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COMPARATIVE STUDIES ON THE EFFECT OF SOME TREATMENTS ON FLOWERING AND FRUITING OF PEACH TREES.

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ABSTRACT

The present investigation was carried out during 2008 and 2009 seasons to comparative compare the effect of winter pruning with dormancy breaking agents on some vegetative growth, blooming, fruiting, fruit yield and fruit quality of Early Grand peach cultivar under North Sinai conditions. Six treatments; control (without [A]); winter pruning only [B]; winter pruning with Dormex at 0.25% [C]; winter pruning with Dormex at 0.5% [D]; winter pruning with Dormex at 0.75% [E]; winter pruning with Dormex at 1.0% [F] were investigated at El-Areesh, North Sinai Governorate, Egypt. The winter pruning treatment with 0.25% or 0.50% Dormex spray was gave the highest number of shoots per branch, number of leaves per shoot, leaf length and width, leaf area, fruit set, yield and fruit quality. While treatment, including winter pruning plus 0.75% Dormex spray gave the highest total acidity.

Key words: Winter pruning, Dormex spray, vegetative parameters, yield, fruit quality

INTRODUCTION

Egypt lies mostly in the sub-tropical zone between 22º to 30º latitudes. Chilling hours varying between 150-300 hours in the most production areas. Commercial production of temperate zone fruits started at the beginning of the twenty – century around 1913 when Suez Canal Company or American School at Assiut introduced low chilling pears, plums and peaches.

The area devoted to such trees remained limited for a long period. Majority of peach trees were seedy trees with inferior quality.

Peach is considered as one of the most important crops for farmers in North Sinai. Peach acreage reached about 60447 feddans in North Sinai (in Rafah, El-Sheikh Zouied and El-Areesh regions), these area production about 185232 tons (The Statistics of the Ministry of Agriculture and Land Reclamation, Egypt, 2007).

To overcome this problem, many investigation had been made for termination of bud dormancy by the application of some bud breaking chemical agents such as hydrogen cyanamide, thiourea, potassium nitrate, oil plus gibberellins and cytokinins (Khalil *et al*., 1988; Steffens and Stutte, 1989 and Mansour et al., 1999). Working on two peach cultivars 'Red Haven and Red Skin' Erez *et al*., (1979) found that Red Skin cultivar buds have a higher chilling requirement than Red Haven cultivar terminal buds, which the later showed a very low chilling requirement. Hydrogen cyanamide (Dormex) is the main rest breaking agent registered for use for deciduous fruit trees.

Therefore, the main target of this study was to evaluate the effect of Dormex as spray applications on some vegetative growth, flowering, fruit set and fruit quality of Early Grand peach cultivar under conditions of North Sinai.

MATERIALS AND METHODS

The investigation was carried out during the two successive seasons 2008 and 2009 at the Experimental orchard at El-Areesh, North Sinai Governorate, Egypt, on 36 Early Grand peach cultivar (Prunus persica L.) trees – 12 years old grafted on sour almond rootstock were randomly selected and their similarity in growth, vigor, productivity and uniform as possible and devoted for achieving this experiments. The trees were planted at 5×5 m apart, fertilized by organic fertilizer (10 m^3 per feddan years) and watered with rainfall without any another additions. The following spraying treatments were applied once a year:

1.Control (untreated trees) [A].
2.Winter pruning only [B].
3.Winter pruning with 0.25% Dormex spray [C].
4.Winter pruning with 0.50% Dormex spray [D].
5.Winter pruning with 0.75% Dormex spray [E].
6.Winter pruning with 1.00% Dormex spray [F].

Winter pruning carried out during last week of November (Removing of some one-year-old shoots and remove some of the older branches) and Dormex spray carried out during the first week of December in both seasons.

The six experimental treatments were arranged in a randomized complete block design with three replications (two peach trees for each replicate = 36 trees). The yield of each trees was harvested through the first half of May in each season to determine the following estimates:

A- Measurement of some vegetative growth characters:

- Tree height:

Tree height (cm) of each tree was measured from the soil surface to the main branch apex.

- Trunk thickness (cm):

At the end of the both seasons, trunk thickness (cm) was measured at fixed point (20 cm above the soil surface) in October.

- Shoots length, Number of shoots per branch and number of leaves per shoot:

In late March, for each tree five similarly branches distributed around the tree canopy were labeled in each season. Number of shoots per branch was recorded. A sample of thirty uniform shoots of the spring cycle was chosen at random and labeled on each experimental tree to determined growth measurements such as shoots length (cm) and number of leaves per shoot. The determinations were carried out during October on current season's growth.

- Leaf length, width and leaf area

In mid October (after 7 months), twenty mature leaves from the middle of every new shoot growth from spring cycle were taken at random from each tree and placed on paper sheets, the leaf length and leaf width were measured. The leaf area was measured also by counting the squares to the nearest cm by using the fresh weight method. Certain known disks were taken from the leaves with a cork borer and weighted. The leaf area was calculated using the following formula:

$$L.A = \frac{LFW}{\text{Disk fresh weight}} \times \text{Area of disks (cm2)}$$

Where: LA = Leaf area (cm2), LFW = Leaf fresh weight (g).

B- Physical fruit properties:

- Number of flowers per shoots:

Thirty (one-year-old) shoots were chosen at random and labeled on each tree for each seasons during full bloom (April) to count the total number of flowers per shoot.

- Percentages of fruit set and fruit retention:

Twenty shoots (one-year-old) on each tree were labeled for counting the initial number of flowers to full bloom. . Number of fruitlets and fruits were recorded at monthly intervals up to harvest. The percentage of fruits set was calculated according to Ferguson *et al*., (1994) as follows:

$$\text{Fruit set (\%)} = \frac{\text{No. of developing fruitlets}}{\text{Total initial No. of flowers at full bloom}} \times 100$$

Fruit retention was calculated on the basis of initial number of fruit set on the one hand and the total number of fruitlets drop on the other during each season.

$$\text{Fruit retention (\%)} = \frac{\text{No. of fruit/shoots at harvest}}{\text{Total No. of flowers/ shoot}} \times 100$$

- The average yield

At harvesting the yield of individual peach tree was weighed in kg per tree.

- Fruit weight

The selected twenty fruits from each tree under study were weighted and the average weight of fruit (g) was calculated.

- Fruit dimensions (cm) and shape index (L/W):

The average fruit length (L) and width (W) were measured by using vernier caliper and the average was calculated. The fruit shape indexes (L/W) was recorded.

C- Chemical fruit properties:

- Total soluble solids percentage (T.S.S):

Total soluble solids were measured by using 10-15 fruit samples per tree at 1 to 3 harvest dates. A hand held refractometer was used to determine the soluble solids percentages.

- Total acidity percentage:

The acidity value (%) was determined (titration against 0.1 N sodium hydroxide) according to the methods of A.O.A.C. (1985).

- Sugars content percentage:

Total, reducing and non-reducing sugar percentages were determined in fruit juice according to the method of A.O.A.C. (1985).

All collected data were subjected to statistical analysis according to Snedecor and Cochran (1980). Treatment means were compared using the Duncan Multiple range test at the 5 percent level of probability in both seasons of experimentation.

RESULTS AND DISCUSSION

A- Effect of dormancy breaking agents and winter pruning on some vegetative growth characters:

- Tree height:

Data in Table (1) clearly indicated the change in tree height of the studied Early Grand peach cultivar according to the dormancy breaking agents and winter pruning.

Significant effect was found on tree height by using Dormex spray and winter pruning for Early Grand peach cultivar in the two seasons. On the other hand, winter pruning with 0.25% Dormex spray followed by 0.50% Dormex spray gave the higher tree height compared with the control (untreated trees) and other treatments in both seasons.

- Trunk thickness (cm):

Concerning trunk thickness, the results obtained indicated that, there were significant differences between treatments of Early Grand peach cultivar in both seasons. The most obvious increments were observed by winter pruning with 0.25% Dormex spray followed by winter pruning with 0.50% Dormex spray as compared with the control and other treatments in the two seasons, (Table 1). the present results are in agreement with those of Abdallah (2008).

- Shoots length, number of shoots per branch and number of leaves per shoot:

- Shoots length (cm):

In both seasons, it is clear that the winter pruning and dormancy breaking agents treatments caused significant increments in the shoot length of Early Grand peach cultivar comparing with the control and other treatments in both seasons. Winter pruning with 0.25% Dormex spray treatment gave the highest shoot length as compared with the control and other treatments in the two seasons.

These results supported by those of Erez (1987), Ahmed (1993), Abdel-Aal (1996), El-Kassas *et al*. (1998), El-Shazly (1999), Omran (2000), El-Salhy (2002), Ramteke *et al*. (2003), El-Akkad (2004), Abdallah (2008) and Hassan (2009), they found that spraying Dormex was responsible for enhancing tree vegetative growth resulted in an increase in the shoot length.

- Number of shoots per branch

Regarding the effect of winter pruning and dormancy breaking agent's treatments on number of shoots per branch, results showed significant differences among treatments. Treatment, winter pruning with 0.25% Dormex spray gave higher values of number of shoots per branch of Early Grand peach cultivar as compared with the control and other treatments in the two seasons. In the meantime, the present results are in agreement with those of Ragheb (2004) working on Florda Prince and tropic Snow peach cultivars.

- Number of leaves per shoot:

Significant effect was found on number of leaves per shoot of Early Grand peach cultivar to the winter pruning and dormancy breaking agents in the two seasons. Treatments, the winter pruning with 0.25% Dormex spray gave the highest number of leaves per

shoot followed by winter pruning with 0.50% Dormex spray than the control (untreated trees) and other treatments in both seasons. These findings partially agree with those of Raghab (2004) working on Florda Prince and tropic Snow peach cultivars.

- Leaf length, width and leaf area

- Leaf length (cm):

The obtained data (Table, 1) indicated that, the leaf length of Early Grand peach cultivar were significantly affected by winter pruning and dormancy breaking agents treatments in the second season only. Treatments, winter pruning 0.25% followed by 0.50% Dormex spray gave the highest leaf length as compared with the control and other treatments in the second season. These results are in agreement with Abdallah (2008).

- Leaf width (cm):

The results in Table (1) clearly indicated the effect of winter pruning and dormancy breaking agents treatments on the leaf width of Early Grand peach cultivar. Results showed that, in the two seasons, all treatments significantly increased width of

leaf as compared with the control and other treatments in the two seasons. Winter pruning with 0.25% Dormex spray treatment gave the highest leaf width in both seasons. These findings partially agree with those of Raghab (2004) and Abdallah (2008) on some peach cultivars.

- Leaf area (cm^2):

Regarding specific effect of winter pruning and dormancy breaking agents, data in Table (1) show that there is significant differences among all treatments and the control (untreated trees) in both seasons. Treatments, Winter pruning with 0.25% followed by 0.05% Dormex spray gave the higher values of leaf area as compared with the control and other treatments for Early Grand peach cultivar in the two seasons.

These results supported by those of Erez (1987), Ahmed (1993), Abdel-Aal (1996), El-Kassas *et al*. (1998), El-Shazly (1999), Omran (2000), El-Salhy (2002), Ramteke *et al*. (2003), El-Akkad (2004), Abdallah (2008) and Hassan (2009), they found that spraying Dormex was responsible for enhancing tree vegetative growth resulted in an increase in the leaf area.

Table (1): Effect of dormancy breaking agents and winter pruning on some vegetative growth properties of Early Grand peach during 2008 and 2009 seasons.

Treatments	Tree height (m)	Trunk thickness (cm)	Shoot length (cm)	No. of shoots/ brunch	No. of leaves/ shoot	Leaf length (cm)	Leaf width (cm)	Leaf area (cm^2)
The first season								
Control (A)	2.277 C	69.38 D	35.22 C	9.563 B	50.98 E	4.561 A	2.567 C	8.590 BC
Winter pruning (B)	2.370 AB	75.72 C	37.31 B	10.63 A	53.59 D	4.670 A	2.685 ABC	8.708 BC
(B) + 0.25% Dormex (C)	2.530 A	86.66 A	39.44 A	11.11 A	62.35 A	4.900 A	2.762 A	9.606 A
(B) + 0.50% Dormex (D)	2.450 AB	85.94 AB	38.61 AB	10.81 A	60.64 AB	4.850 A	2.629 BC	9.057 B
(B) + 0.75% Dormex (E)	2.420 AB	80.72 BC	37.52 B	10.80 A	59.56 BC	4.830 A	2.715 AB	8.790 BC
(B) + 1.0 % Dormex (F)	2.327 B	80.16 C	37.51 B	10.82 A	58.04 C	4.800 A	2.726 AB	8.539 C
The second season								
Control (A)	2.310 B	63.22 F	37.00 C	9.55 C	52.26 D	4.574 D	2.542 C	8.778 AB
Winter pruning (B)	2.380 AB	67.38 E	37.84 BC	10.44 B	56.55 C	4.664 C	2.623 BC	8.857 AB
(B) + 0.25% Dormex (C)	2.530 A	86.10 A	39.32 A	11.21 A	60.91 A	4.861 A	2.855 A	9.355 A
(B) + 0.50% Dormex (D)	2.507 AB	76.64 C	38.46 AB	10.83 AB	60.44 A	4.819 AB	2.756 AB	8.726 B
(B) + 0.75% Dormex (E)	2.450 AB	79.32 B	38.33 ABC	10.51 B	59.73 AB	4.769 B	2.665 BC	8.858 AB
(B) + 1.0 % Dormex (F)	2.420 AB	73.31 D	38.21 ABC	10.54 B	58.59 B	4.769 B	2.603 C	8.816 AB

B- Physical fruit properties:

Data concerning the physical properties of the fruits in both seasons are presented in Table (2).

- Number of flowers per shoots:

Results indicated that winter pruning and dormancy breaking agents had significant effect on number of flowers per shoots in both

seasons. Treatment, winter pruning with 0.25% Dormex spray gave the highest number of flowers per shoots as compared with the control (untreated trees) and other treatments for Early Grand peach cultivar in the two seasons. These results agree with these reported by Fuss *et al*. (1990) and Abdallah (2008) who worked on peach, Shin-Chie *et al*. (1996) on nectarine, Wasan *et al.* (1990) who indicated that the dormancy breaker Dormex (2.0%) caused bud abscission in peach trees.

- Percentages of fruit set and fruit retention:

Significant effect was found on percentages of fruit set and fruit retention due to the winter pruning and dormancy breaking agents in both seasons. Treatment, winter pruning with 0.25% Dormex spray gave the higher values of fruit set and fruit retention percentages as tended compared with the control and other treatments in the two seasons. These results tend to agree with those reported by Fernandez and Martin (1987) and Abdallah (2008) working in peach trees.

- The yield (kg per tree):

The results in Table (2) clearly indicated the effect of winter pruning and dormancy breaking agent's treatments on the fruit yield per tree. Results showed that, in both seasons, all treatments significantly produced higher yield compared with untreated trees (control). Treatment, winter pruning with 0.25% Dormex spray gave the highest yield per peach tree, followed by 0.5% Dormex spray with winter pruning in both seasons.

These results are in agreement with those obtained by Petri and Fortes (1982), Mansour *et al*. (1986), Kuden *et a*l. (1995), El-Agamy *et al*. (2001), Nunes *et al*. (2001), Cook *et al*. (2001) and Abdallah (2008). They worked on different peach cultivars and reported that using dormancy breaking agents induced increment the initial fruit set and fruit retention at harvest and consequently increased the yield.

- Fruit weight

Concerning the fruit weight, the obtained results indicated that, there were significant differences among treatments in both seasons. Winter pruning treatment with 0.25% followed by 0.5% Dormex spray gave the highest fruit weight as compared with the control and other treatments in the two seasons. These finding emphasized those of Sourour and El-Deeb (2002), Abdallah (2008) and Hassan (2009) working on different peach cultivars.

- Fruit dimensions (cm) and shape index (L/W):

Result of fruit length, fruit width and shape index in the two seasons showed that fruit dimensions and shape index were significantly affected by winter pruning and dormancy breaking agents. Treatment, winter pruning with 0.25% Dormex spray gave the highest fruit length, fruit width and shape index as compared with the control (untreated trees) and other treatments in the first and second

seasons. Abdallah (2008) and Hassan (2009) in partial agreement with those report these results.

Table (2): Effect of dormancy breaking agents and winter pruning on some fruit physical properties of Early Grand peach during 2008 and 2009 seasons.

Treatments	No. of flowers/ shoot	Fruit Set (%)	Fruit retention (%)	Total yield (kg)/tree	Fruit weight (g)	Fruit length (cm)	Fruit width (cm)	Shape index (L/W)
The first season								
Control (A)	50.34 E	56.92 B	43.79 D	89.64 F	65.11 B	5.078 E	5.045 B	1.006 B
Winter pruning (B)	59.23 D	57.04 B	45.33 CD	111.60 E	96.57 A	5.324 D	5.165 B	1.030 B
(B) + 0.25% Dormex (C)	71.33 A	90.97 A	52.96 A	139.60 A	121.20 A	6.683 A	6.049 A	1.111 A
(B) + 0.50% Dormex (D)	66.73 B	84.13 A	52.29 AB	131.50 B	111.40 A	6.212 B	6.055 A	1.026 B
(B) + 0.75% Dormex (E)	64.12 C	81.58 A	48.00 BCD	121.80 C	108.10 A	5.881 C	5.665 A	1.040 B
(B) + 1.0 % Dormex (F)	62.88 C	77.77 A	48.44 BC	115.00 C	105.70 A	5.953 C	5.666 A	1.051 B
The second season								
Control (A)	54.62 D	59.32 D	44.36 B	90.67 E	65.74 C	5.100 D	5.124 C	0.995 B
Winter pruning (B)	60.22 CD	62.70 CD	46.72 AB	114.40 D	80.70 C	5.279 D	5.190 C	1.017 AB
(B) + 0.25% Dormex (C)	73.65 A	95.90 A	53.49 A	147.30 A	124.50 A	6.354 A	6.008 A	1.060 A
(B) + 0.50% Dormex (D)	68.77 AB	84.79 AB	51.36 AB	135.20 B	114.20 AB	6.050 B	5.712 AB	1.061 A
(B) + 0.75% Dormex (E)	67.36 ABC	79.15 B	50.89 AB	126.60 C	99.09 B	5.609 C	5.443 BC	1.030 AB
(B) + 1.0 % Dormex (F)	64.36 BC	75.45 BC	50.18 AB	118.20 D	100.50 B	5.600 C	5.427 BC	1.031 AB

C- Chemical fruit properties:

Data regarding the chemical properties of the fruits in the two seasons are presented in Table (3).

- Total soluble solids percentage (T.S.S):

Concerning the effect of winter pruning treatment and dormancy breaking agents on total soluble solids percentage (TSS), results showed that there was significant effect between different treatments. Treatments, 0.25% and 0.50% Dormex spray with the winter pruning gave higher values of total soluble solids percentage as compared with the control (untreated trees) and other treatments in the two seasons.

These results are in partial agreement with those found by El-Kassas *et al*. (1996), El-Agamy *et al*. (2001), Sourour and El-Deeb

(2002), Abdallah (2008) and Hassan (2009) They reported that total soluble solids percentage was increased as a results of Dormex and ammonium nitrate applications as compared with those untreated trees (control).

- Total acidity percentage:

Results indicated that the total acidity percentage was significantly affected by winter pruning treatment and dormancy breaking agents in the first season only. Treatment, winter pruning with 0.75% Dormex spray gave the highest total acidity percentage of Early Grand peach fruits as compared with the control (untreated trees) and other treatments in the first season. Abdallah (2008) and Hassan (2009) in partial agreement with those of these results. In the second season control recorded highest significant value.

- Sugars content percentage:

- Total sugars (%):

No significant effect was found on total sugars percentage by using different dormancy breaking agents treatments with winter pruning in both seasons. On the other hand, winter pruning treatment with 0.25% Dormex spray gave the highest total sugars percentage of Early Grand peach fruits compared to the control and other treatments in the two seasons.

- Reducing sugars (%):

The obtained data indicated that, the reducing sugars percentage was significantly affected by winter pruning and dormancy breaking agents. The highest reducing sugars percentage in Early Grand peach fruits was produced with 0.25% Followed by 0.50% Dormex spray with winter pruning treatment in the two seasons.

El-Kassas *et al*. (1996), El-Agamy *et al*. (2001), Abdallah (2008) and Hassan (2009) in partial agreement with those of these results.

- Non-reducing sugars (%):

Table (3) show the effect of winter pruning treatment and dormancy breaking agents of Early Grand peach fruits during the present study. It is noticed from the obtained results that during in both seasons of Early Grand peach cultivar the non-reducing sugars exhibits similar trend as the total sugars percentage.

In conclusion, the winter pruning treatment with 0.25% or 0.50% Dormex spray used was the most effective in speeding up applications from floweral buds open and shorten blooming duration as well as increase the fruit set, fruit retention percentages and improving the fruit quality than did the untreated trees (control) and some other treatments.

Table (3): Effect of dormancy breaking agents and winter pruning on some fruit chemical properties of Early Grand peach during 2008 and 2009 seasons.

Treatments	Total Soluble solids (%)	Total acidity (%)	Sugars content		
			Total sugars (%)	Reducing sugars (%)	Non-Reducing sugars (%)
The first season					
Control (A)	11.26 E	0.3900 B	5.320 A	2.463 C	2.857 A
Winter pruning (B)	11.79 D	0.3917 B	5.533 A	2.567 BC	2.967 A
(B) + 0.25% Dormex (C)	14.70 A	0.2660 E	5.840 A	2.880 A	2.960 A
(B) + 0.50% Dormex (D)	14.25 A	0.3327 D	5.730 A	2.677 ABC	2.600 A
(B) + 0.75% Dormex (E)	12.41 C	0.3997 A	5.660 A	2.757 AB	2.903 A
(B) + 1.0 % Dormex (F)	12.95 B	0.3860 C	5.687 A	2.690 ABC	2.997 A
The second season					
Control (A)	11.27 C	0.5587 A	4.797 A	2.413 B	2.383 A
Winter pruning (B)	11.88 BC	0.3523 B	5.703 A	2.743 AB	2.960 A
(B) + 0.25% Dormex (C)	14.01 A	0.3317 B	5.720 A	2.850 A	2.870 A
(B) + 0.50% Dormex (D)	13.74 A	0.3423 B	4.927 A	2.597 AB	2.330 A
(B) + 0.75% Dormex (E)	13.29 A	0.4017 B	5.193 A	2.607 AB	2.587 A
(B) + 1.0 % Dormex (F)	12.48 B	0.4013 B	4.787 A	2.337 B	2.450 A

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دراسات مقارنة على أثر بعض المعاملات على التزهير والإثمار فى أشجار الخوخ

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أجريت هذه الدراسة خلال موسمي 2008، 2009 وذلك لدراسة تأثير معاملة التقليم بإزالة بعض الأفرع عمر سنة وبعض الأفرع المسنة مع الرش بمادة الدورميكس بتركيزات مختلفة على النمو الخضرى والإزهار والإثمار وكذلك كمية المحصول وجودة الثمار فى أشجار الخوخ صنف إيرلى جراند المنزرعة بمزرعة بمنطقة العريش – محافظة شمال سيناء - مصر، حيث التربة الرملية والأشجار منزرعة على مسافة 5م × 5م وتعتمد المزرعة على الرى المطرى فقط، وقد أوضحت النتائج المتحصل عليها الآتي:

1- أدت معاملة التقليم مع الرش بالدورميكس بتركيز 0.25٪ يليها الرش بالدورميكس بتركيز 0.5٪ إلى أعطاء أفضل نمو خضرى مقارنة بالمعاملات الآخرى.
2- أدت معاملة التقليم مع الرش بالدورميكس بتركيز 0.25٪ يليها الرش بالدورميكس بتركيز 0.5٪ إلى زيادة نسبة الثمار العاقدة وكذلك نسبة الثمار المتبقية مقارنة بالأشجار الغير معاملة.
3- أدت معاملة التقليم مع الرش بالدورميكس بتركيز 0.25٪ يليها الرش بالدورميكس بتركيز 0.5٪ إلى زيادة كمية المحصول مقارنة بالأشجار الغير معاملة.
4- أدت معاملة التقليم مع الرش بالدورميكس بتركيز 0.25٪ يليها الرش بالدورميكس بتركيز 0.5٪ إلى تحسين الصفات الثمرية الطبيعية والكيميائية مقارنة بالأشجار الغير معاملة.
5- بينما أدت معاملة التقليم مع الرش بالدورميكس بتركيز 0.75٪ إلى زيادة محتوى الثمار من الحموضة الكلية مقارنة بالأشجار الغير معاملة.

وبناء على النتائج المتحصل عليها فإنه يمكن التوصية بإجراء التقليم بإزالة بعض الأفرع عمر سنة وكذلك بعض الأفرع المسنة مع الرش بالدورميكس بتركيز 0.25٪ أو 0.5٪ لأشجار الخوخ صنف إيرلى جراند وذلك للحصول على أفضل نمو خضرى وأفضل محصول مناسب وجودة ثمار عالية تحت ظروف شمال سيناء.