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A- EFFECT OF CANE LENGTH ON BUD BEHAVIOR, YIELD, BUNCH CHARACTERISTICS, WOOD RIPENING AND CHEMICAL CONTENTS OF EARLY SUPERIOR GRAPEVINES.

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ABSTRACT

This investigation was carried out in a private vineyard located at Madenet El Sadat, Menofya Governorate on five years old trees of Early Superior grapevines. The study was conducted for two successive seasons 2001 and 2002. Vines were trained according to cane system, with different number of canes (5, 6, 7, 9 canes/vine) and different number of buds (14, 12, 10, 8 buds/cane). Number of buds/vine being fixed at 70-72 buds, in addition to the renual spure buds per each level of cane length.

The results showed that, the period of bud burst lasted about 3-4 weeks (from the mid of February till the first week of March). Regardless cane length treatments, the percentage of the bursted buds showed a gradual increase all along the period of bud burst activity. The percentage of buds burst increased with increasing cane length to 14 buds/cane, while the fruitful buds percentage and fertility coefficient were increased at cane length 12, 10 buds/cane. The treatment of 8 buds/cane followed by treatment 10 buds/cane showed a significant increase in shoot length, leaf number, leaf area and pruning wood weight. Vines with treatments (12 & 10 buds/cane) gave greater number of bunches and higher yield per vine than vines with longer and shorter canes. Vines, with cane length 8 buds/cane followed by treatment with 10 and 12 buds/cane gave the greatest bunch, rachis weight, number of berries/bunch, weight and size of berry. T.S.S and T.S.S/acid ratio were increased at the short cane length, while acidity was decreased. The process of wood maturity on the resulting shoots was obviously slowed by increasing cane length, wood ripening gradually advanced in all treatments till November. Increasing the cane length decreased total carbohydrates and total nitrogen of wood pruning.

INTRODUCTION

Egypt cultivates about one hundred and fifty thousand feddans grapes and has a crop of nearly a million tons. Producing good quality grape for export necessitates the attribution of some factors like precocity and high bunch quality, in addition to crop quantity. The cultivars in Egypt (e.g. Flame Seedless, Superior, Early Superior, King Ruby and Thompson Seedless), cover approximately the whole season. These cultivars help in increasing exports to European, Arab and Asian countries. Early superior is an early variety, which can be useful for grape export. Usually growers adopt the cane training system to obtain a high yield without taking into account the negative effect on the bunch quality.Cane length and number of canes per vine are the most important factors affecting high and good quality of bunches in relation with the vine vigor of Vitis cultivars. Many investigators studied the effect of cane length and bud load per vine on fruit quality and yield (Naidenov *et al.*, 1980; Morris and Cawthon,1980; May *et al.*,1982; Andrson and Sims, 1991; Rizk *et al.*, 1994; Rizl, 1996; Sehrawate *et al.*, 1998 and Ali *et al.*, 2000).

In this connection, Fawzi *et al.*, (1984) showed that within a constant bud load (72 buds/vine) the increase of cane length resulted in a paralle increase in bunch number and yield per vine.

The objective of this work is to obtain the optimum number of canes left on the vine with constant 70 - 72 buds per vine on early superior cultivar. Also, to study the effect of cane length on the quality of bunches, berries, total yield per vine, wood ripening, total carbohydrate and nitrogen contents.

MATERIALS AND METHODS

This work was carried out during two successive seasons (2001 and 2002) and extended up to April, 2003 in a private vineyard at Sadat area, Menofya governorate on Early Superior grapevines. These vines were five years old, growing in sandy soil under drip irrigation system, spaced at (2 × 3.5) meters, and trained according to the cane system. Telephone system was used as a supporting system. The vines were subjected to the same horticultural practices and pruned during the last week of December in both seasons of the study to leave a fixed number of buds per vine. Four treatments of cane length were carried out as follows:

1) 5 canes × 14 buds per each cane. (70 buds / vine).
2) 6 canes × 12 buds per each cane. (72 buds / vine).
3) 7 canes × 10 buds per each cane. (70 buds / vine).
4) 9 canes × 8 buds per each cane. (72 buds / vine).

These treatments were arranged in a complete randomized block design with 3 replicates in each treatment and 3 vines / replicate. Data were statistically analyzed according to the methods described by Snadecor, 1967. The vines were subjected to the following evaluations:

1 - Bud behavior:

Dorment buds per vine were observed at weekly intervals along burst period. Number and percentages of bursted buds, vegetative and fruitful buds were recorded on the spring of 2002 and 2003, i.e. the season, following to the seasons of application (2001 & 2002). Number of clusters at different positions of the cane was also recorded. The percentage of bud burst, vegetative buds and fruitful buds were calculated as follows:

$$\text{Percentage of bud burst} = \frac{\text{No. of ursted buds}}{\text{Bud load / vine}} \times 100$$

$$\text{Percentage of vegetative buds} = \frac{\text{No. of vegetative buds}}{\text{No. of bursted buds}} \times 100$$

$$\text{Percentage of fruitful buds} = \frac{\text{No. of fruitful buds}}{\text{No. of bursted buds}} \times 100$$

Fertility coefficient was calculated by dividing number of bunches per vine by total number of buds per vine as mentioned by (Huglin, 1958 and Bessis, R., 1960). Also, the percentage of fertile buds at the a fore-mentioned positions lengthwise the cane were calculated in relation to the number of the bursted buds in each position.

2 - Growth vigor:

At growth cessation, the ultimated shoot length, number of leaves per shoot and the average leaf area of leaves were measured using a leaf area meter. Weight of one year old pruning wood was recorded at the pruning time in the last week of December.

3 - Number of bunches and yield / vine:

Average number of clusters and weight of yield / vine were determined at harvest time (first week of June) of the two studied seasons.

4 - Physical and chemical characteristics of clusters and berries (fruit quality):

At harvest time, samples of 24 bunches per each treatment were taken to the laboratory to carrying out the following data:

a) Average weight of cluster.
b) Average dimensions of cluster.
c) Average number of berries / cluster.
d) Average weight of rachis per bunch.
e) Berry weight and size as an average of 100 berries / replicate.
f) Berry dimensions and coefficient of berry elongation (length/ diameter) as an average of 10 berries / replicate.
g) Total soluble solids (T.S.S %) in berry juice using a hand refractometer.
h) Total titratable acidity (as tartaric acid %) according to the Official Analysis Methods (A. O. A. C., 1970).
i) T.S.S / acid ratio.

5 - Dynamics of wood ripening:

On each experimental treatment, 16 shoots of the current season were tagged for each treatment to follow up the rate of wood ripening on their basal section. Starting from September and at monthly intervals till mid of November. Coefficient of wood ripening was calculated as follows:

$$\text{Dynamics of wood ripening} = \frac{\text{Length of ripened part}}{\text{Total length of the shoot}}$$

At each measuring data, the part of the shoot that ripened always change in color from greenish to brownish (Bouard, 1966).

6 - Chemical contents of 1-year-old wood:

Samples of one-year-old cane which bore bunches in summer were collected at winter pruning (one cane per each vine). In the laboratory, canes were mixed, dried and ground as one sample for the following assays:

A. Total carbohydrates:

Total carbohydrates were determined according to the method described by Plummer (1971).

B. Nitrogen contents:

Nitrogen content was estimated in the obtained digests using microkjeldehl distillation method (A. O. A. C., 1965).

The complete randomized block design was followed. The statistical analysis of the present data was carried out according to Snedecor and Cochran (1972).

RESULTS AND DISCUSSION

Bud behavior:

Bud burst:

Observations recorded for all treatments in both seasons of the investigation, showed that the dormant buds of Early Superior grapevines under our study started to burst in the mid of February and continued up to the first week of March; i.e., for a duration of about 3 weeks. This feature was more pronouncing from (14/2) to (6/3) (Fig.1) in both seasons. However, cane length treatments did not appear to exert an obvious effect on the beginning of bud burst activity. This result seemed to be in harmony with that mentioned by Jauhari and Nand (1970); Sharma *et al.*, (1977 & 1978) and Abd El-Wahab (1997). In addition, data in Fig. (1) indicate a significant gradual increase in bud burst percentage from mid February until the first week of March. The highest averages 69.39 % in the first season and 65.82 % in the second season were obtained on 6th of March in both seasons. As regard to the differences between the studied treatments it appears, that the length of (14, 12 and 10 buds/cane) possessed a high percentage of bud burst in both seasons. Moreover, treatment of (9canes × 8 buds / cane) recorded the least percentage of bud burst in both seasons. Thus, it could be disclosed that the over length canes (14buds/cane) resulted in an increase in bud burst behavior.

By the end of each bursting period (March 6th in both seasons), data presented in Table (1) showed that bud burst was markedly affected by increasing cane length. It was significantly increased as cane length increase in the two seasons of the study. This increase may be attributed to the elimination of polarity phenomenon. Fouad 1990, showed that the least percentage of bud burst observed in oblique orientation of the cane of Thompson Seedless grapevines, could be ascribed to the slight influence of this treatment on polarity phenomenon, since the position of canes approaches the vertical position at which polarity is accentuated.

The upper most bud burst percentages were 76.93 in the first season and 74.13 in the second season respectively for the treatment (5canes × 14buds/cane) followed by (6canes × 12buds/cane), (7canes × 10buds/cane) and (9canes × 8buds/cane). The results in this respect agree with those obtained by Fawzi *et al.*, (1984b); Fouad (1990); Rizk *et al.*, (1994) and Abd El-Rhman (2002).

Vegetative buds:

Data concerning the effect of cane length on the percentage of vegetative buds in relation to the total number of bursted buds are presented in Table (1). The results indicated that treatments of (9canes × 8buds/cane & 5canes × 14buds/cane) gave the highest significant average (76.26 & 74.00) in the first season and (70.08 & 69.17) in the second season, respectively.

Fruitful buds & fertility coefficient:

Data in Table (1) indicated that treatments of (6canes × 12buds/cane and 7canes × 10buds/cane) gave the highest significant values concerning the percentage of fruitful buds. These treatments recorded (32.43% & 28.50%) and (36.52% & 32.87%) at the two seasons 2002 and 2003 respectively. Regarding the fertility coefficient, data in Table (1) indicated that treatments of (6canes × 12buds/cane & 7canes × 10buds/cane) gave the highest significant values (0.23 & 0.23) in the first season and (0.26 & 0.25) in the second season, respectively. These results are in agreement with the finding of Balasubranmanyam and Khanduja (1977); Singhrot *et al.*, (1977) and Rizk *et al.*, (1994).

Growth vigor:

Data concerning the effect of cane length on the growth vigor are presented in Table (2). It is clear that treatment No. 4 (9canes × 8buds/cane) gave the longest shoot during the first season (174.23cm) and the second season (172.07cm) followed by treatment No. 3 (7canes× 10buds/cane) (164.63 & 157.94cm) in both seasons, respectively. However, the shortest shoots were noticed in canes of (14buds/cane) (148.54cm) in the first season and (140.0cm) in the second one. The same trend was found for the number of leaves/shoot, it gave the highest values (50.00 & 43.85 leaves/shoot) for the treatment comprised (9canes × 8buds/cane) followed by treatments of (7canes × 10buds/cane) (42.07 & 45.33) in both seasons, respectively. These results, as a general trend are in agreement with the conclusions given by Shinde & Rane (1979); Ibrahim *et al.*, (1996) and Abd El-Wahab (1997).

The average measurements of leaf area are shown in Table (2). The same trend for the above-mentioned treatments comprised (9canes × 8buds/cane) and (7canes × 10buds/cane). Increasing the cane length decreased the current season's shoot length, number of leaves / shoot and leaf area. This may be attributed to competition between the shoots in the treatments of high cane length. These results are in agreement with those obtained by Sommer (1995); Ibrahim *et al.*, (1996); Abd El-Wahab (1997) and Abd El-Rhman (2002).

Weight of 1-year-old pruning wood:

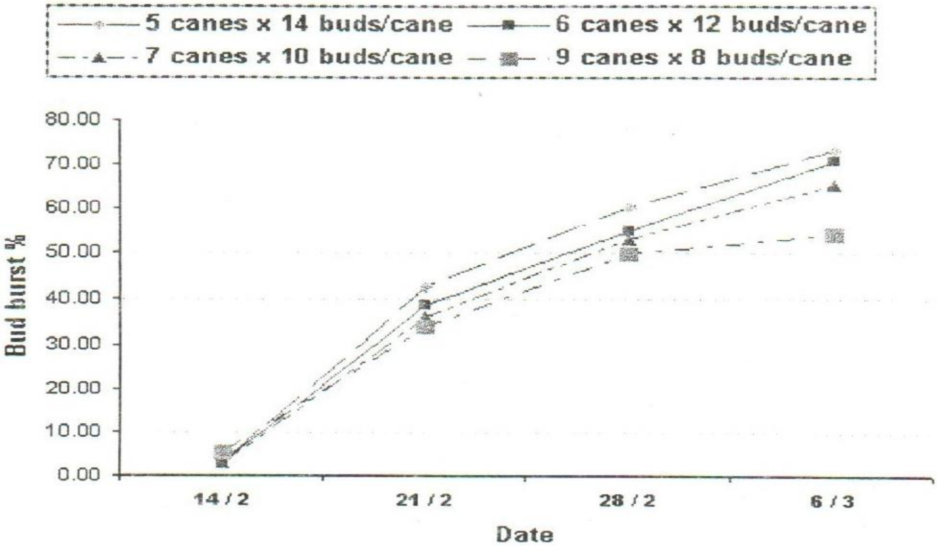
The average measurements of pruning wood weight are given in Table (2). The effect of cane length significantly proved the results. Such effect showed that pruning wood weight gave a pronounced increase with decreasing cane length. The treatments comprised (9canes × 8buds/cane) significantly increased pruning wood weight during the two seasons (7.50 & 8.47 kg) followed by treatments of 10buds/cane (7.37 & 8.10 kg) in both seasons, respectively, while the lowest values were obtained from the highest cane length treatment 14buds/cane with (6.93 & 7.00 kg) in both seasons, respectively. Increasing number of buds per cane lead to decrease wood ripening Fig. (2), total carbohydrates Table (7) consequently, decrease weight of 1-year-old pruning wood. Similar results were obtained by Abd El-Fattah *et al.*, (1993).

Table (1): Effect of cane length on bud behavior of Early Superior grapevines

Treatments	First season (2002)								Second season (2003)							
No. of canes × No. of Buds / cane	Bud burst (%)		Vegetative buds (%)		Fruitful buds (%)		Fertility coefficient		Bud burst (%)		Vegetative buds (%)		Fruitful buds (%)		Fertility coefficient	
5 x 14	76.93	A	74.00	A	26.00	C	0.21	D	74.13	A	69.17	A	30.83	C	0.19	C
6 x 12	73.11	B	67.57	C	32.43	A	0.23	A	70.43	B	63.48	C	36.52	A	0.26	A
7 x 10	69.03	C	71.50	B	28.50	B	0.23	A	65.20	C	67.13	B	32.87	B	0.25	A
9 x 8	58.50	D	76.26	A	23.74	C	0.14	C	54.17	D	70.08	A	29.92	C	0.23	B
L.S.D. at 5%	3.36		2.31		2.31		0.01		3.53		1.60		1.60		0.01	

Table (2): Ultimate measurments of vegetative growth of Early Superior grapevines as affected by cane length.

Treatments	First season (2002)								Second season (2003)							
No. of canes × No. of Buds / cane	Shoot length (cm)		No. of leaves/shoot		Leaf area (cm2)		Weight of pruning wood (kg)		Shoot length (cm)		No. of leaves/shoot		Leaf area (cm2)		Weight of pruning wood (kg)	
5 x 14	148.54	C	35.33	D	126.40	C	6.93	D	140.00	D	36.23	D	121.69	D	7.00	C
6 x 12	151.77	C	37.67	C	121.17	D	7.07	C	146.73	C	38.84	C	130.47	C	8.07	B
7 x 10	164.63	B	45.33	B	131.53	B	7.37	B	157.94	B	42.07	B	140.67	B	8.10	B
9 x 8	174.23	A	50.00	A	139.00	A	7.50	A	172.07	A	43.85	A	158.60	A	8.47	A
L.S.D. at 5%	3.79		1.49		2.48		0.11		2.88		1.62		3.99		0.18	



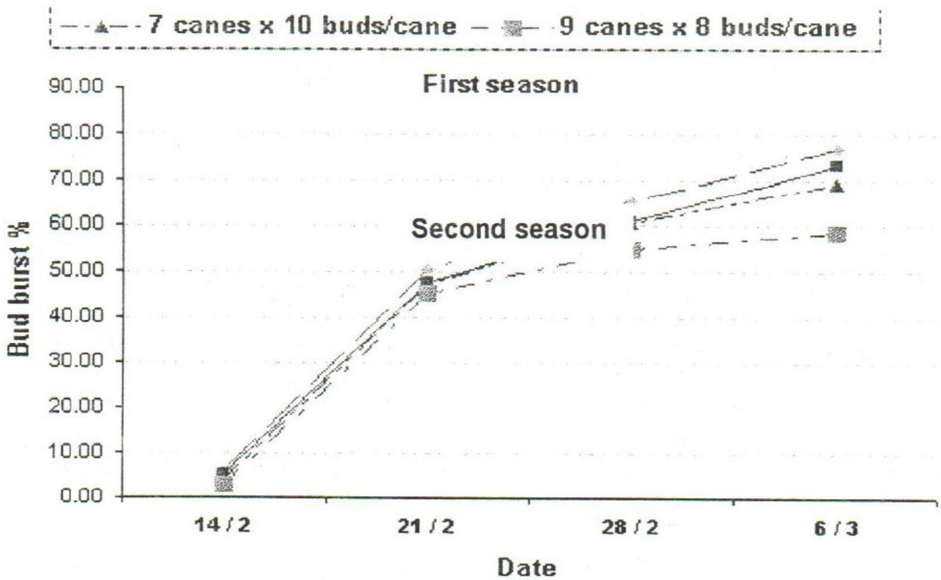


Fig (1): Periodical changes in bud burst % of Early Superior Grapevines as affected by length of cane (season 2002 & 2003).

Number of bunches and yield per vine:

Concerning the number of bunches/vine from Table (3), it is clear that treatments (6canes × 12buds/cane and 7canes × 10buds/cane) gave the highest number of bunches per vine in a significant way. They recorded (16.67 & 16.00) and (18.67 & 17.67) bunch / vine in the two seasons respectively. The least values were recorded with the shortest cane (9canes × 8buds/cane). Similarly, the yield per vine recorded (11.77&11) and (14.37&11.63) for the above mentioned treatments. Such results could be ascribed to the higher percentage of fruitful buds and higher fertility coefficient per bud when long canes (12 & 10 buds each) were used. The least values of the yield per vine were for the long and very short cane length (5 × 14 and 9 × 8) and no significant differences were noticed between them in the first season, while in the second season the least value was very short cane length only. These results are in harmony with those obtained by Sourial (1976); Fawzi *et al.*, (1984b); Lagarda (1986); Marwad *et al.*, (1993); Rizk *et al.*, (1994) and Rizk (1996).

Table (3): Effect of cane length on number of bunches and yield of Early Superior grapevines.

Treatments	First season (2001)				Second season (2002)			
No. of canes × No. of Buds / cane	No. of Bunches / vine		Yield / vine (Kg)		No. of Bunches / vine		Yield / vine (Kg)	
5 × 14	15.00	B	8.33	B	16.00	B	9.19	C
6 × 12	16.67	A	11.77	A	18.67	A	14.37	A
7 × 10	16.00	AB	11.00	A	17.67	A	13.67	A
9 × 8	10.00	C	7.89	B	13.67	C	11.13	B
L.S.D at 5%	1.53		0.96		1.29		1.24	

Bunch characteristics:

Data in Table (4) indicates that treatments of (9canes × 8buds) gave the highest significant values concerning bunch weight. This treatment recorded (788.80 and 814.50) during 2001 and 2002 seasons, respectively. The treatments (7canes × 10buds/cane and 8canes × 12buds/cane) were the second in rank. Treatments of (5canes × 14buds/cane) gave the lowest values in that respect, and recorded (555.63 and 574.63) at the two seasons respectively. This increasing in bunch weight was due to the decreasing in the number of bunches Table (3), as a result of decreasing cane length, There is a correlation between number of bunches and bunch weight. The same was noticed for the rachis weight. The highest bunch weight gave the highest rachis weight. These results agree with Naidenov *et al.*, 1980; Rizk *et al.*, 1994; Rizk 1996; Yusta *et al.*, 1996 and Abd El-Wahab 1997.

As shown in Table (4), no reliable differences in the length and width of clusters can be observed by different pruning treatments. The clusters of cane length nearly had similar values with no significant differences. These results agree with the conclusion giving by Fawzi *et al.*, (1984).

Table (4) showed that number of berries per bunch were increased in treatments having (9 × 8, 7 × 10 and 6 × 12) and no significant differences were noticed between them.

Table (4) : Effect of cane length on some bunch characteristics of Early Superior grapevines.

Treatments	First season (2001)								Second season (2002)							
No. of canes × No. of Buds / cane	Bunch weight (g)		Rashis weight (g)		Bunch width (cm)	Bunch length (cm)	No. of berries/ bunch		Bunch weight (g)		Rashis weight (g)		Bunch width (cm)	Bunch length (cm)	No. of berries/ bunch	
5 × 14	555.63	C	9.50	D	21.00	24.67	160.33	B	574.63	C	11.00	D	20.67	26.67	165.67	B
6 × 12	687.20	B	10.53	C	20.67	25.33	176.20	A	745.63	B	12.33	C	20.00	27.00	182.00	A
7 × 10	706.07	B	13.07	B	21.67	25.00	175.00	A	769.63	B	15.00	B	20.67	26.67	180.90	A
9 × 8	788.80	A	15.17	A	20.00	24.33	179.00	A	814.50	A	18.50	A	19.00	26.00	176.00	A
L.S.D at 5%	26.06		0.35		N.S	N.S	4.41		29.13		0.15		N.S	N.S	6.50	

Table (5) : Physical characteristics of berries of Early Superior grapevines as affected by cane length.

Treatments	First season (2001)							Second season (2002)						
No. of canes × No. of Buds / cane	Berry weight (g)		Berry size (cm)		Berry length (cm)	Berry diameter (cm)	length / diameter ratio	Berry weight (g)		Berry size (cm)		Berry length (cm)	Berry diameter (cm)	Length / diameter ratio
5 × 14	3.41	C	3.10	C	2.11	1.85	1.14	3.42	C	3.10	C	2.30	1.75	1.32
6 × 12	3.86	B	3.60	B	2.08	1.86	1.12	4.01	B	3.73	B	2.25	1.78	1.26
7 × 10	3.93	B	3.70	B	2.05	1.85	1.11	4.11	B	3.83	B	2.25	1.80	1.25
9 × 8	4.33	A	4.00	A	2.01	1.85	1.10	4.46	A	4.07	A	2.18	1.73	1.27
L.S.D at 5%	0.29		0.20		N.S	N.S	N.S	0.36		0.23		N.S	N.S	N.S

The least number of berries for treatment comprised (5canes × 14buds/ cane).

Berry characteristics:

It is evident that the average berry weight significantly increased at the treatment of (9canes × 8buds/cane), in comparison of other treatments Table (5). Data recorded (4.33 & 4.46) in the two seasons, respectively. This increase in berry weight was due to the increase of the bunch weight to the same treatment (Howell *et al.*, 1991; Abd El-Fattah *et al.*, 1993 and Rizk, 1996). The same was noticed for the berry size.

Data in Table (5) indicates that neither berry dimensions nor berry shape (length/diameter ratio) were markedly affected in both seasons. These results are in line with those obtained by Fawzi *et al.*, (1984); Abd El-Wahab (1997) and Abd El-Rhman (2002).

T.S.S & Acidity and T.S.S/Acid ratio:

The total soluble solids in Table (6) generally revealed significant increase at the tested treatments (10buds/cane and 8buds/cane) treatments No. (3and4) in comparison by the two other treatments having 14 and 12 buds/cane. The increases in TSS at the above mentioned treatments for cane length (10 and 8 buds/cane) has been directly related to cluster exposure to sunlight accelerate berry ripening as a reason for the short cane where no more shoots causing shading. These results are in agreement with Shaulis May (1971); Clingeleffer (1989); Howell *et al.*, (1991); Abd El-Fattah *et al.*, (1993); Marawad *et al.*, (1993) and Rizk (1996). They found that, a significant increment in TSS could be noticed with pruning to short canes in comparison by long canes pruning.

Data in this respect recorded the highest TSS values, they were (15.77 & 15.37%) and (16.53 & 16.20%) for the two seasons respectively. As for total acidity, the same treatments (10, 8 buds per cane) showed a significant decrease for the above shorter canes as compared to the other long canes treatments with (14 and 12 buds/cane). On the other hand, the TSS/acid ratio was significantly higher with short treatments (with cane length 10, 8 buds/cane). These results are in harmony with those obtained by Bhujal (1974).

Dynamics of wood ripening:

As shown in Fig.(2),wood ripening gradually advanced in the successive dates of measurements. Coefficient of wood ripening was always higher in November than in the other months. As for the effect of cane length on this parameter, it is obvious that in all measuring dates, coefficient of wood ripening was negatively influenced by the increase in cane length. The parts of the shoots with mature wood were (0.50 & 0.41%) with the longest canes (5canes × 14 buds/cane), while reached (0.75 & 0.66%) with the shortest canes (9canes × 8 buds/cane). These results are in line with those obtained by, Fawzi *et al.*, (1984); Marwad *et al.*, (1993); Rizk *et al.*, (1993) and Rizk (1996).

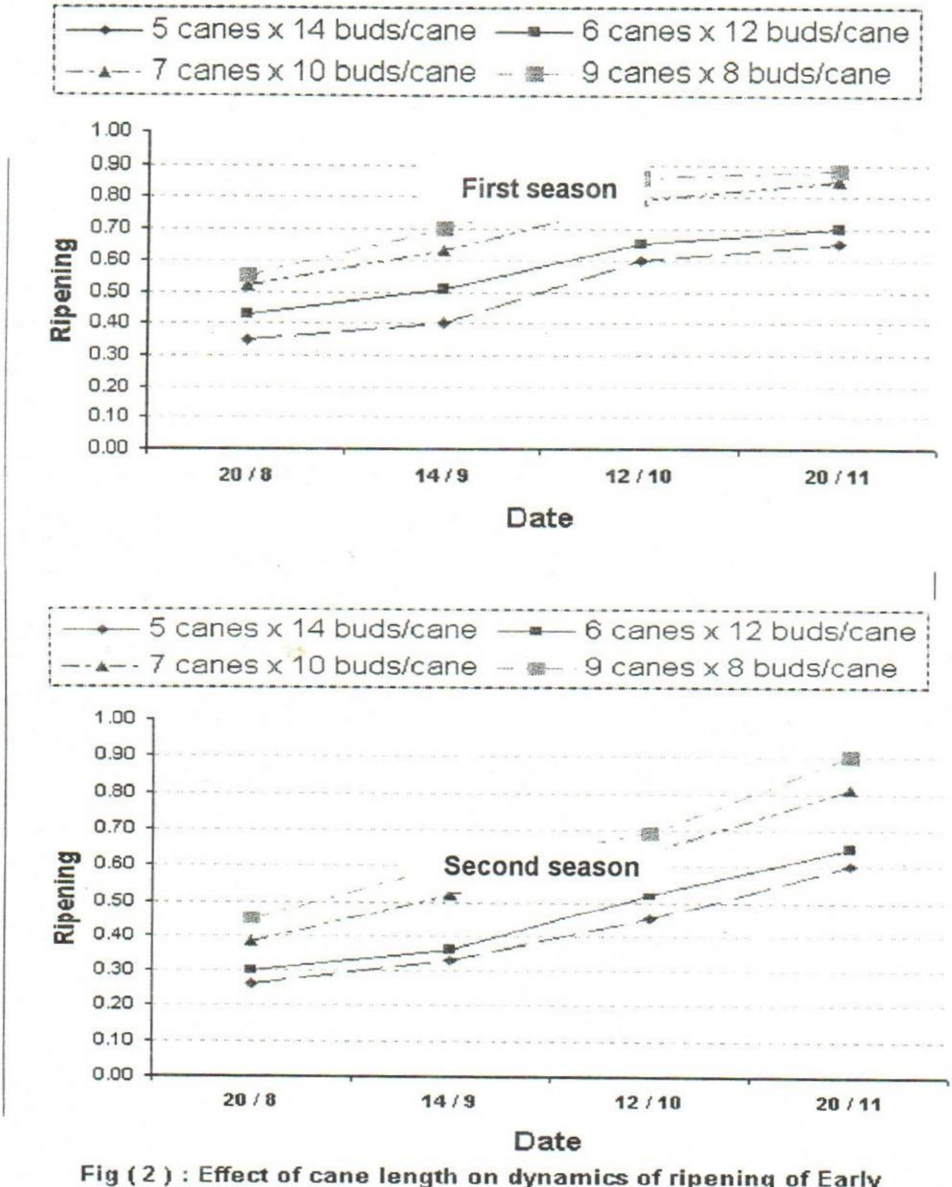


Fig (2) : Effect of cane length on dynamics of ripening of Early Superior grapevines (season 2001 & 2002).

Total carbohydrates:

Cane length is one of the factors affecting chemical composition of grape shoots. Results concerning total carbohydrates as influenced by cane length/vine in Table (7). Data indicate gradual significant decrease as cane length increased in the two seasons. The highest values were (40.10 & 39.57%) and (41.87 & 40.83%) for treatments comprised (9canes × 8buds/cane and 7canes × 10buds/cane) at the two seasons, respectively. Similar observations were reported by Kliwer (1973); Melkonyan (1985); Mikitenko (1985); Bowen and Kliewer (1990) and Abd El-Fattah *et al.*, (1993). They reported that the increment in total yield needs more vegetative growth which resulted in low total carbohydrates in the canes.

Table (6): Chemical characteristics of Early superior berries as affected by cane length.

Treatments	First season (2002)						Second season (2003)					
No. of canes × No. of Buds / cane	T.S.S %		Acidity %		T.S.S/acid ratio		T.S.S %		Acidity %		T.S.S/acid ratio	
5 × 14	14.85	C	0.67	A	22.28	D	15.50	D	0.63	A	24.73	D
6 × 12	15.07	C	0.64	B	23.67	C	16.00	C	0.62	A	25.81	C
7 × 10	15.77	A	0.59	C	26.73	A	16.53	A	0.58	C	28.51	A
9 × 8	15.37	B	0.61	C	25.19	B	16.20	B	0.60	B	27.00	B
L.S.D at 5%	0.25		0.021		1.129		0.153		0.015		0.641	

Nitrogen percentage:

Table (7) clarified that nitrogen percentage of the 1-year-wood was not significantly affected by cane length in both seasons. This result may be due to insufficient synthesis of protein from soluble nitrogenous compounds to supply the fast growing of shoots in the previous growing season. This result is in agreement with Abe El-Fattah *et al.*, (1993).

On account of the four mentioned results it can be concluded that, the cane length of (10 and 12 buds/cane) was considered the most optimum for production of high yield, while, the cane length of (8 and 10 buds/cane) gave the best quality of clusters.

Table (7): Percentage of total carbohydrates and nitrogen contents as influenced by cane length of Early Superior grapevines.

Treatments	First season (2001)			Second season (2002)		
No. of canes × No. of Buds / cane	Total carbohydrate (%)		Total nitrogen (%)	Total carbohydrate (%)		Total nitrogen (%)
5 × 14	33.30	C	0.89	30.33	C	0.97
6 × 12	36.10	B	0.90	36.50	B	0.97
7 × 10	39.57	A	0.91	40.83	A	0.98
9 × 8	40.10	A	0.92	41.87	A	0.99
L.S.D at 5%	1.96		N.S	1.25		N.S

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أ- تأثير طول القصبة الثمرية على سلوك البـراعم والنمـو والانتاجيـة ونضـج الخشب والمحتوى الكيماوى لصنف العنب الايرلى سوبيريور

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أجرى هذا البحث فى مزرعة خاصة فى منطقة السادات التابعة لمحافظة المنوفيـة علـى كرمات عمرها ٥ سنوات من العنب الايرلى سوبيريور – الدراسـة اسـتمرت لمـدة عـامين والكرمات مرباة بنظام التربية القصبية ، قلمت الكرمات إلى عدد مختلف من القصبات والقصبات إلى عدد مختلف من العيون بحيث ثبت عدد العيون فى النهاية من (٧٠ – ٧٢ عـين / كرمـة) وكانت المعاملات (٥ ، ٦ ، ٧ ، ٩ قصبة و عدد العيون ١٤ ، ١٢ ، ١٠ ، ٨ عين / القصـبة) على الترتيب هذا بالإضافة إلى الدوابر التجديدية المتروكة على الكرمة.

أوضحت النتائج أنه تستمر فترة تفتح البراعم ٣ – ٤ أسابيع (من نصف فبرايـر وحتـى أوائل مارس). كانت هناك زيادة تدريجية فى تفتح البراعم طوال فترة التفتح فى كل المعاملات وقد ازدادت النسبة المئوية لتفتح العيون بزيادة طول القصبة إلى ١٤ عين للقصبة بينما زادت النسـبة المئوية للعيون الثمرية ومعامل الخصوبة فى القصبات المقلمة إلى ١٢ ، ١٠ عيون للقصبة. وقد أظهرت المعاملة ٨عين للقصبة تلتها ١٠ عين للقصبة زيادة معنوية فى طول الفرع وعدد الأوراق ومساحة الورقة ووزن قصاصة التقليم. أعطت كروم المعاملات ١٢ ، ١٠ عين للقصبة أعـداداً أكبر من العناقيد وزيادة فى المحصول عن المعاملات ذات القصبات الطويلة والقصيرة نسبياً وكان أعلى وزن للعنقود والشمراخ وعدد الحبات بالعنقود ووزن وحجم الحبة لمعاملة التقلـيم ٨ عـين للقصبة تلتها ١٠ ، ١٢ عين للقصبة. بينما زادت المواد الصلبة الذائبة الكلية والنسبة بين السـكر والحموضة وقل معدل الحموضة بقصر طول القصبات. وتبين النتائج أيضـاً أن زيـادة طـول القصبات الثمرية قلل من نضج الخشب فى الأفرخ الناتجة عليها وكان نضج الخشب متقدماً فـى جميع المعاملات حتى شهر نوفمبر. كما أثر زيادة طول التقليم حيث قلل من الكربوهيدرات الكلية ونسبة النيتروجين الكلى لخشب التقليم.