

(3) (2) (1)

10 2009 2008 2007

50+ /P₂O₅ 25 + / N 75) (NPK) (/K₂O

30
 pH NPK C
 %50.3 %44.6 %40.9
 5.92; 5.89; 5.73 5.45 pH
 %42.8 11.1 15.3

C %10 %2.5

pH %4.2

.C pH

...

Effect of Mineral Fertilization Rates and Method of Triple Superphosphate Application on Some Chemical Properties of Berry of the Grapevine Cultivar, Al-Helwani

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ABSTRACT

The research experiment was carried out during the 2007, 2008 and 2009 seasons on grape variety Al- Helwani (10 years old) to study the effect of NPK fertilization rates and the triple superphosphate (T.S.P) application method on some fruits characters. Three fertilization NPK rates were used, rate 1 (75:25:50) kg/ ha, twofold and fourfold of rate 1, in three replicates in addition to control. The application of (T.S.P) was on soil surface and at 30 cm depth. The results showed significant increase of the total soluble solids (TSS), pH and vitamin C compared to control while the content of TSS in juice increased by 40.9%, 44.6%, 50.3% in the three rates, respectively, compared to control. pH increased from 5.45 in control to 5.92: 5.89: 5.73 in the three rates, respectively, in turn, significant decrease in total acidity (TA) was noted by 15.3, 11.1 and 42.8%, in the three rates, respectively, compared to control. A significant increase of (TSS) by 2.5% and vitamin C by 10 % in deep T.S.P application compared to the surface application, on the other hand, (TA) decreased significantly by 4.2%, while, there was no significant differences in pH, in both treatments.

Key words: Grapevine, TSS, TA, pH juice, Superphosphate, vitaminC.

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-1

(2008)
(*Vitis vinifera L, cv. Helwani.*)

2008)
1965) (Abu-Nuqta, 1995;
(Kornichik and Plakeda,1962; Boublena,1960; Aroutunian;
(2005)
(1998) C

(2000) Bravdo

(2004) Salem *et al.*,
11 Thompson seedless

(N3:P1:K1)

(1997) Hellmann
(Kessel, 2000)

(1984) Vernovski
%25 -15
(1980) Toma
(1986) Molchanov *et al.*,

(1998)
) (1998
(2003)

Lang, 1983; Patrik *et al.*, 2001; Krauss and Johanston,)
(2002
(1989)

(2004) (2000) Nicolantonakis
(1998)

Diakou *et*)
(Giomo *et al.*, 1996) (*al.*, 1997
(Kaserer *et al.*, 1996)
(Policarpo *et al.*, 2006; Hirano *et al.*, 2002; Pire and Rivas, 1987)
pH (2000) Ruhle, (1980) Boulton
(1998)
pH pH

(Chemical Composition of food Book, 1 & 2, 1987)

(1998) 100 / 69 C
 (1999) 100/ 2.3
 (1985) Koo 100/ 4
 (1997) Dirk C

(1991) Wermelingr

NPK -1

-2

-2

2009 2008 2007
 B41 (Vitis vinifera L,cv. Helwani)

10

4× 4

: **1-2**

pH pH meter pH :pH -

. 2.5:1

:E.C -

: -

Olsen : -
 (Olsen *et al.*, 1954) N 0.2

660 (Spectrophotometer)

Skalar : -
 (Richards, 1962)

: -

(Jackson, 1958)

() 5:1 : -

: -

Isaac) Varian DTPA
 (1) (Jones, 2001) and Kerber (1971)

(1)

%	%	%	%	%	%	EC dS/m	pH 2.5:1	()
11.76	0.10	2.01	58	19	23	1.15	7.83	25-0
10.16	0.05	1.20	60	18	22	1.16	7.79	50 -25
9.8	0.05	1.20	59	18	23	1.34	7.87	75-50
10.16	0.03	0.4	62	19	19	1.29	7.88	100 -75
(/)								()
B		Zn	Mn	Cu	Fe	p	k	
0.34		0.99	9.02	1.48	4.12	13.9	675	25-0
0.32		0.61	7.62	1.38	5.23	7.7	400	50 -25
0.58		0.41	10.21	1.15	4.86	3.6	296	75-50
0.18		0.38	7.84	1.11	5.66	2.6	193	100 -75

USAD. Haploxerepts
 FAO Typic Cambisols Tax. (2006)
 (1989) Carbonatic cinnamon soil (1993)
 (1) (2009) (2004)

()
 pH
 .(Jones, 2001)

: 2-2

3 63
 (Split Plot) 3
 (N,P,K) ()

(L.S.D)

.Costatc (C.V%) %5

:

0	NPK		
1	NPK	1	30
2	NPK	2	
3	NPK	3	
1	NPK	4	
2	NPK	5	
3	NPK	6	

: -3-2

25 + /N 75) ()
 50 + / N 150) (/K₂O 50 + /P₂O₅
 100 + / N 300) (/ K₂O 100 + / P₂O₅
 (/ K₂O 200 + /P₂O₅
 (625)

/	/	/		
0.263	163	75	1	%46 N
0.526	326	150	2	
1.052	652	300	3	
0.089	55.5	25	1	P2O5 %45
0.179	111	50	2	
0.358	222	100	3	
0.161	100	50	1	%50 K2O
0.232	200	100	2	
0.645	400	200	3	

: (%46 N)

30 (3,2,1)
(6,5,4) (1)

(15-12) / 20 (15-12) (9-7)

: -4-2

(TSS) Refractometer -1

(TA) N 0.1 -2

. (1997)

. pH meter pH -3

RQeasy C -4

100 / (A.O.A.C,1990) Ascorbic

)

()

(

-3

-1-3

:

)

(2)

(

(3,2,1)

(2) (1)

(3)

% 29, 15.4, 21.8

(2) (1)
 %27.1, 28.2, 22.2 (6,5,4)
 (4) (6,5)
 (6,5) (3)

(4) (1)
 Salem *et al.*, 2004; Martin *et al.*, 2004;)
 (Okamoto *et al.*, 2003; Hilbert *et al.*, 2003
 (Dirk, 1997)
 (2)

(%)			
13.22 d	0	NPK	
16.10 b	1	NPK	1
15.26 c	2	NPK	2
17.05 a	3	NPK	3
16.15 b	1	NPK	4
16.95 a	2	NPK	5
16.80 a	3	NPK	6
0.369	LSD _{0.05}		(Sig)
1.33	C.V %		

) (3)

(NPK

%2.5

(1991)

.(2004)

(2008) Fructose-6- phosphate Glucose-1-phosphate

(Molchanov *et al.* ,1986)

(3)

(%)		
15.40 b		3, 2, 1
15.78 a	30	6, 5, 4
0.127	LSD _{0.05}	

(4)

NPK

%27.98

%21.78

%21.93

Salem *et al.*, 2004; Okamoto *et al.*, 2003; 2008)

(Hilbert *et al.*, 2003;

(4)

(%)			
16.12 b	1	NPK	4, 1
16.10 b	2	NPK	5, 2
16.92 a	3	NPK	6, 3
13.22 c	0	NPK	
0.261	LSD _{0.05}		

2-3

:

(5)

(3)

(2,1)

(3,2,1)

% 47.6, 19.2, 19.2

(5,4) (6)
 (6,5,4) % 47.6, 10.7, 14.8
 Salem *et al.*, 2004; Martin *et al.* 2004; Hunter *et al.*) :
 .(*al.*, 2000; Pire and Rivas,1987

() (5)

(%)				
0.31 a	0	NPK		
0.26 c	1	NPK	1	()
0.26 c	2	NPK	2	
0.21 d	3	NPK	3	
0.27 bc	1	NPK	4	30
0.28 b	2	NPK	5	
0.21 d	3	NPK	6	
0.0125	LSD _{0.05}		(Sig)	
2.68	C.V %			

(6)

.%4.2 30

(6)
 .()

(%)		
0.258 b		3, 2, 1
0.269 a	30	6, 5, 4
0.0071	LSD _{0.05}	

(7)

NPK
 . %42.8 %11.1 %15.3
 .(Salem *et al.*, 2004; Pire and Rivas, 1987)

...

(7)

.()

(%)			
0.26 c	1	NPK	4, 1
0.27 b	2	NPK	5, 2
0.21 d	3	NPK	6, 3
0.30 a	0	NPK	
0.0088	LSD _{0.05}		

: pH

3-3

pH

(4)

(8)

% 9.5, 6, 7.5 (3,2,1)

(2,1)

(3)

% 7.5, 9.7, 2.5 (6,5,4)

(4)

(6,5)

(6,5)

(3)

(Gay – E ynard *et al.*, 2000)

(Morris *et al.*, 1983; Morries *et al.*, 1980)

potassium Bitartrate

PH

) pH

(8)

(

pH				
5.46 c	0	NPK		
5.87 ab	1	NPK	1	()
5.79 b	2	NPK	2	
5.98 a	3	NPK	3	
5.60 c	1	NPK	4	30
5.99 a	2	NPK	5	
5.87 ab	3	NPK	6	
0.147	LSD _{0.05}		(Sig)	
1.44	C.V %			

(9)

.(Vernovski, 1984)

pH

) PH (9)

PH		
5.77 a		3, 2, 1
5.72 a	30	6, 5, 4
0.093	LSD 0.05	

pH (10)
pH

NPK

5.92, 5.89, 5.73 5.45 pH

(Gay-E ynard *et al.*, 2000)

pH

Davies *et al.*,) (Morris *et al.*,1983)

(2006

Fregoni and Vercesi,1995) pH

(Candolfi-Vasconcelos *et al.*,1997; Ruhl,1989; Brancadoro *et al.*,1994

pH

() PH (10)

PH			
5.73 b	1	NPK	4, 1
5.89 a	2	NPK	5, 2
5.92 a	3	NPK	6, 3
5.45 c	0	NPK	
0.10	LSD 0.05		

4-3

:C

(11)

C

(3,2,1)

(2) (1) (3)

%26, 10.9, 11.5

(6,5,4)

%32.7, 29.7, 30.9

C (6)

(3)

(5) (4)

C

(1998) (1999)

Salem *et al.*, 2004; Martin *et al.*, 2004; Okamoto) 2008) :

(*et al.*, 2003; Hilbert *et al.*, 2003

الجدول (11) تأثير التسميد المعدني وموضع إضافة الفوسفات في متوسط محتوى العصير من فيتامين C (المتوسط لثلاث سنوات)

(100/) C				
1.65 d	0	NPK		
1.84 c	1	NPK	1	()
1.83 c	2	NPK	2	
2.08 a	3	NPK	3	
2.16 ab	1	NPK	4	30
2.14 ab	2	NPK	5	
2.19 a	3	NPK	6	
0.104	LSD _{0.05}		(Sig)	
3.01	C.V %			

(12)

C

%10

:

C

(Mortvedt and Osborn,1977; Terman,1975)

C

(12)

()

C	(100/)		
1.849 b			3, 2, 1
2.035 a	30		6, 5, 4
0.127	LSD _{0.05}		

(13)
 NPK C
 1.65 C
 Salem *et al.* 2008)
 (1991) Wermelingr)
 C (1985) Koo
 (1997) Dirk
) C (13)

C (100/)			
1.998 b	1	NPK	4,1
1.985 b	2	NPK	5,2
2.135 a	3	NPK	6,3
1.650 c	0	NPK	
0.073	LSD _{0.05}		

-4

C .1
 30
 C .2
 NPK pH
 pH .3

...

()	NPK	.4
pH	NPK	.5
	NPK	.6
	C	.7
	%4.2	.8

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 .262 -239

.275-265 . .(2009) .
 .(2005) .

. 207-189 -2 (21) . .
 .(1997) .

.(1999) .
 .511 .

.(1998) .
 .512

.(2008)

.(2008) .

.32-15 2 24 .
 .(2004) .

. 249-237 1 26 .
 .(2003) .

.278

- .(1998) .
 .432

.(2008) .

. 222 -205 2 24 .
 .(2004) .

.352

.(1991) .

.395

.(1989) .

.399

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