J. Agric. Sci. Mansoura Univ., 34 (12): 11207 - 11216, 2009

PERFORMANCE OF SUPERIOR GRAPE ON DIFFERENT GRAPE ROOTSTOCKS

El-Banna, G.I.*; El. El. T. El-Baz*; S.S. El-Shahat and Thoraya S. Abo El-Wafa****

*** Pomology Dept., Fac. of Agric., Mansoura University.**

**** Viticul. Dept., Hort. Res. Inst., Agric. Res. Center, Giza.**

ABSTRACT

This investigation was carried out during the three seasons of 2005, 2006 and 2007 in a private vineyard located at EL-Khatatba district, EL-Monofia Governorate. For this study, Superior Seedless grapevines (*Vitis vinifera*, L.) were used as source of scions and four rootstocks, Teleki 5C, Paulsen 1103 and SO4 (American stocks) besides of the control (own-rooted). The following determinations were carried out : bud behaviour, average leaf area, yield per vine, physical and chemical characteristics of bunch and berries. The data reveal that, most of rootstocks increased N, P, K contents in the leaves and total carbohydrates in the canes. The results also showed that bud burst, bud fertility and leaf area of Superior seedless grapevine on Telelki 5C rootstock gave a higher value than the other rootstocks or the control. Superior on Teleki 5C rootstock increased the yield per vine, cluster weight and number of berries per cluster as compared with the other rootstock or the control. Vines grafted on Paulsen 1103 or Teleki 5C increased berry weight, size and juice volume compared to other treatments used. Whereas, the control gave the lowest values in this respect. Superior own rooted (control) generally resulted a higher percentages of SSC, SSC/acid ratio and lower acidity in berry juice than the other rootstocks used. The highest value of carbohydrate in canes was observed in the vines rooted on Teleki 5C, Paulsen 1103 or SO4 than the control. Whereas, N content in the leaves of Superior in own rooted was higher than other rootstocks used. Furthermore, the content of P in leaves of Superior on SO4 and Paulsen 1103 rootstocks were higher than the other Teleki 5C rootstock or the control. Whereas, there is no significant differences in potassium content in leaves between the rootstocks used or the control.

INTRODUCTION

Graftage on selected rootstocks is generally practiced nowadays all over the world. Vines are grafted for any of the following purposes : (a) to obtain vines of the desired fruiting variety on roots resistant to phylloxera (Kurtiashvili, 1989 and Levinskii *et al*., 1989) which is not recognized in Egypt up till now or nematodes (MacCarthy and Cirami, 1990 and Fraschini, 1990). Certain species of nematodes are the main cause of vine decline. Many species of these nematodes have been found on vine roots in Egypt (Riad, 1974); (b) to correct mixed varieties in an established vineyard; (c) to change the variety of an established vineyard; (d) to rapidly increase the supply of new or rare varieties; or (e) to obtain vines on roots tolerant to certain adverse soil conditions such as calcareous soils, drought (Southey, 1992). In this respect, SO4 (*V. berlandieri* x *V. riparia*), it is moderate to vigorous, tolerates high levels of lime in the soil and performs satisfactorily acidic soils, adopted to a wide range of soils, but does well resistant to in light, well drained soils of low fertility and drought tolerant. Also, it is very high phylloxera resistant and resistant to root knot nematodes. Teleki 5C (*V. berlandieri* x *V. riparia*), is moderate to vigorous, suitable to well-drained and

fertile soils. It represents a good choice for heavy soils, moderate drought resistant and highly tolerant to calcareous soils, good resistant to phylloxera and also to root knot and dagger nematodes. Paulsen 1103 (*V. berlandieri* x *V. riparia*), is moderate to vigorous; with high resistant to phylloxera, good resistant to root knot nematodes and moderately resistant to dagger nematodes, high drought tolerant, moderately tolerant of salt and it does well in acidic soils (Wolpert *et al*., 1994; McCarthy and Cirami, 1990; Mullins *et al*., 1992; Southey, 1992; Gao *et al*., 1993; Lider *et al*., 1995; Kocsis *et al*., 1998; Schmid *et al*., 1998; Sule, 1999 and Walker *et al*., 2002).

The use of grafted vines led to an increase in the cost of vineyard establishment. It can be anticipated that the added cost of establishment will be offset by an increase in vine productivity. In this respect, EL-Morsi *et al*. (2006) studied the effect of three rootstocks namely, Salt Creek, Freedom and Superior seedless on own roots on the grafted scion (Superior seedless). They found that bud burst percentage and fruitfull buds of grafted on Freedom rootstock gave the highest values in both seasons followed by vines grafted on Salt creek are compared with the control which resulted in the lowest values in this respect. Similar results were recorded by Gaser, (2007) when grafted scion (Superior seedless) on Dog ridge, Salt creek, Freedom, Harmony, SO4, Teleki 5C and Paulsen 1103 rootstocks in addition to own rooted plants. The same findings were found by Pauletto *et al*. (2001) and Goncolves *et al*. (2002). This investigation was carried to study the effect of different rootstocks (Teleki 5C, Paulsen 1103 and SO4 in addition to Superior on own rooted, on bud behaviour, vegetative growth, productivity of Superior grape cultivar.

MATERIALS AND METHODS

This study was carried out during the three successive seasons of 2005, 2006 and 2007 on Superior seedless grape cv. (*Vitis vinifera*, L.) grafted on four rootstocks (Superior, Teleki 5C, Paulsen 1103 and SO4). The vineyard was established in 2005 and are growing in sandy soil spaced at 2.5 x 3 m (vine x row spacing) under drip irrigation system, and trained to cane pruning under Spanish baron trellis system in a private orchard in EL-Khatatba district, EL-Monofia governorate. Vines were pruned at January first during dormant season to 8 canes in the both seasons.

A randomized complete block design with four replicates each one presented with three vines (12 vines per each treatment). In this study 48 vines of almost similar vigor were selected to present one of the following treatments.

1- Superior on Superior (control).
2- Superior on Teleki 5C.
3- Superior on Paulsen 1103.
4- Superior on SO4.

During the growing season the following parameters were determined :

1- Bud behaviour :

Number of bursted buds and clusters per each vine were counted one month after bud burst. Date of bud burst date was estimated when 5 % of buds were bursted according EL-Shahat (1992). The percentage of bud burst and fertility were calculated as follows according to (Bessis, 1960) during the seasons of the study.

$$\text{Bud burst \%} = \frac{\text{Number of bursted buds}}{\text{Total number of buds}}$$

$$\text{Bud fertility \%} = \frac{\text{Number of clusters per vine}}{\text{Total number of buds}}$$

2- Average leaf area :

At full bloom stage, samples of fully matured leaves were collected from each replicate from the sixth leaf position from the top of the shoots to determine leaf area (cm^2) using Digital Planimeter.

- Yield and berries quality :

Harvesting data was carried out, when the berries of the cluster attained (creamy, greenish-yellow) and soluble solids percentage in berries juice reached about 14-16 %, with SSC/acid ratio 18-20 according to Food and Agriculture Organization of the United Nations (2003).

At harvest time, number of clusters per each vine was counted to estimate yield/vine. Samples 12 clusters per each replicate were taken to Pomology Laboratory, Horticulture Research Station, Mansoura Dakahlia to determine the following parameters :

1- Average cluster weight (g).
2- Average cluster length and diameter (cm).
3- Average number of berries per each cluster.

Samples of 100 berries from each replicate were randomly collected to determine averages of physical and chemical properties of the berries :

1) Berry weight (g). 2) Berry diameter (mm).
3) Berry length (mm). 4) Berry volume (mm).
5) Total soluble solids content using Carlzeiss Hand Refractometer.
6) Titratable acidity by titration 10 ml juice sample against (0.1 N) NaOH. Acidity was expressed as (g) tartaric acid/100 ml juice according to AOAC, (1980).
7) Soluble solids/acid ratio in berry juice.

Chemical studies :

1- NPK contents in leaf petioles :

Samples of fully matured leaves which opposite to clusters were taken at full bloom stage from the replicate of each treatment. Samples were digested by using perchloric and sulphuric acids according to (Chapman and Pratt, 1978) for the following determinations :

a- Nitrogen (N %) according to the method of Nelson and Sommers, (1980).
b- Phosphorus (P %) according to the method of Jackson, (1967).
c- Potassium (K %) was detrmined using flame photometer according to Brown and Lilliand, (1946).

2- Total carbohydrates in the canes :

It was determined by using sulphoric acid and the concentration of the glucose standard curve was obtained to show total carbohydrates content which calculated as gm glucose / 100 g as dry weight according the method Dubios *et al*. (1956).

RESULTS AND DISCUSSION

The results of the present study reveal the effect of grafting Superior grapes on different rootstocks on bud behaviour :

1- Bud burst percentage:

Data in Table (1) revealed that, bud burst percentages on Teleki 5C rootstock, gained the highest values (97.3 and 95.1) in the two seasons respectively followed by Superior on Paulsen 1103 and SO4 rootstocks. Whereas, Superior on own root gave the lowest bud burst percentages compared with the other rootstocks used. It is interesting to notice that, Superior cv. on all rootstocks gave a higher values of than those obtained from grafting Superior on SO4 or own root. The results are in line with those reported by EL-Morsi *et al*., (2006) and Gaser, (2007), which showed that, bud burst percentages, grafted Superior seedless on Freedom rootstock, gained the highest values in both seasons.

2- Bud fertility percentage :

Data from Table (1) revealed that, bud fertility percentages on Teleki 5C rootstock, gained the highest values (80.0 and 65.1) in both seasons, respectively followed by Superior on Paulsen 1103 and SO4 rootstocks in 2006 and 2007 seasons. Whereas, Superior on his own root gave the lowest values of bud fertility percentages compared with the other rootstocks used in the both seasons. Similar results were obtained by Gaser (2007) who found that Dog ridge, Salt Creek, Paulsen 1103 and Freedom rootstocks gave the highest values of coefficient of bud fertility as compared to the control (own-rooted) which had the lowest values.

Table (1): Effect of different rootstocks on No. bud burst (%), bud fertility (%) and leaf area (cm^2) of superior grape.

Treatments	Bud burst (%)			Bud fertility (%)			Leaf area (cm^2)		
	2006	2007	M	2006	2007	M	2006	2007	M
Superior on Superior	88.1	92.7	90.4	32.3	33.3	32.8	168.8	240.7	204.8
Superior on Teleki	97.3	95.1	96.2	68.4	65.1	66.8	200.0	306.4	253.2
Superior on Paulsen	89.7	93.4	91.6	59.0	57.8	58.4	193.6	278.2	235.9
Superior on SO4	94.9	92.7	93.8	59.4	50.8	55.1	187.6	270.5	229.1
L.S.D at 5%	3.49	2.04	--	9.22	10.82	--	23.16	24.02	--

3- Leaf area index :

It is clear from Table (1) that leaf area index of Superior seedless grapevine on Teleki 5C rootstock, gained the highest values (200.0 and 306.4) in the two seasons, respectively followed by Superior on Paulsen 1103 and SO4 rootstocks. Whereas, Superior on his own root gave the lowest values of leaf area index compared with the other rootstocks used in the three seasons.

The ameliorative effect of the grafting on leaf area could be attributed to the high efficiency of the root system of Teleki 5C and other rootstocks in absorbing and transporting the water and minerals via the grafted union to the shoot of Superior scion and the favorable reciprocal relationships between scion and rootstock. The results are in line with those reported by

Reddy (1992); Fardossi *et al*., (1992); Sallam (1992); Malossini *et al*., (1999); Goncolves *et al*., (2002); Abo EL-Wafa (2003); EL-Morsi *et al*., (2006) and Gaser, (2007).

3- Yield per vine :

It was estimated by counting No. of clusters per vine, yield per vine and its average weight. In this respect, data in Table (2) show that the highest cluster number and yield per vine were obtained by grafted Superior vine on to Teleki 5C rootstock followed by Paulsen 1103 and SO4 rootstocks compared with control. Moreover, Superior on to Teleki 5C rootstock significantly increased the yield to attain (34.4 and 39.0 kg/vine) in both seasons, respectively, followed by Superior on to Paulsen 1103 rootstock. Yet, Superior seedless grapevines grown on their own roots gave the lowest yield/vine (6.0 and 12.1 kg/vine) in 2006 and 2007 seasons, respectively.

Similarly, Ferree *et al*. (1996) reported that an increase in the yield was obtained in grafted 'Cabernet Franc' and 'White Riesling' than the own vines, Novell *et al*., (2000); Zamboni *et al*., (2002); Colapietra, (2003); EL-Morsi *et al*., (2006) and Gaser, (2007).

Table (2): Effect of different rootstocks on No. Cluster/vine, cluster weight and yield/vine (kg) of superior grape during 2006 & 2007 season.

Treatments	No. Cluster/vine			Cluster weight (g)			Yield /vine (kg)		
	2006	2007	M	2006	2007	M	2006	2007	M
Superior on Superior	18.8	16.8	17.8	676.7	723.1	699.9	6.0	12.1	9.00
Superior on Teleki	37.0	38.5	37.8	929.2	1009.9	519.6	34.4	39.0	36.7
Superior on Paulsen	26.8	31.5	29.2	812.5	981.7	897.1	21.8	31.0	26.4
Superior on SO4	25.0	30.2	28.1	837.5	885.6	861.6	20.9	27.0	23.9
L.S.D at 5%	**5.6**	**2.7**	**---**	**174.50**	**147.86**	**---**	**5.4**	**5.4**	**---**

4- Cluster length, width and number of berries :

As shown in Table (3) the rootstocks variably affected of cluster weight, length, width and number of berries per cluster. Teleki 5C rootstock significantly increased these parameters as compared with the control and the other rootstocks. On the contrary, control was from 263.3 to 156.2 % for Paulsen 1103 and from 248.3 to 123.1 % for SO4 rootstock compared with the control (own-rooted). Similar results were obtained for number of cluster per vine which were appreciably increased in vines grafted on Teleki 5C, Paulsen 1103 and SO4 rootstocks. Adjusting the number of bunches per vine made it logic to explain that the increase or decrease of the observed yield/vine could be ascribed only to the change of the bunch weight. The obtained results are nearly similar to those achieved by Hedberg (1980) who found that yield of all grafted (own-rooted) was the lowest one in this respect in the two seasons under study except cluster width.

The obtained results are nearly similar to those achieved by Leeuwen *et al*. (1998); Colapiotra *et al*. (1999); Novello *et al*. (2000); Pauletto *et al*. (2001); EL-Morsi *et al*., (2006) and Gaser, (2007) studied the effect of rootstocks (Dog Ridge, Salt Creek, Freedom, Harmony, SO4, Teleki and

Paulsen 1103 addition to own-rooted plants on the grafted scion (Superior seedless) and found that a significant in the yield per vine of Dog Ridge and Salt Creek rootstocks as compared with the other rootstocks, while, control (own-rooted) gave the lowest values on the three seasons study.

Table (3): Effect of different rootstocks on cluster width, length and yield/vine (kg) of superior grape.

Treatments	Cluster width (cm)			Cluster length (cm)			No. of berries/ cluster		
	2006	2007	M	2006	2007	M	2006	2007	M
Superior on Superior	15.4	16.1	15.8	24.9	23.0	23.9	207.8	209.5	208.7
Superior on Teleki	17.7	18.1	17.9	32.8	25.5	29.2	268.0	271.8	269.9
Superior on Paulsen	15.9	16.9	16.4	29.0	25.2	27.1	195.5	234.0	214.8
Superior on SO4	15.1	16.1	15.6	29.0	24.6	26.8	220.8	232.5	226.7
L.S.D at 5%	**1.60**	**1.59**	**---**	**3.98**	**1.82**	**---**	**62.71**	**28.47**	**---**

5- Berry characteristics :

As shown in Table (4) Paulsen 1103 and Teleki 5C rootstocks increased berry weight and size as compared with the other rootstock (SO4) and the control (own-rooted). While, control was the lowest one in this respect in the two seasons of the study. The increment which occurred in these parameters in Paulsen 1103 and Teleki 5C rootstocks could be ascribed to the parallel increment noticed in the total leaf area and its photosynthesis activity of the leaves was increased. The obtained results are in accordance with those obtained by EL-Morsi *et al*., (2006) and Gaser, (2007).

Table (4) : Effect of different rootstocks on berry weight and berry size of Superior grape.

Treatments	100 Berry weight (g)			100 Berry size (cm)		
	2006	2007	M	2006	2007	M
Superior on Superior	512.9	517.4	515.2	475.0	460	467.5
Superior on Teleki	560.3	568.8	564.6	530.0	561	545.5
Superior on Paulsen	617.4	560.2	588.8	585.0	540	562.5
Superior on SO4	539.2	556.8	548.0	505.0	500	502.5
L.S.D at 5%	**44.8**	**48.16**	**---**	**73.46**	**89.61**	**---**

Chemical characteristics of berries :

SSC, total acidity and SSC/acid ratio :

Data from Table (5) show that the SSC, total acidity and SSC/acid ratio of Superior seedless grapevine on rootstocks used. In this respect, data revealed that, Superior on Teleki 5C gave somewhat increment in this respect as the mean of two seasons compared with the other rootstocks and control.

With regard to the effect on SSC, total acidity and SSC/acid ratio (Table 5), showed no clear trend was noticed about the effect of rootstock during the two seasons of this study. But, the control (Superior on own-

rooted) generally resulted in higher percentages of SSC and SSC/acid ratio and lower acidity of the berry juice, while, the rootstocks used were shown to have the lowest values in this respect as the mean of two seasons of this study. Our results are in line with those reported by Cirami *et al*. (1984); Walker *et al*. (1998 & 2000) and Gaser, (2007). With regard to the chemical characteristics of berries i.e., SSC, acidity and SS/acid ratio, they were significantly affected by the kind of rootstock used. Control (own-rooted) and some rootstocks except for Dog Ridge and Salt Creek rootstocks which enhanced bunch maturity may be attributed to the decrease of bunch weight.

Table (5): Effect of different rootstocks on SSC %, acidity % and SS/acid ratio of Superior grape.

Treatments	SSC %			Acidity (%)			SS/acid ratio		
	2006	2007	M	2006	2007	M	2006	2007	M
Superior on Superior	15	12	13.5	0.734	1.10	0.917	20.5	10.9	15.7
Superior on Teleki	13	13.5	13.3	0.780	1.01	0.895	16.8	13.4	15.1
Superior on Paulsen	13	12.9	12.9	0.831	1.09	0.961	15.9	12.5	14.2
Superior on SO4	13.3	12.1	12.7	0.825	1.06	0.943	15.5	11.4	13.5
L.S.D at 5%	**1.20**	**1.11**	**---**	**3.18**	**1.32**	**---**	**3.18**	**1.32**	**---**

- N, P and K contents in leaves :

Data in Table (6) showed the content of nitrogen, phosphorus and potassium in leaves of Superior seedless grapevine on different rootstocks used. Data in this Table indicated that N content in leaves of Superior on his own root was higher in leaves compared with the other rootstocks used as the mean of two seasons. Yet, Teleki 5C rootstock contained the lowest values in this respect compared with the other rootstocks used.

Regarding to the content of P, Superior on SO4 and Paulsen 1103 rootstocks were higher than the other rootstocks used and the control.

Concerning to K contents in leaves there were no significant difference found between the rootstocks used or the control in the two seasons of this study.

Table (6): Effect of different rootstocks on N, P and K in leaves of superior grape.

Treatments	Nitrogen %			Phosphorus %			Potassium %		
	2006	2007	M	2006	2007	M	2006	2007	M
Superior on Superior	5.70	5.04	5.6	0.52	0.53	0.53	1.58	1.70	1.64
Superior on Teleki	2.36	2.78	2.6	0.55	0.49	0.52	0.52	1.75	1.14
Superior on Paulsen	2.87	5.77	4.3	0.76	0.81	0.78	1.64	1.94	1.79
Superior on SO4	3.63	3.45	3.5	0.91	0.71	0.81	1.74	1.54	1.64
L.S.D at 5%	**2.61**	**2.21**	**---**	**0.30**	**0.21**	**---**	**N. S**	**N. S**	**---**

REFERENCES

A.O.A.C. (1980). Association of official of Analytical chemist the 14th Ed. Published by the A.O.A.C.P.O. Box 540, Washingtion, D.C.USA.

Abo El-Wafa, T.S. (2003). Studies on grape propagation. M.Sc. Thesis Fac. of Agric., Mansoura Univ.

Bessis, R. (1960). Sur different Moderns Depression Quantifier Dela Fertilte chez I a vigne Aca p p .828-882

Brown, I.D. and D. and O. Lilliland (1946). Rapid determination of potassium and sodium in plant material and Soil extracts by flame photometry Proc. Amer. Soc. Hort. Sci., 48:341 -346.

Chapman, H.D. and P.F. Pratt (1978). Methods of analysis for soils, plants and water, 6th Ch.2 pp 56-64 Division of Agric. Sci. Univ. Calif.

Cirami, R.M.; McCarthy, M.G. and Glenn, T. (1984). Comparison of the effects of rootstock on crop, juice and wine composition in a replanted nematode-infected Barossa Valley vineyard-Austral. J. Expr. Ag. Anim. Husbandry, 24: 283-289.

Colapietra, M. (2003). Protection of table grapes in order to hasten period and precocity treatment of Black Magic. Informator Agrario supplemento 55 (50): 15 -20. (C.F. Hort. Abst., 70: 4645).

Dubios, M.; Gilles, K.A.; Hamilton, J.K.; Rebers and Smith, F. (1956). Colorimetric method for determination of sugars and related substances. Anal Chem., 28(30): 350-356.

El-Morsi, F.M.; Rafaat S.S. El Gendy and Merrat A.K. (2006). Effects of two grape rootstocks on growth, yield and cluster quality of Superior seedless scion cultivar under conditions of the open field and overhead plastic covering. Egypt J. of Apple. Sci.,21 (108).

El-Shahat, S.S. (1992). Bud dormancy in Thompson seedless grape as affected by some field practices Ph.D. Thesis, Fac of Agric. Mansoura Univ.

Fardossi, A.; E. Hepp; C. Mayer and R. Kalchiguber (1992). On the influence of different rootstock cultivars on growth, yield, must quality and nutritional status of the scion cultivar Neuburger (*Vitis vinifera*, L.) in the third year. Mitleilungen Klosterneuburg. Rebe and wein, Obstbou und fruchte. Verwerturg, 42(2): 47-57. (C.F. Hort Abst., 64: 8609).

Ferree, D.C.; Cahoon, G.A.; Ellis, M.A.; Scurlock, D.M. and Johns, G.R. (1996). Influence of eight rootstocks on the performance of “White Riesling” and “Cabernet Franc” over five years. Fruit Varieties J., 50: 124-130.

Fraschini, P. (1990). New American grapevine rootstocks resistant to nematodes. Vignevini, 17(4): 30-32.

Gao, X.P.; Guo, X.W.; Wang, K. and Fu, W.H. (1993). The resistance of grape rootstocks to cold and crown gall. Acta Hort, Sci., 20:313-318

Gaser, Aisha S.A. (2007). Impact of some rootstocks on performance of Superior grape cultivar. J. Agric. Sci., Mansoura Univ., 32 (11): 9347-9375.

Goncolves, C.A.A.; Chalfun, N.N.J.; Regina, M.A.; Alvarenga, A.A.; Souz, M.T. DE and Abrahao, E. (2002). Estimate of leaf of the grapevine (*Vitis labrusca*. cv. Folha de Figo) grown on different rootstocks. Ciencia e Agrotecnologia 26(3): 500-504 lavras. [C.F. Hort. Abst., No.3:2159].

Jakson, M.L. (1967). Soil chemical analysis. Printic–Hall of India PP. 144-197.

Kocsis, L; Lehoczky, E.; Bakonyi, L; Szoke, L. and Hajdu. E. (1998). New time and drought tolerant grape rootstocks variety. Acta. Hort., 473, 75-82.

Kurtiashvili, D.A. (1984). Phylloxera resistant rootstocks of grape in Georgia. Sadovodetvo IV inogradaistve No.12, 35-36. (C.F. Hort. Abst., 61: 1863).

Leeuwen, C.V.A.N.; P. Guigal and P. Pieri (1998). Observation on the influence of vine covering by means of anti transparent plastic sheet on berry ripening and wine quality. J. International de science de vigne el du rin 32(3): 136 (comp- search).

Levinskii, A.I.; A. Belinskii, and V.E. Botnor (1989). Phylloxera – resistant rootstocks of grope in western foothills of the cimea Sadovodstvo IV inogradaistve No.12, 35-36. (C.F. Hort. Abst, 61: 1863).

Lider, L.A.; Walker, M.A. and Wolpeit, J.A. (1995). Grape rootstocks in California vineyards : the changing picture. Acta Hort., 388,13-18.

Malossini, V.; Roncador, I. and Fellinof (1999). Weak vine rootstocks in the piana Rotaliana-Informator Agrario 55(34): 63-64.[C.F. Hort Abst., 70, No.(1): 1062].

McCarthy, M.G. and Cirami, R.M. (1990). The effect of rootstocks on the performance of chardonnay from a nematode-infested Barossa valley vineyard. Amer. J. Enol. Vitic., 41: 126-130.

Mullins, G.M.; Bouquet, A. and Williams, L.E. (1992). Biology of the grapevines, Cambridge Univ. Press, NY.

Nelson, D.W. and L. E. Sommers (1980). Total nitrogen analysis of soil and plant tissues. J. Assoc. affic Anal. Chem..,63-78 .

Novella, V.; I. de Palma; L. Tarricone; G. Vox and L. De Palma (2000). Effects of different plastic sheet covering on microclimate and berry ripening of table grape cv. Maltilde. J. Internat Des Sciences de la vigne et du via, 34(2): 49-55 (comp search).

Pauletto, D.; Mourao Filho, F.DEA.A.; Kluge, R.A.; Scarpare Filho, J.A. (2001). Effect of Niagara Rosada table grape. Agropcuaria Brasileira 36(7): 935–939 Brasilia, Brazil. (C.F. Hort Abst. 72: 5216).

Reddy, M.M.C. (1992). Effect of rootstocks on growth, yield and quality of Anab-e-Shahi grape symposium of grapevine development in India, Hyderobed, Feb.

Riad, P.W. (1974). Studies on plant parasitic nematodes associated with grape *Vitis vinifera* in Egypt. M.Sc. Thesis Fac. of Agric., Cairo Univ.

Sallam, A.M. (1992). Studies on grafting some grape cultivars. M.Sc. Thesis Fac. of Agric., Mansoura Univ.

Schmid, J.; E. Sopp; E.H. Ruhl and E. Hajdu (1998). Breeding rootstock varieties with complete phylloxera resistance. Acta Hort., 473: 131-135.

Southey, S.M. (1992). Root distribution of different grapevine rootstocks on a relatively saline soil. South African J. Enol. Viticul., 13: 1-9.

Sule, S. (1999). The influence of rootstocks resistance to crown gall (*Agrobacterium* spp) on the susceptibility of scions in grapevine. proceedings of New Aspects of Resistance Research on cultivated plants: Bacterial Diseases 5:32-34.

Walker, R.R.; Clingeleffer, P.R.; Kerridge, G.H.; Ruhi, E.H.; Nicholas P.R. and Blackmore, D.H. (1998). Effect of rootstock Ramsey (*Vitis champini*) on ion and organic acid composition of grapes and wine, and on wine spectral characteristics Austra L. J. Grape and Wine Res., 4: 100-110

Walker, R.B.; Blackmore, D.H.; Clingeleffer, R.P. and Ray, C.I. (2002). Rootstock effects on salt tolerance of irrigated field grown grapevines (*Vitis vinifera* L. cv. Sultana). I. Yield and vigor interrelate ion ships. Austria L-Y. Grape and wine Res.8:3-14.

Walker, R.R.; Read, P.E. and Blackmore, D.H. (2000). Rootstock and salinity effects on rates of berry maturation, ion accumulation and colour development in Res. 6:227-239.

Wolpert, S.A.; Walker, E.W.; Weber, E.; Bettiga, R.S. and Virdedall, P. (1991). Use of phylloxera – resistant rootstocks in California, Past, Present and Future Grape grower, 26:10-17.

Zachariakis, M.; Tzora Kakis, E; Kritastakis, I.; Manios V. Humic (2002). Substances stimulate plant growth and nutrient accumulation in grapevine rootstocks . Acta. Hort. No 459, 131-136 ISBN 90-6605-794-7.

Zamboni, M.; Venturi, A. and Vespignani, G. (2002). Rootstock influence on vegetative and productive characteristics of Sauvignon vines grown on the sands of Bosce Eliceo. Vignevini 29(10): 74-79 Boldogna, Italy (C.F. Hort. Abst., 2003. No. 5: 4206).

تأثير سلوك العنب السوبريور على بعض أصول العنب

غازي إبراهيم البنا *، السيد البدوي طه الباز *، سيف الدين سليمان الشحات ** و ثريا صابر أبو الوفا**

*** كلية الزراعة جامعة المنصورة .**

**** معهد بحوث البساتين بالمنصورة – مركز البحوث الزراعية – الجيزة**

أجرى هذا البحث خلال موسمي ٢٠٠٦ - ٢٠٠٧ في مزرعة خاصة بالخطاطبة محافظة المنوفية في أرض رملية تروى بالتنقيط ، وكان الهدف من البحث هو دراسة تأثير الأصول على سلوك العنب السوبريور من حيث تفتح البراعم وخصوبتها والمساحة الورقية ومحصول الكرمة والصفات الطبيعية والكيماوية للثمار وكذا NPK والكربوهيدرات الكلية.

وقد أظهرت النتائج أن جميع الأصول تحت الدراسة أدت إلى زيادة في النمو والمحصول والصفات الكلية الطبيعية وكان أكثر الأصول تفوقاً هو تلكى Teleki أما بالنسبة لأثر الأصول على كل من NPK والكربوهيدرات الكلية فقد أظهرت زيادة في NPK والكربوهيدرات في القصبات خلال موسمي الدراسة وهذا ناتج لأثر التطعيم على زيادة النمو الخضري وقوة الكرمة.

قام بتحكيم البحث

أ. د/ نبيل رشاد السيد سمرة — كلية الزراعة – جامعة المنصورة

أ. د/ احمد عطيه العايدى — كلية الزراعة – جامعة طنطا