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INFLUENCE OF SOURCES AND PLACEMENT OF ORGANIC FERTILIZERS ON NUTRITIONAL STATUS, YIELD AND BUNCH CHARACTERISTICS OF THOMPSON SEEDLESS GRAPEVINES

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ABSTRACT

The effect of various sources of organic N fertilizers namely, filter mud (2.5% N), Compost El-Neel (2.15% N), Chicken manure (2.0% N) and Farmyard manure (0.25% N) applied at 25% of the recommended rate of nitrogen (80 g/vine) and placements (25, 50 and 75 cm dig depth) on leaf area, percentages of N, P and K, berry set (%), yield and quality of Thompson seedless grapes was investigated during three consecutive seasons, 2005 , 2006 and 2007,in the grapevine field in Assuit.

Results showed that fertilization with filter mud, Compost El-Neel, Chicken manure and Farmyard manure, in the descending order was highly effective for enhancing leaf area, percentages of N, P and K in the leaves, berry set, yield as well as physical and chemical characters of the berries. Placement of organic fertilizers had obvious effect on these characters. Increasing placement depth from 25 to 50 cm around the vines resulted in stimulating leaf area, percentages of N, P and K in the leaves, yield and quality of the berries. However, placing these, organic fertilizers in digs 75 cm depth caused a slight reduction in these characters and had adverse effect on yield and quality of the berries.

Fertilizing Thompson seedless grapevines annually with Nat 80 g/ vine composed of 50% inorganic + 25% organic (0.8 kg filter mud/vine in digs 50 cm depth) + 25% Biogen (20 g/vine) is suggested for obtaining an economical yield and improving berries quality.

INTRODUCTION

N fertilization is an important and limiting factor for growth and productivity of grapevines. Nitrogen has many functions in plant life, an important constituent of protoplasm, responsible for the biosynthesis of enzymes, amino acids, plant pigments and encouragement of cell division (Nijjar, 1985).

Application of organic fertilizers in the vineyard is a production system which avoids or, largely excludes the use of synthetic mineral fertilizers, and produces clean fruits and juice. Using organic fertilizers covers all forms of organic soil amendments as it depends on using recycled animal manure and farm residues to produce Compost for enhancing biological cycles, improving soil fertility and avoiding all forms of pollution that may result from conventional agricultural techniques (Nijjar, 1985).

The correct placement of organic fertilizers has a major effect on quantity of nutrients available for plant use and quantity lost through erosion and leaching (Miller *et al*., 1990). Varying sources and placement of organic fertilizers caused a remarkable effect on growth, nutritional status, yield and quality of different grapevine cvs. (Balbaa, 1988; Bhangoo *et al*., 1988;

Fregoni and Fraschini, 1989; Garcia- Lujan, 1990; Fardossi, *et al*., 1991; Wang *et al*., 1991; Mehana *et al*., 1992; El- Sayed, 1994 ; Akyuz *et al*., 1997; El- Morsy, 1997: Arutjumjan, 1999; Kose and Guleryuz, 1999; Ragab and Mohamed, 1999; Ahmed *et al*., 2000; Ezz-Thanaa, 2000; Vercesi, 2000; Contradie, 2001. Kamel, 2002; Abd El- Hameed and Rabeea, 2005; Mahran, 2005; Refaai, 2007 and Seleem and Telep, 2008).

Selecting the best source and placement of organic fertilizers that are responsible for gaining an economical yield and improving quality of Thompson seedless grapes was the main target of this study.

MATERIALS AND METHODS

This investigation was carried out during 2005, 2006 and 2007 seasons on 108 uniform in vigour, ten years old Thompson seedless grapevines grown in a private vineyard located at Dear Moase district, Minia Governorate where the soil is clay. Cane pruning system using T supporting method was followed. The chosen vines were planted at 2x3 meters apart and pruned at the first week of January in the three seasons as to leave 72 eyes (6 fruiting canes x 10 eyes plus six renewal spares x two eyes). Surface irrigation system and horticultural practices that are commonly used in the vineyard except N fertilization were followed:

Table 1: Analysis data of the tested soil.

Particle size distribution , Sand %	11.5
Silt %	25.0
Clay %	63.5
Texture	Clay
pH (1: 2.5 extract)	7.72
O.M. %	1.01
CaCO3 %	1.79
Total N%	0.09
Available P (ppm, Oslen)	5.1
Exch. K (ppm, ammonium acetate)	415.5

The study involved two factors; the first factor (A) included the four organic fertilizers, namely (a1) filter mud; (2.5% N) (a2) Compost El-Neel (2.15% N), (a3) Chicken manure (2.0% N), (a4) farmyard manure (0.25% N) and, the second factor (B) consisted of three placements of organic fertilizers b1) putting these fertilizers in digs 25 cm depth , (b2), in digs 50 cm depth and (b3) and in digs 75 cm depth. Therefore, the experiment comprised twelve treatments (four organic fertilizers x three placement treatments). Each treatment was replicated three times, three vines per each replicate. All selected vines received N at the fixed rate (80 g/vine annually) and applied as 50% inorganic fertilizer (Ammonium sulphate 20.6% N), 25% organic, and 25% Biogen biofertilizer (20 g/vine) as recommended by Abd El-Hameed and Rebeea (2005) and Mahran (2005). Ammonium sulphate was splitted into three unequal batches added as 50% on the first week of Feb., 25% just after

berry set (first week of April) and 25% at one month later (first week of May). All organic fertilizers at 25% out of the recommended rate of N, i.e. 80 g N/vine (i.e. 0.80 kg filter mud, 0.93 kg Compost El-Neel, 1.0 kg Chicken manure and 8.0 kg farmyard manure/vine) were added once at 25% out of the recommended rate of N (20 g/vine) at the first week of Jan. Biogen was added once at the first week of Feb.

Measurements included

1. Leaf area (cm^2) of the leaves opposite to the basal clusters according to Ahmed and morsy (1999). [in the middle of may]
2. Percentages of N, P and K in the same leaves taken for measuring leaf area according to the procedures outlined by Piper (1950).
3. Berry set (%) was measured by dividing number of fruitletes by total number of flowers per cluster and multiplying the product by 100.
4. Yield per vine expressed in weight (kg.) and number of clusters per vine was recorded at harvesting date (first week of July).
5. Average cluster weight (g).
6. Five clusters were taken at random from the yield of each vine for the determination of berry weight (g), percentages of total soluble solids and total sugars (AOAC, 1985). Total acidity (as g tartaric acid/100 ml juice) was measured according to AOAC (1985).

Statistical Analysis :

The obtained result of every grown season wer statistical analyzed by the analysis of vartany using a completely randomized block adopted , where the four organic N fertilizers Occupied the main plots and the three placement treatment ranked the subplots , the least significant difference test (new L.s.d) at 5% level of probability was calculated according to the procedure described by snedecor and Cochran (1967) .

RESULTS AND DISCUSSION

Leaf area and N, P and K contents:

Data in Tables 2 and 3 clearly show that varying the source of organic fertilizers was accompanied with significant differences in leaf area and N, P and K content in the leaves of Thompson seedless grapevines. The four organic fertilizers; filter mud, Compost El-Neel, Chicken manure and Farmyard manure; in a descending order significantly stimulated leaf area and N, P and K content in the leaves. Maximum values were recorded on vines fertilized with filter mud, while farmyard manure gave the minimum values. These results were true in the three seasons.

Concerning the effect of organic fertilizer placement on leaf area and N, P and K content, the data clearly show that varying the depth of the digs, where organic fertilizers were put, significantly altered leaf area and the content of these essential elements. A great and significant promotion on these characters was observed with increasing the depth of the digs from 25 to 50 cm. A slight reduction on such parameters was observed when depth of fertilizer placement was increased from 50 to 75 cm. Placing filter mud on 50 cm depth gave the maximum values. These results were true in the three seasons.

Table 2: Effect of sources and placement of organic fertilizers *on* leaf area (cm)^2 and percentage of N in the leaves of Thompson seedless grapevines during 2005 , 2006 and 2007 seasons.

Organic fertilizers (A)	Leaf area (cm)											
	2005				2006				2007			
	Depth of digs (cm) (B)											
	b_1 25	b_2 50	b_3 75	Mean (A)	b_1 25	b_2 50	b_3 75	Mean (A)	b_1 25	b_2 50	b_3 75	Mean (A)
a_1 F.M.	131.0	137.1	135.0	134.4	133.9	141.0	140.0	138.3	134.0	144.0	142.0	140.0
a2 C.E.	111.0	116.0	114.0	113.7	115.0	122.0	121.0	119.3	116.0	125.0	123.5	121.5
a3 C.M.	106.2	112.0	110.0	109.4	109.7	117.0	116.0	114.2	110.0	118.0	116.9	115.0
a4 F.Y.M.	101.5	107.1	104.2	104.3	102.2	108.5	107.4	106.0	103.1	108.0	107.3	106.1
Mean (B)	112.4	118.1	115.8		115.2	122.1	121.1		115.8	123.8	122.4	
New L.S.D. at 5%	A	B	AB		A	B	AB		A	B	AB	
	3.3	3.0	6.0		3.0	2.7	5.4		3.2	3.0	6.0	
	Leaf N %											
a_1 F.M.	2.44	2.59	2.56	2.53	2.45	2.66	2.64	2.58	2.50	2.64	2.59	2.58
a2 C.E.	2.30	2.46	2.43	2.40	2.33	2.50	2.47	2.43	2.35	2.47	2.45	2.42
a3 C.M.	2.16	2.31	2.30	2.26	2.18	2.33	2.30	2.27	2.15	2.31	2.29	2.25
a4 F.Y.M.	1.97	2.11	2.10	2.06	1.98	2.12	2.10	2.07	1.99	2.11	2.08	2.06
Mean (B)	2.22	2.37	2.35		2.24	2.40	2.38		2.25	2.38	2.35	
New L.S.D. at 5%	A	B	AB		A	B	AB		A	B	AB	
	0.11	0.09	0.18		0.10	0.11	0.22		0.08	0.09	0.18	

F.M. = Filter mud (2.5% N) **C.E. = Compost El-Neel (2.15% N)**
CM. = Chicken manure (2.0 % N) **F.Y.M. = Farmyard manure (0.25% N)**

Table 3: Effect of sources and placement of organic fertilizers on percentages of P and K in the leaves of Thompson seedless grapevines during 2005, 2006 and 2007 seasons.

Organic fertilizers (A)	Leaf P %											
	2005				2006				2007			
	Depth of digs (cm) (B)											
	b_1 25	b_2 50	b_3 75	Mean (A)	b_1 25	b_2 50	b_3 75	Mean (A)	b_1 25	b_2 50	b_3 75	Mean (A)
a_1 F.M.	0.28	0.34	0.33	0.32	0.29	0.36	0.35	0.33	0.31	0.39	0.38	0.36
a2 C.E.	0.22	0.27	0.26	0.25	0.22	0.29	0.28	0.26	0.25	0.36	0.34	0.32
a3 C.M.	0.16	0.21	0.20	0.19	0.18	0.25	0.24	0.22	0.17	0.27	0.26	0.23
a4 F.Y.M.	0.11	0.15	0.14	0.13	0.14	0.21	0.20	0.18	0.11	0.19	0.18	0.16
Mean (B)	0.19	0.24	0.23		0.21	0.27	0.27		0.21	0.30	0.29	
New L.S.D. at 5%	A	B	AB		A	B	AB		A	B	AB	
	0.03	0.02	0.04		0.03	0.03	0.06		0.02	0.03	0.06	
	Leaf K %											
a_1 F.M.	1.41	1.52	1.51	1.48	1.55	1.65	1.63	1.61	1.61	1.71	1.70	1.67
a2 C.E.	1.29	1.40	1.38	1.36	1.40	1.48	1.46	1.45	1.40	1.49	1.45	1.45
a3 C.M.	1.18	1.29	1.27	1.25	1.21	1.27	1.25	1.24	1.20	1.28	1.26	1.25
a4 F.Y.M.	1.01	1.12	1.11	1.08	1.06	1.13	1.12	1.10	1.05	1.15	1.13	1.11
Mean (B)	1.22	1.33	1.32		1.31	1.38	1.37		1.32	1.41	1.39	
New L.S.D. at 5%	A	B	AB		A	B	AB		A	B	AB	
	0.09	0.08	0.16		0.11	0.08	0.16		0.11	0.09	0.18	

F.M. = Filter mud (2.5% N) **C.E. = Compost El-Neel (2.15% N)**
CM. = Chicken manure (2.0 % N) **F.Y.M. = Farmyard manure (0.25% N)**

The merits of organic fertilizer expend in improving physical and chemical characters of the soil (soil fertility) could result in stimulating root growth and enhancing the availability of the essential nutrients (Nijjar, 1985

and Miller *et al.,* 1990). The great effect of root distribution and soil fertility among different placements could explain the present results.

The present results are in harmony with those obtained by El-Sayed (1994) and El- Morsy (1997), also Mahran (2005) observed the same trend.

Berry set, yield and cluster weight:

Data in Tables 4 and 5 clearly show that supplying Thompson seedless grapevines with organic fertilizers was favourable in improving berry set, yield (expressed in weight/kg.) and number of clusters per vine and cluster weight. Number of clusters per vine did not change significantly among the four organic fertilizer treatments in the first season of the study. Treating the vines with filter mud and farmyard manure gave the maximum and minimum values, respectively. These results were true in the three seasons.

Table 4: Effect of sources and placement of organic fertilizers on the percentage of berry set and yield/vine (kg) of Thompson

Organic fertilizers (A)	Berry set %											
	2005				2006				2007			
	Depth of digs (cm) (B)											
	b_1 25	b_2 50	b_3 75	Mean (A)	b_1 25	b_2 50	b_3 75	Mean (A)	b_1 25	b_2 50	b_3 75	Mean (A)
a_1 F.M.	18.9	21.0	20.1	20.0	19.0	21.0	20.7	20.2	19.1	22.1	21.8	21.0
a2 C.E.	15.5	17.8	16.9	16.7	15.6	17.9	17.5	17.0	15.9	19.9	19.7	18.5
a3 C.M.	12.9	16.0	15.7	14.9	13.0	15.5	15.3	14.6	12.9	16.0	15.7	14.9
a4 F.Y.M.	10.5	12.7	12.2	11.8	11.0	13.0	12.7	12.2	11.1	14.1	13.9	13.0
Mean (B)	14.5	16.9	16.2		14.7	16.9	16.6		14.8	18.0	17.8	
New L.S.D.	**A**	**B**	**AB**		**A**	**B**	**AB**		**A**	**B**	**AB**	
at 5%	1.9	1.7	3.4		2.0	1.6	3.2		2.3	2.0	4.0	
	Yield/vine (kg)											
a_1 F.M.	8.1	8.6	8.4	8.4	11.1	12.5	11.6	11.7	12.2	14.4	13.9	13.5
a2 C.E.	7.6	8.0	7.9	7.8	9.7	11.0	10.6	10.4	10.2	11.6	11.1	11.0
a3 C.M.	7.1	7.5	7.5	7.4	8.1	9.3	8.9	8.8	8.6	10.2	9.8	9.5
a4 F.Y.M.	6.3	6.8	7.0	6.7	6.6	7.6	7.1	7.1	6.8	8.1	7.8	7.6
Mean (B)	7.3	7.7	7.7		8.9	10.1	9.6		9.5	11.1	10.7	
New L.S.D.	**A**	**B**	**AB**		**A**	**B**	**AB**		**A**	**B**	**AB**	
at 5%	0.4	0.3	0.6		0.5	0.5	1.0		0.5	0.5	1.0	

F.M. = Filter mud (2.5% N) **C.E. = Compost El-Neel (2.15% N)**
CM. = Chicken manure (2.0 % N) **F.Y.M. = Farmyard manure (0.25% N)**

Placement of organic fertilizers had significant effect on berry *set,* yield and cluster weight. Placing in digs 50 cm. depth significantly resulted in the maximum values compared with 25 or 75 cm depth. Increasing depth of digs, from 50 to 75 cm in most cases resulted in insignificant reduction in these characters. The minimum values were recorded on vines supplied with organic fertilizers at 25 cm depth. Putting organic fertilizers in 75 cm digs depth was favourable than placing in 25 cm depth. However, organic fertilizer placement had no effect on the number of clusters per vine in the first season of the study. These results were true in the three seasons.

Placing filter mud in digs of 50 CM depth resulted in the maximum values while, farmyard manure at 25 cm depth gave the minimum values. Similar results were recorded in the three seasons.

The great promotion on growth and vine nutritional status in response to organic fertilization and placement at the optimum depth could explain the present results.

The present results are in confirmation with those reported by Wang *et al.,* (1991); Mehana *et al.,* (1992), Mahran (2005) and Seleem and Telep (2008).

Table 5: Effect of sources and placement of organic fertilizers on the number of clusters per vine and cluster weight of Thompson seedless grapevines during 2005, 2006 and 2007 seasons.

Organic fertilizers (A)	No. of clusters per vine											
	2005				2006				2007			
	Depth of digs (cm) (B)											
	b_1 25	b_2 50	b_3 75	Mean (A)	b_1 25	b_2 50	b_3 75	Mean (A)	b_1 25	b_2 50	b_3 75	Mean (A)
a_1 F.M.	22.0	22.0	22.0	22.0	30.0	32.0	30.0	30.7	33.0	37.0	36.0	35.3
a2 C.E.	22.0	22.0	22.0	22.0	28.0	30.0	29.0	29.0	30.0	32.0	31.0	31.0
a3 C.M.	22.0	22.0	22.0	22.0	25.0	27.0	26.0	26.0	27.0	30.0	29.0	28.7
a4 F.Y.M.	21.0	21.0	21.0	21.3	22.0	24.0	23.0	23.0	23.0	26.0	25.0	24.7
Mean (B)	21.8	21.8	22.0		26.3	28.3	27.0		28.3	31.3	30.3	
New L.S.D. at 5%	A	B	AB		A	B	AB		A	B	AB	
	NS	NS	NS		2.0	2.0	4.0		3.0	2.0	4.0	
	Cluster weight (g)											
a_1 F.M.	366.0	391.0	380.0	379.0	370.0	391.0	388.0	383.0	369.0	390.0	386.0	381.7
a2 C.E.	344.1	365.0	360.0	356.4	346.0	366.0	364.0	358.7	340.0	361.0	357.0	352.7
a3 C.M.	321.0	343.0	340.0	334.7	322.0	344.0	341.0	335.7	318.0	340.0	338.0	332.0
a4 F.Y.M.	301.0	323.0	320.0	314.7	300.0	318.0	310.0	309.3	296.0	313.0	310.0	306.3
Mean (B)	333.0	355.5	350.0		334.5	354.8	350.8		330.8	351.0	347.8	
New L.S.D. at 5%	A	B	AB		A	B	AB		A	B	AB	
	20	20	40		20	18	36		18	16	32	

F.M. = Filter mud (2.5% N)
C.E. = Compost El-Neel (2.15% N)
CM. = Chicken manure (2.0 % N)
F.Y.M. = Farmyard manure (0.25% N)

Quality of the berries

As shown in Tables 6 and 7, berry quality, improved significantly in terms of increasing berry weight, total soluble solids and total sugars and decreasing total acidity in response to organic fertilization with filter mud, Compost El-Neel, Chicken manure and Farmyard manure, as arranged in a descending order in the three seasons.

Placement of organic fertilizers had an obvious effect on the quality of the berries. Placing organic fertilizers in digs at 50, 75 and 25 depth, was highly effective in enhancing of berries quality. Placing organic fertilziers in digs of 50 cm depth gave the best results. Unfavourable effects on fruit quality were observed when the vines received Farmyard manure in digs 25 cm depth. These results were true in the three seasons.

Table 6: Effect of sources and placement of organic fertilizers on berry weight (g) and total soluble solids in berry juice of Thompson seedless grapes during 2005, 2006 and 2007 seasons.

Organic fertilizers (A)	Berry weight (g)											
	2005				2006				2007			
	Depth of digs (cm) (B)											
	b_1 25	b_2 50	b_3 75	Mean (A)	b_1 25	b_2 50	b_3 75	Mean (A)	b_1 25	b_2 50	b_3 75	Mean (A)
a_1 F.M.	2.09	2.25	2.23	2.19	2.20	2.40	2.37	2.32	2.19	2.37	2.35	2.30
a2 C.E.	1.93	2.03	2.00	1.99	2.05	2.16	2.15	2.12	2.07	2.18	2.16	2.14
a3 C.M.	1.82	1.94	1.92	1.89	1.92	2.05	2.03	2.00	1.96	2.09	2.08	2.04
a4 F.Y.M.	1.71	1.84	1.82	1.79	1.80	1.92	1.91	1.94	1.84	1.95	1.94	1.90
Mean (B)	1.89	2.02	1.99		1.99	2.13	2.12		2.02	2.15	2.13	
New L.S.D.	A	B	AB		A	B	AB		A	B	AB	
at 5%	0.10	0.10	0.20		0.10	0.10	0.20		0.40	0.40	0.20	
	T.S.S. %											
a_1 F.M.	19.2	19.7	19.6	19.5	19.3	19.6	19.5	19.5	19.2	19.9	19.8	19.6
a2 C.E.	18.8	18.2	18.2	18.4	19.0	19.4	19.3	19.2	19.1	19.6	19.5	19.4
a3 C.M.	18.4	18.8	18.7	18.6	18.5	19.0	19.0	18.8	18.6	19.0	19.0	18.9
a4 F.Y.M.	18.0	18.3	18.2	18.2	18.0	18.3	18.2	18.2	18.0	18.5	18.3	18.3
Mean (B)	18.6	18.8	18.7		18.7	19.1	19.0		18.7	19.3	19.2	
New L.S.D.	A	B	AB		A	B	AB		A	B	AB	
at 5%	0.3	0.2	0.4		0.2	0.3	0.6		0.3	0.3	0.6	

F.M. = Filter mud (2.5% N)
C.E. = Compost El-Neel (2.15% N)
CM. = Chicken manure (2.0 % N)
F.Y.M. = Farmyard manure (0.25% N)

Table 7: Effect of sources and placement of organic fertilizers on total acidity and total sugars in berry juice of Thompson seedless grapes during 2005, 2006 and 2007 seasons.

Organic fertilizers (A)	Total acidity %											
	2005				2006				2007			
	Depth of digs (cm) (B)											
	b_1 25	b_2 50	b_3 75	Mean (A)	b_1 25	b_2 50	b_3 75	Mean (A)	b_1 25	b_2 50	b_3 75	Mean (A)
a_1 F.M.	0.627	0.594	0.601	0.607	0.627	0.596	0.599	0.607	0.618	0.588	0.591	0.599
a2 C.E.	0.661	0.627	0.630	0.639	0.661	0.627	0.631	0.640	0.650	0.620	0.625	0.632
a3 C.M.	0.701	0.660	0.666	0.676	0.700	0.661	0.666	0.676	0.700	0.660	0.666	0.675
a4 F.Y.M.	0.740	0.710	0.711	0.720	0.736	0.700	0.710	0.715	0.714	0.708	0.710	0.720
Mean (B)	0.682	0.648	0.667		0.681	0.646	0.656		0.677	0.644	0.648	
New L.S.D.	A	B	AB		A	B	AB		A	B	AB	
at 5%	0.032	0.030	0.060		0.029	0.027	0.054		0.030	0.028	0.056	
	Total sugars %											
a_1 F.M.	17.5	18.0	17.9	17.8	18.0	18.5	18.4	18.3	18.3	19.0	18.9	18.7
a2 C.E.	17.0	17.5	17.3	17.3	17.5	18.0	17.8	17.8	17.5	18.0	17.8	17.8
a3 C.M.	16.5	17.0	16.8	16.8	16.7	17.5	17.4	17.2	16.6	17.1	17.0	16.9
a4 F.Y.M.	16.1	16.6	16.4	16.4	16.2	16.6	16.5	16.4	16.0	16.6	16.5	16.4
Mean (B)	16.8	17.3	17.1		17.1	17.7	17.5		17.1	17.7	17.6	
New L.S.D.	A	B	AB		A	B	AB		A	B	AB	
at 5%	0.2	0.2	0.4		0.3	0.25	0.4		0.2	0.2	0.4	

F.M. = Filter mud (2.5% N)
C.E. = Compost El-Neel (2.15% N)
CM. = Chicken manure (2.0 % N)
F.Y.M. = Farmyard manure (0.25% N)

The beneficial effect of organic fertilizers on enhancing soil fertility and the uptake of N and Mg could result in enhancing the the formation of plant pigments and the biosynthesis of carbohydrates, which lead to the promotion of fruit maturity.

The present results are in harmony with those obtained by Mahran (2005) and Seleem and Telep (2008).

As a conclusion, supplying Thompson seedless grapevines with N at 80 g/vines via 50 % inorganic + 25 % organic (0.8 kg filter mud vine in digs 50 cm depth) + 25% biofertilizer Biogen (20 g/vine) is beneficial for improving yield and fruit quality.

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تـأثير مصـادر وموضـع الأسـمدة العضـوية علـى النمـو والحالـة الغذائيـة للكرمـات والأثمار في صنف العنب الطومسون الخالى من البذور

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تـم دراسـة تـأثير اخـتلاف مصـادر الأسـمدة العضـوية وهـي طينـة المرشـحات (٢,٥ % نيتـروجين)، كمبوسـت النيـل (٢,١٥ % نيتـروجين) ، سـماد زرق الـدواجن (٢ /% نيتـروجين) والسماد البلدى (٠,٢٥ % نيتروجين) والتى استخدمت بسنة ٢٥ % من كمية النيتروجين الموصـى بها وهى ٨٠ جرام للكرمة سنويا ومواضع هذه الأسمدة (في حفر على عمق ٢٥ ، ٥٠ ، ٧٥ سم) على مساحة الورقة والنسبة المئوية للنيتروجين والفوسفور والبوتاسيوم ، النسبة المئوية لعقد الحبات ، كمية المحصول وخصائص الجودة لحبات العنب الطومسون الخالى من البذور وذلك خلال ثلاثة مواسم متتالية هي ٢٠٠٥ ، ٢٠٠٦ ، ٢٠٠٧ .

أشارت نتائج الدراسة إلى أن التسميد العضوى بإستخدام طينه المرشحات ، كمبوست النيل ، زرق الدواجن، السماد البلدى مرتبة ترتيبا تنازليا كان فعالا جدا في تحسين مساحة الورقة والنسبة المئويـة للنيتـروجين والفوسـفور والبوتاسـيوم فـي الأوراق والنسـبة المئويـة لعقد الحبـات ، كميـة المحصول والخصائص الطبيعية والكيميائية للحبات، وكان لوضع هذه الأسمدة العضوية تأثير واضح علـى هذه الصـفات وأدى زيـادة عمق وضـع هذه الأسمدة من ٢٥ إلـى ٥٠ سم حـول الكرمـات إلـى حدوث تحسن واضح في مساحة الورقة والنسبة المئوية لعناصر النتيروجين والفوسفور والبوتاسيوم في الورقة وكمية المحصول وخصائص الجودة للحبات بينما أدى وضع هذه الأسمدة في حفر عمقها ٧٥ سم إلى حدوث نقص طفيف في هذه الصفات كما كان لـه تـأثير ضـار علـى كميـة المحصـول وخصائص الحبات.

يقترح تسميد كرمات العنب الطومسون الخـالى مـن البـذور بـالنيتروجين بمعدل ٨٠ جـرام نيتروجين للكرمة سنويا في صورة ٥٠ % سماد غير عضوى + ٢٥ % سماد عضوى (٠,٨ كجم طينة المرشحات توضع في حفر على عمق ٥٠ سم حول الكرمـات) + ٢٥ % فـي السماد الحيـوى البيوجين (٢٠ جرام للكرمة) للحصول على محصول اقتصادى وفي نفس الوقت تحسين خصـائص الجودة للحبات.