

Effect Of Some Slow Release N Fertilizers on Growth and Fruiting in Early Sweet Grapevines

Ahmed, M.M.A. Akl¹, Ahmed M.K. Abdelaal¹, Mohamed A.M. Abada² and Meena N. I. Hanna²

¹Hort. Dept. Fac. of Agric. Minia. Univ. Egypt.

²Viticulture, Res. Dept. Hort. Rest. Institut., ARC., Giza, Egypt.

Abstract: During 2016 and 2017 seasons, Early Sweet grapevines grown under sandy soil were fertilized with four slow release N fertilizers namely phosphorus – coated urea, sulphur coated urea, formyldehyde and Methylene urea and the urea the fast soluble fertilizer. The four slow release N fertilizers were used at 25 to 50 g N/ vine and the urea was used at 50 g N/ vine. Using the four slow release N fertilizers namely phosphorus – coated urea, sulphur coated urea, methylene urea and urea- formaldehyde each at 25 to 50 g N/ vine was superior than using urea the fast release fertilizer in improving all growth aspects, photosynthetic pigments, N, P, K, Mg, Zn, Fe and Mn, yield and quality of the grapes. The best slow release N fertilizers were phosphorus coated urea, urea formaldehyde, methylen urea and sulphur coated urea, in descending order. No measurable promotion on these aspects was detected among using 25 and 50 g N/ vine for each slow release N fertilizer. The best results with regard to yield and quality of Early sweet grapevines were obtained, due to supplying the vines with phosphorus- coated urea at 25 g N/ vine.

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1. Introduction

Nitrogen is the most important mineral element in fertilization programs of grapevines because plants usually need N in greater amounts than other nutrients. However, less than 20% of the N applied to orchard fruits seems to be recovered by fruit trees. Nitrogen losses are caused by leaching, erosion, volatilization, denitrification and fixation in soil organic matter. Low N recovery by trees increases N losses from the orchards causing in negative impact on the environment (Nijjar, 1085).

Availability of nutrients during the entire growing season; reduced capital and labor quality in horticultural crop production, nutrient loss via leaching and run-off, chemical and biological immobilization reactions in soil which cause plant unavailable forms, rapid nitrification and nitrogen loss through ammonia volatilization and denitrification, seed or seedling damage from high local concentrations of salts, leaf burn from heavy rates of surface applied fertilizers and better seasonal distribution of growth and better acclimatization in home or display environment.

Previous studies showed that using slow release N fertilizers was preferable than using fast ones in enhancing, yield and fruit quality in different grapevine cvs (Ali- Mervet, 2000; Ibrahim-Asmaa, 2001; Tomasi *et al.*, 2001; Kamel, 2002, Uwakiem, 2011; Ahmed and Abada, 2012, Rabie

and Negm, 2012; Alam, 2014 and Ahmed *et al.*, 2014).

The merit of this study was examining the effect of using some slow release N fertilizers versus urea on fruiting of Early sweet grapevines grown under sandy soil.

2. Materials and Methods

This study was carried out during two consecutive seasons 2016 and 2017 on fifty – four uniform in vigour of 5- years old Early sweet grapevines grafted onto freedom grape rootstock. The selected vines are grown in a private vineyard located at West Matay, Matay district; Minia Governorate where the texture of the soil is sandy (Table 1). The selected vines are planted at 3.0 m between rows x 2.0 m (between vines) apart. The chosen vines were trained by spur system leaving 36 eyes/ vine (16 fruiting spurs x two eyes plus two replacement spurs x two eyes) using Baron supporting system. Winter pruning was carried out at the first week of Jan. during 2016 and 2017 seasons. Drip irrigation system using well water (550 ppm salinity) was followed. The selected vines (54 vines) received the same horticultural practices that were already applied in the vineyard.

Soil analysis was done before starting of the experiment (Piper 1950) and the obtained data are shown in Table (1).

This experiment included the following nine treatments from urea (46 % N) the fast release N fertilizer and the four controlled release fertilizers namely urea, formaldehyde (38.37 % N), phosphorus – coated urea (37.11 % N), sulphur – coated urea (41 % N) and methylene urea (38 % N):

- 1- Soil addition of urea at 50 g N / vine (107.5 g / vine)
- 2- Soil addition of urea – formaldehyde at 25 g / vine (65.8 g / vine)
- 3- Soil addition of urea formaldehyde at 50 g/ vine (131.6 g / vine)
- 4- Soil addition of P- coated urea at 25 g/ vine (67.4 g / vine)
- 5- Soil addition of P- coated at urea 50 g/ vine (134.8 g / vine)
- 6- Soil addition of S- coated urea at 25 g/ vine (102.5 g / vine)
- 7- Soil addition of S- coated urea at 50 g/ vine (205.0 g / vine).
- 8- Soil addition of methylene urea at 25 g/ vine (65.8 g / vine)
- 9- Soil addition of methylene urea at 50 g/ vine (131.6 g / vine)

Table (1): Analysis of the tested soil

Constituents	Values
Particle size distribution:	
Sand %	66.5
Silt %	20.0
Clay %	13.5
Texture %	Sandy
pH (1: 2.5 extract)	8.05
E.C. (1: 2.5 extract) (dsm ⁻¹) 1cm / 25°C	1.5
O.M. %	25.0
CaCO ₃ %	3.55
Total N %	0.04
Available P (Olsen method, ppm)	2.22
Available K (ammonium acetate, ppm)	100

Each treatment was replicated three times, two vines per each. The four slow release N fertilizers namely urea formaldehyde (38.37 % N), S- coated urea (41 %N), P- coated urea (38.33 % N) and methylene urea (38.0 %N) each at 25 to 50 g N/ vine were applied once at growth start (1st week of Mar.) in circular digs around each vine 10 cm apart from trunk and covered with soil, while the fast release N fertilizer namely urea was added at ten equal weekly batches via fertigation.

Randomized complete block design (RCBD) was adopted where the experiment included nine treatments, each treatment was replicated three times, two vines per each.

Various measurements:

1- Measurements of vegetative growth characteristics:

At the first week of May, during both seasons. twenty mature leaves were picked from the opposite side to the basal clusters on the shoots for calculating the leaf area using the following equation outlined by **Ahmed and Morsy (1999)**.

Leaf area (cm²) $0.45 (0.79 \times \text{diameter}^2) - 17.77$.

The average leaf area was recorded. Average main shoot The length (cm) was recorded as a result of measuring the length of the ten shoots per vine (cm) and the average shoot length was recorded. Number of leaves per shoot was also recorded. Dynamic of wood ripening coefficient was calculated by dividing the length of the ripened part of shoot that had brownish colour by the total length of the shoots (green colour) in the ten shoots/ vine (last week of Oct.) according to **Bouard (1966)**. Weight of prunings (kg.)/ vine was recorded just after carrying out winter pruning by weighing the removal one year old wood (1st week of Jan.). Average cane thickness (cm) was estimated in the five basal internodes of ten canes per vine by using a vernier caliper.

2-Measurements of leaf photosynthetic pigments:

Five leaves from the same previously leaves taken for measuring the leaf area from each vine were cut into small pieces and a known sample (0.5g) from each sample was taken, homogenized and extracted using 25% acetone with the assistance of little amounts of Na₂CO₃ and cleaned sand then filtrate. Filtration was washed several times with acetone till the filtrate was colorless. Acetone x1 was used as a blank. In the filtrates, the optical density % was determined using spectrophotometer at the wave length of 662 and 644 nm to determine chlorophylls a and b. respectively. The following equations were used for determination of these plant pigments according to **Von- Wettstein (1957)**

Chl.a= $(9.784 - E_{622}) - 0.99 - E_{644}$ = mg/l

Chl.b= $(21.426 - E_{644}) - (4.65 - E_{662}) +$ mg/l

Total chl. = chl.A + chl.B

Where E = optical density at a given wave length. Calculations were estimated as mg/ 100 g F.W.

3-Measurements of leaf contents of N, P and K (as %):

Petioles of the same leaves that were taken for measuring the leaf area according to **Summer (1985)** were washed several times with water and distilled water and then oven dried at 70°C and grounded, then 0.5weight of each sample was digested using

H₂SO₄ and H₂O₂ until clear solution (**Peach and Tracey, 1968**). In the digested solutions. The following nutrients were determined:

1- Percentage of N by the modified niucrokjeldahle method as described by **Piper (1950)**.

2- Percentage of P by using Olsen method as reported by (**Cottenie et al., 1982**).

3- Percentage of K by using Flame photometer apparatus as outlined by **Wilde et al., (1985)**.

4- 4- Mg by titration against EDTA (Versene method) (**Wilde et al., 1985**)

5- 5- Micronutrients namely Fe, Zn, Mn and Cu (as ppm) by using atomic absorption spectrophotometer according to (**Wilde et al., 1985**).

4-Measurements of berry setting %:

It was calculated by caging five clusters/ vine in perforated paper bag's before blooming stage. The bages were removed at the end of berry setting stage. The number of attached and dropped berries as well as total number of flowers per vine were recorded (dropped + attached berries). Percentage of berry setting was estimated by dividing number of attached berries by total number of flowers per cluster and multiplying the product by 100.

5-Measurements of yield as well as physical and chemical characteristics of the berries:

Harvesting was conducted (last week of May). The yield of each vine was recorded in terms of weight of cluster (g.) and number of clusters/vine. Five clusters per each vine were taken for determination of the following physical and chemical characteristics of the berries:

1- Custer dimensions (length and shoulder in cm).

2- Cluster compactness by dividing luster weight by luster length.

3- Percentage of shot berries by dividing number of small dividing berries by total number of berries/cluster and multiplying the product by 100.

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

5- Percentage of total soluble solids in the juice by using handy refractometer.

6- Percentage of total acidity in the juice (as g tartaric acid/100 ml juice) by titration against 0.1 N NaOH using phenolphthalein indicator (**A.O.A.C., 2000**).

7- The percentage of reducing sugars in the juice (**Lane and Eynon, 1965**) as described by **A.O.A.C. (2000)**.

8- Total nitrite (**Rindour Lisa et al., 2000**).

Statistical analysis:

Statistical analysis was done and different treatment means were compared using new L.S.D. at 5% (**Snedecor and Cochran, 1980; and Mead et al., 1993**)

3. Results

1-Some vegetative growth aspects:

It is clear from the obtained data (in Table 2) that fertilizing the vines with the four slow release N fertilizers at 25 to 50 g N/ vine significantly was accompanied with stimulating the six growth traits namely main shoot length, number of leaves/ shoot, leaf area, wood ripening coefficient, cane thickness and pruning wood weight over the application of urea the fast release N fertilizer at 50 g N/ vine. The promotion on these growth aspects was significantly associated with fertilizing with phosphorus coated urea (Pcu), urea formaldehyde (uF), methylene urea (Mu) and sulphur coated urea (Scu), in descending order. Significant differences on these growth traits were observed among the five fertilizer treatments. Increasing concentrations of the four slow release N fertilizers from 25 to 50 g N/ vine failed to show significant promotion on these growth aspects. Therefore from economical point of view it is advised to use any slow release N fertilizers at 25 g N / vine instead of using 50 g N/ vine. The maximum values were recorded on the vines that fertilized with N via Pcu at 25 g N/ vine. Using urea the fast release N fertilizer at 50 g N/ vine gave the minimum values. These results were true during both seasons.

2- Photosynthetic pigments in the leaves.

It is clear from the obtained data (in Table 3) that chlorophylls a & b, total chlorophylls and total carotenoids were significantly varied among the five slow and fast release in fertilizers. They were significantly increased with using the four slow release N fertilizers than using urea the fast ones. The best slow release N fertilizers in this respect were Pcu, UF, Mu and Scu, in descending order. No significant promotion on these plant pigments was observed among the application of 25 and 50 g N/ vine. Significant differences on these pigments were detected among the five slow and fast release N fertilizers. The maximum values were recorded on the vines that fertilized with Pcu at 25 g / vine. The lowest values were recorded on the vines that fertilized with urea the fast release N fertilizer at 50 g N/ vine. These results were true during both seasons.

3- Percentages of N, P, K, Mg (as %) and Zn, Fe, Mn and Cu (as ppm)

It is clear from the data obtained in Tables (3 & 4) that treating Early Sweet grapevines with any one of the four slow release N fertilizers Pcu, UF, Mu and Scu each at 25 to 50g / vine significantly was responsible for enhancing N, P, K, Mg, Zn, Fe and Mn compared to supplying the vines with urea the fast release N fertilizer. There was a gradual and insignificant promotion on these nutrients with increasing levels of N from 25 to 50 g N/ vine. The

promotion on these nutrients was significantly related to using Pcu, UF, Mu and Scu, in descending order. Significant differences on these nutrients were observed between the five slow and fast observed between the five slow and fast release N fertilizers. Using Pcu at 25 g / vine gave the maximum values. The minimum values were recorded on the leaves of the vines that received urea at 50 g N/ vine. These results were true during both seasons leaf content of Cu was significantly unaffected by the present treatments.

4- The percentage of berry setting.

Fertilizing Early sweet grapevines as shown in Table (5) with any one of the four slow release N fertilizers significantly improved the percentage of berry setting than using urea the fast release N fertilizers. Significant differences on such percentage were observed among the five slow and fast release N fertilizers. The highest values were recorded when the vines treated with Pcu, UF, Mu and Scu, in descending order. The maximum values (15.5 & 15.3 %) were recorded on the vines that fertilized with Pcu at 25 g N/ vine. The lowest values (10.1 & 9.7 %) were recorded on the vines that received urea at 50 g N/ vine. These results were true during both seasons.

5- The yield and cluster aspects

It is evident from the obtained data (in Table 5) that supplying Early Sweet grapevines with any one of the four slow release N fertilizers significantly was accompanied with improving yield expressed in weight and number of clusters / vine as well as

weight, length, shoulder and compactness of cluster compared to the application of the urea. Significant differences on these parameters were recorded among the five slow and fast release N fertilizers. The best slow release N fertilizers in improving the yield and cluster weight were Pcu, UF, M, Scu, in descending order. The maximum yield (12.3 & 15.1 kg) were observed on the vines that supplied with PCU at 25 g N/ vine during both seasons. The lowest yield was detected on the vines that fertilized with urea at 50 g N/ vine. Similar trend was noticed during both seasons. Number of clusters / vine in the first season of study was significantly unaffected by the present treatments.

6- Berries characteristics

It is clear from the obtained data on Table (6) that fertilizing the vines with any one of the four slow release N fertilizers (Pcu, UF, Mu and Scu) each at 25 to 50 G N/ tree was significantly very effective in enhancing fruit quality in terms of increasing berry weight, longitudinal and equatorial, T.S.S. and reducing sugars and decreasing total acidity and total nitrite relative to the use of urea. The best slow release N fertilizer in this respect was Pcu, UF, MU and Scu, in descending order. Significant differences on these parameters were noticed among the five slow and fast release N fertilizers. Increasing N levels from 25 to 50 g N/ vine failed to show significant promotion on the quality of the berries. Therefore, from economical point of view, it is suggested to use Pcu at 25 g N/ tree. Similar trend was noticed during both seasons.

Table (2): Effect of some slow release N fertilizers on some vegetative growth aspects of Early sweet grapevines during 2016 and 2017 seasons.

Treatments	Main shoot length (cm)		Number of leaves/ shoot		Leaf area (cm) ²		Wood ripening coefficient		Cane thickness (cm)		Pruning wood weight kg/ vine	
	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017
U at 50 g./ vine	110.1	109.0	15.0	14.0	109.0	110.0	0.64	0.62	0.92	0.90	1.94	1.99
UF at 25 g./ vine	115.5	114.5	22.0	22.0	113.9	115.0	0.82	0.85	1.19	1.20	2.42	2.47
UF at 50 g./ vine	115.6	114.6	22.0	22.0	114.0	115.1	0.83	0.85	1.20	1.20	2.43	2.50
PCU at 25 g./ vine	118.0	116.9	25.0	25.0	116.6	117.8	0.90	0.92	1.29	1.30	2.55	2.66
PCU at 50 g./ vine	118.3	117.3	25.0	25.0	116.7	118.0	0.91	0.92	1.30	1.31	2.56	2.66
SCU at 25 g./ vine	112.0	111.0	17.0	17.0	110.6	111.8	0.69	0.69	1.00	1.02	2.11	2.16
SCU at 50 g./ vine	112.2	111.2	17.0	17.0	110.8	112.0	0.70	0.70	1.01	1.02	2.12	2.17
MU at 25 g./ vine	113.9	113.0	20.0	20.0	112.0	113.5	0.76	0.77	1.10	1.11	2.24	2.30
MU at 50 g./ vine	114.0	113.3	20.0	20.0	112.0	113.6	0.77	0.78	1.11	1.12	2.25	2.31
New L.S.D. at 5%	0.9	1.1	2.0	2.0	1.3	1.2	0.05	0.06	0.07	0.05	0.11	0.13

U= urea (46% N); UF = Urea Formaldehyde (38.37% N); PCU= Phosphours Coated Urea (37.11% N); SCU = Sulphur Coated Urea (41 % N); MU = Methyl Urea (38 %).

Table (3): Effect of some slow release N fertilizers on photosynthetic pigments and percentages of N and P in the leaves of Early sweet grapevines during 2016 and 2017 seasons.

Treatments	Chlorophyll a (mg/ g F.W.)		Chlorophylla (mg/ g F.W.)		Total chlorophylls (mg/ g F.W.)		Total carotenoids (mg/ g F.W.)		Leaf N %		Leaf P %	
	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017
U at 50 g./ vine	4.1	3.9	1.2	1.0	5.3	4.9	1.1	1.2	1.50	1.48	1.161	0.160
UF at 25 g./ vine	6.0	6.0	2.5	2.3	8.5	8.3	2.2	2.3	1.73	1.75	0.198	0.200
UF at 50 g./ vine	6.0	6.0	2.6	2.4	8.6	8.4	2.3	2.3	1.74	1.75	0.199	0.200
PCU at 25 g./ vine	6.6	6.8	3.2	2.8	9.8	9.6	2.6	2.8	1.81	1.82	0.221	0.222
PCU at 50 g./ vine	6.7	6.9	3.3	2.9	10.0	9.8	2.7	2.9	1.82	1.82	0.222	0.223
SCU at 25 g./ vine	4.5	4.5	1.5	1.3	6.0	5.8	1.4	1.4	1.57	1.59	0.172	0.173
SCU at 50 g./ vine	4.6	4.6	1.6	1.4	6.2	6.0	1.4	1.4	1.58	1.60	1.73	1.74
MU at 25 g./ vine	5.3	5.4	2.0	1.8	7.3	7.2	1.7	1.7	1.65	1.66	0.186	0.187
MU at 50 g./ vine	5.4	5.5	2.0	1.9	7.4	7.4	1.8	1.8	1.66	1.66	0.187	0.188
New L.S.D. at 5%	0.3	0.3	0.2	0.2	0.4	0.4	0.2	0.2	0.05	0.06	0.009	0.010

U= urea (46% N); UF = Urea Formaldehyde (38.37% N); PCU= Phosphours Coated Urea (37.11% N); SCU = Sulphur Coated Urea (41 % N); MU = Methyl Urea (38 %).

Table (4): Effect of some slow release N fertilizers on the leaf content of K and Mg (as %) and Zn, Fe, Mn and Cu (as ppm) of Early sweet grapevines during 2016 and 2017 seasons.

Treatments	Leaf K %		Leaf Mg %		Leaf Zn (ppm)		Leaf Fe (ppm)		Leaf Mn (ppm)		Leaf Cu (ppm)	
	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017
U at 50 g./ vine	1.06	1.00	0.52	0.51	50.1	51.0	51.9	52.3	53.0	52.9	1.22	1.23
UF at 25 g./ vine	1.30	1.26	0.69	0.71	59.9	60.1	62.0	60.9	61.0	60.9	1.024	1.25
UF at 50 g./ vine	1.32	1.27	0.70	0.72	60.0	60.2	62.2	61.0	61.3	61.2	1.24	1.24
PCU at 25 g./ vine	1.41	1.35	0.75	0.76	64.0	65.0	65.6	65.9	63.5	64.4	1.24	1.24
PCU at 50 g./ vine	1.42	1.36	0.75	0.76	64.1	65.2	65.7	66.0	63.6	64.5	1.24	1.24
SCU at 25 g./ vine	1.13	1.09	0.56	0.59	52.9	53.9	55.5	55.0	55.5	55.6	1.23	1.24
SCU at 50 g./ vine	1.14	1.10	0.56	0.60	53.0	54.0	55.6	55.1	55.6	55.7	1.23	1.24
MU at 25 g./ vine	1.20	1.19	0.62	0.62	56.9	56.9	56.9	58.9	58.0	58.3	1.23	1.24
MU at 50 g./ vine	1.21	1.20	0.63	0.63	57.0	57.0	59.0	58.0	58.3	58.5	1.24	1.21
New L.S.D. at 5%	0.05	0.04	0.03	0.04	11.9	2.1	2.1	1.9	2.0	2.1	NS	NS

U= urea (46% N); UF = Urea Formaldehyde (38.37% N); PCU= Phosphours Coated Urea (37.11% N); SCU = Sulphur Coated Urea (41 % N); MU = Methyl Urea (38 %).

Table (5): Effect of some slow release N fertilizers on the percentage of berry setting, yield per vine, weight, length and width of cluster and cluster compactness of Early sweet grapevines during 2016 and 2017 seasons.

Treatments	Berry setting %		No. of clusters per vine		Yield/ vine (kg.)		Av. Cluster weight (g.)		Av/ cluster length (cm)		Av. Cluster width (cm)		Cluster compactness	
	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017
U at 50 g./vine	10.1	9.7	24.0	23.0	10.8	10.1	450.0	441.0	16.0	16.9	12.0	12.5	4.11	4.20
UF at 25 g./vine	13.9	14.0	24.0	29.0	11.6	14.0	482.0	483.0	17.6	18.6	13.4	14.0	7.69	7.78
UF at 50 g./vine	14.0	14.2	29.0	25.0	12.1	14.0	483.0	483.5	17.7	18.7	13.5	14.0	7.80	7.90
PCU at 25 g./vine	15.3	15.5	25.0	31.0	12.3	15.2	492.0	491.9	18.9	20.0	14.0	14.8	8.41	8.51
PCU at 50 g./vine	15.5	15.6	25.0	31.0	12.3	15.3	492.0	492.0	19.0	20.2	14.1	15.0	8.50	8.61
SCU at 25 g./vine	10.6	10.4	24.0	25.0	11.0	11.5	460.0	459.7	16.4	17.5	12.4	13.0	4.55	4.70
SCU at 50 g./vine	10.7	10.5	24.0	25.0	11.1	11.5	461.0	461.2	16.5	17.6	12.5	13.2	4.70	4.78
MU at 25 g./vine	12.0	11.9	24.0	27.0	11.3	12.7	470.0	468.9	17.0	18.0	13.0	13.4	5.90	6.00
MU at 50 g./vine	12.1	12.0	24.0	27.0	11.3	12.7	471.0	469.0	17.1	18.1	13.0	13.5	6.06	6.13
New L.S.D. at 5%	1.0	1.1	NS	2.0	0.2	0.2	8.3	8.1	0.4	0.3	0.3	0.3	0.31	0.41

U= urea (46% N); UF = Urea Formaldehyde (38.37% N); PCU= Phosphors Coated Urea (37.11% N); SCU = Sulphur Coated Urea (41 % N); MU = Methyl Urea (38 %).

Table (6): Effect of some slow release N fertilizers on some physical and chemical characteristics of Early sweet grapevines during 2016 and 2017 seasons.

Treatments	Av. Berry weight (g.)		Av. Berry longitudinal (cm)		Av. Berry equatorial (cm)		T.S.S. %		Reducing sugars %		Total acidity %		Nitrite in the juice (ppm)	
	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017
U at 50 g./vine	3.40	3.38	1.90	1.85	1.81	1.79	19.5	15.7	17.8	18.0	0.779	0.781	3.22	3.40
UF at 25 g./vine	3.84	3.87	2.06	2.08	1.93	1.94	17.3	17.4	19.3	19.5	0.701	0.711	1.21	1.06
UF at 50 g./vine	3.86	3.89	2.07	2.09	1.94	1.95	17.4	17.5	19.4	19.6	0.699	0.709	1.18	1.03
PCU at 25 g./vine	3.94	3.97	2.13	2.15	1.98	1.99	18.0	18.0	19.8	20.1	0.680	0.681	1.00	0.84
PCU at 50 g./vine	3.96	4.00	2.13	2.16	2.00	2.01	18.0	18.2	19.9	20.2	0.677	0.679	0.98	0.83
SCU at 25 g./vine	3.52	3.55	1.94	1.95	1.84	1.86	16.0	16.2	18.2	18.4	0.760	0.761	2.15	1.99
SCU at 50 g./vine	3.53	3.57	1.95	1.96	1.85	1.87	16.1	16.3	18.3	18.5	0.759	0.760	2.11	1.94
MU at 25 g./vine	3.66	3.67	2.00	2.02	1.88	1.89	16.6	16.6	18.7	19.0	0.737	0.736	1.82	1.67
MU at 50 g./vine	3.68	3.71	2.01	2.03	1.89	1.90	16.7	16.7	18.8	19.0	0.736	0.735	1.76	1.64
New L.S.D. at 5%	0.08	0.07	0.04	0.03	0.02	0.02	0.4	0.4	0.4	0.4	0.011	0.010	0.06	0.07

U= urea (46% N); UF = Urea Formaldehyde (38.37% N); PCU= Phosphors Coated Urea (37.11% N); SCU = Sulphur Coated Urea (41 % N); MU = Methyl Urea (38 %).

4. Discussion

Recently, new techniques for fertilization of fruit trees grown under sandy soil were arisen. Out of those, the application of controlled release N fertilizers they were developed mainly to reduce the number of replications per year, minimize the cost of production, improve the efficiency of N used by trees, reactions and the rapid denitrification (Nijjar, 1985) The control and continues providing of the trees with their requirements from N can be achieved by using controlled release N fertilizers which are responsible for releasing their own N at a longer period and at the critical date of fruit development.

These results are in agreement with those obtained by Ali- Mervat (2001), Ibrahim – Asmaa (2001); Tomasi *et al.*, (2010), Kamel (2002); Uwakiem and Abada (2011), Ahmed and Abada, (2012); Rabie and Negm (2012), Alam (2014) and Ahmed *et al.*, (2014).

Conclusion

Under the experimental and resembling conditions, it is suggested to fertilize Early Sweet grapevines grown under sandy soil with P- coated urea or urea- formaldehyde each at 25 g N/ vine for improving yield and berries characteristics.

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