Trials for Alleviating The Problems of Poor Setting, Uneven Colouration of Berries and Fruit Quality Impaired of Crimson Seedless Grapevines

Ahmed, M. K. Abdel Aal
Hort. Dept. Fac. of Agric. Minia Univ. Egypt
E-mail: ahmed_aly66@hotmail.com

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ABSTRACT

This study was carried out during 2011 and 2012 seasons to examine the effect of spraying ethrel at 300 ppm either alone or in combinations with potassin at 0.1 %, orthophosphoric acid at 0.1 %, magnesium sulphate at 0.1 %, boric acid at 0.05 % and potassium silicate (Si) at 0.05 % on alleviating yield decline, uneven berries colouration and impaired fruit quality problems in Crimson seedless grapevines grown under Minia region conditions.

Using ethrel alone had no effect on berry setting %, yield, cluster weight as well as berry weight and dimensions, while it was very effective in enhancing red berries %, T.S.S %, total sugars %, T.S.S/ acid and berries peel content of anthocyanins in relative to the check treatment. Maturation date was also greatly advanced with ethrel treatments. Total acidity %, percentages of pink and green berries, chlorophylls a & b and total carotenoids in the peels tended to reduce with ethrel application. Using K, P, Mg, B or Si fertilizers along with ethrel effectively enhanced yield, berries colouration as well as physical and chemical characteristics of the berries comparing with using ethrel alone. The promoting effect of these nutrients on yield and quality could be arranged as follows in ascending order K, P, Mg, B and Si.

Four sprays of a mixture containing potassin at 0.1 %, orthophosphoric acid at 0.1 %, magnesium sulphate at 0.1 %, boric acid at 0.05 % and potassium silicate at 0.05 % in addition to one spray of ethrel at 300 ppm applied only with the fourth spray of nutrients was responsible for improving yield quantitively and qualitatively and at the same time for reducing the problems of poor setting and uneven colouration of berries of Crimson seedless grapevines.

Key words: Crimson seedless grapevines, ethrel, nutrients, silicon, berries colouration.

INTRODUCTION

Crimson seedless grapevine cv. is a late season, and fast becoming the preferred red seedless grape in supermarkets worldwide. Berries of such cv. have exception shelf life, sweet juice and higher sugar content with half as glucose and half as fructose. Grapes contain adequate amounts of K, vitamin A and dietary fiber. The serious problems of such grapevine cv. grown in arid regions are the poor berry setting, small berries and uneven colouration of berries in clusters.

For solving the previous problems of such grapevine cv, it is advised to use compounds that are responsible for enhancing the biosynthesis of plant pigments and carbohydrates such as boron, magnesium, potassium and phosphorous as well as materials such as silicon that are responsible for protecting the vines from higher temperature. In addition, using compounds such as ethrel are beneficial in enhancing enzymes that breakdown complex nutrients to soluble ones.

Anthocyanins are considered very important components in grapes of Crimson seedless grapevine cv. that greatly governed colouration of the berries. This pigment is negatively affected by air temperature, solar and temperature differences between day and night (Downey *et al*., 2006).

Ethrel is considered a promoting compound responsible for enhancing colouration and ripening of some fruits. This is attributed to its action in releasing ethylene that activates hydrolytic and oxidative enzymes involved in maturation, increasing the degradation of chlorophylls and the appearance of anthocyanins, xanthophylls and carotenoides (Morre, 1979).

The beneficial effects of silicon (Si) on fruit trees are mainly associated with enhancing trees resistance to biotic and abiotic stresses especially temperature by stimulating defense reaction mechanisms. It is very essential for using Si during fruit development for protecting the vine from higher temperature that negatively affect berries colouration.

As a matter of fact, many researchers revealed that B application to vineyards increased grape yield. Boron is known as an essential element for the optimum growth of plant. Excessive amounts of boron just as in the case of its deficiency have negative effects and stop the growth of plant (Marschner, 1995). Boron has a more critical and important place in generative period compared to its place in vegetative period (Dell and Huang, 1997). It has crucial and apparent functions pertaining sugar carriage, cell wall synthesis, lignin amount, cell wall structure, carbohydrate metabolism, RNA metabolism, respiration, IAA metabolism, phenol metabolism, the structural and functional characteristics of biological membrane and positively affects growth of fruits (Faust, 1989). Lack of boron is the most serious problem in vine cultivation. Fruit growth was weaker and the yield decreased by 80 % compared to the plants nourished with boron. This is a result of the need for high amount of boron for pollen tube growth and vividness (Mengel and Kirkby, 2001).

Supplying vines with Mg, P and K has beneficial effects on the biosynthesis of plant pigments, sugars, IAA, vitamins and enzymes (Mengel and Kirkby, 2001).

Application of ethrel, when seven to eight berries of 20 % of the clusters per vine were coloured, was found by many authors to advance maturity and enhance colouration of berries in different grapevine cvs (Dal *et al*., 2010; Amiri *et al*., 2010; Kassem *et al*., 2011; Farag *et al*., 2011; Farag *et al*., 2012 a and 2012 b and Mohamed-Ebtesam, 2012).

An obvious promotion on berry setting, berry colouration and quality of the berries was observed due to using silicon (Matichenkov *et al*., 2000; Ma *et al*., 2002; Neumann and Zur- Nieden, 2001; Kanto, 2002; Ma and Takahashi, 2002; Ma and Yamaji, 2006 and Abdel- Hameed, 2012), boron (Wojicik, 2005; Mostafa *et al*., 2006; Farahat, 2008; Morsi *et al*., 2009 and Er *et al*., 2011) as well as phosphorus, potassium and magnesium (Amin, 2007; Abd El- Gaber- Nermean, 2009; El- Sawy, 2009; Abd El- Wahab, 2010; Ahmed *et al*., 2011; El-Kady- Hanaa, 2011; Abdelaal, 2012 and Ebrahiem-Asmaa and Ahmed- Basma, 2012).

The target of this study was defining the best nutrients applied with ethrel that lead to enhance berry setting, berry weight and colouration of berries in the clusters of Crimson seedless grapes.

MATERIALS AND METHODS

This study was carried out during 2011 and 2012 seasons on 48 uniform in vigour 8 years old Crimson seedless grapevines. The vines are grown in clay soil (2.5% O.M; 7.91 pH; 0.92 mmhos1cm/25C E.C; 1.1 % $CaCO_3$; 0.09 % total N; 390 ppm K and 5.0 ppm P) and planted at 2x3 meters apart in a private vineyard located at Samalout district, Minia Governorate. Surface irrigation system was followed. Winter pruning was done at the middle of January using cane pruning method with Gable shape supporting system leaving 72 eyes/ vine (6 fruiting canes X 10 eyes + 6 renewal spurs X 2 eyes).

All the selected vines received regular horticultural practices that already applied in the vineyard except those dealing with the application of ethrel, boron, phosphorus, potassium, magnesium and silicon (Si).

The present work included the following eight treatments:

1. Control (untreated vines)
2. Spraying ethrel at 300 ppm
3. Spraying ethrel at 300 ppm+ Potassin at 0.1 %.
4. Spraying ethrel at 300 ppm+ Orthophosphoric acid at 0.1 %
5. Spraying ethrel at 300 ppm+ magnesium sulphate at 0.1 %
6. Spraying ethrel at 300 ppm+ boric acid at 0.05 %
7. Spraying ethrel at 300 ppm+ potassium silicate at 0.05 %
8. Spraying ethrel at 300 ppm+ Potassin at 0.1 %+ orthophosphoric acid at 0.1 %+ magnesium sulphate at 0.1 %+ boric acid at 0.05 %+ potassium silicate at 0.05 %.

Each treatment was replicated three times, two vines per each. Potassin (40 % K_2O); orthophosphoric acid (85 % P_2O_5); magnesium sulphate (9.6 % Mg); boric acid (17% B) and potassium silicate (25 % Si + 10 % K_2O) were sprayed four times started at growth start (2^{nd} week of April); just after berry setting (2^{nd} week of June); one month later (2^{nd} week of July) and when 7 to 8 berries in the 20 % of the clusters per vine were red coloured (3^{rd} week of August) during both seasons.

Ethrel was sprayed to clusters only once when 7 to 8 berries in the 20 % of clusters per vine were red coloured. It was mixed thoroughly with the specific nutrient at the named concentrations before application. It is worth to mention that, the fourth sprays of nutrients included the application of ethrel. They were applied at the recommended concentrations as reported by Mohamed-Ebtesam (2012) and Abdelaal (2012). Triton B as a wetting agent was applied at 0.05 % to all the investigated solutions. Untreated vines were sprayed with water containing Triton B. The selected vines were sprayed with these nutrients till runoff (2 l/vine).

The present experiment was set up in a randomized complete block design with three replicates each consisted of two Crimson seedless grapevines.

Berry setting % was recorded by dividing the number of attached berries/cluster by total number of flowers (attached fruitlets+ dropped flowers+ dropped fruitlets in the bags) and multiplying the product by 100.

Maturation date was recorded when T.S.S/ acid in the berries of any treatment reached 25/1 (Weaver, 1976).

Harvesting took place when T.S.S/ acid in the berries of the check treatment reached 25/1 in both seasons. The yield of each vine was recorded in terms of weight (Kg) and number of clusters per vine and then the average weight of cluster (g) was recorded. In addition, berry weight and dimensions (equatorial and longitudinal in cm) were registered. Percentages of pink, red and green berries in each cluster were estimated by dividing number of berries for each color group by total number of berries/ cluster and multiplying the product by 100.

Chemical characteristics of the berries namely total soluble solids %, total sugars % and total acidity (as g tartaric acid/ 100 ml juice) were determined according to the procedures that outlined in A. O. A. C (1995). Plant pigments namely chlorophylls a&b and total carotenoids were determined in the berries as (mg/ 1.0 Kg) (according to Wettstein, 1957). Total chlorophylls were then calculated. Anthocyanin was determined in the peels as (mg/ 100 g) according to the methods of Fuleki and Francis (1968) by using extraction solution contains 85 ml ethyl alcohol 95 %+ 15 ml HCl 1.5 N that was added to 4 g fresh berry peel. The mixture was left for at least two weeks, then 2 ml of the filtrate was used to determine the optical density at 535 nm.

Data were statistically analyzed with standard methods according to Mead *et al.,* (1993) and the new L.S.D test was used to make all comparisons between different treatment means.

RESULTS AND DISCUSSION

1- Maturation date:

It is clear from data in Table (1) that treating the vines once with ethrel either alone or combined with any nutrient (K, P, Mg, B, Si) was accompanied with advancing maturation date relative to the check treatment. The hastening in maturation date was depended on using ethrel with K, P, Mg, B and Si, in ascending order. Treating the vines four times with a mixture of the five investigated nutrients as well as using ethrel once gave the highest advancement in maturation date. Under such promised treatment, vines ripened at 10th and 9th Sept. during both seasons, respectively. Maturation date of untreated vines was 30th Sept. and 2nd Oct. during both seasons, respectively. In the promised treatment, maturation date was advanced by 20 and 23 days relative to the check treatment.

The beneficial effect of ethrel and nutrients on enhancing sugars and plant pigments (Moore, 1979 and Mengel and Kirkby, 2001) could explain the present results.

These results are in harmony with those obtained by Farag *et al*., (2011) on ethrel; Abdel-Hameed (2012) on Si; Farahat (2008) on B and Abd El- Wahab (2010) on P, K and Mg.

2. Berry setting %, yield (Kg) and cluster weight (g)

It is clear from the data in Tables (1&2) and Figure (1) that using ethrel at 300 ppm alone had no significant effect on berry setting%, yield expressed in weight and number of clusters per vine and cluster weight relative to the check treatment. Using ethrel combined with any nutrient namely K, P, Mg, B or Si was significantly very effective in improving berry setting, yield and cluster weight relative to check treatment or when ethrel was applied alone (without nutrients). The best nutrients applied with ethrel in this respect were K, P, Mg, B and Si, in ascending order. Application of all nutrients along with ethrel gave the best results. The check vines as well as those vines that treated only with ethrel gave the lowest values. These results were true during both seasons.

The beneficial effects of K, P, Mg, B and Si on enhancing growth and vine nutritional status surely reflected on enhancing berry setting, yield and cluster weight.

These results are in agreement with those obtained by Farag *et al*., (2012 a and 2012 b) and Mohamed-Ebtesam (2012) on ethrel; Abdel-Hameed, (2012) on silicon (Si); Er *et al*., (2011) and Abdelaal (2012) on B and Abdelaal (2012) and Ebrahiem-Asmaa and Ahmed- Basma (2012) on P, K and Mg.

3- Berry weight and dimensions

Data in Table (2) clearly show that berry weight and dimensions (longitudinal and equatorial) did not alter significantly with using ethrel alone in relative to the check treatment. However, application of ethrel combined with these different nutrients (K, P, Mg, B or Si) significantly improved berry weight and dimensions in relative to using ethrel alone and the check treatment. Using K, P, Mg, B and Si with ethrel, in ascending order was significantly favourable in improving berry weight and dimensions. Using the five nutrients combined with ethrel gave the maximum values. Untreated vines or using ethrel alone gave the minimum values. These results were true during both seasons.

The promoting effect of P, K, Mg, B and Si on berry weight and dimensions might be attributed to their positive action on cell division and the biosynthesis and translocation of organic foods (Mengel and Kirkby, 2001).

These results are in concordance with those obtained by Farag *et al*., (2011) on ethrel; Abdel-Hameed (2012) on Si; Farahat (2008) on B and Abd El- Wahab (2010) on P, K and Mg.

4- Colouration of the berries

It is clear from the data in Table (3) and Figure (2) that using ethrel at 300 ppm either singly or in combined with fertilization with K, P, Mg, B or Si significantly was accompanied with enhancing percentage of red coloured berries and at the same time reducing percentages of pink and green coloured berries in relative to the check treatment. The stimulation on percentage of red coloured berries was significantly associated with using K, P, Mg, B and Si with ethrel, in ascending order. Combined application of ethrel plus nutrients was superior than using ethrel alone in promoting colouration of the berries. The best percentage of red berries in the clusters were recorded with spraying ethrel once at 20 % berries colouration + supplying the vines with P, K, Mg, B and Si four times. Under such promised treatment, percentage of red berries for each cluster reached 57 and 58 % during both seasons, respectively. The lowest colouration of berries (2.5 and 3.0 %) was recorded on the clusters harvested from untreated vines. Similar results were announced during 2011 and 2012 seasons.

The beneficial effect of ethrel on enhancing the release of ethylene and stimulating enzymes that were responsible for converting complex sugars to soluble ones (Moore, 1979). The promoting effect of K, P, Mg, B and Si on enhancing the biosynthesis and translocation of sugars and plant pigments could result in enhancing berries colouration (Mengel and Kirkby, 2001).

These results are in approval with those obtained by Kassem *et al.* (2011) on ethrel; Abd El-Hameed (2012) on Si; Morsi *et al.* (2009) on B and Amin (2007) in P, K, and Mg.

Table 1: Effect of ethrel either applied singly or in combinations with some nutrients on maturation date, berry set %, number of cluster per vine and yield/ vine (Kg) of Crimson seedless grapevines during 2011 and 2012 seasons.

Ethrel and nutrient treatments	Maturation date		Berry Set %		No. of clusters/ vine		Yield/ vine (Kg)	
	2011	2012	2011	2012	2011	2012	2011	2012
Control	30th Sept	2nd Oct.	6.9	6.8	24.0	25.0	7.5	7.8
Ethrel at 300 ppm	22nd Sept	23rd Sept	6.9	6.8	25.0	25.0	7.8	7.8
Ethrel+ K at 0.1 %	20th Sept	19th Sept	7.3	7.5	25.0	27.0	8.8	9.5
Ethrel+ P at 0.1 %	19th Sept	17th Sept	7.8	8.1	25.0	29.0	8.9	10.3
Ethrel+ Mg at 0.1 %	18th Sept	16th Sept	8.4	8.7	25.0	29.0	9.0	10.5
Ethrel+ B at 0.05 %	16th Sept	14th Sept	9.0	9.3	25.0	31.0	9.2	11.5
Ethrel+ Si at 0.05 %	12th Sept	11th Sept	9.5	9.8	25.0	32.0	9.5	12.2
Ethrel+ all nutrients	10th Sept	9th Sept	9.9	10.4	25.0	32.0	10.3	13.1
New L.S.D at 0.5 %	-	-	0.3	0.5	N.S	2.0	0.8	0.7

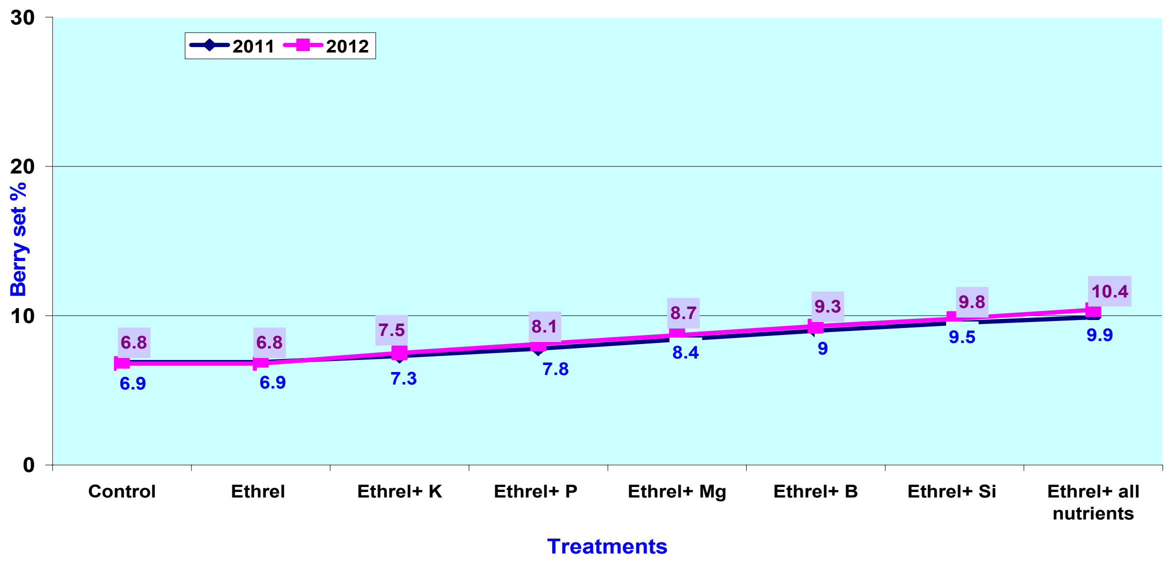

Figure1: Effect of either applied singly or in combinations with some nutrient on berry set% of Crimson seedless grapecines during 2011 and 2012 seasons

Table 2: Effect of ethrel either applied singly or in combinations with some nutrients on cluster weight (g), berry weight (g) as well as berry equatorial and longitudinal (cm) of Crimson seedless grapevines during 2011 and 2012 seasons.

Ethrel and nutrient treatments	Cluster weight (g)		Berry weight (g)		Berry equatorial (cm)		Berry longitudinal (cm)	
	2011	2012	2011	2012	2011	2012	2011	2012
Control	312.0	310.0	3.71	3.74	1.61	1.59	2.20	2.18
Ethrel at 300 ppm	313.0	311.0	3.70	3.75	1.60	1.60	2.20	2.18
Ethrel+ K at 0.1 %	351.0	352.0	3.79	3.81	1.64	1.66	2.26	2.26
Ethrel+ P at 0.1 %	355.0	356.0	3.82	3.87	1.67	1.69	2.32	2.33
Ethrel+ Mg at 0.1 %	360.0	362.0	3.91	3.94	1.70	1.72	2.38	2.40
Ethrel+ B at 0.05 %	367.0	370.0	3.96	4.00	1.74	1.75	2.45	2.45
Ethrel+ Si at 0.05 %	380.0	381.0	4.03	4.06	1.77	1.80	2.48	2.49
Ethrel+ all nutrients	411.0	410.0	4.10	4.15	1.81	1.84	2.52	2.55
New L.S.D at 0.5 %	18.0	18.9	0.05	0.06	0.03	0.02	0.04	0.05

Table 3: Effect of ethrel either applied singly or in combinations with some nutrients on pink, red and green colouration % of the berries of Crimson seedless grapevines during 2011 and 2012 seasons

Ethrel and nutrient treatments	Pink berries %		Red berries %		Green berries %	
	2011	2012	2011	2012	2011	2012
Control	50.0	51.1	2.5	3.0	47.5	45.9
Ethrel at 300 ppm	48.5	48.0	41.0	41.6	10.5	10.4
Ethrel+ K at 0.1 %	47.5	47.0	44.0	44.2	8.5	8.8
Ethrel+ P at 0.1 %	46.4	46.0	47.5	48.0	6.1	6.0
Ethrel+ Mg at 0.1 %	45.6	45.1	49.0	49.1	5.4	5.8
Ethrel+ B at 0.05 %	42.9	42.8	52.2	52.5	4.9	5.0
Ethrel+ Si at 0.05 %	41.0	40.8	54.5	54.6	4.5	4.6
Ethrel+ all nutrients	40.0	39.0	57.0	58.0	3.0	3.0
New L.S.D at 0.5 %	0.9	1.0	1.0	1.1	1.0	1.2

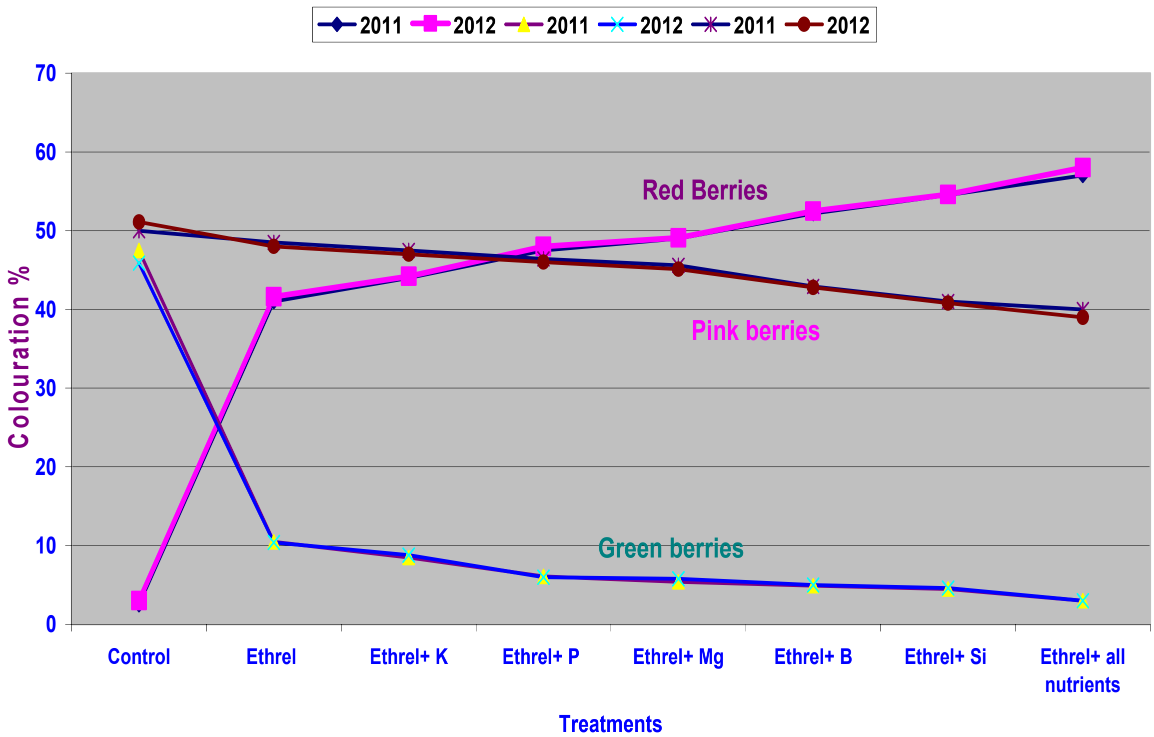

Figure 2: Effect of ethrel either applied singly or in combination with some nutrients on pink, red and green colouration % of the berries of Crimson seedless grapevines during 2011 and 2012 seasons

5- Chemical characteristics of the berries

Table (4) obviously reveals that using ethrel at 300 ppm either singly or combined with various nutrients significantly was favourable in improving chemical characteristics of the berries in terms of increasing T.S.S %, total sugars% and T.S.S/ acid and reducing total acidity relative to the control treatment. Using ethrel plus these nutrients was significantly superior in promoting chemical quality parameters than using ethrel alone. The best nutrient was Si followed by B and K came in the last position in this connection. Treating the vines once with ethrel at 300 ppm followed by using all nutrients together gave the best results with regard to chemical quality of the berries. Unfavourable effects on chemical quality of the berries were observed on untreated vines. The same trend was observed during both seasons.

The beneficial effects of ethrel on promoting maturity (Moore, 1979) and K, P, Mg, B and Si on the biosynthesis and translocation of sugars (Mengel and Kirkby, 2001) could explain the present results.

These results are in harmony with those obtained by Kassem *et al.* (2011) on ethrel; Abd El-Hameed (2012) on Si; Morsi *et al.* (2009) on B and Amin (2007) in P, K, and Mg.

6- Plant pigments in the berries

It is worth to mention from the data in Table (5) that chlorophylls a & b, total carotenoids and anthocyanins significantly varied among ethrel and nutrient treatments. Using ethrel alone or joining with any of the investigated nutrients (K, P, Mg, B or Si) significantly was followed by a reduction in chlorophylls a &b and total carotenoids and at the same time improved anthocyanins rather than non-application. Application of ethrel combined with any of the five nutrients was significantly preferable than using ethrel alone in this respect. The promotion on anthocyanins (Figure 3) and the reduction in chlorophylls a &b and total carotenoids were significantly accompanied with using K, P, Mg, B and Si with ethrel, in ascending order. The maximum anthocyanins and the lowest chlorophylls a &b and total carotenoids were observed on the vines that treated with ethrel and all nutrients (P, K, Mg, B and Si) together. Untreated vines produced the lowest values of anthocyanins and highest values of chlorophylls a &b and total carotenoids. Similar results were noticed during both seasons.

Table 4: Effect of ethrel either applied singly or in combinations with some nutrients on some chemical characteristics of the berries of Crimson seedless grapevines during 2011 and 2012 seasons

Ethrel and nutrient treatments	T.S.S %		Total sugars (%)		Total acidity (%)		T.S.S/ acid	
	2011	2012	2011	2012	2011	2012	2011	2012
Control	18.2	18.0	16.0	16.0	0.710	0.715	25.6	25.2
Ethrel at 300 ppm	18.8	18.9	16.6	16.5	0.660	0.659	28.5	28.7
Ethrel+ K at 0.1 %	19.5	19.7	17.2	17.3	0.628	0.627	31.1	31.4
Ethrel+ P at 0.1 %	20.0	20.5	18.0	18.2	0.589	0.585	34.0	35.0
Ethrel+ Mg at 0.1 %	20.5	21.3	18.5	18.7	0.555	0.551	36.9	38.7
Ethrel+ B at 0.05 %	21.2	22.0	19.1	19.2	0.549	0.547	38.6	40.2
Ethrel+ Si at 0.05 %	21.9	22.8	19.6	19.8	0.540	0.538	40.6	42.4
Ethrel+ all nutrients	22.1	23.0	20.2	20.5	0.502	0.501	43.6	45.9
New L.S.D at 0.5 %	0.5	0.7	0.5	0.5	0.031	0.027	1.5	1.8

Table 5: Effect of ethrel either applied singly or in combinations with some nutrients on plant pigments in the berries of Crimson seedless grapevines during 2011 and 2012 seasons

Ethrel and nutrient treatments	Chlorophyll a (mg/1 kg)		Chlorophyll b (mg/1 kg)		Total carotenoids (mg/1 kg)		Anthocyanins (mg/100g)	
	2011	2012	2011	2012	2011	2012	2011	2012
Control	1.11	1.14	0.44	0.46	1.61	1.66	22.2	23.3
Ethrel at 300 ppm	1.00	0.99	0.40	0.38	1.31	1.25	23.8	24.0
Ethrel+ K at 0.1 %	0.90	0.88	0.36	0.34	1.00	0.94	25.6	25.8
Ethrel+ P at 0.1 %	0.80	0.79	0.32	0.30	0.71	0.65	27.8	28.0
Ethrel+ Mg at 0.1 %	0.68	0.66	0.28	0.27	0.66	0.60	29.0	29.3
Ethrel+ B at 0.05 %	0.58	0.56	0.24	0.23	0.60	0.55	30.6	30.8
Ethrel+ Si at 0.05 %	0.47	0.45	0.21	0.20	0.50	0.45	32.3	32.5
Ethrel+ all nutrients	0.32	0.30	0.17	0.16	0.40	0.33	34.9	35.3
New L.S.D at 0.5 %	0.08	0.07	0.03	0.04	0.25	0.27	1.1	0.8

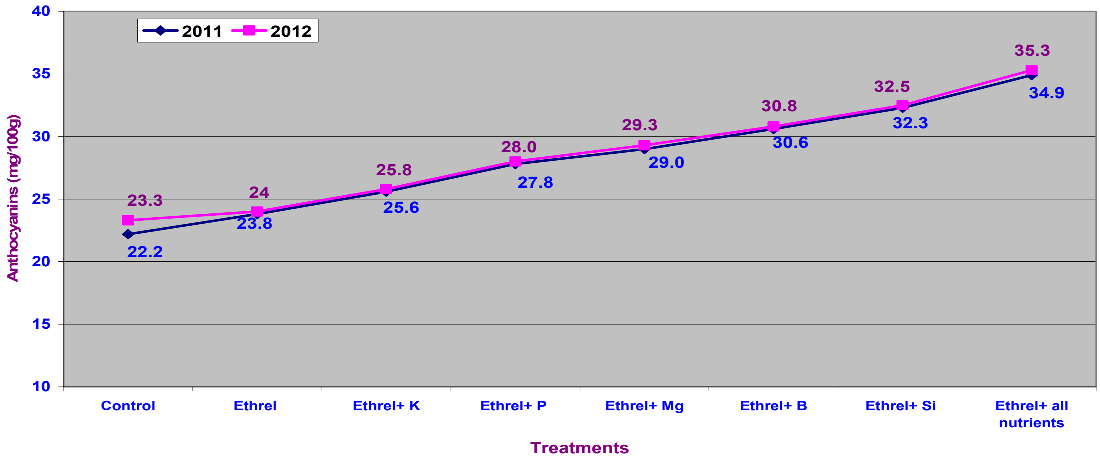

Figure 3: Effect of ethrel either applied singly or in combinations with some nutrients on anthocyanins (mg/100g) in the berries of Crimson seedless grapevines during 2011 and 2012 seasons

The beneficial effect of ethrel on breaking down chlorophylls a &b and total carotenoids and stimulating maturity (Moore, 1979) could explain the present results. The promoting effect of K, P, Mg, B and Si on stimulating the biosynthesis and translocation of sugars (Mengel and Kirkby, 2001) could explain the present results.

These results are in accordance with those obtained by Kassem *et al.* (2011) on ethrel; Abd El-Hameed (2012) on Si; Morsi *et al.* (2009) on B and Amin (2007) on P, K, and Mg.

As a conclusion, for promoting yield of Crimson seedless grapevines quantitively and qualitatively as well as solving the problem of uneven colouration of berries, it is suggested to spray, ethrel once at 300 ppm as well as treating the vines four times with a mixture of P, K, Mg, B and Si.

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الملخص العربى

محاولات لتقليل حدة مشاكل انخفاض نسبة العقد وعدم تجانس تلوين الحبات وانخفاض جودة الثمار فى كرمات العنب الكريمسون سيدلس

احمد محمد كمال عبدالعال

قسم البساتين- كلية الزراعة- جامعة المنيا- مصر

أجريت هذه الدراسة خلال موسمي ٢٠١١، ٢٠١٢ لاختبار تأثير رش الأيثريل بتركيز ٣٠٠ جزء فى المليون إما بمفردة أو مع توليفات من أسمدة البوتاسين بتركيز ٠.١%، حامض الارثوفوسفوريك بتركيز ٠.١%، كبريتات الماغنسيوم بتركيز٠.١%، حامض البوريك بتركيز ٠.٠٥% وسليكات البوتاسيوم بتركيز ٠.٠٥% فى تقليل حدة قلة المحصول وعدم تجانس تلوين الحبات وانخفاض جودة الثمار فى كرمات العنب الكريمسون سيدلس النامي تحت ظروف منطقة المنيا.

لم يكن لرش الأيثريل بمفردة اى تأثير على النسبة المئوية لعقد الحبات وكمية المحصول ووزن العنقود ووزن وأبعاد الحبة، بينما كان فعالا جدا فى تحسين النسبة المئوية للحبات الحمراء والنسبة المئوية للمواد الصلبة الذائبة الكلية والسكريات الكلية والنسبة ما بين المواد الصلبة الذائبة الكلية والحموضة ومحتوى قشرة الثمار من صبغة الأنثوسيانين وذلك بالمقارنة بمعاملة الكونترول، وكان موعد نضج الحبات مبكرا بمعاملات الأيثريل. أما النسبة المئوية للحموضة الكلية والحبات الخضراء والوردية والكلورفيلات والكاروتينات الكلية فى قشرة الثمار فقد كانت تميل إلى الانخفاض. وكان استخدام الأيثريل جنبا الى جنب مع أسمدة البوتاسيوم أو الفوسفور أو الماغنسيوم أو البورون أو السيلكون فعالا جدا فى تحسين كمية المحصول، تلوين الحبات وكذلك خصائص الجودة الطبيعية والكيمائية للحبات وذلك بالمقارنة باستخدام الأيثريل بمفردة، وكان التحسن الناتج من استخدام هذه العناصر الغذائية واضحا عند استخدام البوتاسيوم والفوسفور والماغنسيوم والبورون والسيلكون مرتبا ترتيبا تصاعديا.

إن معاملة الكرمات أربعة مرات بمخلوط يحتوى على أسمدة البوتاسين بتركيز ٠.١%، حامض الارثوفوسفوريك بتركيز ٠.١%، كبريتات الماغنسيوم بتركيز٠.١%، حامض البوريك بتركيز ٠.٠٥% وسليكات البوتاسيوم بتركيز ٠.٠٥% بالإضافة الى رشة واحدة من الايثريل بتركيز ٣٠٠ جزء فى المليون يكون فعال فى تحسين المحصول كما ونوعا وفى نفس الوقت فى تقليل مشاكل قلة العقد وعدم تجانس تلوين الحبات فى كرمات العنب الكريمسون سيدلس.