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EVALUATION OF GARLIC & ONION OILS AND GA₃ AS BREAKING DORMANCY MATERIALS ON YIELD AND FRUIT QUALITY OF "SUPERIOR" GRAPES.

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ABSTRACT

Garlic and Onion oils both at 5, 10 and 15 % and GA₃ at 150, 200 and 250 ppm in comparison with dormex 5% (commercial application) were sprayed at 27 December, 5 January and 13 January on "Superior" grape. during 2006 and 2007 seasons .Evaluation of these materials as breaking dormancy agents included bud burst %, bud fertility %, total yield (Kg/vine), number of clusters /vine, clusters weight (g) ,TSS % , acidity % , TSS/acid ratio, total carbohydrates%, total nitrogen%,and C/ N ratio , It could be concluded that 15 % garlic oil and 5 %onion oil improved the previous studied characters especially bud burst % and bud fertility %in addition to increasing yield and fruit quality of "Superior" grape. On the other hand GA₃ at 150 ppm was not favorable treatment where it give similar effect as the control.

INTRODUCTION

The grape (*Vitis vinifera* L.) is one of the important fruit trees grown in Egypt. It is well known that deciduous fruit trees, including grape, in temperate climates enter a period of rest or dormancy in autumn and remain dormant. Where dormancy is ended before the accumulation of sufficient cold, fruit bud opening is delayed and leaf and flower buds open synchronously, followed by flower abscission and poor fruit set (Schaffer and Andersen, 1994) Several chemicals can be used to induce bud break of deciduous fruit trees in areas

lacking sufficient chilling units. Responses to the application of such chemicals are often inconsistent as the efficacy of these chemicals appears to depend on rate of application, stage of bud development and method of application (George and Nissen 1990 and Abba *et al* 1999).

Hydrogen cyanamide (Dormex 49% H₂ CN₂) has been used to induce budbreak in areas with no late frosts to increase budburst percentage, to increase uniform bud breaking to concentrate flowering and harvest, to hasten bud break of a cultivar for improved cross pollination and to regulate bud break in tropical zones. Hydrogen cyanamide is used on the grapes and other deciduous fruit trees (Poni *et al* 1990 Dokoozlian *et al* 1995 and El-Sabrou 1998).

Hydrogen cyanamide is used in Latin America on grapes apples, cherries, plums, peaches and persimmons (Behnke *et al* 1992). Many factors influence the response of grapevines to H₂CN₂, including pruning date and application time (McColl, 1986 and Wicks *et al* 1984), application rate, bud physiological stage (Nir *et al* 1983) and cultivar (Lavee *et al* 1984 & Dokoozlian and Williams 1995).

On the other side of view, Garlic and onion paste, oil or extract have been widely used for stimulating bud break in various fruit species. In this concern, Kubota and Mayumi 1992 and Kim *et al* (2000), breaking bud dormancy in grapevines with onion and garlic paste. They found that garlic and onion paste significantly increased percent budbreak compared to the controls. Additionally, Kubota *et al* (2002) reported that onion and garlic oil induced a more uniform bud break of grapevine.

Moreover, Botelho *et al* (2007) studied the effect of garlic extract at 1.5 or 3.0% on bud break of Cabernet Sauvignon grapevine cuttings compared with the conventionally used hydrogen cyanamide at 1.5% immediately after 0,168,336 or 508 chilling hr (6.0°C) respectively, before spraying. All treatments improved and advanced bud sprouting over the control. Garlic extract promoted bud sprouting attaining greater than 70% budbreak after 35 days for cutting chilled for 168, 336 and 504 hr.

Morsi and El-Yazal (2008) reported that garlic extract (20%) and onion extract (20%) increased percentage of bud break of Anna apple fruit setting, fruit weight, yield/tree (Kg) and some chemical constituents of fruits (T.S.S, T.S.S/acid ratio, total carbohydrates and

total sugars), On the contrary decreased total acidity and total phenols in fruit compared to the control..

Yueyan (2004), evaluated the effect of GA₃ on the distribution of endogenous hormones during grapevine dormancy. Treatment of vines with 100 and 150mg GA₃/Liter reduced the ABA content, but substantially increased GA and IAA contents. Changes in the amount of endogenous hormones in the middle to upper buds were more pronounced than those in lower buds.

Thus, the objective of this study is to compare the efficacy of hydrogen cyanamide, garlic oil, onion oil and GA₃ as dormant breaking agents on budburst, bud fertility, yield, fruit quality and some chemical constituents of Superior seedless grapevines.

MATERIALS AND METHODS

The present study was carried out during the two successive seasons of 2006 and 2007 on "Superior" grapevines (6- year old) planted at 3.0 × 1.5m in a sandy soil under drip irrigation system and grown in a private orchard at Giza Governorate. Egypt. The vines were trained with cane trellised using Gable system and pruned by leaving about 80-96 buds (i.e. 8 canes per vine, each comprised 10-12 buds).

Normal horticulture practices were similar for all vines. The experimental treatments were arranged in completely randomized blocks design. Grape vines was uniform as possible (3 spraying dates × 11 treatments × 4 replicates) were selected at random for this study. Each treatment was replicated 4 times and each replicate consisted of two vine. The selected vines were divided into three equal groups. The vines of the first group were sprayed on December 27th, while the second and third groups were sprayed on January 5th and January 13th, respectively in both seasons. The treatments were spraying by hydrogen cyanamide (using Dormex at 5 %), onion and garlic oils at 5, 10 and 15% as well as spray of GA₃ at 150,200 and 250ppm.

Control vines were sprayed with tap water only. These treatments were carried out after pruning of the vines. Foliar spray was carried out using a hand gun sprayer until the drip point to the dormant buds.

Twine – 20 at 0.2 % was added to the spraying solutions of garlic and onion oils as spreading agent .The following parameters

were determined to evaluate the effect of different spray materials on growth, yield and chemical constituents of "Superior" grapevine.

1- Budburst and Bud fertility %.

The percentage of opening buds (bud burst) and bud fertility were calculated according to Sourial *et al* (1993) as follows:

$$\text{Bud burst \%} = \frac{\text{Number of bursted buds}}{\text{Total number of buds}} \times 100$$

$$\text{Bud fertility \%} = \frac{\text{Number of fruiting buds}}{\text{Total number of buds}} \times 100$$

2- Yield and fruit quality

At harvest time (16-17% TSS; 0.6-0.7% acidity and 24-26 T.S.S /acid ratio, nearly at the first week of June for both seasons. The total yield (kg /vine) was determined by weight. However, number of clusters per vine and average cluster weight (g) were determined and recoded. A sample of 2 clusters was taken at random from the harvested clusters of each replicate for quality determination, including total soluble solids (TSS%) were determined using a hand refractometer and the percentage of acidity (as g tartaric acid/100 ml juice) by titration with 0.1 N Sodium hydroxide was determined in fruit juice (A.O.A.C. 1980)

3- Chemical analysis

Total carbohydrates in one-year-old canes as g/100g dry weight were determined colorimetrically by using reagent according to the method described by Herbert *et al* 1971 .Total nitrogen in on-year old canes were determined colorimetrically using reagent and counted as g/100g dry weight according to the method described by Pregel 1945. However, the ratio of total carbohydrates to total nitrogen (C/N ratio) in on-year old canes was calculated by dividing the percentage of total carbohydrates on the percentage of total nitrogen.

Statistical analysis

Data were then analyzed for statistical significant differences using Duncan's multiple range tests. The standardized least significant range (L.S.R) at 5% level was used to compare the effect of various treatments according to (Sendecor and Cochran, 1982).

RESULTS AND DISCUSSION

1- Budburst and Bud fertility %.

1-1- Budburst %

Results presented in Table (1) showed the effect of some breaking dormancy treatments and different spraying dates on budburst percentage of Superior grapevines during 2006 and 2007 seasons. As for the effect of breaking dormancy treatment, it is evident that all concentrations of garlic, onion and GA₃ treatments as well as Dormex treatment significantly increased the percentage of budburst than the control in the two seasons. As for treatments effect the most effective treatment on budburst % was obtained when superior grapevines were treated with Dormex followed by vines treated with garlic at 15% and onion at 5% with slight differences among them which gave (71.39, 70.01 and 69.25%), respectively. Whereas the vines treated with GA₃ at 150 and 200 ppm and onion at 15% gave the least percentage of budburst (51.63, 52.00 and 53.35% respectively) without significant differences among them. Regarding the effect of different spraying dates, the vines sprayed on second or third dates (5th and 13th January) had significantly higher Budburst % as compared with those sprayed on first date (27th December).

The preference of late application in promoting bud opening percentage in comparison with early application date might be attributed to coincidence of deep (winter) dormancy of the buds at time of early application as suggested by Smit and Burnett (1986) and El-Shazly (1999). Also Kubota *et al* 1999 reported that garlic oil promoted bud break of grape on the other hand Kim *et al* 1998 found that garlic juice had no effect on budburst date of grapes although did not induce even budbreak. Kubota and Miyamuki (1992) studied breaking bud dormancy in grapevines with garlic paste. They found that Garlic paste significantly accelerated budbreak and increased the rate of budbreak.

The interaction between the two studied factors (breaking dormancy treatments and spraying dates) was significant in most cases. The highest percentage of bud burst (74.29%) was cleared with the vines sprayed with 15% garlic oil on the last tested application date (January,13) followed by the vines sprayed with garlic oil at (10 and 15%) on the second tested application dates and dormex on the

last tested application date (73.65,73.32 and 72.49%) respectively without significant differences among them .On the other hand, the vines sprayed with all GA₃ concentrations on the early application date exhibited the least percentage of budburst(43.35 & 46.49 and 48.41).

Those treatments gave values similar to the untreated vines during all application dates (30.70 & 40.80 and 45.47%).The same trend of results was also obtained in the second season of study.

The increment of budburst could be attributed to the role of these chemicals in accelerating the internal physiological changes in bud constituents (Rizk, 1996) and Abbas *et al* 1998.

Also Bachelard and Wightman (1973) observed that a probable correlation could exist between the state of dormancy and the dominant total amino acids in the buds. Moreover, they added that significant decrease in the dormant status of bud occurred and this was accompanied by an increase level of catabolic metabolism of protein. A further changes in anabolic metabolism nearly two weeks before bud burst resulted in a net synthesis of cellular constituents in preparation for budburst.

Table (1) Effect of some breaking dormancy treatments and different spraying dates on bud burst percentage of Superior grapevines during 2006 and 2007 seasons.

Treatments	2006 season			Mean
	Dates of spraying			
	First (27Dec.)	Second (5Jan.)	Third (13 Jan.)	
Control	30.70 o	40.80 n	45.47 mn	38.99 F
Dormex 5%	70.15 a-e	71.53 a-c	72.49 ab	71.39 A
Garlic 5%	60.89 g-i	68.74 b-e	65.58 d-g	65.07 C
Garlic 10%	58.53 h-j	73.65 ab	69.71 a-e	67.36 BC
Garlic 15%	62.41 f-h	73.32 ab	74.29 a	70.01 AB
Onion 5%	65.38 d-g	71.57 a-c	70.77 a-d	69.25 AB
Onion 10%	54.63 jk	60.28 g-i	64.88 e-g	59.93 D
Onion 15%	48.72 lm	54.24 jk	57.09 h-k	53.35 E
GA ₃ 150ppm	43.35 mn	57.93 h-j	54.71 jk	52.00 E
GA ₃ 200ppm	46.46 m	55.76 i-k	52.66 kl	51.63 E
GA ₃ 250ppm	48.41 lm	67.38 c-f	58.08 h-k	57.96 D
Mean	53.60 B	63.20 A	62.34 A	
Treatments	2007 season			Mean
Control	43.04 k-m	37.97 m	42.47 lm	41.17 E
Dormex 5%	74.92 bc	82.81 a	81.68 a	79.81 A
Garlic 5%	49.33 h-j	68.30 d	60.15 ef	59.26 BC
Garlic 10%	55.92 fg	69.75 cd	57.22 fg	60.96 B
Garlic 15%	74.60 bc	77.06 ab	78.50 ab	76.72 A
Onion 5%	60.09 ef	68.16 d	53.21 g-i	60.49 BC
Onion 10%	55.49 fg	69.47 cd	54.01 gh	59.66 BC
Onion 15%	56.78 fg	53.95 gh	47.10 j-l	52.61 D
GA ₃ 150ppm	48.68 h-k	58.49 e-g	47.76 i-l	51.98 D
GA ₃ 200ppm	44.12 j-l	53.88 gh	64.00 de	54.00 D
GA ₃ 250ppm	48.54 h-k	55.72 fg	68.18 d	57.48 C
Mean	55.59 B	63.23 A	55.20 B	

Means followed by the same letter (s) are not significantly different from each other at 5 % level.

1-2-Bud fertility %.

The presented data in Table (2) showed the effect of some breaking dormancy treatments and different spraying dates on bud fertility percentage of Superior grapevines during 2006 and 2007 seasons.

Regarding different treatments effect, data in first season showed that bud fertility was (32.33%) for control vines, while it ranged from 43-54% to 61.38% with other treatment. Differences between any of the tested treatments and the control were statistically significant. The highest value of bud % fertility (61.38%) was belonged to the treatment of garlic oil at 15% followed by garlic at 10% and dormex treatment (60.84 and 59.35% respectively) with slight different among them Kubota and Mayumi(1992) reported that garlic extract significantly increased percent bud fertility of grapevines .As for spraying date effect, no significant differences between the sprayed vines on the second and third dates which gave higher percentages of bud fertility compared with the sprayed vines on the first date.

As for the interaction between the bearing dormancy treatments and spraying dates, data showed that the highest value of bud fertility (68.02%) resulted from the second date of application (5 Jan.) with the highest concentration of garlic (15%) followed by the vines sprayed with garlic at 15% on the third application date (66.080 and 66.14% respectively) and the vines sprayed on the second application date with the garlic at 10% without significant differences between them. Whereas the sprayed vines on the first application date with all concentration of GA₃ exhibited the least values of bud fertility where they were similar to the control. GA₃ delayed bud break, whether vines were at endodormancy or ecodormancy (Sanjug and Read 2004).

Increasing bud fertility by such chemicals may be due to a possible "complementary flower bud differentiation" after termination of the endodormancy and before bud opening (Abbas *et al* 1998).

2- Yield and fruit quality

2-1- Total yield/vine (kg).

Data in Table (3) indicated the effect of some breaking dormancy treatments and different spraying dates on total yield/vine (kg) of Superior grapes during 2006 and 2007 seasons.

Generally, data of both seasons showed a significant increase in yield per vine with all treatments under study compared with the control. Garlic oil treatment had significant effect on total yield per vine than other treatments. In the first season, the vines sprayed with garlic at 10% exhibited the highest value of yield (11.53Kg) followed by the vines sprayed with garlic oil at 15% and onion oil at 10% without significant differences among them. Meanwhile, the vines sprayed with the highest concentration of GA₃ (250ppm) exhibited the least value (9.53kg) of total yield.

With regard to the effect of application date, it was cleared that the yield increments were more pronounced with late application date rather than the other application dates, late application (January,13) yielded 12.42kg per vine while medium and early application (January 5 and December 27) produced (10.69 and 8.25Kg respectively).

Increasing the yield through increasing bud opening and bud fertility percentage and consequently increasing yield could be achieved through late application.

The interaction between the two studied factors, cleared that the highest yield (13.64, 813.46 and 13.48 Kg/vines) resulted from the treatments of garlic at 15% & 10%² and onion at 15% in the third application date, respectively without significant differences among them. Whereas the least yield were recorded with all treatments under study during the first application date. However the sprayed vines with dormex in the first date resulted the least yield /vine (6.66 Kg/vine).The same trend of results was also obtained in the second season of study.

Sourial *et al* 1993 and El-Shazy (1999) studied the effect of hydrogen cyanamide spray on yield .They found that Dormex application at 1.0 & 3.0 and 5.0% on 20 January markedly increased yield per vine compared with the control and the other application dates. On the contrary, Carreno *et al* (1999) and Tombe (2002) reported that, H₂CN₂ had not significant effect on yield of Thompson seedless grapevine.

Also, Morsi and El-Yazal (2008) found that sprayed apple trees with garlic and onion extract both at 20% increased yield/tree (Kg) compared with untreated tree

Table (2) Effect of some breaking dormancy treatments and different spraying dates on buds fertility percentage of Superior grapevines during 2006 and 2007 seasons.

Treatments	2006 season			Mean
	Dates of spraying			
	First (27Dec.)	Second (5Jan.)	Third (13 Jan.)	
Control	26.28 p	30.93 p	39.78 o	32.33 H
Dormex 5%	51.48 g-j	62.53 b-d	64.03 a-c	59.35 AB
Garlic 5%	45.76 k-n	53.14 f-i	41.93 no	46.94 F
Garlic 10%	54.01 f-i	66.14 ab	63.36 a-c	60.84 AB
Garlic 15%	49.33 i-l	68.02 a	66.80 ab	61.38 A
Onion 5%	54.56 e-h	63.23 a-c	58.00 d-f	58.61 B
Onion 10%	46.95 j-m	55.99 e-g	59.31 c-e	54.08 C
Onion 15%	45.34 l-n	54.21 f-i	51.19 g-j	50.25 DE
GA ₃ 150ppm	39.02 o	44.03 m-o	47.57 j-m	43.54 G
GA ₃ 200ppm	41.46 no	51.67 g-j	50.60 h-k	47.91 EF
GA ₃ 250ppm	43.04 m-o	53.91 f-i	53.42 f-i	50.12 DE
Mean	45.20 B'	54.89 A'	54.09 A'	
Treatments	2007 season			Mean
Control	31.52 m-l	29.43 l	31.90 m-l	30.95 E
Dormex 5%	56.81 cd	59.30 b-c	44.53 g	53.54 A
Garlic 5%	43.13 h	36.15 k-n	50.94 ef	43.41 D
Garlic 10%	52.62 d-f	40.12 lk	47.37 fg	46.70 C
Garlic 15%	58.70 bc	62.62ab	41.49 g	54.27 A
Onion 5%	47.94 ef	43.21 h	50.76 ef	47.31 BC
Onion 10%	60.78 ab	51.97 d-f	37.25 k-m	50.0 B
Onion 15%	52.59 d-f	34.07 l-n	49.35 e-g	45.34 CD
GA ₃ 150ppm	43.37 fg	54.01 c-e	44.29 g	47.22 BC
GA ₃ 200ppm	38.47 h-l	54.68 c-e	30.40ef	47.85 BC
GA ₃ 250ppm	35.57 k-n	58.52 bc	66.14 a	53.41 AB
Mean	47.41 A'	47.56 A'	46.76 A'	

Means followed by the same letter (s) are not significantly different from each other at 5 % level.

Table (3) Effect of some breaking dormancy treatments and different spraying dates on vine yield in Kg of Superior grapevines during 2006 and 2007 seasons.

Treatments	2006 season			Mean
	Dates of spraying			
	First (27Dec.)	Second (5Jan.)	Third (13 Jan.)	
Control	5.091 m	6.622 l	7.857 k	6.478 E
Dormex 5%	6.600 l	10.993 ef	12.676 ab	9.949 CD
Garlic oil 5%	8.042 jk	9.841 f-h	12.431 bc	10.036 CD
Garlic oil 10%	9.142 hi	12.017 b-d	13.643 a	11.538 A
Garlic oil 15%	8.059 jk	11.358 d-f	13.466 a	10.847 AB
Onion oil 5%	8.334 i-k	9.438 h	11.323 d-f	9.669 D
Onion oil 10%	9.220 hi	11.940 b-e	12.393 bc	11.162 AB
Onion oil 15%	7.858 k	8.938 h-j	13.488 a	10.684 BC
GA ₃ 150ppm	8.990 h-j	11.120 ef	12.251 b-d	10.824 AB
GA ₃ 200ppm	9.207 hi	11.618 c-e	10.700 f-g	10.500 BC
GA ₃ 250ppm	8.347 i-k	9.658 gh	10.653 fg	9.532 D
Mean	8.258 C'	10.698 B'	12.419 A'	
Treatments	2007 season			Mean
Control	7.588 no	8.010 mn	9.316 kl	8.306 F
Dormex 5%	10.497 h-j	10.165 i-k	10.205 i-k	10.300 E
Garlic oil 5%	13.118 cd	12.371 d-f	11.544 f-h	12.338 B
Garlic oil 10%	12.855 c-e	15.716 a	15.363 a	14.711 A
Garlic oil 15%	10.100 jk	12.973 c-e	13.175 cd	12.064 BC
Onion oil 5%	10.900 g-j	11.752 e-g	11.362 gh	11.033 DE
Onion oil 10%	9.824 j-l	14.677 ab	13.848 bc	10.287 E
Onion oil 15%	6.830 o	11.981 e-g	13.363 cd	10.572 E
GA ₃ 150ppm	9.006 lm	13.173 cd	10.293 i-k	10.762 DE
GA ₃ 200ppm	9.178 kl	11.580 f-h	11.256 g-i	10.644 E
GA ₃ 250ppm	10.614 h-j	11.285 g-i	12.527 d-f	11.465 CD
Mean	10.240 B	12.306 A	12.203 A	

Means followed by the same letter (s) are not significantly different from each other at 5 % level.

2-2- Number of clusters.

Data in table (4) declare the effect of some breaking dormancy treatments different spraying dates on No. of clusters of Superior grapevines during 2006 and 2007 seasons.

Table (4) Effect of some breaking dormancy treatments and different spraying dates on No. of clusters / vine of Superior grapevines during 2006 and 2007 seasons.

Treatments	2006 season			Mean
	Dates of spraying			
	First (27Dec.)	Second (5Jan.)	Third (13 Jan.)	
Control	8.67 n	10.33 mn	11.67 m	10.22 F
Dormex 5%	17.33 i-l	25.33 a-d	28.00 ab	23.55 A-C
Garlic oil 5%	17.00 kl	19.67 f-l	23.00 c-f	19.89 DE
Garlic oil 10%	20.33 e-k	24.0 b-e	27.00 a-c	23.78 AB
Garlic oil 15%	22.0 d-h	25.00 a-d	28.67 a	25.22 A'
Onion oil 5%	21.33 d-i	22.00 d-h	23.00 c-f	22.11 B-D
Onion oil 10%	18.00 h-l	22.67 d-g	21.33 d-i	20.67 C-E
Onion oil 15%	16.00 l	20.67 c-k	24.00 b-e	20.22 D-E
GA ₃ 150ppm	16.00 l	20.00 e-l	20.67 e-k	18.89 E
GA ₃ 200ppm	18.33 h-l	21.33 d-i	18.67 g-l	19.44 DE
GA ₃ 250ppm	18.00 h-l	19.00 f-l	21.00 d-i	19.33 DE
Mean	17.54 B'	20.91 A'	22.46 A'	
Treatments	2007 season			Mean
Control	12.05 h	13.11 h	15.16 h	13.44 F
Dormex 5%	27.33 a-d	25.33 b-f	25.33 b-f	26.00 BC
Garlic oil 5%	23.33 d-g	22.67 e-g	21.67 fg	22.56 C-E
Garlic oil 10%	23.33 d-g	28.00 a-c	28.33 a-c	26.67 AB
Garlic oil 15%	25.00 b-f	29.33 ab	31.67 a	28.67 A
Onion oil 5%	26.67 b-e	26.00 b-e	26.00 b-e	26.22 AB
Onion oil 10%	20.67 g	26.67 b-e	24.00 c-g	23.78 B-D
Onion oil 15%	15.00 h	21.33 fg	23.00 d-g	19.79 E
GA ₃ 150ppm	20.00 g	23.14 d-g	20.19 g	21.11 DE
GA ₃ 200ppm	21.56 fg	24.11 e-g	23.99 d-g	23.22 B-E
GA ₃ 250ppm	23.11 d-g	24.15 c-g	26.06 b-e	24.44 B-D
Mean	21.64 B'	23.99 A'	24.13 A'	

Means followed by the same letter (s) are not significantly different from each other at 5 % level.

It was evident from the data that, generally, all tested treatments increased number of clusters as compared with the control. Differences between any of the tested treatments and the control were statistically significant.

As for the breaking dormancy treatments effect, in the first season the average number of cluster per control vines was (10.22 cluster) while it ranged from 18.89-25.22 cluster for other treatments. Whereas in the second season, however, control vine bore (13.44 cluster) in average against to (19.79 to 28.67 cluster) for other treatments.

The greatest number of clusters per vine (25.22 and 28.67 cluster) resulted from sprayed vines with garlic at 15% in first and second seasons, respectively. On the other band, the lowest values of clusters number (18.89 and 1979 cluster) were recorded with treated vines with GA₃ at 150ppm in the first season and onion at 15% in the second season, respectively.

The Specific effect of spraying dates, showed that no significant differences were noticed with the second and third application dates which give the higher number of clusters compared with the first application date in both seasons.

The interaction between the two studied factors cleared that, the highest values of cluster number / vine (28.67 and 31.67 cluster) were obtained by the late tested application date (13, January) with the highest tested garlic concentration (15%) in both seasons. Whereas the least values of cluster of (16.00 & 16.00 and 15.00) were recorded by the early tested application date with onion at 15% & GA₃ at 150ppm in the first season and onion at 15% in the second season, respectively.

2-3-Cluster weight (g).

Results presented in table (5) showed the effect of some breaking dormancy treatments and different spraying dates on cluster weight (g) of Superior grapevines during 2006 and 2007 seasons.

Regarding the effect of breaking dormancy treatments, all the tested treatments decreased the cluster weight as compared with the control treatment in both seasons. The least values of cluster weight (422.5 & 430.1 and 437.3g) were

Table (5) Effect of some breaking dormancy treatments and different spraying dates on cluster weight (g) of Superior grapevines during 2006 and 2007 seasons

Treatments	2006 season			Mean
	Dates of spraying			
	First (27Dec.)	Second (5Jan.)	Third (13 Jan.)	
Control	587.3 b	641.0 a	673.3 a	633.9 A
Dormex 5%	380.7 n	434.0 kf	452.7 j-l	422.5 F
Garlic oil 5%	473.1 g-k	500.3 f-i	540.5 e-f	504.6 D
Garlic oil 10%	449.7 kl	500.7 f-i	505.3 e-h	485.2 E
Garlic oil 15%	366.3 n	454.3 j-l	469.7 h-l	430.1 F
Onion oil 5%	390.7 mn	429.0 lm	492.3 f-j	437.3 F
Onion oil 10%	512.3 e-g	526.7 d-f	581.0 bc	540.0 BC
Onion oil 15%	491.1 f-j	432.4 d-f	562.0 b-d	528.4 CD
GA ₃ 150ppm	562.0 b-d	556.0 b-d	592.7 b	573.0 B
GA ₃ 200ppm	502.3 f-i	544.7 c-e	573.3 e-h	540.1 BC
GA ₃ 250ppm	463.7 i-l	508.3 e-h	507.3 e-h	493.1 DE
Mean	470.8 C'	511.6 B'	540.9 A'	
Treatments	2007 season			Mean
Control	629.7 a	611.0 ab	614.5 ab	618.A
Dormex 5%	384.1 l	4013 kl	402.9 kl	396.1 E
Garlic oil 5%	562.3 cd	545.7 c-e	532.7 de	546.9 B
Garlic oil 10%	551.0 cd	561.3 cd	542.3 c-e	551.6 AB
Garlic oil 15%	404. 0 kl	442.3 g-k	416.0 j-l	420.8 C
Onion oil 5%	408.7 kl	452.0 g-j	437.0 h-k	420.8 E
Onion oil 10%	475.3 f-h	550.3 c-e	577.0 bc	432.6 DE
Onion oil 15%	455.3 g-j	561.7 cd	581.0 bc	534.2 BC
GA ₃ 150ppm	450.3 g-j	569.3 cd	509.8 ef	509.8 C
GA ₃ 200ppm	425.7 i-k	480.3 fg	469.2 f-h	458.4 D
GA ₃ 250ppm	459.3 g-i	467.3 gh	480.7 fg	469.1 D
Mean	473.2 B'	513.0 A'	505.7 A'	

Means followed by the same letter (s) are not significantly different from each other at 5 % level.

With regard of the effect of application date in the first season, it is clear that the cluster weight increments were more pronounced with late application date than the other application dates. In the first

seasons, late application (13 January) give (540.9g) while medium and early application dates produced (511.6 and 470.8g) respectively. In the second season, the corresponding values were (505.7 & 513.0 and 473.2 g) for late, medium and early application dates, respectively.

The interaction between the two studied factors revealed that, the vines sprayed with tap water (control treatment) on the three application dates for both season exhibited the highest values of cluster weight. While the least values of cluster weight were cleared with vines sprayed with dormex and garlic at 15% on early application date (27 Dec.) in the first and second seasons

2-4- T.S.S. %.

The present results in table (6) showed the effect of some breaking dormancy treatments and different spraying dates on T.S.S.% of Superior grapevine during 2006 and 2007 seasons.

It is clear that all used treatments increased T.S.S.% as compared with the control. The increment was more pronounced with onion oil at 5%.

Regarding the effect of breaking dormancy treatments in the first season, no significant differences were noticed (15.84 & 15.96 & 16.19 & 15.96 and 16.11) among vines sprayed with dormex , Garlic at 15% & onion at 5 & 10% and GA₃ at 250% respectively which gave the highest percentage of T.S.S. Meanwhile the control treatment (13.87%) was recorded the least percentage of T.S.S.

However, in the second season, the highest TSS percentage resulted from treatment of garlic at 15% which recorded 16.31% against 13.38% for the control.

As for the effect of spraying date, no significant differences between second and third application date which recorded higher percentages of TSS as compared with these sprayed on first application data which gave the least percentage of T.S.S.% during both tested seasons.

As for The interaction between the two studied factors, the highest percentage of T.S.S. (16.67 & 16.00 and 16.00%) were observed with the vines sprayed with onion oil at 5 & 10% and GA₃ at 250 ppm on second application date respectively without significant differences among them. However, the least concentration of GA₃ (150ppm) on first application date resulted the least percentage of T.S.S. These treatments gave a similar result with control treatment during the three application dates in the first season, however, the

second season, the vines sprayed with garlic at 15% on second and third application data T.S.S. (16.40 and 16.80) exhibited the highest values of without significant differences between them.

Table (6) Effect of some breaking dormancy treatments and different spraying dates on T.S.S % of Superior grapevines during 2006 and 2007 seasons.

Treatments	2006 season			Mean
	Dates of spraying			
	First (27Dec.)	Second (5Jan.)	Third (13 Jan.)	
Control	13.93 gh	14.20 e-h	13.47 h	13.87 D
Dormex 5%	15.65 a-d	16.00 a-c	15.87 a-c	15.84 A
Garlic oil 5%	14.00 f-h	15.13 c-f	15.00 c-f	14.71 BC
Garlic oil 10%	14.27 e-h	15.34 b-e	15.17 c-f	14.93 BC
Garlic oil 15%	15.73 a-d	16.33 ab	15.83 a-c	15.96 A
Onion oil 5%	15.90 a-c	16.67 a	16.00 a-c	16.19 A
Onion oil 10%	15.27 b-e	16.60 a	16.00 a-c	15.96 A
Onion oil 15%	14.60 d-g	16.27 ab	15.69 a-d	15.52 AB
GA ₃ 150ppm	14.13 f-h	14.67 d-g	14.47 e-h	14.42 CD
GA ₃ 200ppm	14.93 c-g	15.93 a-c	15.33 b-e	15.40 AB
GA ₃ 250ppm	15.53 a-d	16.60 a	16.20 ab	16.11 A
Mean	14.90 B	15.79 A	15.37 AB	
Treatments	2007 season			Mean
Control	13.35 g	13.23 g	13.57 fg	13.38 D
Dormex 5%	15.53 b-e	16.27 ab	15.98 a-d	15.93 AB
Garlic oil 5%	14.50 ef	15.47 b-e	15.10 c-e	15.02 C
Garlic oil 10%	14.73 de	15.04 de	15.47 b-e	15.08 C
Garlic oil 15%	15.74 de	16.40 a	16.80 a	16.31 A
Onion oil 5%	15.30 b-e	16.20 a-c	16.20 a-c	15.90 AB
Onion oil 10%	14.80 de	15.43 b-e	15.13 c-e	15.12 BC
Onion oil 15%	14.74 de	15.03 de	15.13 c-e	14.97 C
GA ₃ 150ppm	14.67 d-f	15.23 b-e	15.20 b-e	15.03 C
GA ₃ 200ppm	15.03 de	15.43 b-e	15.33 b-e	15.26 BC
GA ₃ 250ppm	15.27 bc	16.13 a-c	15.74 a-d	15.71 A-C
Mean	14.88 B'	15.44 A'	15.40 A'	

Means followed by the same letter (s) are not significantly different from each other at 5 % level.

Table (7) Effect of some breaking dormancy treatments and different spraying dates on acidity % of Superior grapevines during 2006 and 2007 seasons.

Treatments	2006 season			Mean
	Dates of spraying			
	First (27Dec.)	Second (5Jan.)	Third (13 Jan.)	
Control	0.70 a	0.70 a	0.68 ab	0.69 A
Dormex 5%	0.54 d-g	0.50 fg	0.55 d-g	0.53 DE
Garlic oil 5%	0.58 c-f	0.53 e-g	0.61b-d	0.57 B-D
Garlic oil 10%	0.59 c-e	0.52 fg	0.62 bc	0.58 B-D
Garlic oil 15%	0.53 e-g	0.52 fg	0.52 fg	0.52 C-E
Onion oil 5%	0.52 fg	0.51 fg	0.51 fg	0.51 E
Onion oil 10%	0.57 c-f	0.54 d-g	0.55 d-g	0.55 C-E
Onion oil 15%	0.64 bc	0.60 c-e	0.57 c-f	0.60 BC
GA ₃ 150ppm	0.60 c-e	0.60 c-e	0.62 bc	0.61 B
GA ₃ 200ppm	0.61 b-d	0.57 c-f	0.57 c-f	0.58 B-D
GA ₃ 250ppm	0.56 c-f	0.53 e-g	0.53 e-g	0.54 DE
Mean	0.59 A'	0.56 A'	0.58 A'	
Treatments	2007 season			Mean
Control	0.76 a	0.71 a	0.67 a	0.71A
Dormex 5%	0.50 d-g	0.47 e-g	0.46 fg	0.48 CD
Garlic oil 5%	0.58 bc	0.46 fg	0.53 b-e	0.52 BC
Garlic oil 10%	0.58 bc	0.56 b-d	0.54 b-e	0.56 B
Garlic oil 15%	0.51 c-f	0.44 g	0.43 g	0.46 D
Onion oil 5%	0.47 e-g	0.46 fg	0.48 e-g	0.47 CD
Onion oil 10%	0.51 c-f	0.50 d-g	0.53 b-e	0.51 B-D
Onion oil 15%	0.58 e-g	0.58 bc	0.53 b-e	0.56 B
GA ₃ 150ppm	0.59 b	0.50 d-g	0.51c-f	0.53 BC
GA ₃ 200ppm	0.53 b-e	0.48 e-g	0.50 d-g	0.50 B-D
GA ₃ 250ppm	0.54 b-e	0.47 e-g	0.47 e-g	0.49 B-D
Mean	0.56 A'	0.51 A'	0.51A'	

Means followed by the same letter (s) are not significantly different from each other at 5 % level.

2-5- Acidity %

Results presented in Table (7) showed the effect of some breaking dormancy treatments and different spraying dates on acidity % of Superior grapes during 2006 and 2007 seasons.

The data generally, revealed that all tested treatments tended to reduce acidity percentage in the berry juice .As for breaking dormancy treatments effect in the first season, acidity values for different treatments ranged from 0.51 to 61% against 0.69% for the control. However, the least value of acidity (0.51%) was noticed with onion at 5%. Whereas the highest value of acidity (0.61%) was recorded with the least concentration of GA₃ (150ppm).

In the second season, the percentage of acidity of control was 0.71% while it ranged from 0.46 to 0.56% for other treatments. The least percentage of acidity (0.46%) was obtained with vine sprayed with garlic at 15%. Meanwhile, the highest percentage of acidity (0.56%) was observed with vine sprayed with onion oil at 15% with regard to the effect of spraying dates, no significant effect were noticed between all application dates in the both season.

The interaction between breaking dormancy treatments and spraying dates was significant in most cases, the least acidity (0.50 & 0.51 & 0.51%) produced with vines sprayed with dormex on the medium application date and the vines sprayed with onion at 5 % on the medium and late application dates respectively without significant differences among them in the first season. However, the vines sprayed with garlic at 15% on the second and third application dates exhibited the least percentage of acidity (0.044 and 0.43%) in the second season.

On the other hand, the greatest values of acidity were found with control treatment during the all tested application dates for both seasons.

2-6-T.S.S. /acid ratio

Data tabulated in Table (8) showed the effect of some breaking dormancy treatments and different spraying dates on T.S.S. /acid ratio of superior grapevines during 2006 and 2007 seasons.

It was evident from the data that, generally, all tested treatments increased T.S.S. / acid ratio (increased TSS and reduced acidity which meaning increase fruit quality) as compared with the control. The increment was more pronounced with onion treatment at 5% which gave the highest value of TSS/acid ratio (31.55) followed by the vines treated with dormex & garlic oil at 15% and GA₃ at 250% which gave (29.93 & 30.51 and 29.87), respectively without significant differences among them.

Table (8) Effect of some breaking dormancy treatments and different spraying dates on TSS/acid ratio in fruit juice of Superior grapevines during 2006 and 2007 seasons.

Treatments	2006 season			Mean
	Dates of spraying			
	First (27Dec.)	Second (5Jan.)	Third (13 Jan.)	
Control	19.90 h	20.30 h	19.80 h	20.0 E
Dormex 5%	28.90 b-e	32.00 a	28.90 b-e	29.93 AB
Garlic oil 5%	24.14 g	28.55 c-e	24.59 fg	25.76 CD
Garlic oil 10%	24.19 g	29.50 b-d	24.47 fg	26.05 C
Garlic oil 15%	29.68 b-d	31.40 ab	30.44 a-c	30.51 AB
Onion oil 5%	30.58 a-c	32.69 a	31.37 ab	31.55 A
Onion oil 10%	26.79 ef	30.74 a-c	29.09 b-d	28.87 B
Onion oil 15%	22.81 g	27.12 e	27.53 de	25.82 C
GA ₃ 150ppm	23.55 g	24.45 fg	23.34 g	23.78 D
GA ₃ 200ppm	24.48 fg	27.95 de	26.89 e	26.44 C
GA ₃ 250ppm	27.73 de	31.32 ab	30.57a-c	29.87 AB
Mean	25.70 B'	28.73 A'	27.10 AB'	
Treatments	2007 season			Mean
Control	17.57 h	18.63 h	20.25 h	18.82 F
Dormex 5%	31.06 cd	34.62 b	34.74 b	33.47 B
Garlic oil 5%	25.00 g	33.63 b	28.49 ef	29.04 D
Garlic oil 10%	25.40 g	26.56 fg	28.64 ef	26.87 E
Garlic oil 15%	30.86 c-e	37.27 a	39.07 a	35.73 A
Onion oil 5%	32.55 bc	34.47 b	33.75 b	33.59 B
Onion oil 10%	29.02 de	30.86 c-e	28.55 ef	29.48 D
Onion oil 15%	25.41 g	25.91 g	28.55 ef	26.62 E
GA ₃ 150ppm	24.86 g	30.46 c-e	29.80 de	28.41 DE
GA ₃ 200ppm	28.36 ef	32.15 bc	30.66 c-e	30.39 CD
GA ₃ 250ppm	28.28 ef	34.32 b	33.49 b	32.03 BC
Mean	27.12 A	30.81A'	30.54 A'	

Means followed by the same letter (s) are not significantly different from each other at 5 % level.

Concerning, the effect of spraying date, slight differences were noticed with the three application dates on TSS acid ratio. However, vines sprayed at the second application date resulted the highest value

of TSS/acid ratio .The interaction between the two studied factors, revealed that the highest values of TSS acid ratio (32.69 and 32.00) were observed with vines sprayed with onion at 5% and dormex during the second application date, respectively without significant differences between them. Whereas, the least values of TSS /acid ratio (24.14 & 24.19, 22.81 and 23.55) were noticed with vines treated with garlic at 5 & 10% and onion at 15% as wall as GA₃ at 150ppm during the first application date, respectively without significant differences among them. These treatments gave a similar result as control treatment.

Abu-Qaoud, 2004 and Abbas *et al* 1999 declare the effect of hydrogen cyanamide on quality of grapes. They found that hydrogen cyanamide at 6.0% had the greatest effect increased TSS bud had no effect on acidity. Also, El-Shazly 1999 and Sourial *et al* 1993 mentioned that total soluble solids (TSS) and total sugars increase with increasing Dormex concentration of grape, whereas total acidity was reduced. The same trend of results was also obtained in second season of study.

3- Chemical analysis.

3-1- Total carbohydrates.

Results presented in Table (9) showed the effect of some breaking dormancy treatments and different spraying dates on total carbohydrates % on one year old canes of Superior grapevines during 2006 and 2007 seasons. As for the effect of breaking dormancy treatment, it is evident that all tested treatments significantly increased the total carbohydrates than the control in the two seasons. The grapevines treated with garlic at 15% exhibited the greatest value (16.65) followed by vines treated with dormex (16.40) with slight differences between them. Whereas the vines treated with garlic at 5% gave the least value of total carbohydrates without significant differences between this treatment and control. Regarding the effect of different spraying dates, the vines sprayed at the second or third dates (5th and 13th January) had significantly higher total carbohydrates as compared with those sprayed at the first date (27th December).

The interaction between the two studied factors (breaking dormancy treatments and spraying dates) was significant in most cases. The highest value of total carbohydrates % (17.72) was cleared with the vines sprayed with 15% garlic oil on the second tested application date .On the other hand, the vines sprayed with 5% garlic

on the early application date exhibited the least value (13.62) of total carbohydrates. The same trend of results was also obtained in the second season of study.

Table (9) Effect of some breaking dormancy treatments and different spraying dates on total carbohydrates on one year old canes of Superior grapevines during 2006 and 2007 seasons.

Treatments	2006 season			Mean
	Dates of spraying			
	First (27Dec.)	Second (5Jan.)	Third (13 Jan.)	
Control	14.24 jk	14.73 j	15.03 h-j	14.67 D
Dormex 5%	16.36 b-f	16.84 a-c	15.99 d-f	16.40 AB
Garlic oil 5%	13.62 k	15.59 f-i	15.54 f-i	14.92 D
Garlic oil 10%	14.74 ij	14.49j	17.08 ab	15.44 CD
Garlic oil 15%	16.03 d-f	17.42a	16.59 a-d	16.65 A
Onion oil 5%	15.93 d-g	16.54b-d	16.03 d-f	16.17 A-C
Onion oil 10%	14.44 jk	15.69 e-h	16.34 b-f	15.49 CD
Onion oil 15%	14.73 j	16.96 a-c	16.21 c-f	15.96 A-C
GA ₃ 150ppm	15.69 e-h	16.49 b-e	14.84 a-c	15.67 BC
GA ₃ 200ppm	15.14 g-j	16.59 a-d	17.05 ab	16.26 AB
GA ₃ 250ppm	15.82 d-g	15.63 e-g	16.66 a-d	16.04 A-C
Mean	15.16 B	16.09 A	16.12 A	
Treatments	2007 season			Mean
Control	14.16 i	14.85 g-i	15.54 e-g	14.85 D
Dormex 5%	17.00 ab	17.37 a	17.35 a	17.24 A
Garlic 5%	14.47 hi	15.35 fg	14.22 f-h	14.68 D
Garlic 10%	15.88 d-f	16.13 c-e	15.78 ef	15.93 C
Garlic 15%	16.64 a-d	16.93 a-c	17.11 a	16.90 A
Onion 5%	15.94 d-f	17.03 ab	17.49 a	16.82 AB
Onion 10%	15.22 f-h	15.96 d-f	15.80 d-f	15.66 C
Onion 15%	15.85 d-f	16.24 b-e	16.00 d-f	16.03 C
GA ₃ 150ppm	14.38 hi	14.89 g-i	14.17 i	14.48 D
GA ₃ 200ppm	15.68 e-g	15.84 d-f	15.97 d-f	15.83 C
GA ₃ 250ppm	16.06 d-f	16.65 a-d	15.95 d-f	16.22 BC
Mean	15.57 B	16.11 A	15.93 AB	

Means followed by the same letter (s) are not significantly different from each other at 5 % level.

Table (10) Effect of some breaking dormancy treatments and different spraying dates on total nitrogen % on one year old canes of Superior grapevines during 2006 and 2007 seasons.

Treatments	2006 season			Mean
	Dates of spraying			
	First (27Dec.)	Second (5Jan.)	Third (13 Jan.)	
Control	2.91 a-c	2.80 b-f	2.83 a-e	2.84 A
Dormex 5%	2.71 d-g	2.54 g-j	2.46 h-j	2.56 DE
Garlic oil 5%	2.75 c-g	2.63 f-h	2.93 ab	2.77 A-C
Garlic oil 10%	2.98 a	2.80 b-f	2.65 fg	2.81 AB
Garlic oil 15%	2.54 g-j	2.44 ij	2.40 j	2.46 E
Onion oil 5%	2.65 fg	2.47 h-j	2.47 h-j	2.53 DE
Onion oil 10%	2.88 a-d	2.59 g-i	2.54 g-j	2.67 B-D
Onion oil 15%	3.00 a	2.77 b-f	2.75 c-g	2.84 A
GA ₃ 150ppm	2.78 b-f	2.75 c-g	2.84 a-e	2.79 AB
GA ₃ 200ppm	2.47 h-i	2.67 e-g	2.75 c-g	2.63 CD
GA ₃ 250ppm	2.68 e-g	2.86 a-d	2.59 g-i	2.71 A-C
Mean	2.76 A'	2.67 B'	2.66 B'	
Treatments	2007 season			Mean
Control	2.64 f-i	2.86 b-d	2.66 e-i	2.72 B
Dormex 5%	2.56 h-j	2.44 jk	2.32 k	2.44 C
Garlic oil 5%	2.72 d-h	2.80 c-f	2.43 jk	2.65 B
Garlic oil 10%	2.80 c-f	2.61 g-i	2.87 b-d	2.76 B
Garlic oil 15%	2.37 k	2.26 k	2.41 jk	2.35 C
Onion oil 5%	2.53 ij	2.42 jk	2.28 k	2.41 C
Onion oil 10%	2.54 h-j	2.33 k	2.57 g-j	2.48 C
Onion oil 15%	2.74 d-g	2.68 e-i	2.89 b-d	2.77 B
GA ₃ 150ppm	3.07 a	2.89 b-d	2.83 b-e	2.93 A
GA ₃ 200ppm	3.00 ab	2.92 a-c	2.78 c-f	2.90 A
GA ₃ 250ppm	2.56 h-j	2.73 d-g	2.78 c-f	2.69 B
Mean	2.68 A'	2.63 A'	2.62 A'	

Means followed by the same letter (s) are not significantly different from each other at 5 % level.

3-2-Total nitrogen %.

Results presented in Table (10) showed the effect of some breaking dormancy treatments and different spraying dates on total

nitrogen % on one year old canes of Superior grapevines during 2006 and 2007 seasons.

As for breaking dormancy treatments effect, in the first season, the highest values of total nitrogen % (2.84 and 2.84) were noticed control and 15 % onion without significant difference between them. Whereas the least value of total nitrogen %(2.46 and 2.53) were noticed with garlic at 5% and onion at 5% with slight difference between them.

In the second season, the vine sprayed with 200 and 250 ppm GA₃ exhibited the highest values of total nitrogen which give (2.93 and 2.90 respectively) Meanwhile, the least values (2.44 & 2.35 & 2.41 and 2.48) were observed with vine sprayed with dormex & 15% garlic & 5 and 10 onion respectively without significant difference among them.

Concerning , the effect of spraying date, no significant effect were noticed between second and third dates which give the least values of total nitrogen content than the first date in the first season .however in the second season , no significant difference were noticed among all application dates.

The interaction between the two studied factors (breaking dormancy treatments and spraying dates) was significant in most cases. The least value of total nitrogen (2.40 and 2.44) were obtained that vines were sprayed with 15% garlic at the second and third application dates respectively in the first season and the vines which were sprayed with 15% garlic in fist and second application dates & 5% onion in the third application date and 10% onion in the second date which give (2.37 & 2.26 & 2.23 and 2.33, respectively) in the second season. On the other hand, the greatest values of total nitrogen (2.98 & 3.00 & 3.07) were found with 10% garlic & 15% onion in the first season and 150 GA₃ in the second season .

3-3-C/N ratio:

The data listed in Table (11) revealed the effect of some breaking dormancy treatments and different spraying dates on C/N ratio in one year old canes of Superior grapes during 2006 and 2007 seasons. It was cleared that all tested treatments except the least concentration of garlic (5%) increased the value of C/N ratio as compared with the control. The highest values of C/N ratio (6.79 and 6.40) were achieved with vines sprayed with garlic 15% and onion oil at 5%. respectively with slight differences between them. Meanwhile,

the vines sprayed with garlic at 5% and tap water (control) resulted the least values of C/N ratio (5.39 and 5.15) without significant differences between them.

Table (11) Effect of some breaking dormancy treatments and different spraying dates on C/ N ratio in one year old canes of Superior grapevines during 2006 and 2007 seasons.

Treatments	2006 season			Mean
	Dates of spraying			
	First	Second	Third	
Control	4.89 j	5.26 h-j	5.31 g-i	5.15 E
Dormex 5%	6.03 d-f	6.63 a-c	6.50 b-d	6.39 AB
Garlic oil 5%	4.95 ij	5.92 e-g	5.30 g-i	5.39 E
Garlic oil 10%	4.95 ij	5.18 h-j	6.44 b-d	5.52 DE
Garlic oil 15%	6.31 c-e	7.14 a	6.91 ab	6.79 A
Onion oil 5%	6.01 d-f	6.70 a-c	6.49 b-d	6.40 AB
Onion oil 10%	5.01 ij	6.06 d-f	6.43 b-d	5.83 CD
Onion oil 15%	4.91 ij	6.12 d-f	5.89 e-g	5.64 DE
GA ₃ 150ppm	5.64 fh	6.00 d-f	5.22 h-j	5.62 DE
GA ₃ 200ppm	6.13 d-f	6.21 c-e	6.20 c-e	6.18 BC
GA ₃ 250ppm	5.90 e-g	5.47 g-i	6.43 b-d	5.93 B-C
Mean	5.52 A	6.06 A	6.10 A	
Treatments	2007 season			Mean
Control	5.36 i-k	5.19 j-l	5.84 f-i	5.46 DE
Dormex 5%	6.64 c-e	7.12 b-d	7.48 ab	7.08 A
Garlic oil 5%	5.32 i-k	5.48 h-k	5.85 f-i	5.55 C-E
Garlic oil 10%	5.67 g-j	6.18 e-g	5.50 h-j	5.78 CD
Garlic oil 15%	7.02 b-d	7.50 ab	7.02 b-d	7.18 A
Onion oil 5%	6.30 ef	7.04 b-d	7.67 a	7.00 A
Onion oil 10%	5.99 f-g	6.85 cd	6.15 e-g	6.33 B
Onion oil 15%	5.78 g-i	6.06 fg	5.54 h-j	5.79 CD
GA ₃ 150ppm	4.68 l	5.62 g-j	5.00 kl	5.10 E
GA ₃ 200ppm	5.23 jk	5.43 i-j	5.74 g-i	5.47 DE
GA ₃ 250ppm	6.27 ef	6.10 fg	5.74 g-i	6.04 BC
Mean	5.84 B	6.23 A	6.14 AB	

Means followed by the same letter (s) are not significantly different from each other at 5 % level.

Regarding, the effect of spraying date, no significant difference were detected between the three application dates during the first season. However, the second application date recorded higher value (6.23) followed by the third date (6.14) without significant difference between them during the second season.

The interaction between the two studied factors was significant in most cases. The highest value of C/N ratio (7.14) was noticed with the vine sprayed with garlic at 15% at the second application date followed by the same treatment garlic at 15% on the third application date (6.14) with slight differences between them. On the other hand, the most treatments during the first application date exhibited the least values of C/N ratio in the first season, Meanwhile during the second season, the highest significant of C/N ratio (7.67) was noticed with vines sprayed with onion at 5% during the second application date. Meanwhile, the least concentration of GA3 (150 ppm) exhibited the lowest significant value of C/N ratio.

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تقييم استخدام زيت الثوم وزيت البصل وحمض الجبريليك ككاسرات سكون علي المحصول وجودة الثمار في العنب السوبيريور

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استخدم كلا من زيت البصل والثوم بتركيز ١٥&١٠&٥ % وحمض الجبريليك بتركيز ١٥٠ & ٢٠٠ & ٢٥٠ جزء في المليون في مقارنة مع معاملة الدروميكس بتركيز ٥ % (المعاملة التجارية لمزارع العنب) إلى جانب المقارنة (بدون معاملة) وذلك رشا علي نباتات العنب السوبيريور في ثلاث مواعيد وهي ٢٧ ديسمبر & ٥ يناير & ١٣ يناير خلال موسمي ٢٠٠٦ و ٢٠٠٧ وتم تقييم هذه المواد ككاسرات للسكون من خلال دراسة تأثيرهم علي نسبة تفتح البراعم ، نسبة خصوبة البراعم ، المحصول الكلي ، عدد العناقيد / نبات ، وزن العنقود ، نسبة المواد الصلبة الذائبة الكلية ، الحموضة والنسبة بينهما ، نسبة الكربوهيدرات ، النتروجين وكذلك النسبة بين الكربوهيدرات إلى النتروجين وعموما يمكن القول بأن استخدام زيت البصل ١٥ % وزيت الثوم ٥ % قد حسن كثيرا من الصفات سابقة الذكر وخاصة نسبة التفتح للبراعم وخصوبة البراعم إلي جاني زيادة المحصول الكلي وجودة الحبات للعنب السوبيريور ومن ناحية أخرى فان معاملة الجبريلين بتركيز ١٥٠ جزء في المليون لم تكن ذات تأثير جيد في هذا الشأن حيث أعطت تأثيرا مشابها لمعاملة المقارنة.