsha Raj Kumar for Kalyani. publishers. New Delhi India pp: 1-89.

Omar, A.H. (2005). Fertilization of Thompson seedless grapevines with mineral and organic sourcesof nitrogen. J. Agric. Sci. Mansoura Univ., 30(12): 7855-7862.

Refaai, M.M. (2011). Productive capacity of Thompson seedless grapevines in relation to some inorganic, organic and biofertilization as well as citric acid treatments. Ph.D. Thesis Fac. of Agric. Minia Univ. Egypt.

Ridnour- Lisa, A.;E. Sim- Julia;A.H. Michael; A.W. David; M.M. Scan; R.P. Garry, and R.S. Douglas (2000). A spectrophotometric method for the direct and quantitation of Nitric oxide. Nitrite and Nitrate in cell culture Media. Analytical Biochemistry, 281, 223 – 229.

Saleh, M.S., S. El-Ashry and A.M. Gomaa (2006). Performance of Thompson seedless grapevines as influenced by organic fertilizer, humic acid and biofertilizers under sandy soil conditions. Res. J. of Agric. and Biological Sci., 2(6): 467.

Tatini, M., P. Bertoni, A. Landi and M.L. Traversi (1991). Effect of humic acids on growth and biomass portioning of container-grown olive plants. Acta Hort, 294:75-80.

Wilde, S.A., R.B. Corey, J.G. Lyer and G.K. Voigt (1985). Soil and Plant Analysis for tree culture. Published by Mohan Primlani, oxford, IBH, Publishing Co., New Delhi, pp: 1-142.

Uwakiem, M. Kh. (2011). Effect of some organic, bio and slow release N fertilizers as well as some antioxidants on vegetative growth, yield and berries quality of Thompson seedlees grapevines Ph.D. Thesis. Fac. of Agric. Minia Univ. Egypt.

Vaughan, D. and I.R. McDonald(1976). Some effects of humic acid on the cation uptake by parenchyma tissue. Soil boil. Biochem., 8: 415-421.

Assiut J. Agric. Sci., (48) No. (6) 2017 (63-71) *ISSN: 1110-0486*
Website: http://www.aun.edu.eg/faculty_agriculture *E-mail: ajas@aun.edu.eg*

تأثير بعض المخصبات العضوية والحيوية علي صنف العنب الطومسون سيدلس في الأراضي الرملية المستصلحة

طلعت كامل المهدي[1] ، أسماء أحمد محمد أبراهيم[2] ، محمد أحمد فؤاد بدران[3]

[1]قسم الفاكهة – كلية الزراعة – جامعة اسيوط
[2] قسم بحوث العنب - معهد بحوث البساتين – مركز البحوث الزراعية
[3]معمل الزراعة العضوية – معهد بحوث البساتين - مركز البحوث الزراعية

الملخص

أجريت هذه الدراسة خلال موسمي ٢٠١٦،٢٠١٥ علي كرمات العنب البناتى الابيض(طومسون سيدلس) المنزرعة بالمزرعة البحثية لمركز البحوث الزراعية –أسيوط. وقد تم في هذه الدراسة استبدال جزئي للنيتروجين المعدني بالنيتروجين العضوي في صورة الكمبوست وحمض الهيوميك ومستخلص الطحالب وذلك بهدف تقليل الأضرار الناتجة من النيتروجين المعدني والتي تؤثر علي صحة الانسان وفي نفس الوقت الحصول علي أعلي انتاجية وأحسن جودة

المعاملات كالاتي :-

١-١٠٠% نيتروجين معدني (كنترول)
٢-٥٠% نيتروجين معدني و٥٠%نيتروجين عضوي (كمبوست)
٣-٥٠% نيتروجين معدني و٥٠% كمبوست وحمض الهيوميك ١%
٤-٥٠% نيتروجين معدني و٥٠% كمبوست ومستخلص الطحالب
٥-١٠٠%كمبوست وحمض الهيوميك ١% و مستخلص الطحالب

وكان يضاف السماد العضوي والسماد الحيوي معا دفعة واحدة في الأسبوع الأول من يناير اما النيتروجين المعدني كان يضاف في ثلاث دفعات عند بداية التفتح وعند العقد وبعد الجمع .
وأوضحت النتائج الاتي :

١-اظهرت النتائج ان المعاملة (٥٠% نيتروجين معدني و٥٠% كمبوست ومستخلص الطحالب) افضل المعاملات من حيث عدد العناقيد / الكرمة ووزن العنقود و كمية المحصول /الكرمة وأيضا بالنسبة للمواد الصلبة الذائبة والحموضة الكلية والنسبة بينهما

٢-اما بالنسبة للعناصر المعدنية فإن المعاملة (٥٠%نيتروجين معدني و٥٠% كمبوست وحمض الهيوميك ١%) سجلت اعلي قيمة للنيتروجين في الموسم الاول اما الموسم الثاني كانت اعلي قيمه للمعاملة ١-(١٠٠% نيتروجين معدني)

اما الفسفور والبوتاسيوم كانت اعلي قيمة ناتجة من المعاملة (٥٠% نيتروجين معدني و٥٠% كمبوست ومستخلص الطحالب) في كلا الموسمين.

٣-كل المعاملات من الثانية الي الخامسة أدت إلي تقليل النترات والنيتريت ولكن افضل معاملة هي المعاملة(٥٠% نيتروجين معدني +٥٠% كمبوست +مستخلص الطحالب) وذلك في الموسمين.

من نتائج هذة التجربة يمكن التوصية بالتالي:

أنه للحد من التلوث البيئي والحصول علي إنتاجية وصفات جودة من كروم العنب صنف (الطومسون سيدلس) يمكن استخدام ٥٠% نيتروجين معدني +٥٠% كمبوست + مستخلص الطحالب ٥ملي/الكرمة.