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USING SOME ORGANIC FERTILIZERS ON THOMPSON SEEDLESS VINEYARD

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ABSTRACT

This investigation was carried out during three successive seasons of 2004, 2005 and 2006 to evaluate the effect of different sources of organic fertilizers such as : compost, town refuse and cattle manure on yield, berry quality, both nitrate and nitrite and NPK content in leaf petiole of Thompson Seedless grapevines. The data also reveal that, adding organic fertilization in Thompson Seedless vine yard under low level 40 units of nitrogen/ vine increased yield per vine, average cluster and berry weight than the vine which left without organic fertilization received only to mineral fertilization at 60 units per vines. Furthermore, using compost or cattle manure at 5 kg/vine were more pronounced for increasing yield per vine and per feddan than the other organic fertilizers. Since, these treatments gave a higher cluster and berry weight, but reduced the values of both nitrate and nitrite. So, it become safe to be used for our fertilization program of Thompson Seedless grapevines under similar conditions.

INTRODUCTION

Grape (*Vitis vinifera*, L.) is considered the first deciduous fruit crop in the world, and the second in Egypt after citrus. Vineyards, have increased in the last few years especially in the newly reclaimed lands. Since, the total area of grape in Egypt reached about 159929 feddans producing about 1275288 tons according to the last statistics of the Ministry of Agriculture (2005).

Organic fertilizers were added at 5 or 10 kg. + 40 units of mineral nitrogen per vine. Yet, the control received only to 60 units of mineral nitrogen during the season.

Therefore, organic matter can play an important role in soil through its active groups which have the ability to retain the inorganic elements complex and chelated forms.

The beneficial effects of organic fertilizers involved in their physical, chemical and biogical characteristics which led to decreasing soil pH, increasing microbial populations and activity of microbial enzymes i.e. dehydrogenase, urease and nitrogenase. Also, its necessary for giving better growth and balanced leaf nutrient contents as well as increase yield, fruit quality as compared with mineral fertilizers.

Application of organic fertilizers such as compost, town refuse and cattle manure in improving soil and fruit crops has been increased steadily in the recent years for two reasons; firstly, manure has been advocated as an alternative nutrient source to manufacture fertilizers, and secondly its application to soils provides currently acceptable method for its disposal. Also, it considered as a good source of many essential nutrients.

This study was carried out to give some light on using different sources of organic fertilizers like; compost, Damietta town refuses and cattle manure with low level of mineral nitrogen to megitate mineral nitrogenous

fertilizer for Thompson Seedless grapevine. The final goal is to produce a healthy products less polluted with chemical fertilizers, as well as, suitable for export with lower cost by involving organic fertilizers in the manuring program of grapes.

From this study its clear that adding organic fertilization in Thompson Seedless vine yard under low level of mineral nitrogen fertilization (40 units/ vine) increased yield per vine than the vine which left without organic fertilization received only to mineral fertilization at 60 units per vines. The increment in yield may be due to the effect of increasing both average cluster and berry weight. Also, using organic fertilization increased the values of SSC/acid ratio, but reduced the amount of both nitrate and nitrite in berry juice.

Furthermore, using compost or cattle manure at 5 kg/vine was more pronounced for increasing yield per vine and per feddan than the other organic fertilizers. Since, these treatments gave higher cluster and berry weight, but reduced the values of both nitrate and nitrite. So, it become safe to be used for our fertilization program of Thompson Seedless grape-vines under similar conditions.

MATERIALS AND METHODS

This study was carried out during the seasons of 2004, 2005 and 2006 to evaluate the effect of different sources of organic fertilization as a partial substitute for nitrogen mineral and their effect on yield , berry quality and content of both nitrate and nitrite of Thompson Seedless grapevines.

Before this experiment, soil samples were taken from (0-30 and 30-60 cm depths) at 5 different sites representing major portion of the root zone. The samples of each layer were completely mixed and resample to measure physical and chemical characteristics of the soil and the obtained results are presented in Table (1).

Table (1) : soil physical and chemical characteristics:

A- physical characteristics:	**Soil depth**	
contents	**(0-30 cm)**	**(30-60 cm)**
Clay %	43.70	43.54
Silt %	40.63	40.85
Sand %	10.67	10.26
Organic matter %	1.45	2.14
CaCo3	3.10	3.21
Texture class	Silty-clay	Silty-clay
B- Chemical characteristics:		
Mg	6.14	7.11
Available K	0.42	0.49
pH	7.4	7.2
Salt conc. ppm	413	405

In this study, 56 vines of about 15 years old were almost similar in vigor, healthy and subjected to the normal horticultural practices used in vineyard. Complete randomized Block Design were used from this experimental. Since, the vines chosen in 4 replicates, each replicate

represented with 2 vines for each treatment. Guard vines and also borders were made between each replicate and block.

Three types of organic fertilizers (compost, Damietta town refuse and cattle manure) were used from this study. Samples from each organic fertilizer during the two season of 2005, 2006 were taken for analysis to shown each content of macro and micro nutrients, as shown in Table (2).

Table (2) : Analysis of the used organic fertilizers (on dry weight basis) :

Constituents	Compost		Town wastes		Cattle manure	
	2005	2006	2005	2006	2005	2006
O.M %	49.23	46.15	40.61	16.92	57.69	25.38
Total N %	1.73	2.04	1.76	1.25	0,86	0.98
C%	28.55	26.77	31.68	9.82	33.46	14.72
C/N %	16.5	13.0	18.0	7.0	38.0	15.0
pH	8.77	8.81	8.18	8.02	8.30	8.13
Balk density g./ litter	0.3594	0.2948	0.5970	0.5552	0.6978	0.8010
Ec, ds/ m (1:10)	7.13	9.00	4.82	5.06	3.27	2.21
Total macro- nutrients %						
P %	0.04	0.04	0.88	0.13	0.44	0.21
K %	0.65	0.55	0.30	0.20	0.39	0.42
Ca %	1.62	1.40	5.40	4.60	0.92	0.80
Mg %	1.84	1.56	1.43	1.36	2.88	2.96
Total micro- nutrients (ppm)						
Fe (ppm)	3.36	1.76	5.48	11.40	13.80	16.60
Mn (ppm)	662.0	566.0	668.0	746.0	2700.0	2540.0
Zn (ppm)	216.0	130.0	792.0	962.0	226.0	290.0
Cu (ppm)	66.00	50.00	234.00	224.00	136.00	146.00

Organic fertilizers were added at 5 or 10 kg for each vine at the second week of January in both seasons in holes with 50 cm length, 40 cm diameter and 50 cm depth at a distance of 50 cm from the vines trunk.

From this study, 8 vines were undertaken to represent one of the following treatments as shown from Table (3).

Table (3): The applied treatments :

No.	Treatments
1	Compost at 10 kg/vine + 40 units of nitrogen.
2	Compost at 5 kg/vine + 40 units of nitrogen.
3	Town wastes at 10 kg/vine + 40 units of nitrogen.
4	Town wastes at 5 kg/vine + 40 units of nitrogen.
5	Cattle manure at 10 kg/vine + 40 units of nitrogen.
6	Cattle manure at 5 kg/vine + 40 units of nitrogen.
7	Control — + 60 units of nitrogen.

Super phosphate/ vine (15.5 % P_2O_5) were added to all vines at the same time of organic fertilization at 200 g/vine. Whereas, potassium fertilization was applied to the soil as potassium sulphate (48 k_2O) at 100 kg per feddan in two equal doses, one at the same time of organic fertilization and after fruit set.

Nitrogen was applied in the soil as ammonium nitrate (33.5 % N) at 60 units in three equal doses (20 g/N/vine), the first after fruit set stage in may and the second during June, but the third after harvesting at August.

On the other hand, (40 units) of N applied with organic fertilization in two equal doses one after fruit set and the other after harvest time. Whereas, control received to the normal fertilization used in the farm (60 units of nitrogen per feddan, 200 kg of super phosphate/vine and 100 kg potassium sulphate per vine during the seasons).

After bud burst stage the following parameters were estimated:

1- Trunk growth.
2- Average leaf area.
3- yield and cluster weight (g).

Samples of 100 berries from each replicate were taken to determine both physical and chemical properties of berries :

1- Average of berry weight (g).
2- Soluble solids content (SSC).
3- Titratable acidity % : acidity was expressed as gm tartaric acid/100ml juice according to A.O.A.C. (1980).
4- Nitrate and nitrite in berries were determined according to (Singh,1988).

Leaf nutrient content :

Samples of 24 leaf petioles were taken from opposite side from the cluster and cleaned with tap water, dried and grounded to determine NPK content.

1-Total nitrogen %: it was determined by using micro-kjeldahl according to Pregle (1945).
2-Phosphorus % : it was estimated colourmetrically using the chorotannus-reduse molybdo phosphoric blue colour method in sulphoric system as described by, Jackson and Volk (1968).
3-Potassium % : it was determined in the digested plant materials using flame photometer according to, Black (1960).

Statistical analysis :

Data from the seasons of 2005 and 2006 were presented statistically analyzed according to the technique of analysis of variance according (ANOVA) for experiment in completely randomized block design according to Snedecor and Cochran (1980).

RESULTS AND DISCUSSION

This Investigation aimed to study the effect of some organic fertilizers such as compost, town refuse and cattle manure on yield, cluster and berry quality of Thompson Seedless grapes. Also, the effect of these organic fertilizers on the mineral content in leaf petioles. Content of nitrate and nitrite in the berries were also carried out. The obtained data during both seasons of 2005 and 2006 are presented as follow:

1- Effect on leaf area :

It is clear from Table (4) that all organic fertilization used increased leaf area than the control. Furthermore, using compost at 5 or 10 kg/vine

presented a higher leaf area than the other organic fertilization or the control. So, these treatments increased the values of leaf area by about 15.4 - 23.1 % higher than the control. In this respect, adding compost at 10 kg/vine per year increase the leaf area significantly than town refuse or cattle manure during both seasons of the study. Whereas, using cattle manure at 5 kg/vine gave a higher values of leaf area than town refuse at 5 or 10 kg/vine and the control. Since, town refuse at 5 kg/vine presented a lower values of leaf area than the other organic fertilization, but almost higher than the control by about 9.0 % as mean of two seasons. Our data go in line with those obtained by Omar (2005) found that supplying Thompson Seedless grapevines with mineral nitrogen is more effective in increasing leaf area than the other sources of nitrogen such as compost or humic acid.

2- Effect on trunk thickness :

Date from Table (4) presented that adding compost, town refuse and cattle manure increased the values of trunk thickness than the control. In this respect, compost or town refuse at 10 kg/vine/year increased trunk thickness than adding cattle manure or the other organic fertilization. Since, these treatments increased trunk thickness by about 23.3 - 22.4 % respectively than the control. Whereas, adding cattle manure or town refuse at 5 kg/vine presented a lower trunk thickness than the control. So, these treatments increased the trunk thickness by about 5.9 - 7.8 % higher than the control respectively. In this respect, Abdel-Mohsen (2003) mentioned that when N level increased from 50 to 70 kg/fed., no significant effect on trunk diameter had obtained. However, slight increase in trunk diameter was detected by raising NPK ratio.

Table (4) : Effect of organic fertilization on leaf area and trunk thickness of Thompson Seedless grapevine.

Treatments	Leaf area (cm^2)			Trunk thickness (cm)		
	2005	2006	Mean	2005	2006	Mean
Control	141.7	143.6	142.6	4.17	4.30	4.24
Compost (10 kg)	170.7	180.6	175.6	5.15	5.27	5.23
Compost (5 kg)	161.4	167.5	164.5	4.62	4.97	4.79
T. Refuse (10 kg)	158.8	163.3	161.1	5.08	5.30	5.19
T. Refuse (5 kg)	153.8	157.1	155.5	4.43	4.70	4.57
Cattle manure (10 kg)	161.9	161.4	161.6	4.72	4.97	4.84
Cattle manure (5 kg)	160.9	170.6	165.8	4.38	4.60	4.49
L.S.D at 5 %	6.70	6.63	---	0.27	0.24	---

I- Effect of organic fertilization on yield :

Concerning to the effect of organic fertilization on yield per vine, data from Table (5) show that all organic fertilization significantly increased both yield per vine than the control. In this respect, using compost or cattle manure at 5 kg/vine with 40 units of mineral nitrogen increased the yield per vine by about 37.6 - 35.7 % respectively than the control which received to 60 units of mineral nitrogen. Whereas, adding town refuse at 10 or 5 kg/vine in the year

increased the yield per vine than using cattle manure at 10 kg/vine in the year. Since, this treatment increased the yield by about 9.5 % over the control.

Table (5): Effect of organic fertilization on yield per vine and cluster weight and length of Thompson Seedless grapevine.

Treatments	Yield per vine kg			Cluster weight kg		
	2005	2006	Mean	2005	2006	Mean
Control	10.83	11.64	11.23	430.6	472.6	451.6
Compost (10 k.g)	12.74	13.14	12.94	531.9	614.5	573.2
Compost (5 k.g)	14.12	15.44	15.45	519.7	635.2	577.4
T. Refuse (10 k.g)	13.95	15.38	14.66	488.6	570.5	529.6
T. Refuse (5 k.g)	13.77	14.04	13.90	480.0	491.1	485.5
Cattle manure (10 kg)	12.33	12.24	12.29	45.6	465.3	460.5
Cattle manure (5k.g)	14.37	16.11	15.24	524.5	629.7	577.1
L.S.D at 5 %	0.68	1.02	---	28.30	27.96	---

With regard to the effect of fertilization on grapevine, Kassem and Marzouk (2002) showed that yield, berry and cluster weight were significantly increased with using cattle manure and chicken manure combined with ammonium sulphate compared with organic or mineral fertilizers alone. Also, Abd El-Hameed and Rabeea (2005) investigated the effect of mineral N and organic N on superior grapevines grown in silty loam soil. Application of organic N along with mineral N resulted in positive effects on yield and cluster weight compared with mineral N alone.

4- Cluster weight :

From Table (5) it is clear that all organic fertilization used significantly increased average cluster weight than the control. Furthermore, using compost at 5 or 10 kg/vine or cattle manure at 5 kg/vine significantly increased average cluster weight than the other treatments or the control. So, the increments due to these treatments were about 26.9 - 27.9 % higher than the control as a mean of two seasons of the study. Whereas, adding cattle manure at 10 kg/vine or town refuse at 5 kg/vine presented a lower cluster weight than the other treatments used or the control. Since, these treatments presented 2.0 - 7.5 % higher than the control, but almost lower than the other organic fertilization. Similar results had obtained by Ahmed *et al.* (2000) reported that the applications of farmyard manure or filter mud at 10-40 g/vine/year improved the yield, cluster weight, berry weight and chemical properties of the berries compared to the untreated vines. Also, Harhash and Abd EL-Nasser (2000) found that sulfur and organic manure with mineral N significantly increased cluster weight.

5- Effect on berry weight and diameter :

From Table (6) it is clear that adding compost, town refuse or cattle manure at 5 or 10 kg/vine at dormant season in the year significantly increased both average berry weight and diameter than the control which left without adding organic fertilization. The data also reveal that using compost or town refuse or cattle manure at 10 kg/vine gave a higher berry weight and

size than using the same organic fertilization at 5 kg/vine. Thus, using compost or town refuse at 10 kg/vine gave a higher berry weight than using cattle manure at 10 kg/vine. Since, the increment in berry weight due to these organic fertilization was about 33.8 - 38.5 % higher than the control as a mean of two seasons under the study. Whereas, using town refuse at 5 kg/vine gave a lower berry weight than the control.

Table (6): Effect of organic fertilization on berry weight and diameter of Thompson Seedless grapevine.

Treatments	Berry weight (g)			Berry diameter (mm)		
	2005	2006	Mean	2005	2006	Mean
Control	1.47	1.49	1.48	13.3	13.5	13.8
Compost (10 kg)	1.95	2.02	1.98	13.7	14.2	14.0
Compost (5 kg)	1.82	1.96	1.89	13.3	14.0	13.7
T. Refuse (10 kg)	2.01	2.08	2.05	13.7	14.4	14.0
T. Refuse (5 kg)	1.74	1.79	1.77	13.8	13.8	13.8
Cattle manure (10 kg)	1.84	1.91	1.88	13.8	14.4	14.1
Cattle manure (5 kg)	1.72	1.88	1.80	14.1	13.3	13.7
L.S.D at 5 %	0.17	0.22	---	0.66	0.78	---

With regard on berry diameter, the data also show that organic fertilization gave a some what increment in average berry diameter than the control. So, there is no difference between these treatments and the untreated vine on berry diameter during both seasons under the study. Similarly, Ragab and Mohamed (1999) studied the growth nutritional status, yield and berry quality of Flame seedless grapevines in response to the application of three organic N fertilizers, filter mud, sludge and farmyard manure in various ratios with mineral nitrogen source. Application of filter mud, sludge and farmyard manure in descending order was very effective in improving yield and quality of fruits.

The effect of compost, town refuse and cattle manure at 5 or 10 kg/vine on soluble solids content, total acidity and SSC/ acid ratio in berry juice of Thompson Seedless grapevines are presented in Table (7).

4- SSC :

Data show that all organic fertilization increased the content of soluble solids in berry juice than the control during both seasons of the study. Furthermore, using cattle manure at 5 or 10 kg/vine gave a higher soluble solids content than the other treatment or the control. Whereas, adding cattle manure at 5 kg/vine presented a higher values of soluble solids in berry juice than the other treatment use or the control. On the other hand, using town refuse at 5 or 10 kg/vine gave a lower soluble solids content than the other organic fertilization. But, this treatments were almost nearly to those obtained to the control which left without adding organic fertilization.

5- Total acidity :

Data in the same table presented an opposite trend to those obtained from soluble solids in berry juice so these treatments reduced the

content of total acidity than the control. Furthermore, using town refuse at 10 kg/vine gave a lower values of total acidity than the other treatments or the control. Yet, cattle manure at 5 kg/vine gave a higher values of total acidity in berry juice than the other organic fertilization used or the control. Abd El-Hady *et al.* (2003) reported that application of organic materials was effective in improving berry quality, increasing berry weight, total soluble solids and in decreasing the total acidity compared to that of inorganic amendments in Flame Seedless grapevine.

Table (7): Effect of organic fertilization on SSC, acidity and SSC/acid ratio of Thompson Seedless grapevine.

Treatments	SSC %		Acidity %		SSC/acid ratio	
	2005	2006	2005	2006	2005	2006
Control	19.4	19.8	0.851	0.925	22.77	21.40
Compost (10 kg)	20.1	20.7	0.758	0.838	26.53	24.76
Compost (5 kg)	20.8	20.4	0.751	0.825	27.71	24.79
T. Refuse (10 kg)	20.2	19.7	0.656	0.675	30.84	29.25
T. Refuse (5 kg)	19.8	20.2	0.744	0.838	26.67	24.18
Cattle manure (10 kg)	21.3	20.0	0.744	0.850	28.76	23.62
Cattle manure (5 kg)	21.2	20.9	0.700	0.763	30.40	27.54
L.S.D at 5 %	1.06	0.55	0.038	0.058	2.16	1.80

6- Soluble solid content/acid :

Data from Table (7) mentioned that all organic fertilization used gave a higher significant value of SSC/acid ratio than the control during the both seasons of the study. In this respect, adding cattle manure at 5 kg/vine gave a higher values of SSC/acid ratio in berry juice than the other organic fertilization used or the control. The increment due this treatment may be due to the effect of cattle manure on increasing the soluble solids content and somewhat reducing the total acidity in berry juice during the both seasons under the study. Thus, the difference between compost or town refuse on SSC/acid ratio in berry juice were unpronounced during the both seasons but almost high than these obtained from the untreated vine. Likewise, Abd El-Maksood (2006) found that no significant differences between all organic nitrogen sources on SSC% and SSC/acid ratio, but the application of farmyard manure (FYM) gave the higher values on SSC % and SSC/acid ratio but gave the lowest values on total acidity in berry juice. Increasing the doses of mineral nitrogen to 60 units with decreasing the doses of mineral nitrogen to 20 units gave the highest significant increase for SSC%, the lowest significant for total acidity and the highest significant for SSC/acid ratio % in berry juice of Thompson Seedless grapes.

Nitrate and nitrite content :

From Table (8) the data reveal that adding organic fertilization reduced both Nitrate and nitrite nutrients in berry juice of Thompson Seedless grapevines during the both season of the study. The data also reveal that using cattle manure at 10 kg/vine reduced the values of nitrate content of berry juice than adding compost or town refuse. Since, this treatment reduce the value of nitrate by about 62% than the control which left without organic

fertilization. Also, using compost at 5 or 10 kg/vine also reduce the value of nitrate in berry juice than adding town refuse. Since, compost at 5 or 10 kg/vine reduced the values of nitrate in berry juice by about 53.4 - 43.6 % respectively than the control as mean of two seasons of the study. Whereas, town refuse also reduced the values of nitrate content than the control but almost higher than using compost or cattle manure. So, using town refuse with 5kg/vine presented a lower reduction of nitrate content which reached about 20.7% than the untreated vine.

Table (8): Effect of organic fertilization on nitrate and nitrite content of Thompson Seedless grapevine.

Treatments	Nitrate content PPM			Nitrite content PPM		
	2005	2006	Mean	2005	2006	Mean
Control	8.94	8.82	8.88	0.879	0.839	0.859
Compost (10 kg)	5.13	4.88	5.01	0.555	0.492	0.524
Compost (5 kg)	4.30	3.98	4.14	0.661	0.628	0.645
T. Refuse (10 kg)	6.12	5.93	6.03	0.693	0.654	0.674
T. Refuse (5 kg)	7.27	6.81	7.04	0.750	0.696	0.723
Cattle manure (10 kg)	3.52	3.22	3.37	0.478	0.419	0.449
Cattle manure (5 kg)	5.13	4.92	5.03	0.709	0.674	0.692
L.S.D at 5 %	0.246	0.310	---	0.030	0.020	---

With regard to the effect of organic fertilization in nitrite content data from the same Table (8) also reveal that adding cattle manure or compost at 10 kg/vine presented a lower values of nitrite in berry juice than the other treatments used. Since, these treatments reduced this values by about 47.7 and 38.9 % respectively as a mean of two season of the study. Whereas, using compost at 5 kg/vine also reduced the values of nitrite than those obtained from cattle manure or town refuse at 5 kg/vine. Since, adding town refuse at 5 kg/vine gave a lower reduction of both nitrate and nitrite in beery juice of Thompson Seedless grapevine during the both season of the study.

In this respect, Omar (2005) reported that nitrate and nitrite residues of Thompson seedless berries as affected by mineral and / or organic N sources. At the same time, the lowest values for nitrate and nitrite were observed when Compost alone or plus humic acid treatments were applied to fertilize the vineyard. Yet, the highest nitrate and nitrite residues in the berries were observed in mineral fertilization. The lowest values were recorded for compost fertilization followed by humic acid and the combination of mineral + organic fertilization. Since, the fertilization with compost reduced the residues of nitrate and nitrite.

NPK content in leaf petioles :

Data from Table (9) show the effect of adding compost, town refuse and cattle manure as an organic fertilization on NPK content in leaf petiole of Thompson Seedless grapevine. From Table (9) its clear that all organic fertilization increased NPK contents in leaf petiole than those obtained from the untreated vines.

It is clear from this table that using cattle manure at 5 or 10 kg/vine gave a higher significant values of nitrogen in leaf petiole than adding compost or town refuse at 5 or 10 kg/vine. Also, compost or town refuse presented a higher values of nitrogen than the control. Whereas, the effect of using compost or town refuse on the values of nitrogen in leaf petiole was unpronounced during the both seasons under the study. Similar, Ragab and Mohamed (1999) revealed that N content in the leaves was significantly increased as a result of using the three organic N fertilizers combined with mineral N source compared with the application of N units in mineral source only.

Regard to the effect of organic fertilization on phosphorus content in leaf petiole, data show that all organic fertilization significantly increased phosphorus content in leaf petiole than the untreated vines. Yet, using compost at 5 kg/vine with 40 units of mineral nitrogen gave a higher values of phosphorus than the other organic fertilization used or the untreated one. Whereas, cattle manure gave a higher phosphorus content than those obtained from using town refuse during the both seasons under the study.

Table (9) : Effect of organic fertilization on NPK content of Thompson Seedless grapevine.

Treatments	Nitrogen %		Phosphorus %		Potassium %	
	2005	2006	2005	2006	2005	2006
Control	1.210	1.265	0.166	0.236	0.703	0.766
Compost (10 kg)	1.770	1.860	0.281	0.240	0.863	0.866
Compost (5 kg)	1.820	1.870	0.335	0.321	0.852	0.770
T. Refuse (10 kg)	1.850	1.841	0.266	0.221	0.712	0.782
T. Refuse (5 kg)	1.860	1.893	0.236	0.256	0.720	0.789
Cattle manure (10 kg)	1.910	1.934	0.255	0.324	0.843	0.818
Cattle manure (5 kg)	1.930	1.945	0.248	0.284	0.848	0.839
L.S.D at 5 %	0.019	0.017	0.030	0.031	0.045	0.024

With regard to the effect on potassium content, it is clear that both compost or cattle manure at 5 or 10 kg/vine significantly increased the values of potassium content in leaf petiole than those obtained from using town refuse or the control during the two seasons of the study. Since, adding town refuse at 5 or 10 kg/vine gave no clear effect on potassium content than the control. In this respect, using compost at 10 kg/vine gave a higher values of potassium content than those obtained from using cattle manure at 5 or 10 kg/vine. Whereas, no significant different had obtained from adding 5 kg than adding 10 kg/vine from the same organic fertilization. Generally, it could be concluded that adding organic fertilization increased NPK content in leaf petiole than the untreated vines. Whereas, using cattle manure or compost significantly increased the values of NPK than those obtained from the untreated vines. Likewise, Ahmed et al. (2000) reported that the applications of Farmyard manure or filter mud at 10-40 g/vine/year improved the leaf NPK compared to the untreated vines. The promotion occurred in three characters was positively correlated with increasing the dose of both organic N fertilizer.

From this study its clear that adding organic fertilization in Thompson Seedless vine yard under low level of mineral nitrogen fertilization (40 units/ vine) increased yield per vine than the vine which left without organic fertilization received only to mineral fertilization at 60 units per vines. The increment in yield may be due to the effect of increasing both average cluster and berry weight. Also, using organic fertilization increased the values of SSC/acid ratio, but reduced the amount of both nitrate and nitrite in berry juice.

Furthermore, using compost or cattle manure at 5 kg/vine were more pronounced for increasing yield per vine and per feddan than the other organic fertilizers. Since, these treatments gave a higher cluster and berry weight, but reduced the values of both nitrate and nitrite. So, it become safe to be used for our fertilization program of Thompson Seedless grapevines under similar conditions.

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التسميد العضوى فى مزارع العنب البناتى

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أجريت هذة الدراسة خلال ثلاث مواسم ناجحة وهى ٢٠٠٤ و ٢٠٠٥ و ٢٠٠٦ لتقييم تأثير مصادر مختلفة من الأسمدة العضوية مثل : الكمبوست و مخلفات المدن و كذا السماد البلدي على المحصول و صفات الحبات و كذلك محتواها من النترات و النيتريت وكذلك محتوى أعناق أوراق العنب البناتى من النتروجين و الفوسفور و البوتاسيوم . ولقد أوضحت النتائج أن إضافة السماد العضوى بمعدل ٥ أو ١٠ كجم / كرمة تحت مستويات منخفضة من التسميد المعدني (٤٠ وحدة أزوت) أدى إلى زيادة المحصول و كذلك متوسط وزن العنقود و الحبات مقارنة بالكرمات التى لم يتم تسميدها عضوي و سمدت بالأزوت بمعدل ٦٠ وحدة/ كرمة علاوة على أن استخدام الكمبوست أو السماد البلدي بمعدل ٥ كجم/ كرمة كان أكثر فاعلية فى زيادة محصول الكرمة و كذلك الفدان مقارنة بباقي أنواع الأسمدة العضوية المستخدمة. كما أن هذة المعاملات أعطت زيادة واضحة فى وزن العنقود و كذلك الحبات كما أنها قللت من محتوى الحبات من كلا من النترات و النيتريت .