J. Agric. Sci. Mansoura Univ., 32 (12): 10825 - 10834, 2007

RESPONSE OF SUPERIOR GRAPEVINES TO APPLICATION OF FILTER MUD, COMPOST EL-NILE AND GREEN MANURE

Abd-Elaal, A. H .*; Basma M. Selim and Ghada Sh. Shaker ****

*** Hort. Dept., Fac. Agric., El- Azhar Univ., Assiut, Egypt**

**** Viticulture Dept., Hort. Res. Inst., Agric. Res. Center, Giza, Egypt**

ABSTRACT

During 2005, 2006 and 2007 seasons, three organic N sources: Filter mud (2.5% N), Compost El- Nile (2% N) and Green manure were applied to Superior grapevines as to represent two levels of N i.e 25 or 50g N/vine by using 1.0 or 2.0 kg Filter mud and 1.25 or 2.50kg Compost El- Nile. Organic N sources were added either singly or combined with mineral N source as ammonium Nitrate form (33.3% N). Vine growth and nutritional status as well as berry set, yield per vine and quality of Superior grapes in response to organic materials were investigated.

Application of Green manure, Compost El- Nile and Filter mud aside from mineral N source was in a descending order highly effective in stimulating growth and nutritional status of the vines in addition to improving berry set, increasing yield and number of clusters per vine, cluster weight, berry weight and dimensions and percentage of total soluble solids while decreasing the total acidity of the juice compared to using mineral N source only. A supreme influence was attributed to the application of Green manure plus 75g N/vine in the mineral source on the studied characteristics in comparison with using Filter mud or Compost El- Nile each alone.

The study confirmed the efficiency of Green manure as a good source of organic N fertilizer for Superior grapevines and it was recommended to plough clover in the soil after taking three cuts plus the addition of 75g N/vine in the mineral N source to get the best results with regard to yield and quality of the berries. The beneficial effects of compost on growth and fruiting of Superior grapevines were also confirmed.

INTRODUCTION

Organic matter affects growth and yield of fruit crops directly by supplying the plants with nutrients or indirectly through modifying soil physical properties, thus improving the root environment and stimulating plant growth (Nijjar, 1985). A soil seldom has sufficient organic matter for the optimal plant growth. Soil productivity can therefore be improved by the addition of organic matter materials. Abundant sources of organic matter are animal manure, compost, wastes and green manure. Application of these materials to agricultural lands has been steadily increased in the recent years for two reasons: firstly, they have been advocated as alternative nutrient source to mineral fertilizers, and secondly, their application on croplands provides a currently acceptable method for their disposal (Darwish, *et al.*, 1995). As the quantities of the common farmyard manure are limited in Egypt as well as the known disadvantages of such manure, the problem of finding out suitable substitutes imposed the use of some new natural organic materials such as Filter mud, Compost and green manure to improve soil fertility and productivity of the trees. Filter mud is a new local organic material fertilizer, which is a by-product of sugar cane industry/ in El- Minia Governorate.

Compost El- Nile is also one of the new local organic amendments made from various agricultural wastes.

Data dealing with the determination of accurate rate of such organic N fertilizers and mineral N fertilizers which could be applied and adopted for the promising Superior grape cultivar are lacking.

The great necessity of using N in both Green manure and mineral N sources for enhancing growth and productivity of grapevines was emphasized by the results of Fregoni (1978); Markin (1989); Fregoni and Fraschini (1989), Pool etal (1990); Garicia- Lujan (1990); Darwish *et al.* (1996a and 1996b); Abou El- Lail (2001) and El- Sayed (2002).

Previous studies confirmed the great benefits of using N in both organic and mineral sources on growth and yield of various grape cvs. (Griffin and Laine, 1983; Bhangoo *et al.* 1988; Wang *et al.* 1991; Fardossi *et al.*, 1991; El- Sayed, 1994; Ahmed *et al.*, 1996; El-Morsy, 1997 and Abd El-Ghafar- Gehan, 2002).

This study was initiated to compare the effects of Filter mud; Compost El- Nile and Green manure on growth, vine nutritional status, yield as well as physical and chemical properties of Superior grapes.

MATERIALS AND METHODS

This study was carried out in 2005, 2006 and 2007 seasons in a private vineyard located at 77 Kilometers from Cairo in Cairo- Alexandria dessert Road on one hundred and Twenty, 8-year-old cane trained superior grapevines (leaving seven canes of 10 buds each plus five renewal spurs of two buds each). Vines were planted at 2 x 3 meters and supported by Gable system. The vineyard soil was sandy and well-drained. Drip irrigation system was followed. All vines received the same cultural practices usually applied in the vineyard i.e. spraying Dormex, fertilization, pests and weed control except organic and mineral N fertilization. It is to be noted that the data concerning 2005 season (the first season) were excluded.

Soil analysis was carried out according to Wilde *et al.* (1985) and the obtained data are shown in Table (1).

Table (1): Physical and chemical properties of the vineyard soil

Particle size distribution	
Sand %	82.5
Silt %	7.5
Clay %	10.0
Texture	Sandy
pH (l : 2.5 extract)	7.22
E.C (1 : 2.5 extract) (mm hos/cm)	1 .70
O. M %	0.42
Total Ca CO3 %	2.20
Total N %	0.09
Available P(ppm, Olsen)	13.0
Available K (ppm, ammonium acetate)	223

Ten treatments were involved in this experiment as follows:

1- Nitrogen at the recommended rate i.e 100 gN/vine(According to Ahmed *et al.*, 2000 and Abou- El Lail, 2001) was completely added as mineral N source.
2- Filter mud at 100g N/vine without mineral N source.
3- Compost El- Nile at lOOg N/vine without mineral N source.
4- Green manure only.
5- Filter mud at 25g N/vine + mineral N form at 75g N/vine.
6- Filter mud at 50g N/vine + mineral N form at 50g N/vine.
7- Compost El- Nile at 25g N/vine + mineral N form at 75g N/vine.
8- Compost El- Nile at 50g N/vine + mineral N form at 50g N/vine.
9- Green manure + mineral N form at 75g N/vine.
10-Green manure + mineral N form at 50 N/vine.

Each treatment was replicated three times, four vines per each. The completely randomized block design was followed.

The amounts of organic and mineral N applied for the studied treatments are given in Table (2).

Table (2) : Applied amounts of N from organic and mineral sources

Tr. No	Organic fertilizers		Amount of N/vine (%)		Total N/vine
	Type	Amount (kg)/vine	Organic	Mineral	
1	Without	0.0	0.0	100	100
2	Filter mud (2.5%N)	4.0	100	0.0	100
3	Compost El-Nile (2%N)	5.0	100	0.0	100
4	Green/manure	-----	100	0.0	100
5	Filter mud	1.0	25	75	100
6	Filter mud	2.0	50	50	100
7	Compost/ El-Nile	1.25	25	75	100
8	Compost/ El-Nile	2.50	50	50	100
9	Green manure	-----	-----	75	100
10	Green/manure	-----	-----	50	100

Nitrogen in the mineral N source was added as ammonium Nitrate form (33.3% N). It was applied at four equal batches: at growth start, before the onset of bloom, just after berry set and at two weeks later. It is to be observed that this fertilizer was added each batch three times a week. The two tested organic N fertilizers namely Filter mud (2.5% N) and Compost El-Nile (2.0% N) were added at the first week of January in both seasons. Green manure was applied to the soil by sowing clover seeds in the second week of Oct. in 2004 and 2005 years. Three cuts were taken before ploughing clover in the soil.

The tested treatments were evaluated through the following parameters:

1- Leaf area, shoot length & leaf N, P, K, Zn, Fe &Mn contents.

Samples of twenty leaves opposite to the basal clusters were taken and the average leaf area (cm2) was estimated according to Jain & Misra (1966). Shoot length(cm) was also recorded.

Percentages of N,P and K as well as leaf content of Zn, Fe and Mn (in ppm) on dry weight basis were determined in the petioles of these leaves according to Wilde *et al.* (1985).

2- Percentage of berry set, yield/vine and cluster weight.

Percentage of berry set was calculated by dividing the number of attached berries by the total number of flowers per cluster and multiplying the product by 100. Harvesting took place in mid June when T.S.S/Acid ratio reached 25 according to Tourky *et al.*. (1995).The yield per vine was recorded in terms of weight (kg) and number of clusters per vine then the average cluster weight (g) was calculated.

3- Quality of the berries:

Five clusters were taken randomly from the yield of each vine and the following determinations were carried out:

Average berry weight (g) and dimensions (longitudinal and equatorial) in cm.

Percentage of total soluble solids (TSS %).

Percentage of total acidity in the juice as g. tartaric acid/ 100 ml juice (According to A.O.A.C, 1985).

The obtained data were tabulated and statistically analyzed according to Mead *et al.* (1993) using the new L.S.D test for detecting the significant differences between the studied treatment means.

RESULTS AND DISCUSSION

1- Effect of some organic N materials on average leaf area and shoot length:

Data in Table (3) clearly show that supplying Superior grapevines with Filter mud, Compost El- Nile or Green manure either singly or in combination with mineral N source significantly increased the average leaf area and shoot length compared with the application of N completely via mineral source. The effectiveness of the three organic materials on these growth traits could be arranged in a descending order as follows: Green manure, Compost El- Nile and Filter mud. The combined application of N in both organic and mineral sources was preferable in stimulating these growth characters than using each alone. The stimulation on growth traits was slightly associated with increasing the amount of organic N fertilizers. Significant differences were observed on these growth characters between all treatments except between the higher two rates i.e. 25 or 50g N/vine from each organic N fertilizer. The maximum leaf area and shoot length were obtained from vines intercropped with clover (green manure) and received mineral N source at 75g N/vine. The vines which received N completely via mineral N source produced the minimum values. These results were true in both seasons of the study.

The beneficial effects of organic N materials on growth aspects can be attributed to their effect on supplying the vines with their requirements from various nutrients, their influences on improving physical and chemical properties of the soil and consequently ensuring better growth of roots and the vine as a whole (Nijjar, 1985 and Darwish *et al.*, (1995).

The obtained results regarding the positive action of Green manure on growth are in agreement with those obtained by Fregoni (1978); Markin (1989) and Pool *et al.* (1990). The beneficial effect of the other organic N fertilizers on growth was supported by the results of Griffin & Laine (1983); Bhangoo *et al.* (1988) and Wang *et al.* (1991).

Table (3): Effect of Filter mud, Compost El- Nile and Green manure on leaf area, shoot length and leaf content ofN, P, K and Zn of Superior grapevines in 2006 and 2007 seasons

Organic N Fertilizers Treatments	Leaf area (cm.)		Shoot length (cm.)		Leaf N%	
	2006	2007	2006	2007	2006	2007
MS only at 100gN/vine	105.5	102.3	96.5	100.3	1.53	1.61
F.Mat l00gN/vme	108.5	105.7	100.5	104.1	1.60	1.68
C-EL at l00gN/vine	111.3	109.2	104.3	108.9	1.67	1.75
Green. M	114.8	112.5	109.2	113.0	1.74	1.81
F.M at 25g N/vine+75g N M.S	117.4	116.6	114.3	118.0	1.79	1.88
F.M at 50g N/vine+50g N M.S	118.3	117.0	115.0	118.6	1.80	1.89
C-EL at 25g N/vine+75g N M.S	122.2	120.2	119.0	124.0	1.87	1.95
C-EL at 50g N/vine+50g N M.S	123.0	120.7	120.3	125.0	1.90	1.96
Green- M. + 75g N M.S	127.0	125.9	126.2	131.0	1.97	2.03
Green- M. + 50gNM.S	127.7	126.0	127.3	132.0	1.98	2.04
New L.S.D at 5 %	**2.1**	**2.0**	**2.3**	**2.2**	**0.05**	**0.06**
	Leaf P %		**Leaf K %**		**Leaf Zn (ppm)**	
MS only at 100gN/vine	0.09	0.10	1.05	1.00	100.1	99.3
F.Mat l00gN/vme	0.11	0.13	1.11	1.06	103.0	102.
C-EL at l00gN/vine	0.14	0.17	1.17	1.13	106.0	104.0
Green. M	0.18	0.20	1.22	1.20	109.2	106.3
F.M at 25g N/vine+75g N M.S	0.20	0.23	1.27	1.27	112.2	111.2
F.M at 50g N/vine+50g N M.S	0.21	0.24	1.28	1.28	113.0	112.0
C-EL at 25g N/vine+75g N M.S	**0.24**	0.28	1.31	1.34	116.2	114.3
C-EL at 50g N/vine+50g N M.S	0.24	0.28	1.31	1.40	117.0	115.0
Green- M. + 75g N M.S	0.27	0.31	1.36	1.48	120.0	118.9
Green- M. + 50gNM.S	0.28	0.31	1.37	1.50	120.5	119.1
New L.S.D at 5 %	**0.02**	**0.03**	**0.04**	**0.06**	**1.8**	**1.5**

M.S = Mineral source **F.M = Filter mud**
C-EL = Compost El-Nile **Green-m = Green manure**

2- Effect of some organic N materials on the mineral content of leaves:

It is evident from the obtained data in tables (3 and 4) that the values of N, P, K, Zn, Fe and Mn in the leaves were significantly increased as a result of using Green manure, Filter mud and Compost El- Nile either singly or in combination with mineral N source in comparison with the application of N in the mineral source only. The promotion was associated with using green manure, Compost El- Nile and Filter mud as arranged in a descending order. Combined application of the three organic N fertilizers with mineral N source was superior to the application of each alone in increasing these nutrients in the leaves. It is to be noted that no significant increase in these nutrients was observed due to raising the amount of these materials from 25 to 50g N/vine.

The maximum values were obtained from vines intercropped with clover (green manure) plus those fertilized with mineral N source at 75g N/vine.

Table (4): Effect of Filter mud, Compost El- Nile and Green manure on leaf Fe and Mn content, berry set %, No. of clusters/vine, yield/vine and cluster weight of Superior grapevines in 2006 and 2007 seasons

Organic N Fertilizers Treatments	Leaf Fe (ppm)		Leaf Mn (ppm)		Berry set %	
	2006	2007	2006	2007	2006	2007
M.S only at l00gN/vine	80.2	71.9	91.4	87.4	6.2	6.8
F.Mat l00gN/vine	83.3	75.8	95.0	91.0	6.6	7.3
C-EL at 100 g N/vine	88.0	80.2	99.1	95.0	7.1	7.8
Green. M	92.3	84.7	103.3	98.7	7.5	8.3
F.M at 25g N/vine+75g N M.S	97.3	89.3	108.1	102.3	8.0	9.0
F.M at 50g N/vine+50g N M.S	98.9	90.0	109.1	103.0	8.1	9.1
C-EL at 25g N/vine+75g N M.S	103.4	95.3	114.0	107.0	8.4	9.5
C-EL at 50g N/vine+50g N M.S	104.0	96.0	115.0	107.5	8.5	9.7
Green- M. + 75gN M.S	107.0	101.0	119.3	111.9	9.0	10.2
Green-M. + 50gNM.S	107.4	102.3	120.0	112.3	9.2	10.3
New L.S.D at 5 %	2.9	3.4	3.1	2.7	0.3	0.4
	Yield/vine (kg)		**No. of clusters/vine**		**Cluster weight(g)**	
M.S only at l00g N/vine	6.1	5.6	17	18	340.9	311.1
F.Mat l00g N/vine	6.9	6.6	18	20	385.7	329.2
C-EL at l00g N/vine	8.0	7.5	20	21	421.7	355.7
Green- M.	8.9	8.5	21	22	469.6	386.4
F.M at 25g N/vine+75g N M.S	9.8	9.6	21	24	515.0	399.3
F.M at 50g N/vine+50g N M.S	9.8	9.6	22	24	515.0	400.0
C-EL at 25g N/vine+75g N M.S	10.7	10.6	22	25	562.2	423.7
C-EL at 50g N/vine+50g N M.S	11.0	10.8	23	26	550.0	416.7
Green-M. + 75gN M.S	11.8	11.7	23	27	591.7	431.7
Green-M. + 50gN M.S	11.9	11.8	22	27	595.8	436.7
New L.S.D at 5 %	0.97	1.08	2.4	2.9	25.3	18.2

M.S = Mineral source **F.M = Filter mud**
C-EL = Compost El-Nile **Green-m = Green manure**

Fertilizing the vines with 100g N/vine in the mineral N source only produced the minimum values. Similar results were obtained in both seasons.

The stimulation of vine nutritional status in response to the application of organic N material was attributed to their positive action in increasing the organic matter and reducing soil pH, consequently increasing the availability of nutrients.

The improving effect of Green manure occurring on vine nutritional status was supported by the results of Fregoni & Fraschini (1989), Darwish *et al.* (1996a and 1996b) and AbouEl- Lail (2001). The promotion on nutrients in the leaves in response to the application of the other organic N fertilizers was previously confirmed by the results of Fardossi *et al.* (1991), El- Sayed (1994) and Ahmed *et al.* (1996).

3- Effect of some organic N materials on percentage of berry set, yield/vine, and number of clusters per vine and cluster weight.

Data in Table (4) clearly show that organic N materials: Green manure, Filter mud and Compost El- Nile applied either singly or in combination with mineral N source were significantly effective in increasing berry set % and yield expressed in weight (kg) and number of clusters per vine as well as cluster weight compared with the application of mineral N source only. The maximum number of clusters was obtained from vines receiving Green manure and mineral N source at 75g N/vine. The minimum value, however, occurred in vines supplied with mineral N source only at 100g N/vine in the second and third seasons. The increase in berry set %, yield and cluster weight was observed on vines intercropped with Green manure, Compost El-Nile and Filter mud as arranged in a descending order. Combined application of N in both organic and mineral sources was highly effective in increasing these parameters than using each alone. Green manure accompanied with 75g N/vine applied to Superior vines was responsible for maximizing the yield. In this treatment the yield per vine reached 11.8 and 11.7kg in 2006 and 2007 seasons, respectively.

These results could be mainly attributed to the positive action of organic N materials on growth, vine nutritional status, berry set as well as berry weight and dimensions.

The results in this respect are in the same line with those obtained by Darwish *et al.* (1996b), Abou. El- Lail (2001) and El-Sayed (2002) who worked on green manure and Foradossi *et al.* (1991), El-Sayed (1994); Ahmed *et al.* (1996) and El- Morsy (1997) who worked on other organic N materials.

4- Effect of some organic N materials on physical and chemical properties of the berries

It can be shown from the data in Table (5) that the application of the three organic N materials either singly or with mineral N source generally improved the quality of the berries in terms of increasing weight, berry dimensions and total soluble solids and in reducing the total acidity of the juice as compared with the application of mineral source only. The beneficial effect of these materials in improving quality of the berries could be arranged in an ascending order as follows: Filter mud, Compost El- Nile and Green manure. The combined application of organic and mineral N sources was preferable in improving quality of the berries than using each alone. The treatment including Green manure plus application of N at 75g N/vine in mineral N source gave the best results in this respect. Vines fertilized with N at 100g N/vine completely via mineral N source was accompanied by lower quality of the berries. These results were true in both seasons.

The results in this connection could be attributed to the enhancing effect on cell division and fruit maturity in the three organic N materials.

The improving effect of Green manure on fruit quality was confirmed by the results of Dawish *et al.* (1996b), Abou. El- Lail (2001) and El- Sayed (2002). The results of El- Sayed (1994); Ahmed *et al.* (1996), El-Morsy (1997) and Abd El-Ghafar-Gehan (2002).

As a conclusion the best results with regard to yield and quality of Superior grapes were obtained due to the application of Green manure accompanied with 75g N/vine in the mineral N source.

Table (5): Effect of Filter mud, Compost El- Nile and Green manure on some physical and chemical properties in the juice of Superior grapes in 2006 and 2007 seasons

Organic N Fertilizers Treatments	Av. Berry weight (g.)		Av. Berry longitudinal longitudinal		Av. Berry equatorial	
	2006	2007	2006	2007	2006	2007
M.Sonlyat l00gN/vine	5.0	4.2	2.3	2.5	1.9	2.1
F.Mat 100gN/vine	5.4	4.6	2.5	2.8	2.2	2.4
C-EL at 100gN/vine	5.8	4.9	2.8	3.0	2.9	2.6
Green. M	6.1	5.3	3.0	3.2	2.6	2.9
F.M at 25g N/vine+75g N M.S	6.4	5.6	3.2	3.4	2.8	3.0
F.M at 50g N/vine+50g N M.S	6.5	5.7	3.2	3.4	2.8	3.0
C-EL at 25g N/vine+75g N M.S	6.8	6.0	3.5	3.6	3.1	3.2
C-EL at 50g N/vine+50g N M.S	6.9	6.0	3.5	3.7	3.1	3.3
Green- M. + 75gNM.S	7.2	6.4	3.8	3.9	3.4	3.5
Green- M. + 50gN M.S	7.2	6.4	3.9	4.0	3.5	3.5
New L.S.D at 5 %	0.3	0.3	0.2	0.2	0.2	0.2
	T.S.S %			Total acidity %		
M.Sonlyat 100gN/vine	17.3		17.5	0.718		0.725
F.Mat 100gN/vine	17.6		17.9	0.681		0.684
C-EL at 100gN/vine	18.0		18.3	0.650		0.640
Green- M.	18.3		18.6	0.619		0.598
F.M at 25g N/vine+75g N M.S	18.6		19.0	0.589		0.555
F.M at 50g N/vine+50g N M.S	18.7		19.0	0.584		0.553
C-EL at 25g N/vine+75g N M.S	19.0		19.3	0.548		0.505
C-EL at 50g N/vine+50g N M.S	19.0		19.4	0.545		0.501
Green- M. + 75gN M.S	19.5		19.7	0.506		0.457
Green- M. + 50gNM.S	19.6		19.8	0.501		0.455
New L.S.D at 5 %	0.2		0.3	0.031		0.042

M.S = Mineral source **F.M = Filter mud**
C-EL = Compost El-Nile **Green-m = Green manure**

REFERENCES

Abd El-Ghaffar-Gehan, E. (2002): Effect of some organic nitrogen fertilizers on growth and productivity of Red Roomy grapevines (Vitis vinifera L). M. Sc. Thesis Fac. Agric. Minia Univ.

Abou-El-Lail, H. I. (2001): Studies on intercropping some legume crops with Flame seedless grapevines. M. Sc. Thesis Fac. Agric. Minia Univ.

Ahmed, F. F.; Ragab, M. A. and Mansour, A. E. M. (1996): A comparative study on the effects of farmyard manure and filter mud on Red Roomy grapevines (Vitis vinifera L). 1st Egypt-Hung. Hort. Conf. Vol. 2: 224-230.

Association of Official Agricultural Chemists (1985): Official Methods of Analysis, A.O.A.C 12th Ed. pp. 494-500, Benjamin Franklin Station, Washington, D.C., U.S.A.

Bhangoo, M. S.; Day, K. S.; Sunfanagunto, V. R. and Petrucci, V. E. (1988): Application of poultry manure and its influences on Thompson seedless grape production and soil properties. Hort. Sci. 23(611): 1010-1012.

Darwish, O. H.; Persound, N. and Martens, D. C. (1995): Effect of long-term application of animal manure on physical properties of three soils. Plant and soil, 176 : 289-295.

Darwish, O. H.; Hanna, L. F.; Maatouk, M. A.; Ahmed. F. F. and Mohamed, G. A. (1996 a) : Enhancing the availability of phosphorus as rock phosphate for Red Roomy grapevines by some materials. 1- Effect on soil properties, growth and nutritional status of the vines. Fourth Arabic Conf. for Hort. Crops, El- Minia Univ., Egypt. Part. II : 923-967.

Darwish, O. H.; Hanna, L. F. Maatouk, M. A. Ahmed, F. F. and Mohamed, G. A. (1996 b) : Enhancing the availability of phosphorus as rock phosphate for Red Roomy grapevines by some materials. 2- Effect on productivity and quality of berries. Fourth Arabic Conf. for Horticultural Crops, El-Minia Univ., Egypt Part II : 969-995.

El- Morsy, F. M. (1997): Response of Banaty grapevines to application of the organic fertilizers filter mud and sludges. Annals of Agric. Sci. Vol. 35 (1) : 477-488.

El- Sayed H. A. (2002) : Attempts for stimulating the availability of phosphorus in triple calcium super phosphate for Flame vines by using some materilas. Annals of Agric. Sci. Moshtohor Vol. 39 (4): 2403-2414.

El-Sayed, M. A. (1994) : The benefits of some organic introgen fertilizers on Red Roomy grapevines (Vitis vinifera L). Minia J. Agric. Res & Dev. Vol. 16 No. 3: 1295-1306.

Fardossi, A.; Hepp, E.; Nayer, C. and Kalchgruberg, R. (1991): Effect of commercial organic fertilizers on the nutrients uptake of vines. A pot experiment with vine nursery soil. Obstbau und Fruchteverwertung 41 (6) 221-227 Austria.

Fregoni, M. (1978): Green manuring in the vineyard. Vignevini 5 (617): 11-14 Universita Cattolica Piacenza, Italy.

Fregoni, M. and Fraschini, P.(1989) : Manuring of table grapes. Vignevini 16 (9); Italy.

Garicia- Lujan, A.(1990): Grape manuring in Spain. Vignevini 17: 19-23, Spain.

Griffin, G, F. and Laine, A. F. (1983) : Nitrogen fertilization in soils previously amended with organic wastes. Agron. J. Vol. 74 pp 124-129.

Jain, T. C. and Misra, D. K. (1966) : Methods of estimation of leaf area in crop plants. Indian J. Agric. vol. Xl (3).

Markin, M. I. (1989) : Green manure in vineyards. Sadovodstvo I inogradarstovo No. 6, 36-38 Ukrainian SSR.

Mead, R.; Currow, R. N. and Harted, A. M. (1993) : Statistical Methods in Agricultural and Experimental Biology. 2nd Ed. Chapman, Hall, London. 10-14.

Nijjar, G. S. (1985) : Nutrition of Fruit Trees. Mrs Usha Raj Kumar for Kalyani Publishers, New Delhi pp. 10-52.

Pool, R. M; Dunst, R. M. and Lakso, A. N. (1990) : Comparison of sod, mulch cultivation and herbicide floor management practices for grape production in non irrigated vineyards. J. Amer. Soc. Hort. Sci, 115 (6): 872-877.

Tourky, M.N., El-Shahat, S.S. and Rizk, M. H. (1995): Effect of Dormex on fruit set, quality and storage life of Thompson seedless grapes (Banati grapes) J. Agric. Sci., Mansoura Univ., 20(12): 5139-5151.

Wang, C. T.; Chen, H. T. and Lay, F. I. (1991) : Effect of organic manure on the yield and quality of grapes. Bull. Taichung District Agric. Improvement Sta. N. 32 : 41-48.

Wilde, S. A.; Corey, R. B.; Layer, J. G. and Voigt, K. (1995) : Soils and Plant Analysis for Tree Culture. Oxford and IBH Publishing Co., New Delhi. India.

إستجابة كرمات العنب السوبيريور لاستخدام طينة المرشحات وكمبوست النيل والتسميد الأخضر

أحمد حسن عبد العال* ، بسمة محمد سليم و غادة شكر شاكر****

*** قسم البساتين – كلية الزراعة – جامعة الأزهر – أسيوط – مصر**

**** قسم العنب – معهد بحوث البساتين – مركز البحوث الزراعية – الجيزة – مصر**

تم خلال مواسم 2005، 2006، 2007 استخدام ثلاثة مصادر عضوية نيتروجينية هي طينة المرشحات (205 % ن)، كمبوست النيل (2 % ن)، التسميد الأخضر على كرمات العنب السوبيريور بمعدلين من النيتروجين هما 25 ، 50 جرام للكرمة أي بمعدل واحد كيلو جرام أو اثنين كيلو جرام من سماد طينة المرشحات، 1.25 أو 2.5 كيلو جرام من سماد كمبوست النيل. تم إضافة المصادر العضوية النيتروجينية إما بصورة منفردة أو مع مصدر معدني نيتروجيني فى صورة نترات الأمونيوم (33% نيتروجين) ولقد تم دراسة تأثير هذه المواد على النمو والحالة الغذائية للكرمات وكذلك نسبة العقد والمحصول وخصائص الجودة لحبات العنب السوبيريور .

كان لاستخدام التسميد الأخضر، كومبوست النيل، طينة المرشحات جنباً إلى جنب مع استخدام المصدر المعدني للنيتروجين فعالا فى تحسين النمو والحالة الغذائية للكرمات بالإضافة إلى زيادة نسبة عقد الحبات والمحصول للكرمة، عدد عناقيد الكرمة ، وزن العنقود ، وزن وأبعاد الحبة ونسبة المواد الصلبة الذائبة الكلية بالاضافة إلى خفض نسبة الحموضة الكلية فى عصير الحبات وذلك بالمقارنة باستخدام المصدر المعدني النيتروجيني بمفرده . ولقد تميز استخدام التسميد الأخضر مع استخدام 75 جرام نيتروجين في الصورة المعدنية عن طينة المرشحات وكمبوست النيل في تأثيره على جميع الصفات تحت الدراسة .

تؤكد نتائج هذه الدراسة أهمية التسميد الأخضر كمصدر جيد للأسمدة العضوية وتوصي الدراسة أيضا بحرث البرسيم بعد أخذ ثلاث حشات منه في التربة مع إضافة 75 جرام نيتروجين للكرمة في أي صورة نيتروجينية معدنية وذلك للحصول على أفضل النتائج بخصوص المحصول وجودة الحبات . كما أثبتت هذه الدراسة كذلك أهمية سماد الكمبوست في تحسين نمو وإثمار كرمات العنب السوبيريور .