

Table 5. physical characteristics of "Crimson" grape shoot as influenced by picking time factor during the two seasons, 2015 and 2016.

Time	Leaves / shoot (cm)		Shoot length (cm)		Shoot length containing mature leaves (cm)		Internode length (2 nd) (cm)	
	2015	2016	2015	2016	2015	2016	2015	2016
The first time	20.4 b	15.5 b	144.3 b	115.4 b	135.3 b	80.3 b	5.1 b	4.9 b
The second time	21.9 a	17.3 a	155.8 a	143.0 a	147.3 a	91.5 a	5.7 a	5.5 a

* Values, with a column, of similar letters are not significantly different according to the least significant difference (LSD) at 0.05 level.

Table 6. Chemical characteristics of "Crimson" grape fruits as influenced by picking time factor during the two seasons, 2015 and 2016.

Time of picking	Chlorophyll a (mg/g F.W)		Chlorophyll b (mg/g F.W)		Chlorophyll (a + b) (mg/g F.W)		Carotene (mg/100g)		Anthocyanin (mg/100g)		Acidity (%)		Tannins (%)		Vitamin C (mg/100g)		TSS (%)		TSS /Acidity		Reducing Sugar (%)	
	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016
The first picking	0.33 a	0.36 a	0.24 a	0.27 a	0.57 a	0.62 a	0.94 b	0.87 b	31.2 b	28.1 b	0.56 a	0.70 a	2.0 a	1.8 a	9.6 b	9.9 b	18.0 b	16.2 b	32.9 b	29.0 ns	8.8 b	8.3 b
The second picking	0.31 b	0.33 b	0.20 b	0.21 b	0.51 b	0.54 b	1.0 a	1.0 a	34.2 a	31.4 a	0.48 b	0.60 b	1.8 b	1.6 b	10.5 a	10.8 a	20.2 a	19.2 a	43.7 a	29.0 ns	10.1 a	9.4 a

* Values, with a column, of similar letters are not significantly different according to the least significant difference (LSD) at 0.05 level.

Table 7. Chemical characteristics of "Crimson" grape leaves as influenced by picking time factor during the two seasons, 2015 and 2016.

Time of picking	Chlorophyll a (mg/g F.W)		Chlorophyll b (mg/g F.W)		Chlorophyll a + b (mg/g F.W)		Total carbohydrates (%)		Starch (%)		Reducing sugar (%)	
	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016
The first picking	0.66 b	0.66 b	0.50 b	0.52 b	1.2 b	1.2 b	35.5 b	35.1 b	1.5 a	1.5 a	6.4 a	6.2 a
The second picking	0.76 a	0.77 a	0.60 a	0.62 a	1.4 a	1.4 a	38.14 a	38.5 a	1.3 b	1.4 b	5.4 b	5.6 b

* Values, with a column, of similar letters are not significantly different according to the least significant difference (LSD) at 0.05 level.

Table 9. Physical characteristics of "Crimson" grape shoot as influenced by the interaction between applied treatments and the picking time during the two seasons, 2015 and 2016.

Treatments	First picking								Second picking							
	Leaves / shoot (cm)		Shoot length (cm)		Shoot length containing mature leaves (cm)		Internode length 2 nd (cm)		Leaves / shoot (cm)		Shoot length (cm)		Shoot length containing mature leaves (cm)		Internode length 2 nd (cm)	
	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016
Control	22.33	14.89	145.56	143.11	138.50	90.44	5.28	6.11	24.56	16.67	161.89	161.00	157.56	94.33	6.67	7.11
	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
Lisophos 200 ppm	22.22	14.78	131.67	116.44	127.22	83.44	5.61	4.33	23.22	17.22	159.00	131.78	154.78	85.56	5.94	5.67
	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
Lisophos 400 ppm	17.67	14.44	119.44	94.67	113.78	72.33	5.17	4.33	18.33	14.78	128.33	133.11	143.11	86.00	5.67	5.00
	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
ProTone 100 ppm	21.00	15.67	149.00	113.44	143.78	58.33	5.22	40.67	24.00	17.11	153.22	151.22	150.56	98.67	5.78	5.00
	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
ProTone 200 ppm	21.89	15.89	177.00	134.00	158.67	96.00	6.22	4.67	22.11	17.11	180.00	164.44	161.00	96.11	6.22	5.22
	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
Lisophos 200 ppm + MgNo ₃ 1%	18.33	14.56	134.11	76.67	135.44	54.89	4.44	5.11	20.89	15.22	147.22	121.44	140.22	75.89	5.28	5.22
	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
Lisophos 400 ppm + MgNo ₃ 1%	17.78	15.33	120.67	92.44	116.39	65.89	5.44	4.78	18.67	16.11	146.44	121.67	137.56	73.33	5.61	5.56
	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
ProTone 100 ppm + MgNo ₃ 1%	20.33	16.11	168.33	127.11	150.33	91.89	5.83	5.11	21.78	18.78	166.33	153.11	158.56	105.33	6.06	5.56
	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
ProTone 200 ppm + MgNo ₃ 1%	24.11	17.89	175.33	115.78	158.33	80.11	4.56	5.00	25.67	22.67	183.33	148.56	165.00	105.22	5.11	5.22
	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
MgNo ₃ 1%	18.11	15.56	121.67	140.78	110.89	82.44	3.56	4.89	19.44	17.22	132.67	142.44	124.22	95.00	4.28	5.44
	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns

* Values, with a column, of similar letters are not significantly different according to the least significant difference (LSD) at 0.05 level.

Table 10. Chemical characteristics of "Crimson" grape fruits as influenced by the interaction between applied treatments and the picking time during the two seasons, 2015 and 2016.

Treatments	First picking												Second picking												
	Acidity (%)		TSS (%)		TSS /Acidity (%)		Vitamin C (mg/100g)		Tannins (%)		Reducing Sugar (%)		Acidity (%)		TSS (%)		TSS/ Acidity (%)		Vitamin C (mg/100g)		Tannins (%)		Reducing Sugar (%)		
	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015
Control	0.67 ns	0.82 bc	15.23 ns	13.87 l	22.6 m	16.87 m	8.9 ns	9.32 q	2.5 ns	2.32 a	8.0 ns	7.19 m	0.59 ns	0.82 a	17.58 ns	17.05 hi	29.81 ijk	18.81 lm	9.8 ns	10.14 j	2.2 ns	2.06 bc	9.22 ns	8.66 ij	
Lisophos 200 ppm	0.60 ns	0.70 e	16.7 ns	14.73 k	27.9 kl	21.06 jk	9.3 ns	9.62 o	2.2 ns	2.11 b	8.4 ns	7.63 l	0.55 ns	0.82 c	18.75 ns	18.02 ef	34.31 gh	22.07 ijk	10.1 ns	10.44 h	1.98 ns	1.83 ef	9.62 ns	8.97 gh	
Lisophos 400 ppm	0.50 ns	0.56 ij	19.3 ns	16.63 i	38.5 ef	29.62 g	10.0 ns	9.97 l	1.7 ns	1.79 fg	9.2 ns	8.32 k	0.41 ns	0.59 hi	21.72 ns	20.52 b	53.03 b	34.66 d	11.00 ns	11.17 c	1.53 ns	1.39 k	10.53 ns	9.77 bc	
ProTone 100 ppm	0.58 ns	0.68 ef	17.17 ns	15.30 j	29.5 jk	22.66 ij	9.4 ns	9.74 n	2.1 ns	2.02 c	8.5 ns	8.21 k	0.49 ns	0.77 d	19.31 ns	18.49 de	39.19 e	23.93 i	10.34 ns	10.58 g	1.90 ns	1.76 g	9.73 ns	9.08 fg	
ProTone 200 ppm	0.52 ns	0.46 k	18.8 ns	17.43 gh	35.9 fg	37.69 c	9.8 ns	10.26 i	1.8 ns	1.57 i	9.0 ns	8.86 ghi	0.44 ns	0.66 fg	21.13 ns	19.62 c	47.82 c	29.93 fg	10.76 ns	10.88 e	1.62 ns	1.58 i	10.32 ns	9.44 de	
Lisophos 200ppm + MgNo ₃ 1%	0.57 ns	0.60 hi	17.8 ns	15.67 j	31.3 hij	26.30 h	9.6 ns	9.82 m	2.0 ns	1.90 de	8.7 ns	8.10 k	0.44 ns	0.62 gh	19.59 ns	19.97 c	44.21 d	32.09 e	10.46 ns	11.06 d	1.80 ns	1.47 j	10.00 ns	9.57 cd	
Lisophos400 ppm + MgNo ₃ 1%	0.49 ns	0.44 kl	19.8 ns	17.87 fg	40.2 e	40.71 b	10.1 ns	10.43 h	1.6 ns	1.47 j	9.4 ns	9.08 fg	0.41 ns	0.55 j	22.45 ns	20.95 ab	55.42 b	38.43 c	11.05 ns	11.26 b	1.42 ns	1.30 l	10.73 ns	9.89 ab	
ProTone 100 ppm + MgNo ₃ 1%	0.54 ns	0.54 j	18.3 ns	17.10 hi	33.8 gh	31.67 ef	9.7 ns	10.08 k	1.9 ns	1.68 h	8.9 ns	8.57 j	0.49 ns	0.70 e	20.37 ns	18.98 d	41.33 de	27.02 h	10.59 ns	10.73 f	1.68 ns	1.66 h	10.13 ns	9.26 ef	
ProTone 200 ppm + MgNo ₃ 1%	0.47 ns	0.42 l	20.4 ns	18.53 de	43.7 d	44.72 a	10.2 ns	10.54 g	1.6 ns	1.39 k	9.6 ns	9.23 ef	0.39 ns	0.54 j	22.88 ns	21.31 a	59.30 a	39.72 bc	11.18 ns	11.39 a	1.37 ns	1.21 m	10.92 ns	10.08 a	
MgNo ₃ 1%	0.62 ns	0.77 d	16.1 ns	14.57 k	25.8 l	19.00 l	9.1 ns	9.49 p	2.3 ns	2.26 a	8.2 ns	7.42 l	0.55 ns	0.86 b	17.90 ns	17.55 fgh	32.75 hi	20.49 kl	9.98 ns	10.27 i	2.02 ns	1.94 d	9.46 ns	8.82 hi	

* Values, with a column, of similar letters are not significantly different according to the least significant difference (LSD) at 0.05 level.

Table 11. Pigments characteristics of "Crimson" grape fruits as influenced by the interaction between applied treatments and the picking time during the two seasons, 2015 and 2016.

Treatments	First picking										Second picking									
	Chlorophyll a (mg/g F.W)		Chlorophyll b (mg/g F.W)		Chlorophyll (a + b) (mg/g F.W)		Carotene (mg/100g)		Anthocyanin (mg/100g)		Chlorophyll a (mg/g F.W)		Chlorophyll b (mg/g F.W)		Chlorophyll (a + b) (mg/g F.W)		Carotene (mg/100g)		Anthocyanin (mg/100g)	
	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016
Control	0.37 ns	0.39 ns	0.28 ns	0.30 a	0.65 ns	0.69 a	0.71 r	0.68 m	25.9 t	24.94 q	0.34 ns	0.37 ns	0.24 ns	0.26 defg	0.58 ns	0.63 de	0.78 p	0.76 klm	28.62 q	27.38 n
Lisophos 200 ppm	0.35 ns	0.38 ns	0.26 ns	0.28 abc	0.62 ns	0.66 bc	0.81 o	0.77 klm	28.3 r	26.34 o	0.33 ns	0.35 ns	0.22 ns	0.24 ghi	0.54 ns	0.59 ghi	0.89 l	0.86 hijk	30.99 m	29.59 j
Lisophos 400 ppm	0.31 ns	0.33 ns	0.22 ns	0.24 fgh	0.53 ns	0.58 hi	1.1 f	0.97 defgh	34.1 h	30.02 i	0.29 ns	0.30 ns	0.18 ns	0.19 lmn	0.47 ns	0.49 m	1.17 c	1.15 ab	37.84 c	33.69 c
ProTone 100 ppm	0.35 ns	0.37 ns	0.25 ns	0.27 bcd	0.60 ns	0.65 cd	0.86 m	0.81 jkl	29.5 p	27.03 n	0.32 ns	0.34 ns	0.21 ns	0.23 hij	0.53 ns	0.56 ij	0.96 j	0.91 fghij	32.28 k	30.44 h
ProTone 200 ppm	0.32 ns	0.35 ns	0.22 ns	0.25 efg	0.54 ns	0.60 fgh	1.01 h	0.92 efghi	32.9 j	29.33 j	0.30 ns	0.31 ns	0.19 ns	0.20 klm	0.48 ns	0.51 l	1.1 e	1.09 bc	36.05 e	32.91 d
Lisophos 200 ppm + MgNo₃ 1%	0.34 ns	0.36 ns	0.24 ns	0.26 cdef	0.58 ns	0.63 de	0.91 k	0.85 ijkl	30.6 n	27.75 l	0.31 ns	0.33 ns	0.20 ns	0.22 ijk	0.52 ns	0.55 jk	0.99 i	0.97 defg	33.55 i	31.28 f
Lisophos 400 ppm + MgNo₃ 1%	0.30 ns	0.32 ns	0.21 ns	0.23 hij	0.51 ns	0.54 jk	1.13 d	1.1 bcd	35.4 f	31.20 f	0.28 ns	0.29 ns	0.17 ns	0.18 mn	0.45 ns	0.47 mn	1.23 b	1.20 a	38.78 b	34.06 b
ProTone 100 ppm + MgNo₃ 1%	0.33 ns	0.36 ns	0.24 ns	0.26 defg	0.56 ns	0.61 ef	0.96 j	0.88 ghij	31.8 j	28.41 k	0.30 ns	0.32 ns	0.20 ns	0.21 jkl	0.50 ns	0.53 kl	1.05 g	1.03 cde	34.95 g	32.07 e
ProTone 200 ppm + MgNo₃ 1%	0.29 ns	0.33 ns	0.20 ns	0.27 bcde	0.49 ns	0.59 fgh	1.2 c	1.0 cdef	36.5 d	30.73 g	0.28 ns	0.28 ns	0.17 ns	0.17 n	0.43 ns	0.45 n	1.29 a	1.24 a	40.05 a	34.45 a
MgNo₃ 1%	0.36 ns	0.39 ns	0.27 ns	0.29 ab	0.64 ns	0.68 ab	0.76 q	0.75 lm	27.1 s	25.62 p	0.33 ns	0.36 ns	0.23 ns	0.25 efgh	0.56 ns	0.61 efg	0.83 n	0.81 jkl	29.70 o	28.15 k

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Table 12. Chemical characteristics of "Crimson" grape leaves as influenced by the interaction between applied treatments and the picking time during the two seasons, 2015 and 2016.

Treatments	First picking												Second picking												
	Chlorophyll a (mg/g F.W)		Chlorophyll b (mg/g F.W)		Chlorophyll (a + b) (mg/g F.W)		Total carbohydrates (%)		Starch (%)		Reducing sugar (%)		Chlorophyll a (mg/g F.W)		Chlorophyll b (mg/g F.W)		Chlorophyll (a + b) (mg/g F.W)		Total carbohydrates (%)		Starch (%)		Reducing sugar (%)		
	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015
Control	0.70 i	0.71 fghi	0.54 j	0.57 j	1.25 k	1.28 ij	36.28 h	36.72 ns	1.08 kl	0.95 n	7.08 a	6.88 a	0.76 h	0.73 efgh	0.56 i	0.58 i	1.28 j	1.31 hi	37.05 g	37.40 ns	1.78 b	1.97 a	4.83 j	5.01 l	
Lisophos 200 ppm	0.62 o	0.63 lm	0.47 q	0.78 q	1.09 s	1.11 op	34.91 mn	34.41 ns	1.80 b	1.70 cd	5.97 bcdefgh	5.05 l	0.74 g	0.75 cdef	0.58 g	0.60 g	1.32 h	1.35 fgh	37.56 ef	37.98 ns	1.55 d	1.74 c	5.08 hij	5.26 jkl	
Lisophos 400 ppm	0.68 j	0.69 hijk	0.53 l	0.54 l	1.21 m	1.23 kl	35.99 hi	32.94 ns	1.25 h	1.12 l	6.84 abc	5.58 ab	0.78 c	0.79 abc	0.62 c	0.65 b	1.40 c	1.44 abc	38.81 b	39.43 ns	1.11 jk	1.20 k	5.72 defghij	5.96 defgh	
ProTone 100 ppm	0.64 m	0.65 klm	0.49 p	0.50 o	1.13 q	1.15 no	35.24 klm	34.98 ns	1.64 c	1.47 gh	6.27 abcdef	6.03 cdefg	0.75 f	0.76 bcdef	0.59 f	0.61 f	1.33 g	1.37 efg	37.81 de	38.26 ns	1.46 e	1.63 de	5.23 ghij	5.41 ijkl	
ProTone 200 ppm	0.65 m	0.65 jklm	0.50 o	0.51 n	1.15 p	1.17 mn	35.45 jkl	35.32 ns	1.55 d	1.40 hi	6.42 abcde	6.16 bede	0.77 d	0.78 abcd	0.62 d	0.64 c	1.39 e	1.42 bed	38.61 b	37.45 ns	1.21 hi	1.29 j	5.63 defghij	5.80 efghi	
Lisophos 200 ppm + MgNo ₃ 1%	0.66 l	0.66 jklm	0.51 n	0.52 n	1.17 o	1.18 lmn	35.67 ijk	35.59 ns	1.42 ef	1.31 j	6.58 abcd	6.26 bcd	0.75 f	0.77 abcde	0.60 e	0.62 e	1.35 f	1.38 def	38.08 cd	38.54 ns	1.37 f	1.52 fg	5.40 fghij	5.52 hijk	
Lisophos 400 ppm + MgNo ₃ 1%	0.67 k	0.68 ijkl	0.52 m	0.53 m	1.18 n	1.21 lm	35.86 hij	35.88 ns	1.35 fg	1.20 k	6.40 abcde	6.44 abc	0.79 b	0.81 ab	0.63 b	0.66 a	1.42 b	1.46 ab	38.45 bc	39.59 ns	1.02 l	1.12 l	5.86 cdefghi	6.09 cdef	
ProTone 100 ppm + MgNo ₃ 1%	0.63 n	0.58 n	0.48 q	0.49 p	1.11 r	1.07 p	35.02 lmn	34.70 ns	1.70 c	1.57 ef	6.12 abcdefg	5.87 defgh	0.76 e	0.78 abcde	0.61 e	0.63 d	1.37 e	1.40 cde	38.35 bc	38.85 ns	1.28 gh	1.40 i	5.50 efghij	5.66 fghij	
ProTone 200 ppm + MgNo ₃ 1%	0.69 i	0.70 ghij	0.54 k	0.56 k	1.32 l	1.26 jk	36.22 h	36.53 ns	1.57 ij	1.04 m	6.94 Ab	6.72 a	0.80 a	0.81 a	0.64 a	0.66 a	1.44 a	1.48 a	39.36 a	39.84 ns	0.93 m	1.03 m	6.00 bcdegh	6.19 bcde	
MgNo ₃ 1%	0.61 p	0.62 mn	0.46 r	0.47 q	1.07 t	1.09 p	34.65 n	34.13 ns	1.93 a	1.56 b	5.83 defghi	5.61 ghij	0.72 h	0.74 defg	0.57 h	0.59 h	1.30 i	1.33 gh	37.31 fg	37.65 ns	1.68 c	1.87 b	4.94 ij	5.14 kl	

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