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STUDIES CONCERNING THE EFFECT OF POTASSIUM AND MAGNESIUM FERTILIZATION ON BUD BEHAVIOUR, YIELD AND BERRY QUALITY OF THOMPSON SEEDLESS GRAPE

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ABSTRACT

This investigation was undertaken during seasons of 2005 and 2006 to study the effect of potassium and magnesium as soil fertilization each alone or in combination on bud behavior, yield and berry quality of Thompson Seedless grapevines.

Potassium was applied to the soil as potassium sulphate at three rates 75, 150 and 225 g/vine. Also, magnesium was applied as magnesium sulphate at 0, 30 and 60 g/vine. Since, the two fertilizers potassium and magnesium were applied in two equal doses before bud burst and after fruit set.

This study indicated that, potassium sulphate at 150 g with magnesium sulphate at 60 g per vine gave a higher yield per vine and per feddan. Since, this treatment increased both cluster and berry weight during the two seasons. The data also reveal that, the higher level of potassium fertilization (150 or 225 g/vine) with magnesium sulphate at 60 g per vine increased both SSC and SSC/acid ratio in berry juice. Yet vines treated with 225 potassium sulphate and 60 g magnesium sulphate gave a higher bud burst and fertility.

INTRODUCTION

Grape (*Vitis vinifera*, L) is considered the first fruit crop in all over the world and the second one in Egypt. The total area reached about 154685 feddans with an annual production of about 1391749 metric tons. Thompson Seedless grape is the major cultivar since its area reached about 93630 feddans according to the latest statistics of (Ministry of Agriculture, 2005).

Fertilization had an important effect on growth vigour, productivity and fruit quality of grapevine as well as other fruit trees. In this respect, nitrogen is one of the major nutrients required by plants for sufficient growth. When N is applied with insufficient or excessive amounts it can cause negative effects in plant production and productivity. High rates of N application resulted in increasing shoot growth, pruning weights, leaf area/vine, lateral shoot length and trunk girth (Martin *et al*., 2004). Also, increasing nitrogen concentration has increased phosphorus and iron levels in leaf petioles while decreasing calcium and magnesium concentrations (Bell and Robson, 1999).

Potassium fertilization is very important for grapevine so, it is an activator of such enzymes that are considered to be essential for photosynthesis and respiration(Bhandal and Malik, 1988). The application of K can result in increasing vine growth, pruning weights, dry mass, shoots/vine, leaves/vine and trunk girth. Lack of K resulted in a decrease in crop yield and fruit weight (Conradie and Saayman, 1989a).

Magnesium is an essential element in synthesis of chlorophyll and responsible for activation of many enzymes in photosynthesis, respiration and

the formation of DNA and RNA (Salisburg and Ross, 1992). Furthermore, an antagonism was observed with K and Mg, as the addition of K decreased the concentration of Mg in the plant in the same manner as reported by Wolf *et al*., (1983).

This investigation was undertaken to study the effect of different levels of potassium and magnesium as soil fertilization each alone or in combination on bud behaviour, vegetative growth, yield and berry quality of Thompson Seedless grapevine.

MATERIALS AND METHODS

This study was carried out during successive seasons of 2005 and 2006 on 15-year-old of Thompson Seedless grape-vines, grown at EL-Dear village near Aga City, Dakahlia Governorate, Egypt. The vines were planted at 2 m between vines and 2.5 m between raws using cane-pruning under head trellis system with three vertical wires.

This investigation aimed to study the effect of potassium and magnesium as soil fertilization on bud behaviour, vegetative growth, yield, fruit quality and leaf mineral content of Thompson Seedless grapevines.

At the beginning of this study, samples of soil were taken from (0-30 and 30-60 cm depths) at 4 different sites of major parts of the root zone before adding any fertilizers to determine some physical and chemical characters of the soil. The obtained results are presented in Table (1).

Table (1) : Soil physical and chemical characteristics :

A- Physical characteristic	**Soil depth**	
	(0-30 cm)	**(30-60 cm)**
Clay %	43.70	43.54
Silt %	40.63	40.85
Sand %	10.67	10.26
Organic matter %	1.45	2.14
$CaCO_3$	3.10	3.21
Texture class	Silty-clay	Silty-clay
B- Chemical characteristics :		
Mg meq/L	6.14	7.11
Available K meq/L	0.42	0.49
pH	7.4	7.2
Salt conc. ppm	413	405

For this study, 120 vines almost similar in vigor, productivity and subjected to the normal horticultural practices used in the farm. Factorial experimental design with complete randomized block design was used since, the vines chosen in 3 replicates; each replicate containing 4 vines represented one of each treatment under the study. Also, raw of vines received as borders between each replicate and block for our fertilization.

Soil fertilization was applied in a concentrated hand approximately 40 cm. on each side of the trunk through the row at 10-15 cm depth according to (Mannson and Nelson, 1963).

Potassium fertilization was applied in the soil as potassium sulphate (namely commercially Solucros) contains (50 % K_2O and 18 % S) at three rates (75, 150 and 225 g/vine) of potassium sulphate in two equal doses, before bud burst stage on March 10th 2004, March 5th 2005 and March 7th 2006 and after fruit set stage on May 18th 2004, May 15th 2005, May 11th 2006, respectively.

Magnesium fertilization was applied to the soil as magnesium sulphate (98.5 % $MgSO_4$) at three rates (0, 30 and 60 g magnesium sulphate per vine) combined with potassium in the same time through the season.

Nitrogen fertilization at (60 units) was applied to the soil as ammonium nitrate (33.5 %) and added in three equal doses (20 unit of nitrogen/vine) after bud burst, fruit set and after harvesting time.

Whereas, super phosphate (15.5 % P_2O_5) was applied as (200 g super phosphate/vine) in one dose before bud burst stage during the three seasons of the study.

In this respect, our treatments are presented in Table (2) :

Table (2) : The applied treatments :

Treatment	Potassium sulphate	Magnesium sulphate
1	75 g K_2O	---
2	75 g K_2O	30 g
3	75 g K_2O	60 g
4	150 g K_2O	---
5	150 g K_2O	30 g
6	150 g K_2O	60 g
7	225 g K_2O	---
8	225 g K_2O	30 g
9	225 g K_2O	60 g
10	**Control ***	

- **Control treatment which received the normal fertilization used in the farm (60 units of nitrogen, 200 kg of super phosphate during the seasons). Also, these amounts were added to all vines under study during the season.**

Yet, both potassium and magnesium fertilization were added at the time which tested in this investigation. Since, most of growers at this area used to add potassium at very low amount but not adding magnesium through their fertilization programs.

After bud burst stage, the following parameters were estimated :

1- Percentage of bud burst.
2- Percentage of bud fertility.
3- Yield per vine (kg) and per feddan (tons).
4- Cluster weight (g).
5- Berry weight (g).
6- SSC % by using Carlzeiss hand refractometer.

7- Titratable acidity % was expressed as g tartaric acid/100 ml juice according to **(A.O.A.C., 1980)**.
8- SSC/acid ratio was calculated to be used for the normal date of harvesting.

Statistical analysis :

The obtained data were subjected to analysis of variance according to Snedecor and Cochran (1990) and means were compared using L.S.D at 5 % level.

RESULTS AND DISCUSSION

The present investigation aimed to study the effect of both potassium and magnesium fertilization under different levels on bud behaviour, yield and berries quality of Thompson Seedless grape during the season of 2005 and 2006.

I- Effect of potassium and magnesium fertilization on bud behaviour :
Bud burst % :

Data from Table (3) presented the effect of potassium and magnesium fertilization on bud burst and fertility of Thompson Seedless grape. From this Table it is clear that both potassium and magnesium fertilization increased both bud burst and fertility significantly than the control during the two seasons under the study.

Furthermore, potassium fertilization with magnesium sulphate at 60 g per vine gave a higher bud burst percentage than those obtained from adding 30 g magnesium or those left without magnesium fertilization. Not only potassium fertilization alone responded a lower bud burst percentage but also were higher than the control. Potassium fertilization at 225 g with 60 g magnesium sulphate per vine gave a higher bud burst percentage than the other treatments used. Since, the increment in bud burst due these treatments was about 18.8 % over than the control as a mean of two seasons under the study. Whereas, potassium application at 150 g alone (without adding magnesium sulphate) gave a lower bud burst percentage than the other level of fertilization. Since, this treatment increased the bud burst percentage by about 10.9 % than the control as mean of two seasons. In this respect, the data also presented that bud burst percentage increased by increasing the amount of either potassium or magnesium fertilization.

In this respect, Dabas and Jindal (1985) mentioned that application 0.1 % of magnesium resulted in significant increase in fruitful bud and berry set. Furthermore, Motasugi and Lin (1990) found that the percentage of bursted buds of Kyoho grapevines was decreased by increasing nitrogen application. Moreover, Shaker (2001) confirmed that bud burst percentage decreased gradually with increasing NPK ratio 1:1:3 especially with 80 kg/fed., and bud burst was slight increased by increasing N from 60 to 80 kg/fed.

Bud fertility percentage :

Regarding the effect of potassium and magnesium fertilization on bud fertility percentage, data presented in the same Table (3) also reveal that all potassium fertilization with or without magnesium significantly increased bud fertility percentage than the control during both seasons of the study. Increasing the level of magnesium sulphate fertilization under the same level of potassium responded a higher bud fertility than those obtained from potassium fertilization alone (without addition of magnesium sulphate). Since, vines which treated with potassium fertilization alone resulted in a lower bud fertility than those obtained from potassium and magnesium fertilization but also higher than obtained from the control. Eventually, bud fertility obtained from these treatments was higher with about (15.9-17.3 %) than the control one. In this respect, vine treated with potassium sulphate at 225 g per vine with 60 g magnesium sulphate gave a higher bud fertility than the other levels of potassium either alone or combined with magnesium fertilization. The increment due this treatment were about 30.5 % over the control as a mean of the two seasons of the study.

Table (3): Effect of potassium and magnesium fertilization on bud burst and fertility of Thompson Seedless grape.

Treatment		Bud burst %			Bud fertility %		
		2005	2006	Mean	2005	2006	Mean
K_2O 75 g	Mg(0)	71.3	75.7	73.5	52.5	53.4	53.0
	Mg(30)	72.7	76.2	74.5	53.7	53.4	53.6
	Mg(60)	73.5	76.7	75.1	53.8	60.2	57.0
K_2O 150 g	Mg(0)	68.9	73.4	71.2	52.6	53.2	52.9
	Mg(30)	69.2	75.6	72.4	55.1	51.9	53.5
	Mg(60)	70.9	77.4	74.2	52.3	54.0	53.2
K_2O 225 g	Mg(0)	72.0	73.4	72.7	53.4	51.4	52.4
	Mg(30)	74.7	75.1	74.9	52.5	52.8	52.7
	Mg(60)	75.7	76.8	76.3	61.1	56.9	59.0
Control		61.9	66.5	64.2	44.9	45.4	45.2
L.S.D at 5 % K:		1.25	1.64	---	1.66	1.91	---
L.S.D at 5 % Mg:		1.25	1.64	---	1.66	1.91	---
Inter. K x Mg:		2.06	2.72	---	3.12	3.16	---

- Potassium was applied as g potassium sulphate (Solucros contain 50% K_2O and 18% S).
- Magnesium was applied as g magnesium sulphate (China contain 98.5% $MgSO_4$).

Our data go in line with those of Abdel-Mohsen (2003) who found that there was a positive relationship between NPK ratio and their effect on bud fertility. In this respect, increasing the ratio from 1:1:2 to 1:1:3 progressively increased the percentage by about 6.41 % and 5.26 % under the two seasons, respectively. Furthermore, Matter (2003) mentioned that both bud fertility and fruitfullness significantly increased by increasing the level of potassium fertilization. So, potassium fertilization at 150 g/vine gave a

higher significant value than 50 or 100 g of potassium per vine. Yet, potassium application at 50 g per vine gave a lower bud fertility and fruitfullness in Thompson Seedless grape.

II- Effect of potassium and magnesium fertilization on yield :

Yield per vine and per feddan :

Data from Table (4) showed that both potassium and magnesium fertilization increased the yield per vine and per feddan during both seasons of the study.

Table (4): Effect of potassium and magnesium fertilization on yield/vine and /feddan of Thompson Seedless grape.

Treatment		Yield/fed. (ton)			Yield/vine (kg)		
		2005	2006	Mean	2005	2006	Mean
K_2O 75 g	Mg(0)	7.85	8.58	8.22	9.81	10.73	10.27
	Mg(30)	8.35	8.69	8.52	10.44	10.86	10.65
	Mg(60)	8.46	10.24	9.35	10.57	12.80	11.69
K_2O 150 g	Mg(0)	7.86	9.40	8.63	9.82	11.75	10.79
	Mg(30)	8.26	10.38	9.32	10.33	12.98	11.66
	Mg(60)	8.74	10.38	9.56	10.92	12.98	11.95
K_2O 225 g	Mg(0)	8.13	9.81	8.97	10.16	12.26	11.21
	Mg(30)	8.86	10.12	9.49	11.07	12.65	11.86
	Mg(60)	8.62	9.89	9.26	10.77	12.36	11.57
Control		6.33	6.93	6.63	7.91	8.66	8.29
L.S.D at 5 % K :		0.57	0.62	---	0.70	0.77	---
L.S.D at 5 % Mg :		0.57	0.62	---	0.70	0.77	---
Inter. K x Mg :		0.94	1.01	---	1.16	1.26	---

- Potassium was applied as g potassium sulphate (Solucros contain 50% K_2O and 18% S).
- Magnesium was applied as g magnesium sulphate (China contain 98.5% $MgSO_4$).

The data also reveal that both yield per vine or per feddan during the second season was almost higher than the first one, that may be due to the accumulative effect of both potassium and magnesium fertilization which added to the vine during the growth seasons. In this respect, the yield per vine and per feddan increased by increasing the level of potassium from 75 g to 225 g potassium sulphate per vine. In this respect, Morris *et al*. (1987) found that the K fertilization increased the yield and/or the number of bunches/vine. Similarly, EL-Sese *et al*. (1988) indicated that yield per vine was significantly increased with the highest rates of potassium fertilization (200 g K_2O/vine).

Furthermore, potassium fertilization at 150 g combined with magnesium sulphate at 60g/vine resulted in higher yield/vine and also per feddan during the two seasons. The increment in yield per vine may be due to the effect of potassium and magnesium fertilization on increasing the cluster weight per vine. Thus, the increment due these treatments was about 44.1 % over the control as mean of two seasons. Also, potassium fertilization at 225 g potassium sulphate and 30 g magnesium increased the yield per

vine and per feddan by about 43.1 %. Whereas, potassium fertilization 75 g with magnesium sulphate at 30 g or without magnesium sulphate presented a lower yield per vine and per feddan than the other treatments used but higher than the control. Since, potassium fertilization increased the yield by about 28.5 to 24.0 % than the control respectively, as a mean of two seasons of the study.

Similar results are presented by Conradie and Saayman (1989b) found that potassium (45kg K/ha) significantly increased the yield/vine by about 6.1%. Furthermore, Ahmed (1997) found that Mg application was very effective in improving the yield attributes, as well as, physical and chemical properties of Mango fruits. The best results with regard to yield and fruit quality were obtained when mangoes received 3 sprays with mixture containing Zn, S and Mg. Similarly, Shahabian *et al*. (2001) concluded that the application of potassium to the soil plus K, Mg and micronutrients as a foliar application gave the highest yield. Moreover, Matter (2003) presented that yield per vine (kg) and per feddan (tons) significantly increased by increasing the amount of potassium fertilization. Since, potassium fertilization at 150 g/vine resulted in higher yield of Thompson Seedless grape per vine and per feddan than using 50 or 100 g per vine. Also, Rizk-Alla *et al*. (2006) mentioned that Mg-EDTA at 0.3 % resulted in the highest values of number of clusters per vine and bud fertility coefficient. Also, gave the highest yield/vine (13.1-13.9 kg/vine) in both seasons of the study, respectively.

III- Effect of potassium and magnesium fertilization on cluster and berry weight :

Cluster weight :

Data from Table (5) show that average cluster weight was significantly increased by potassium and magnesium fertilization during the both seasons. In this respect, potassium fertilization when added at 150 g potassium sulphate with 60 g magnesium sulphate responded a higher cluster weight than the other level of potassium or magnesium fertilization. Since, these treatments increased the weight of the cluster by about 28.5 % over the control as a mean of two seasons. In this respect, Dhillon *et al*. (1999) found that bunch weight increased with increasing the level of K applied from 100 to 500 g K_2O/vine and the heaviest bunch was obtained with highest K application (500 g K_2O/vine).

On the other hand, potassium fertilization at 75 g potassium sulphate alone without adding magnesium fertilization per vine gave a lower cluster weight than the other treatments used or the control during the two seasons, but these treatments gave about 10.9 % higher than the control as a mean of the two seasons. Similarly, Matter (2003) found that both cluster weight and size significantly increased potassium fertilization at 150 g/vine than vines treated with potassium alone at 50 or 100 g/vine.

Berry weight :

It is obvious from data of Table (5) that potassium and magnesium fertilization increased berry weight significantly than the control. Also,

potassium fertilization at 150 g potassium sulphate with 30 g magnesium sulphate presented a higher berry weight than the other treatments used. The increment due to these treatments was about 11.6 % over the control.

Furthermore, the effect of various potassium fertilization under the two levels of magnesium sulphate on berry weight were unpronounced during both seasons of study. Also, Matter (2003) presented that potassium fertilization at 150 g/ vine significantly increased the berry weight than potassium fertilization at 50 or 100 g/vine. Also, EL-Baz *et al*. (2003) found that, using potassium sulphate at 50-350 g/vine gave a significant increase in both cluster and berry weight. The lowest cluster weight was recorded for untreated vines (242.0 and 257.7 g/cluster), whereas the highest weight was gained by potassium application at 350 g K_2SO_4/vine. Also, potassium application increased cluster weight by 46.9 % and 40.5 %, whereas, berry weight increased by 34.2 % and 25.6 % over the control.

Table (5): Effect of potassium and magnesium fertilization on yield/vine and /feddan of Thompson Seedless grape.

Treatment		Cluster weight (g)			Berry weight (g)		
		2005	2006	Mean	2005	2006	Mean
K_2O 75 g	Mg(0)	437.9	430.9	434.4	2.08	1.90	1.99
	Mg(30)	449.9	480.7	465.3	2.09	1.82	1.95
	Mg(60)	478.5	465.4	472.0	2.00	1.96	1.98
K_2O 150 g	Mg(0)	419.7	487.6	453.7	1.84	1.90	1.87
	Mg(30)	451.1	540.8	496.0	1.85	2.23	2.04
	Mg(60)	470.8	536.2	503.5	1.95	2.02	1.99
K_2O 225 g	Mg(0)	445.5	502.4	474.0	1.87	1.90	1.88
	Mg(30)	461.2	475.5	468.4	1.76	1.94	1.85
	Mg(60)	444.9	477.1	461.0	1.73	1.87	1.80
Control		391.4	392.0	391.7	1.53	1.50	1.51
L.S.D at 5 % K :		19.04	17.45	---	0.083	0.075	---
L.S.D at 5 % Mg :		19.04	17.45	---	0.083	0.075	---
Inter. K x Mg :		31.07	28.60	---	0.136	0.126	---

- Potassium was applied as g potassium sulphate (Solucros contain 50% K_2O and 18% S).
- Magnesium was applied as g magnesium sulphate (China contain 98.5% $MgSO_4$).

IV- Effect of potassium and magnesium fertilization on berry quality :
Soluble solids content (SSC) % :

It is clear from Table (6) that potassium and magnesium fertilization increased the percentage of soluble solids content in berry juice during the both seasons of the study. Since, Shen and Lee (1993) reported that potassium fertilization significantly increased the percent of SSC by increasing the amount of K_2SO_4 application.

In this respect, data presented that potassium fertilization each alone (without magnesium sulphate) produced a lower SSC in berry juice than

those obtained from 30 or 60 g magnesium sulphate under each levels of potassium fertilization. Moreover, potassium fertilization at 150 g or 225 g with magnesium sulphate at 60 g per vine presented a higher values than the other treatments used or the control. So, the increment due these treatments in SSC values were about 8.2% and 11.1 % over the control respectively. Furthermore, Matter (2003) presented that soluble solids content (SSC %) in berry juice of Thompson Seedless grape was gradually increased by increasing the amount of potassium fertilization.

In this respect, potassium fertilization at 100 or 150 g/vine, significantly increased the SSC % than potassium fertilization at 50 g/vine. Also, EL-Baz *et al*. (2003) presented that SSC in berry juice showed a significant increase than the control during both seasons of the study due to potassium application. So, the highest rate of potassium (350 g K_2SO_4/vine) gave the most significant increase in SSC % in berry juice, this increase reached to 19.6 % and 18.34 % over the control during both seasons of the study, respectively.

Total acidity :

Data from Table (6) reveal that total acidity in berry juice was reduced with potassium and magnesium fertilization. Since, the values of total acidity for all treatments were almost lower than the control during the two seasons.

Furthermore, potassium fertilization at 225 g with magnesium sulphate at 60 g per vine reduced the percentage of total acidity in berry juice than the other treatments or the control. Also, the data presented that the effect of various treatments used on total acidity in berry juice were unpronounced. Thus, these values were almost lower than the control. In this respect, EL-Sese *et al*. (1988) noticed that total titratable acidity in berry juice of Thompson Seedless decreased with increasing the level of potassium fertilization. These findings could be due to the reduction in tartaric which might be changed to potassium tartarate. Also, Soyer *et al*. (1992) found that increasing potassium fertilization reduced the content of total acidity in berries of grapevine. Furthermore, Matter (2003) presented that total acidity in berry juice of Thompson Seedless grape was reduced by increasing the level of potassium fertilization. In this respect, potassium fertilization at 150 g/vine produced lower total acidity than potassium fertilization 100 or 50 g/vine.

Soluble solids/acid ratio :

Data from Table (6) reveal that SSC/acid ratio in berry juice significantly increased by potassium and magnesium fertilization at 150 or 225 g potassium sulphate with 60 g magnesium sulphate gave a higher values of SSC/acid ratio than the other treatments used and the control.

Since, these treatments increased the values by about 20.2 % and 24.1 % than the control as a mean of two seasons, respectively. Likewise, Dhillon *et al*. (1999) presented that SSC/acid ratio increased with increasing K rate, however, higher doses of K showed better SSC/acid ratio. Also, EL-Sese *et al*. (1988) showed that potassium sulphate fertilization increased SSC/acid ratio by about 12.7 % relative percentage to control. Furthermore,

Shoeib (2004) found that there are a gradual promotion of total soluble solids % and a reduction in total acidity with increasing potassium sulphate occurred on vines fertilized with 300 kg potassium sulphate/fed.

Table (6) : Effect of potassium and magnesium fertilization on SSC, total acidity and SSC/acid ratio of Thompson Seedless grape.

Treatment		SSC %			Total acidity %			SSC/acid ratio		
		2005	2006	Mean	2005	2006	Mean	2005	2006	Mean
K_2O 75 g	Mg(0)	17.5	18.9	18.2	0.824	0.734	0.779	21.2	25.7	23.5
	Mg(30)	17.8	18.8	18.3	0.825	0.700	0.763	21.6	26.9	24.3
	Mg(60)	17.8	19.0	18.4	0.871	0.704	0.788	20.4	27.0	23.7
K_2O 150 g	Mg(0)	17.0	18.0	17.5	0.775	0.758	0.767	21.9	23.7	22.8
	Mg(30)	17.9	18.4	18.2	0.829	0.763	0.796	21.6	24.1	22.9
	Mg(60)	17.8	19.2	18.5	0.850	0.679	0.765	21.7	27.1	24.4
K_2O 225 g	Mg(0)	17.2	18.5	17.9	0.848	0.725	0.787	20.3	25.5	22.9
	Mg(30)	17.7	18.8	18.3	0.879	0.767	0.823	20.1	24.5	22.3
	Mg(60)	18.2	19.7	19.0	0.802	0.714	0.758	22.7	27.6	25.2
Control		16.3	17.8	17.1	0.886	0.807	0.847	18.4	22.1	20.3
L.S.D at 5% K:		0.36	0.37	---	0.03	0.04	---	0.81	1.38	---
L.S.D at 5% Mg:		0.36	0.37	---	0.03	0.04	---	0.81	1.38	---
Inter. K x Mg:		0.70	0.66	---	0.05	0.06	---	1.52	2.38	---

- Potassium was applied as g potassium sulphate (Solucros contain 50% K_2O and 18% S).
- Magnesium was applied as g magnesium sulphate (China contain 98.5% $MgSO_4$).

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دراسات خاصة على تأثير التسميد بالبوتاسيوم والماغنسيوم على نشاط البراعم والمحصول وجودة الحبات فى عنب الطومسون سيدلس

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أجريت هذه التجربة خلال مواسم ٢٠٠٥ - ٢٠٠٦ لدراسة تأثير التسميد الأرضى بالبوتاسيوم والماغنسيوم بمفردهما أو مجتمعين على نشاط البراعم والمحصول وجودة الحبات فى عنب الطومسون سيدلس.

تم إضافة البوتاسيوم فى صورة سلفات بوتاسيوم فى ٣ مستويات (٧٥ ، ١٥٠ ، ٢٢٥ جرام/كرمة). وإضافة الماغنسيوم فى صورة سلفات ماغنسيوم بمعدل (صفر ، ٣٠ ، ٦٠ جرام/كرمة) حيث تم إضافة التسميد البوتاسى والماغنسيوم على دفعتين متساويتين قبل تفتح البراعم وبعد عقد الثمار.

وقد أظهرت الدراسة أن :

التسميد بسلفات البوتاسيوم بمعدل ١٥٠ جرام مع سلفات الماغنسيوم بمعدل ٦٠ جرام/كرمة أعطى أعلى محصول سواء للكرمة أو الفدان. أعطت هذه المعاملة زيادة فى كل من وزن العناقيد ووزن الحبات خلال موسمي الدراسة.

وأشارت هذه الدراسة أيضاً أن زيادة معدل التسميد البوتاسى (١٥٠ أو ٢٢٥ جرام للكرمة) مع سلفات الماغنسيوم بمعدل ٦٠ جرام/كرمة أدى إلى زيادة كل من نسبة المواد الصلبة الذائبة الكلية ونسبة المواد الصلبة الذائبة إلى الحموضة فى عصير الحبات .

معاملة الكرمات بسلفات البوتاسيوم بمعدل ٢٢٥ جرام مع سلفات الماغنسيوم بمعدل ٦٠ جرام/كرمة أعطت زيادة فى نسبة تفتح وخصوبة البراعم.

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