Yield and Quality of Table Grapes cv. Flame Seedless as affected by Bud Break and Pre-Harvest Treatments

Aly, M. A. M. [(1)], M. M. Harhash[(1)], A. A. El-Kharpotaly [(2)] and A. H. A. Younes[(3)]

[(1)] Plant Production Dept. Faculty of Agriculture (Saba Basha) Alexandria University.
[(2)] Hort. Res. Institute, Agric. Res. Center, Alex., Egypt
[(2)] Postgraduate student.

ABSTRACT: This study was carried out during the two successive seasons of both 2018 and 2019 on 5-year-old Flame Seedless grapevines in a private vineyard located at Kom Hamada - Beheira Governorate, Egypt. The trees were spaced at 1.5 x 3 m apart and irrigated by drip irrigation system and received similar cultural practices adapted in the orchard. The present investigation aimed at study yield and quality of table grapes cv. "Flame seedless" as affected by bud break and pre-harvest treatments. This experiment consisted of sixteen treatments arranged in factorial experiment in Randomized Complete Block Design (RCBD) with four replicates for each treatment and one tree for each replicate. The experiment consisted of 16 treatments (Control, Garlic oil at 1 %**,** Urea at 2 %, Dormex at 4 %, Abscisic acid at 400 mg/ l, Ethrel at 250 mg/ l, Gibberelic acid 250 mg/ l, Garlic oil at 1 % + ASA at 400 mg/l , Garlic oil at 1 % + Ethrel at 250 mg/l, Garlic oil at 1 % + GA_3 at 250 mg/l, Urea at 2 % + ASA at 400 mg/l, Urea at 2 % + Ethrel at 250 mg/l , Urea at 2 % + GA_3 at 250 mg/l, Dormex at 4 % + ASA at 400 mg/l , Dormex at 4 % + Ethrel at 250 mg/l and Dormex at 4 % + GA_3 at 250 mg/l . Results revealed that spraying dormex at 4%, recorded the best values of cluster weight and yield/plant, physical characters i.e. (berry length, berry diameter, weight of100 berry, size of 100 berry and fruit firmness), and all chemical compositions i.e. (total sugars, reducing sugars, anthocyanin content and vitamin c), also, abscisic acid 400 mg/l gave the highest mean values of cluster weight, yield/plant and anthocyanin content, while Ethrel at 250 mg/l recorded the maximum values of physical characters i.e. (berry length, berry diameter, weight of100 berry, size of 100 berry and fruit firmness), and all chemical compositions i.e. (total sugars, reducing sugars, and vitamin c), as compared with the control treatment which recorded the minimum values of this studied characters, during both seasons.

Keywords: 'Flmae Seedless' grape, bud break, gibberelic acid, urea, garlic oil, abscisic acid, ethrel, dormex , yield, fruit quality, chemical compositions.

INTRODUCTION

Grape is considered one of the oldest fruit crops. It was introduced by the Spanish explorers to America about 3000 years ago. It cultivated in temperate, tropical, subtropical and cold regions of the world. Grapes (*Vitis vinifera* L.) is one of the most important commercial fruit crops all over the world. It is the world's fourth or third leading fruit in terms of production. The annual grape production reached 75.1 million metric tons. Egypt ranks fourteen in the world with approximately 1.7 million metric tons per year from a planted area of 77875 hectare **(FAO, 2017).** Egypt table grape production increased as a result of introducing new rootstocks and varieties. However, despite the high productivity of Red globe grapes low marketable due to sunburn or /and compactness. Grape cultivation in Egypt is the fourth important fruit crop **(FAO, 2017).**

Spraying grape with dormex (5%) gave the highest bud burst, yield and berry quality of grape cv. Flame Seedless **(El-Sabrout, 1998).** Those cyanamides are known to have a negative impact on grape growers' health and the

environment. Nevertheless, these bud breaking inducing agents are not authorized for use in organic cultivation **(Settimi *et al.,* 2005).** Hence, there is an urgent need to develop dormancy release agents that pose no health risks to humans and for organic farming products.

Nitrogen plays an important role in vine nutrition management. Reducing level of N in vines is a limiting factor affecting fruit quality **(Khan *et al*., 2009).**

Urea application generally, modified amino acid concentrations especially with high dose. Urea foliar application should be considered as a tool for increasing the percentage of amino acids in grapevines **(Alvarez *et al*., 2016).**

The used Gibberelic acid (GA_3) rates and time are differing according to cultivar and growing stage. For example, gibberellin is applied at bloom to Thompson Seedless and Flame Seedless to reduce berry set. Table grape growers use this hormone at full bloom and fourteen days later to improve berry size and bunch structure **(Cengiz 2012).** Gibberellins (GA_3) are widely used to increase bunch and berry weight and size, as well as yield / vine in seedless grape cvs **(Ezzahouani *et al.,* 1985; Orth, 1990).**

Garlic and its preparations have been widely recognized as agents for prevention and treatment of cardiovascular and other metabolic diseases, atherosclerosis, hyperlipidemia, thrombosis, hypertension and diabetes. Effectiveness of garlic in cardiovascular diseases was more encouraging in experimental studies, which prompted several clinical trials. This review has attempted to make a bridge of the gap between experimental and clinical study and to discuss the possible mechanisms of such therapeutic actions of garlic **(Sanjay and Maulik, 2002). Marodin and Roman (1997)** sprayed "Shiro" plum trees at dormant bud stage, immediately after pruning using 3 or 4% garlic extract.

Ethephon is an ethylene-releasing molecule. Stable in a low pH solution, it hydrolyses in the higher pH of plant tissues releasing ethylene, a gaseous plant growth regulator **(Royer *et al.,* 2006).** Ethephon's chemical characteristics enable growers to apply it to grapes and other plants in the field with commercial spray equipment, and thereby stimulate ethylene- dependent reactions. Ethephon absorption by plant tissues is influenced by temperature, relative humidity, and pH of the surface on which the spray droplets are deposited **(Turnbull *et al.,* 1999).**

Abscisic acids a plant boom regulator which regulated the development of pigments in purple grape cultivars that provide them the one of a kind coloration **(Katayama-Ikegami *et al.,* 2016).** There are high quality results of ABA such as improving hues of grapes except negatively impacting berry or cluster exceptional **(Cantín *et al.,* 2007; Peppi *et al.,* 2007).**

The aim of this study was to improving coloration, earliness and yield of Flame seedless grapes grown under bud break agent foliar application and preharvest treatments.

MATERIALS AND METHODS

This investigation was conducted in a private vineyard located at Kom Hamda – Beheira Governorate, Egypt, on 5-year-old Flame Seedless grapevines. The study extended for two successive seasons (2018 and 2019) The trees were spaced at 1.5 x 3 m apart and irrigated by drip irrigation system and received similar cultural practices adapted in the orchard. The treatments were application as foliar on the plants. The present investigation aimed at study yield and quality of

table grapes cv. flame seedless as effected by bud break and pre-harvest treatments. This experiment consisted of sixteen treatments arranged in a Factorial experiment in Randomized Completely Block Design (RCBD) with four replicates for each treatment and one tree for each replicate.

Experimental design

The applied treatments were arranged as follows:

Factor A (bud break):

- Control (tap water)
- Garlic oil at 1 %
- Urea at 2 %
- Dormex at 4 %

Factor B (coloring treatments)

- Control (tap water)
- Abscisic acid at 400 mg/ l
- Ethrel at 250 mg/ l
- Gibberelic acid 250 mg/ l

Data recorded

A) Yield (kg/vine)

At harvesting date when TSS % of berries reached about 16-17 % in control, six clusters / vine were weighted and the average cluster weight was multiplied by number of clusters/vine to calculation average yield/vine.

B) Physical properties

Hundred berries/cluster were used to determine the average of: Berry length (mm), Berry diameter (mm), 100- Berry weight (g), Juice volume of 100 berry (cm^3) and Berry Firmness (Ib /$inch^2$), by using a texture analyzer instrument; Fruit Hardness Tester, No.510-as a small cylinder (3 mm in diameter) penetrates into a distance of 3 mm inside the berry with a speed of 0.2 mm / second, then the resistance of berry to this penetration force was recorded and taken as an expression of berry firmness (Ib /$inch^2$).

A sample of five clusters/ vine was taken for determining:

- Berry length (cm)
- Berry diameter (cm)
- 100-berry weight (g)
- Juice volume of 100 berry (cm^3)
- Fruit firmness (Lb/ $inch^2$) Fruit firmness was measured using an electronic firmness tester (FG-5020, Lutron).

C) Chemical fruit characteristics:

Regarding fruit chemical characteristics, samples from each replicate were picked randomly at harvest time to determine the following parameters:

- Total sugars (%): were determined in fresh fruit samples according to **Malik and Singh (1980).** Sugars were extracted from 5 gram fresh weight and determined by phenol sulfuric and Nelson arsenate-molybadate colorimetric

methods for total and reducing sugars, respectively. The non-reducing sugars were calculated by difference between total sugars and reducing sugars.

- Vitamin C (mg/100ml juice): The ascorbic acid content of the juice was determined by titration with 2, 6 dichloro phenol-indo-phenol **(AOAC, 1985)** and calculated as milligrams per 100 ml of juice.
- Anthocyanin content (mg/100g)**:** Anthocyanin content was determined at the stage of coloration (mg/100g fresh weight) according to **Rabino *et al*. (1977).**

Statistical analysis:

Results of the measured parameters were subjected to computerized statistical analysis using MSTAT package for analysis of variance (ANOVA) and means of treatments were compared using LSD at 0.05 according to **Snedecor and Cochran (1990).**

RESULTS AND DISCUSSION

A) Yield

Results tabulated in **Table (1)** revealed that the effect of chemical compounds application on average cluster weight and yield/vine (kg) of Flame Seedless grapevines. The results showed highly significant differences among all treatments in 2018 and 2019 seasons. The obtained results cleared that the average cluster weight and yield/ vine (kg) increments were more pronounced with spraying dormex at 4% (622.49 and 647.41 g) and (26.40 and 27.72 kg), as compared with control treatment which gave the lowest values of the cluster weight and yield/ vine (kg) (547.22 and 536.64 g) and (15.54 and 16.32 kg) during both seasons.

These results agreement with **Simancas *et al.* (1987)** who stated that spraying 7% Dormex just after pruning gave satisfactory increase in yield and cluster length of Italia vines. Also, **Abd El-Wadoud (2010)** and **Osman (2014)** showed that using the present chemical for rest breakages was significant to increase average cluster weight with all treatments as compared to control. **Abdalla (2003)** found that spraying Dormex at 3 or 5 % one day after pruning resulted in increasing the number, weight of cluster and yield/vine in Thompson seedless and Red Roomy grapevines.

These results were in line with **El-Mogy *et al*. (2002) and El-Salhy (2002).** They concluded that spraying Dormex on grapevines led to increases in the yield/ vine.

Additionally, spraying abscisic acid 400 mg/l recorded the highest mean values of cluster weight (682.37 and 684.27 g) and yield/plant (kg) (23.52 and 24.70 kg), while, the control treatment recorded the lowest mean values of cluster weight (497.44 and 485.37 g) and yield/ vine (kg) (17.15 and 18.01 kg), during both seasons.

The interaction between bud break agents and coloring treatments was highly significant in the first season and not significant in the second season, respectively on cluster weight, while was highly significant yield/ vine (kg) during both seasons.

Furthermore, the role of exogenous applied polyamines in increasing tree yield was also reported by **Ponce *et al.* (2002).** The increase in yield obtained by the mentioned substances might be due to that they also increased berry and cluster weight in the present study. **Mir *et al.* (2010)** reported that application of ethrel increased yield, dry matter, photosynthesis rate and may therefore constitute a potential management tool for increasing cluster weight and size.

Table (1): Bud break agents, coloring treatment and interaction effect on cluster weight and yield/ vine of Flame Seedless grapes during 2018 and 2019 seasons.

Treatments		Cluster weight (g)		Yield/ vine (kg)	
		2018	2019	2018	2019
A) Bud break agents					
Control		547.22	536.64	15.54	16.32
Garlic oil at 1 %		575.51	574.21	17.44	18.31
Urea at 2 %		601.44	619.48	21.70	22.59
Dormex at 4 %		622.49	647.41	26.40	27.72
LSD(0.05)		**10.94**	**52.28**	**1.89**	**1.78**
B) Coloring treatments					
Control		497.44	485.37	17.15	18.01
Abscisic Acid 400 mg/l		682.37	684.27	23.52	24.70
Ethrel 250 mg/l		614.13	632.55	21.36	22.23
Gibberelic Acid 250 mg/l		552.71	575.55	19.05	20.00
LSD(0.05)		**0.59****	**47.82^{ns}**	**0.30****	**0.12****
Bud break agents	**Coloring Treatments**				
Control	Control	464.00	369.92	13.18	13.84
	ASA 400 mg/l	636.49	655.59	18.08	18.98
	Ethrel 250 mg/l	572.84	590.03	16.27	17.08
	GA_3 250 mg/l	515.56	531.02	14.64	15.37
Garlic oil at 1%	Control	487.98	500.62	14.79	15.53
	ASA 400 mg/l	669.39	615.22	20.29	21.30
	Ethrel 250 mg/l	602.45	620.52	18.26	19.17
	GA_3 250 mg/l	542.20	558.47	16.43	17.25
Urea at 2 %	Control	527.82	543.65	22.38	23.50
	ASA 400 mg/l	724.03	745.75	30.70	32.24
	Ethrel 250 mg/l	651.63	671.17	27.63	29.01
	GA_3 250 mg/l	586.46	629.06	24.87	26.11
Dormex at 4 %	Control	509.97	525.27	18.24	19.15
	ASA 400 mg/l	699.55	720.53	25.02	26.27
	Ethrel 250 mg/l	629.60	648.48	23.27	23.64
	GA_3 250 mg/l	566.63	583.63	20.26	21.28
$LSD_{(0.05)}$		**0.59****	**47.82^{ns}**	**0.30****	**0.12****

B) Physical characteristics:

Results presented in **Table (2)** revealed the effects of chemical compounds application on berry length, berry diameter, 100 berry weight, juice volume/ 100 berry and fruit firmness (Lb/ $inch^2$) of Flame Seedless grapevines. The results showed high significant differences among all treatments in 2018 and 2019 seasons. Results showed that foliar application of dormex at 4 % recorded the highest mean values of berry length (14.29 and 15.01 mm), berry diameter (14.08

and 14.78 mm), 100 berry weight (295.97 and 310.77 g), Juice volume/100 berry (152.95 and 159.94 cm^3) and fruit firmness (14.04 and 14.55 Lb/ $inch^2$), as compared with control treatment which gave the lowest mean values of berry length (11.35 and 11.92 mm), berry diameter (11.74 and 12.32 mm), 100 berry weight (240.92 and 252.97 g), Juice volume/100 berry (113.12 and 118.77 cm^3) and fruit firmness (11.28 and 11.84 Lb/ $inch^2$), respectively, during both seasons.

Similar notations were mentioned by **El-Sabrout (1998)** who pointed out that spraying grapevine with Dormex significantly effects on physical characters**. Abd El-Wadoud (2010)** recorded that the value was obtained by vines sprayed by Dormex at 5% followed in a descending order by spraying Thio-urea at 3% while, control vines gave the lowest values of the average berry weight in both seasons.

On the other hand, foliar application of ethrel at 250 mg/l gave the highest mean values of berry length (14.77 and 15.50 mm), berry diameter (15.08 and 15.83 mm), 100 berry weight (316.99 and 332.84 g), while abscisic acid 400 mg/l recorded the maximum values of fruit firmness (Lb/ $inch^2$) (14.59 and 15.32 Lb/ $inch^2$), as compared with control treatment which recorded the minimum values of berry length (10.76 and 11.30 mm), berry diameter (11.07 and 11.62 mm), 100 berry weight (231.09 and 242.64g), Juice volume/100 berry(114.45 and 120.18 cm^3), and fruit firmness (10. 82 and 11.16 Lb/ $inch^2$), respectively during both seasons.

Raj *et al.* (2016) observed that the most fruit length (6.62 cm) takes place in chilli (*Capsicum annuum* L.) plants as compared to untreated plants (6.08 cm) when 300 ppm Ethrel applied as foliar spray.

Goulao, (2010) found that changes in pectin and hemicelluloses in primary cell wall polysaccharides have been suggested as the primary causes for texture changes that resulted in a decrease of firmness. In addition, the increasing of the berry firmness is strongly associated with the turgor pressure of mesocarp cells, as described by **Thomas *et al.* (2008); Wada *et al.* (2008) and Matthews *et al.* (2009).** Also, **Castellarin *et al.* (2016)** revealed that ABA contributes to the physiological modifications, such as cell turgor and elasticity.

The interaction between bud break agents and coloring treatments was highly significant on berry length during both seasons. While was not significant on berry diameter during both seasons. Also, was highly significant on 100 berry weight during both seasons. In addition, was not significant in the first seasons and highly significant in the second seasons on juice volume/ 100 berry and fruit firmness (Lb/ $inch^2$) of Flame Seedless grapevines during 2018 and 2019 seasons.

C) Chemical fruit characteristics:

Results in **Table (3)** revealed a significant effect of chemical compounds application on total sugars, reducing sugars, anthocyanin content and vitamin C during 2018 and 2019 seasons. The results showed that, foliar application of dormex at 4 % gave the highest values of total sugars (17.15 and 18.01 %), reducing sugars (9.71 and 10.51 %) and anthocyanin content (23.71 and 24.89 mg/100 ml juice), while vitamin C increments were more pronounced with spraying

garlic oil at 1 % (60.30 and 62.20 mg/100 ml juice), as compared with control treatment which gave the lowest values of total sugars (14.39 and 15.12 %), reducing sugars (7.52 and 7.89 %), anthocyanin content (18.34 and 19.48 mg/100 ml juice) and (44.16 and 46.37 mg/100 ml juice), respectively during both seasons.

In addition, foliar application of ethrel 250 mg/l recorded the highest mean values of total sugars percentage (18.34 and 19.27 %), reducing sugars percentage (10.30 and 10.91%) and vitamin C (60.19 and 63.20 mg/100ml juice), while abscisic acid 400 mg/l recorded the highest mean values of anthocyanin content (24.21 and 25.26 mg/100ml juice), as compared with control treatment which gave the lowest values of total sugars (13.37 and 14.04 %), reducing sugars (7.51 and 7.95 %), anthocyanin content (17.65 and 18.99 mg/100ml juice) and vitamin C (43.88 and 44.97 mg/100 ml juice).

The interaction between bud break agents and coloring treatments was highly significant on total sugars, reducing sugars percentage and vitamin C of Flame Seedless grapevines during 2018 and 2019 seasons, also, was highly significant in the first season and not significant in the second season on anthocyanin content.

Similarly, **Giribaldi *et al*. (2011)** reported that in grape cv. Cabernet Sauvignon, ABA treatments before véraison, early and mid-véraison stages on berries modified concentration of skin sugar. **King *et al*. (2012)** observed that crop removal increased sugar concentration in Hawke's Bay grapes. **Somkuwar *et al*. (2014)** observed that concentration of reducing sugar reduced with the increase in number of clusters per vine in grape cv. Jumbo Seedless.

These results corroborate with the previous findings of **Peppi *et al.* (2006)** who reported that application of abscisic acid (ABA) on 'Flame Seedless' grapes led to increased anthocyanin content and fruit colour of berries. **Lacampagne *et al*. (2010)** reported a positive impact of ABA on berry colour of grapes. **Roberto *et al*. (2013)** found that ABA improved the colour of grapes, especially when applied twice (7 days after veraison + 15 days before harvest) at 400 mg l^{-1} in 'Rubi' table grapes.

From the above-mentioned results and under the conditions of this research, it could be concluded that Urea at 2 %, ABA at 400 mg/l and garlic acid 1% gave the best results on yield and its components and chemical composition.

Table (2): Bud break agents, coloring treatment ,and interaction effect on physical characteristics of Flame Seedless grapes during 2018 and 2019 seasons.

Treatments		Berry length (mm)		Berry diameter (mm)		100 Berry weight (g)		Juice volume/ 100 berry (cm^3)		Fruit Firmness ($Lb/inch^2$)	
		2018	2019	2018	2019	2018	2019	2018	2019	2018	2019
A) Bud break agents											
Control		11.35	11.92	11.74	12.32	240.92	252.97	113.12	118.77	11.28	11.84
Garlic oil at 1 %		11.96	12.55	12.65	13.28	269.53	283.01	127.27	133.63	12.08	12.68
Urea at 2 %		13.18	13.85	13.38	14.04	283.72	297.90	139.66	155.96	12.95	13.60
Dormex at 4 %		14.29	15.01	14.08	14.78	295.97	310.77	152.95	159.94	14.04	14.55
LSD(0.05)		**0.40**	**0.42**	**0.33**	**0.36**	**4.74**	**4.98**	**12.59**	**5.78**	**0.47**	**0.45**
B) Coloring treatments											
Control		10.76	11.30	11.07	11.62	231.09	242.64	114.45	120.18	10. 82	11.16
Abscisic Acid 400 mg/l		13.29	13.95	13.57	14.24	285.29	299.56	157.00	164.85	13.13	13.78
Ethrel 250 mg/l		14.77	15.50	15.08	15.83	316.99	332.84	141.87	148.31	14.59	15.32
Gibberelic Acid 250 mg/l		11.96	12.56	12.13	12.73	256.76	269.60	119.67	134.97	11.81	12.40
LSD(0.05)		**0.03^{**}**	**0.03^{**}**	**0.19^{ns}**	**0.20^{ns}**	**0.44^{**}**	**0.46^{**}**	**10.78^{ns}**	**2.06^{**}**	**0.28^{ns}**	**0.30^{**}**
Bud break agents	**Coloring Treatments**										
Control	Control	9.62	10.11	9.95	10.45	204.28	214.50	95.92	100.71	9.56	10.04
	ASA 400 mg/l	11.89	12.48	12.29	12.90	252.20	264.81	131.57	138.15	11.81	12.40
	Ethrel 250 mg/l	13.21	13.86	13.65	14.34	280.23	294.24	118.42	124.33	13.12	13.77
	GA_3 250 mg/l	10.70	11.23	11.06	11.61	226.98	238.33	106.57	111.90	10.63	11.16
Garlic oil at 1%	Control	10.14	10.64	10.72	11.26	228.54	239.97	107.91	113.30	10.24	10.75
	ASA 400 mg/l	12.51	13.14	13.24	13.91	282.15	296.25	148.03	155.43	12.64	13.27
	Ethrel 250 mg/l	13.91	14.60	14.72	15.45	313.50	329.17	133.22	139.88	14.04	14.75
	GA_3 250 mg/l	11.26	11.83	11.92	12.51	253.93	266.63	119.90	125.90	11.38	11.95
Urea at 2 %	Control	12.12	12.73	11.93	12.88	250.96	263.50	129.21	135.67	10.98	11.53
	ASA 400 mg/l	14.96	15.71	14.74	15.47	309.83	325.31	177.24	186.10	13.56	14.24
	Ethrel 250 mg/l	15.33	16.09	15.56	16.33	330.00	346.50	154.05	161.75	15.06	15.82
	GA_3 250 mg/l	13.46	14.14	13.26	13.58	278.84	292.78	143.57	150.74	12.20	12.81
Dormex at 4 %	Control	11.17	11.73	11.66	11.91	240.57	252.60	124.77	131.02	12.50	12.33
	ASA 400 mg/l	13.79	14.48	14.00	14.70	297.00	311.85	171.17	179.73	14.50	15.23
	Ethrel 250 mg/l	16.63	17.46	16.38	17.20	344.25	361.46	161.77	167.25	16.11	16.94
	GA_3 250 mg/l	12.41	13.03	12.28	13.23	267.30	280.66	148.65	151.33	13.05	13.70
$LSD_{(0.05)}$		**0.03^{**}**	**0.03^{**}**	**0.19^{ns}**	**0.20^{ns}**	**0.44^{**}**	**0.46^{**}**	**10.78^{ns}**	**2.06^{**}**	**0.28^{ns}**	**0.30^{**}**

Table (3): Bud break agents, coloring treatment and interaction effect on chemical composition of Flame Seedless grapes during 2018 and 2019 seasons.

Treatments		Total sugars (%)		Reducing sugars (%)		Anthocyanin mg/100ml juice		Vitamin C (mg/100 ml juice)	
		2018	2019	2018	2019	2018	2019	2018	2019
A) Bud break agents									
Control		14.39	15.12	7.52	7.89	18.34	19.48	44.16	46.37
Garlic oil at 1 %		15.27	16.04	8.54	8.97	19.77	20.67	60.30	62.20
Urea at 2 %		16.24	17.06	9.65	10.13	21.44	22.51	48.74	51.18
Dormex at 4 %		17.15	18.01	9.71	10.51	23.71	24.89	53.81	56.50
LSD(0.05)		**0.45**	**0.47**	**0.23**	**0.29**	**1.13**	**1.04**	**3.47**	**4.71**
B) Coloring treatments									
Control		13.37	14.04	7.51	7.95	17.65	18.99	43.88	44.97
Abscisic Acid 400 mg/l		16.50	17.33	9.27	9.82	24.21	25.26	54.17	56.88
Ethrel 250 mg/l		18.34	19.27	10.30	10.91	21.78	24.21	60.19	63.20
Gibberelic Acid 250 mg/l		14.85	15.60	8.34	8.83	19.61	22.80	48.76	51.19
LSD(0.05)		**0.02****	**0.03****	**0.03****	**0.03****	**0.08**^{ns}	**0.84****	**0.21****	**1.58****
Bud break agents	**Coloring Treatments**								
Control	Control	12.20	12.82	6.38	6.69	15.55	16.51	37.45	39.32
	ASA 400 mg/l	15.06	15.82	7.87	8.26	17.27	22.66	46.23	48.54
	Ethrel 250 mg/l	16.74	17.62	8.74	9.18	19.19	20.39	51.37	53.93
	GA_3 250 mg/l	13.56	14.23	7.08	7.44	21.33	18.35	41.61	43.69
Garlic oil at 1%	Control	12.95	13.60	7.24	7.60	16.76	17.59	51.12	49.26
	ASA 400 mg/l	15.99	16.79	8.94	9.39	18.62	23.84	63.12	66.27
	Ethrel 250 mg/l	17.76	18.65	9.93	10.43	20.70	21.72	70.13	73.64
	GA_3 250 mg/l	14.39	15.11	8.05	8.45	22.99	19.54	56.80	59.64
Urea at 2 %	Control	14.54	15.27	8.23	8.91	20.10	21.11	41.33	43.40
	ASA 400 mg/l	17.96	18.85	10.16	11.00	22.34	28.96	51.03	53.58
	Ethrel 250 mg/l	19.95	20.95	11.29	12.23	24.80	26.06	56.70	59.53
	GA_3 250 mg/l	16.16	16.97	9.15	9.90	27.58	23.45	45.92	48.22
Dormex at 4 %	Control	13.77	14.46	8.18	8.59	18.18	20.76	45.63	47.90
	ASA 400 mg/l	17.01	17.85	10.10	10.61	20.20	25.57	56.32	59.14
	Ethrel 250 mg/l	18.90	19.84	11.22	11.78	22.44	23.01	62.58	65.71
	GA_3 250 mg/l	15.30	16.07	9.09	9.54	24.94l	20.71	50.69	53.23
$LSD_{(0.05)}$		**0.02****	**0.03****	**0.03****	**0.03****	**0.08**^{ns}	**0.84****	**0.21****	**1.58****

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الملخص العربي

محصول وجودة عنب المائدة صنف الفليم سيدلس تحت تأثير معاملات كسر السكون وما قبل الحصاد

[*]محمود أحمد محمد علي ،[*]محمد محمد محمد حرحش، [**] أنور عبدالرؤف عبدالحميد الخربوطلي ، [***]علي هشام علي يونس

[*] قسم الإنتاج النباتي – كلية الزراعة سابا باشا – جامعة الأسكندرية.

[**] أستاذ مساعد – شعبة البيئة وزراعات المناطق الجافة مركز بحوث الصحراء– المطرية – القاهرة

[***] طالب دراسات عليا.

أجريت هذه الدراسة خلال الموسمين المتتاليين ٢٠١٨ و ٢٠١٩ على أشجار العنب " الفيليم سيدلس" عمرها خمس سنوات. وزرعت الأشجار في التربة الرملية في مزرعة عنب خاصة تقع في كوم حمادة، محافظة البحيرة، مصر. ومنزرعة على مسافة ١.٥ × ٣ م وتم ريها بنظام الري بالتنقيط . هدفت الدراسة الحالية إلى دراسة محصول وجودة عنب المائدة صنف الفيليم سيدلس" تحت تأثير معاملات كسر السكون وما قبل الحصاد. تتكون هذه التجربة من ستة عشر معاملة في تصميم قطاعات كاملة العشوائية بأربعة مكررات لكل معاملة وشجرة واحدة لكل مكررة. تتكون المعاملات من ١٦ معاملة العامل الاول (كنترول ، زيت ثوم بنسبة ١٪ ، يوريا بنسبة ٢٪ ، دورمكس بنسبة ٤٪)، بينما العامل الثاني (كنترول ، حمض أبسيسيك ٤٠٠ مجم / لتر ، إيثريل ٢٥٠ مجم / لتر ، حمض جبريليك ٢٥٠ مجم / لتر). أوضحت النتائج أن الرش بالدورمكس بنسبة ٤٪ ، سجل أفضل القيم لوزن العنقود والمحصول ، الصفات الفيزيائية (طول الحبة، قطر الحبة ، وزن ١٠٠ حبة ، حجم ١٠٠ عصير حبة والصلابة)، وجميع المكونات الكيميائية مثل (السكريات الكلية والسكريات المختزلة ومحتوى الأنثوسيانين وفيتامين سي) ، كذلك أعطى حمض الأبسيسيك بمعدل ٤٠٠ ملجم / لتر أعلى متوسط قيم لوزن العنقود والمحصول/ النبات ومحتوى الأنثوسيانين ، بينما سجل الإيثريل ٢٥٠ ملجم / لتر القيم القصوى للصفات الفيزيائية أي (طول الحبة، قطر الحبة ، وزن ١٠٠ حبة ، حجم عصير ١٠٠ حبة والصلابة)، وجميع المكونات الكيميائية (السكريات الكلية ، السكريات المختزلة ، وفيتامين سي) ، مقارنة بمعاملة الكنترول التي سجلت أقل القيم لهذه الصفات المدروسة خلال الموسمين. من ناحية آخري، سجل التداخل بين اليوريا بمعدل ٢% وحمض الأبسيسيك بمعدل ٤٠٠مجم/ لتر أفضل النتائج لكل من (وزن العنقود، المحصول ، حجم العصير/ ١٠٠حبة، السكريات الكلية ، السكريات المختزلة) خلال كلا الموسمين، بينما سجل التداخل بين اليوريا بمعدل ٢% وحمض الجبريليك بمعدل ٢٥٠ مجم/لتر أفضل النتائج لصبغة الأنثوسيانين، أما التداخل بين الدورمكس بنسبة ٤٪+ الإيثريل بمعدل ٢٥٠ ملجم / لتر سجل أفضل النتائج لكل من (طول الحبة، قطر الحبة ، وزن ١٠٠ حبة ، حجم عصير ١٠٠ حبة والصلابة)، بينما التداخل بين زيت ثوم بنسبة ١٪ مع الإيثريل بمعدل ٢٥٠ ملجم/ لتر أعطي أفضل محتوي لفيتامين سي في كلا الموسمين.