J. Agric. Sci. Mansoura Univ., 30 (4): 2167 - 2182, 2005

EFFECT OF THE THINNING METHODS ON FLAME SEEDLESS GRAPES:
2- FRUIT QUALITY DURING STORAGE

Mohsen, Abeer T.
Pomology Department , Faculty of Agriculture , Cairo University

ABSTRACT

This study was carried out during two successive seasons 2001 and 2002 on Flame Seedless grapevines grown at a private orchard in Wadi El Faregh Giza governorate to evaluate fruit quality during storage after the application of five thinning methods (GA_3 at 30 PPM + hand thinning – GA_3 at 30 PPM + thinning by cutting back about 25% from the apical portions of cluster – GA_3 at 30 PPM + thinning by cutting back about 33% from the apical portions of cluster – GA_3 at 30 PPM + thinning by removing about 20% from clusters number + shaving – GA_3 at 30 PPM + thinning by removing about 30% from clusters number + shaving , used after fruit set . Grape clusters were harvested at maturity stage and stored at room temperature at 25-30 C^0 and 40-45% R.H., and cold storage at $0C^0$ and 90-95% R.H.,.

Thinning methods improved physical properties of clusters (weight loss, decay percentage, berry shattering percentage and firmnes) and chemical properties (TSS, acidity, TSS/acid, total anthocyanin, total sugar and total amino acids). The data revealed that thinning by combined treatment of GA_3 at 30 PPM + cutting back about 25% from the apical portions of cluster decreased weight loss, decay percentage, acidity and berry shattering percentage, while increased firmness, TSS, TSS/acid, total anthocyanin, total sugar and total amino acids. .

INTRODUCTION

Flame Seedless grape is a seedless cultivar the clusters are medium in size with small, bright and red berries (El-Hammady, 1976). It was found that hand thinning plays an important role with some grape varities (Ditillon *et al.*, 1994 and Buchelli & Giannneti 1996). Applications of gibberelic acid or berry thinning are currently used to increase berry size of Flame Seedless grapes. So effective berry thinning is vital to minimized berry crack and post harvest decay (Orth, 1990 and Wolf *et al*, 1994).

The goal of this study was to examine the effect of interaction between gibberelic acid (GA_3) and different thinning treatments on physical properties of cluster (weight loss, decay percentage, berry shattering percentage and firmnes) and chemical properties (TSS, acidity, TSS/acid, total anthocyanin, total sugar and total amino acids) during ambient temperature at 25-30 C^0 and 40-45% and cold storage at $0C^0$ and 90-95% R.H., of Flame Seedless grapes.

MATERIAL AND METHODS

This study was carried out during the seasons 2001 and 2002 on Flame Seedless grapevines grown at private orchard in wadi El Faregh area at Giza governorate. The vines were 7 years old, planted at 2x3 m apart and grown in sandy soil under drip irrigation system. The vines chosen for this study were of normal growth and received all the recommended horticultural practices. Flame Seedless grapevines were trained to a bilateral cordon system..Crop

temperature and (17.13 & 16.65%) after 45 days of cold storage at C^0 in both study seasons respectively.

Total acidity:

Data presented in Table (4) show that fruit acidity, decreased significantly as the storage period was extended. Besides, it was noticed that thinning by combined treatment GA_3 at 30 PPM + cutting back about 25% from the apical portions of cluster gave the lowest significantly acidity followed by treatment GA_3 at 30 PPM + cutting back about 33% from the apical portions of cluster of Flame Seedless after 9 days of ambient temperature storage at 25-30 $C^0$and 40-45%R.H., and cold storage at C^0 and 90-95%R.H., in both study seasons.

load at all vines was adjusted to 23- 28 clusters / vine prior to anthesis during the two seasons, respectively. Forty-two uniformly vines arranged in a randomized complete block design were used. Each treatment consisted of seven vines, where single vine represent one replicate .

The clusters were subject to the following treatments:

1-GA_3 at 30 PPM + hand thinning.

2-GA_3 at 30 PPM + thinning by cutting back about 25% from the apical

Mohsen, Abeer T.

Table (3) : Effect of thinning treatments on total soluble soild % of Flame Seedless cvs Grape during ambient temperature and cold storage at 0C° (2001 and 2002 seasons).

Tr. atments	Total soluble soild %											
	Ambient temperature					Cold storage						
	Storage periods (days) 2001											
	0	3	6	9	Mean (A)	0	15	30	45	Mean (A)
GA_3 at 30 PPM + hand thinning	16.6	16.8	17.2	17.3	16.98	16.6	16.8	17.4	17.7	17.13
GA_3 at 30 PPM + cutting back about 25% from the apical portions cluster	18.0	18.3	18.5	18.5	18.46	18.0	18.4	18.7	18.8	18.48
GA_3 at 30 PPM + cuting back about 33% from the apical portions cluster	17.6	17.9	18.0	18.2	17.95	17 6	17.7	18.2	18.5	18.08
GA_3 at 30 PPM + removing about 20% from cluster number + shaving.	17.2	17.4	17.7	18.0	17.65	17.2	17.6	17.8	18.3	17.73
GA_3 at 30 PPM + removing about 30% from cluster number + shaving	17.0	17 3	17.6	17.8	17.5	17.0	17.4	17.7	18.0	17.52
Control	16.4	16.6	16.8	17.2	16.80	16.4	16.8	17.2	17.6	17.0
Mean (B)	17.13	17.57	17.63	17.89		17.13	17.45	17.83	18.15	
LSD at 5% level	LSD (A) =0.4230 LSD(B) =0.3454 (AB) =0.7526					LSD(A) =0.2205 LSD(B) =0.1800 (AB) =0.3254				
	Storage periods (days) 2002									
GA_3 at 30 PPM + hand thinning	16.0	16.3	16.4	16.7	16.35	16.0	16.4	16.8	17.4	16.65
GA_3 at 30 PPM + cutting back about 25% from the apical portions cluster	17.0	17.2	17.4	17.8	17.35	17.0	17.4	17.6	18.4	17.50
GA_3 at 30 PPM + cutting back about 33% from the apical portions cluster	16.6	16.7	17.0	17.4	17.06	16.6	17.2	17.7	18.0	17.38
GA_3 at 30 PPM + removing about 20% from cluster number + shaving.	16.4	16.5	16.8	17.2	16.73	16.4	16.7	17.2	17.6	16.98
GA_3 at 30 PPM + removing about 30% from cluster number + shaving	16.4	16.7	16.9	17.2	16.83	16.4	16.8	17.4	17.6	17.05
Control	15.8	16.0	16.2	16.4	16.10	15.8	16.2	16.4	16.8	16.30
Mean (B)	16.44	16.57	16.78	17.15		14.62	16.78	17.18	17.57	
LSD at 5% level	LSD(A) =0.2046 LSD(B) =0.1671 (AB) =0.3862					LSD(A) =0.2519 LSD (B) =0.2057 (AB) =0.4681				

Table (4) : Effect of thinning treatments on total acidity % of Flame Seedless cvs Grape during ambient temperature and cold storage at $0C^0$ (2001 and 2002 seasons).

Treatments	Total acidity %									
	Ambient temperature					Cold storage				
	Storage periods (days) 2001									
	0	3	6	9	Mean (A)	0	15	30	45	Mean (A)
GA_3 at 30 PPM + hand thinning	0.772	0.671	0652	0.610	0.6762	0.772	0.671	0.602	0.564	0.652
GA_3 at 30 PPM + cutting back about 25% from the apical portions cluster	0.423	0.414	0.393	0.373	0.4008	0.423	0.334	0.293	0.247	0.3243
GA_3 at 30 PPM + cutting back about 33% from the apical portions cluster	0 485	0.468	0.445	0.427	0.4563	0.485	0.368	0.324	0.286	0.3658
GA_3 at 30 PPM + removing about 20% from cluster number + shaving	0.583	0.568	0.545	0.526	0.547	0.583	0.476	0.425	0.317	0.4502
GA_3 at 30 PPM + removing about 30% from cluster number + shaving	0.642	0.584	0.562	0.541	0.582	0.642	0.546	0.482	0.341	0.5027
Control	0.781	0.724	0.645	0.647	0.676	0.781	0.689	0.645	0.617	0.6830
Mean (B)	0.614	0.571	0.534	0.505		0.614	0.514	0.461	0.395	
LSD at 5% level	LSD(A) =0.04501 LSD(B) =0.03675 (AB) .0764					LSD(A) =0.02599 LSD(B) =0.02122 (AB) =0.0483				
	Storage periods (days) 2002									
GA_3 at 30 PPM + hand thinning	0.643	0.617	0.584	0.546	0.5975	0.643	0.594	0.526	0.485	0.562
GA_3 at 30 PPM + cutting back about 25% from the apical portions cluster	0 458	0.436	0.373	0.342	0.3925	0.458	0.417	0.364	0.234	0.3683
GA_3 at 30 PPM + cutting back about 33% from the apical portions cluster	0.537	0.512	0.482	0.442	0.4933	0.537	0.484	0.382	0.295	0.4245
GA_3 at 30 PPM + removing about 20% from cluster number + shaving.	0.554	0.532	0.507	0.487	0.5203	0.554	0.926	0.475	0.364	0.4798
GA_3 at 30 PPM + removing about 30% from cluster number + shaving	0.626	0.583	0.516	0.504	0.5573	0.626	0.574	0.493	0.392	0.5213
Control	0.675	0.646	0.609	0.586	0.6290	0.675	0.638	0.582	0.526	0.6053
Mean (B)	0.582	0.554	0.505	0.484		0.582	0.538	0.470	0.383	
LSD at 5% level	LSD(A) =0.05197LSD(B) =0.04244 (AB) 0.0972					LSD(A) =0.04501 LSD(B) =0.03675 (AB) =0.0746				

TSS/acid:

The resultts in Table (5) also disclosed that the effect of various practices used on TSS/acid ratio was almost similar to that found with TSS.TSS/acid ratio gradually increased with all treatments as storage period advanced of Flame Seedlees after 9 days ambient temperature storage at 25-30 $C^0$and 40-45%R.H., and cold storage at C^0 and 90-95%R.H., in both study seasons.The increase in TSS/acid ratio may mainly due to loss in water.The present results are in agreement with those reported by EL-Shobaky (1995).

Fruit Firmness:

The results in Table (6) show that fruit firmness decreased gradually and significantly with the progress of storage. Thinning by combined treatment GA_3 at 30 PPM + cutting back about 25% from the apical portions of cluster gave the highest firmness (383.2 & 430.7 g/cm^3) after 9 days of ambient temperature and (437.8 & 456.5 g/cm^3) after 45 days of cold storage at C^0 ,while combined treatment GA_3 at 30 PPM + hand thinning gave the lowest significant values (312.4 & 355.1 g/cm^3) after 9 days at ambient temperature and (380.6 & 379.4 g/cm^3) after 45 days of cold storage at C^0 respectively in both seasons study .

Shattering percentage:

The results in Table (7) show that shattering percentage increased gradually and significantly with extending the storage period for Flame Seedlees cluster. Thinning by combined treatment GA_3 at 30 PPM + cutting back about 25% from the apical portions of cluster gave the lowest significantly means(2.400 & 2.525%) and (3.525 & 3.300%) followed by treatment GA_3 at 30 PPM + cutting back about 33% from the apical portions of cluster after 9 days of ambient temperature storage at 25-30 C^0 and 45 days of cold storage at C^0 respectively in both seasons of study.

Total anthocyanin:

Data presented in Table (8) show that, total anthocyanin increased significantly with advancing the storage period for Flame Seedlees . Thinning by combined treatment GA_3 at 30 PPM + cutting back about 25% or 33% from the apical portions gave the highest total anthocyanin content, while treatment GA_3 at 30 PPM + hand thinning gave the lowest values compared with control after 9 days of ambient temperature storage at 25-30 C^0 and 45 days of cold storage at C^0 in both study seasons.

Total Sugars:

Data presented in Table (9) show that, total sugars increased significantly with advancing the storage period. Thinning by combined treatment GA_3 at 30 PPM + cutting back about 25% from the apical portions gave the highest total sugar content (16.45 & 16.85%) after 9 days ambient temperature storage at 25-30 C^0 and (16.89 & 16.97 %) after 45 days of cold storage at C^0 respectively in both study seasons.

Total Amino Acid:

The obtained results Table (10) show that total amino acids were decreased by storage. There was no significant difference among all treatments of Flame Seedless after ambient temperature storage at 25-30 C^0 and cold storage at C^0 in both study seasons.

The obtained results are in agreement with those reported by Farzlien *et al.*, (1989), Kotsilo and Ivanchenko (1989), and Magne and Larhe (1992) indicated that free amino acid contents decreased, owing to the intracellular protein hydrolysis and a break down of cell wall proteins during cold storage.

Table (5) : Effect of thinning treatments on TSS/acid ratio of Flame Seedless cvs Grape during ambient temperature and cold storage at $0C^0$ (2001 and 2002 seasons) .

Treatments	TSS/acid									
	Ambient temperature					Cold storage				
	Storage periods (days) 2001									
	0	3	6	9	Mean (A)	0	15	30	45	Mean (A)
GA_3 at 30 PPM + hand thinning	21.5	25	26.3	28.3	25.27	21.5	25.0	28.9	31.3	26.67
GA_3 at 30 PPM + cutting back about 25% from the apical portions cluster	42.5	44.2	47	49	45.67	42.5	55.0	63.8	76.1	59.35
GA_3 at 30 PPM + cutting back about 33% from the apical portions cluster	36.2	38.2	40.4	42.6	39.35	36.2	48 .0	56.1	64.5	51.22
GA_3 at 30 PPM + removing about 20% from cluster number + shaving.	29.5	30.6	32.4	34.2	49.17	29.5	36.9	41.8	57.7	41.47
GA_3 at 30 PPM + removing about 30% from cluster number + shaving	26.4	29.6	31.3	32.9	29.97	26.4	31.8	41.3	52.7	38.17
Control	20.9	22.9	26	26.5	32.99	20.9	24.3	26.6	28.5	25.08
Mean (B)	29.39	43.42	33.90	35.58		29.50	36.83	43.17	51.82	
LSD at 5% level	LSD(A) =2.782 LSD(B) =2.271 (AB) =3.986					LSD(A) =2.673 LSD(B) =2.182 (AB) =4.243				
	Storage periods (days) 2002									
GA_3 at 30 PPM + hand thinning	24.9	26.4	28.1	30.5	27.48	24.9	27.6	31.9	35.9	30.08
GA_3 at 30 PPM +0 cutting back about 25% from the apical portions cluster	37.1	39.4	52.1	52.1	45.09	37.1	41.7	48.4	76.9	51.03
GA_3 at 30 PPM + cutting back about 33% from the apical portions cluster	30.9	32.6	35.3	39.8	34.65	30.9	35.3	46.3	61.0	43.38
GA_3 at 30 PPM + removing about 20% from cluster number + shaving.	29.6	31.01	33.01	35.3	32.28	29.6	31.7	36.2	48.4	36.50
GA_3 at 30 PPM + removing about 30% from cluster number + shaving	26.2	28.6	32.8	34.1	30.42	26.1	29.3	35.3	44.9	33.89
Control	23.4	24.8	26.6	27.9	25.67	23.4	25.4	28.2	31.9	27.23
Mean (B)	28.63	30.48	34.67	36.62		28.68	31.83	37.71	49.83	
LSD at 5% level	LSD(A) =2.520 LSD(B) =2.058 (AB) =4.387					LSD(A) =2.500 LSD(B) =2.041 (AB) =3.978				

Table (6) : Effect of thinning treatments on firmness (by weight) (g/cm^3) of Flame Seedless cvs Grape during ambient temperature and cold storage at $0C^0$ (2001 and 2002 seasons) .

Treatments	Firmness (by weight) (g/cm^3)									
	Ambient temperature					Cold storage				
	Storage periods (days) 2001									
	0	3	6	9	Mean (A)	0	15	30	45	Mean (A)
GA_3 at 30 PPM + hand thinning	414.2	334.3	282.6	218.4	312.4	414.2	395.3	367.4	345.6	380.6
GA_3 at 30 PPM + cutting back about 25% from the apical portions cluster	474.5	406.4	343.2	308.6	383.2	474.5	446.2	423.5	406.8	437.8
GA_3 at 30 PPM + cutting back about 33% from the apical portions cluster	462.3	397.5	315.4	282.7	364.5	462.3	435.3	376.8	342.4	404.2
GA_3 at 30 PPM + removing about 20% from cluster number + shaving.	435.6	375.2	302.5	264.3	352.7	435.6	416.4	397.4	364.5	403.5
GA_3 at 30 PPM + removing about 30% from cluster number + shaving	426.2	354.3	294.2	247.4	330.5	426.2	402.5	373.3	332.4	383.9
Control	402.2	317.6	253.4	196.5	292.4	402.2	375.6	287.4	268.3	333.4
Mean (B)	435.8	369.8	298.5	253.0		435.8	411.9	371.2	343.2	
LSD at 5% level	LSD(A) =41.51 LSD(B) =33.89 (AB) =72.52					LSD(A) =35.86 LSD(B) =29.28 (AB) =64.37				
	Storage periods (days) 2002									
GA_3 at 30 PPM + hand thinning	428.2	392.4	356.3	243.4	355.1	428.2	392.7	362.5	334.2	397.4
GA_3 at 30 PPM + cutting back about 25% from the apical portions cluster	480.7	447.5	407.4	387.3	430.7	480.7	465.4	452.6	427.3	456.5
GA_3 at 30 PPM + cutting back about 33% from the apical portions cluster	472.6	425.6	391.8	366.2	414.0	472.6	443.4	427.3	401.2	436.1
GA_3 at 30 PPM + removing about 20% from cluster number + shaving.	456.2	394.7	354.6	295.3	375.2	546.2	421.4	393.2	373.4	411.1
GA_3 at 30 PPM + removing about 30% from cluster number + shaving	437.3	372.6	332.3	284.5	356.6	437.3	418.6	372.5	352.4	395.2
Control	416.5	356.4	294.5	227.2	323.6	416.5	384.3	356.4	327.2	371.1
Mean (B)	448.6	398.3	356.1	300.7		448.6	421.0	394.1	369.3	
LSD at 5% level	LSD(A) =42.24 LSD(B) =40.09 (AB) =81.96					LSD(A) =30.25 LSD(B) =24.70 (AB) =53.948				

Table (7) : Effect of thinning treatments on berry shattering % of Flame Seedless cvs Grape during ambient temperature and cold storage at $0C^0$ (2001 and 2002 seasons) .

Treatments	berry shattering %									
	Ambient temperature					Cold storage				
	Storage periods (days) 2001									
	0	3	6	9	Mean (A)	0	15	30	45	Mean (A)
GA_3 at 30 PPM + hand thinning	0.0	1.3	6.2	8.2	3.925	0.0	1.8	7.3	13.7	5.7
GA_3 at 30 PPM + cutting back about 25% from the apical portions cluster	0.0	0.0	4.2	5.4	2.40	0.0	0.0	4.7	9.4	3.525
GA_3 at 30 PPM + cutting back about 33% from the apical portions cluster	0.0	0.0	4.6	5.7	2.575	0.0	0.0	5.6	10.6	4.050
GA_3 at 30 PPM + removing about 20% from cluster number + shaving.	0.0	0.0	5.4	6.8	3.050	0.0	0.0	6.2	10.8	4.250
GA_3 at 30 PPM + removing about 30% from cluster number + shaving	0.0	0.0	5.8	7.1	3.225	0.0	1.1	6.7	11.3	4.767
Control	0.0	1.7	6.7	8.5	4.225	0.0	2.6	8.4	14.2	6.30
Mean (B)	0.0	0.5	5.48	6.95		0.0	0.917	6.47	11.67	
LSD at 5% level	LSD(A) =0.6476 LSD(B) =0.5287 (AB) =1.1243					LSD(A) =0.5171 LSD(B) =0.4222 (AB) =0.9345				
	Storage periods (days) 2002									
GA_3 at 30 PPM + hand thinning	0.0	1.8	7.0	9.4	4.550	0.0	2.0	6.8	13.2	5.50
GA_3 at 30 PPM + cutting back about 25% from the apical portions cluster	0.0	0.0	4.3	5.8	2.525	0.0	0.0	4.8	8.4	3.30
GA_3 at 30 PPM + cutting back about 33% from the apical portions cluster	0.0	0.0	4.8	6.2	2.750	0.0	0.0	5.3	9.6	2.75
GA_3 at 30 PPM + removing about 20% from cluster number + shaving.	0.0	0.0	5.2	7.6	3.20	0.0	0.0	5.8	10.3	4.025
GA_3 at 30 PPM + removing about 30% from cluster number + shaving	0.0	0.0	5.4	7.8	3.30	0.0	1.3	6.2	12.6	5.025
Control	0.0	2.0	7.5	9.6	4.775	0.0	2.8	7.6	14.6	6.183
Mean (B)	0.0	0.633	5.70	7.73		0.0	0.972	6.10	11.45	
LSD at 5% level	LSD(A) =0.5828 LSD(B) =0.4759 (AB) =0.9536					LSD (A) =05909 LSD(B) =0.4824 (AB) =0.976				

Table (10) : Effect of thinning treatments on total amino acid % of Flame Seedless cvs Grape during ambient temperature and cold storage at 0C° (2001 and 2002 seasons) .

Treatments	Total amino acid%									
	Ambient temperature					Cold storage				
	Storage periods (days) 2001									
	0	3	6	9	Mean (A)	0	15	30	45	Mean (A)
GA_3 at 30 PPM + hand thinning	0.042	0.038	0.034	0.028	0.0355	0.042	0.04	0.038	0.036	0.0388
GA_3 at 30 PPM + cutting back about 25% from the apical portions cluster	0.078	0.074	0.070	0.068	0.0725	0.078	0.076	0.075	0.075	0.1263
GA_3 at 30 PPM+ cutting back about 33% from the apical portions cluster	0.072	0.068	0.063	0.060	0.06575	0.072	0.070	0.068	0.066	0.1155
GA_3 at 30 PPM + removing about 20% from cluster number + shaving.	0.059	0.047	0.042	0.038	0.04658	0.059	0.057	0.054	0.052	0.0555
GA_3 at 30 PPM + removing about 30% from cluster number + shaving	0.056	0.049	0.042	0.034	0.04533	0.056	0.053	0.050	0.048	0.05175
Control	0.030	0.025	0.020	0.014	0.01975	0.030	0.027	0.024	0.021	0.0230
Mean (B)	0.0545	0.050	0.045	0.0403		0.119	0.0538	0.0513	0.0496	
LSD at 5% level	LSD(A) =0.1162 LSD(B) =0 0948 (AB) =0.2112					LSD(A) =0.0779 LSD(B) =0.06365 (AB) =0.1352				
	Storage periods (days) 2002									
GA_3 at 30 PPM + hand thinning	0.046	0.040	0.032	0.020	0.037	0.046	0.043	0.040	0.040	0.04222
GA_3 at 30 PPM + cutting back about 25% from the apical portions cluster	0.080	0.076	0.074	0.070	0.138	0.080	0.078	0.075	0.74	0.07675
GA_3 at 30 PPM + cutting back about 33% from the apical portions cluster	0.076	0.072	0.067	0.063	0.122	0.076	0.073	0.071	0.068	0.07220
GA_3 at 30 PPM + removing about 20% from cluster number + shaving.	0.063	0.057	0.052	0.046	0.103	0.063	0.061	0.058	0.056	0.0595
GA_3 at 30 PPM + removing about 30% from cluster number + shaving	0.057	0.045	0.037	0.036	0.0437	0.057	0.053	0.052	0.052	0.05358
Control	0.033	0.021	0.017	0.012	0.0207	0.033	0.028	0.023	0.023	0.02767
Mean (B)	0.1342	0.0868	0.0465	0.0428		0.059	0.0560	0.0532	0.0522	
LSD at 5% level	LSD(A) =0.1103 LSD(B) =0.09002 (AB) =0.1242					LSD(A) =0.06875 LSD(B) =0.0561 (AB) =0.1323				

REFERNCES

A.O.A.C. (1985). Association of Official Agriculture Chemists Official Methods of Analy sis , Washington , D.C.,USA,P382

Bucelli, P. and F. Gianneti (1996). Effect of cluters thinning on grape and wine quality . Rivista di viticaltura e di Emolagia , 1996 , 49 (2) : 59-67 . (C.F.Hort .Abst., 66:11) .

Ditillon, W. S.; S. Bindra and S. Sohan (1994). Note on effect of bery thinning on quality of grapes cv Perlette. Indian J. Hort., 49(1) : 50-52.

El Hammady, M. M. (1976). Introduction of new fruit varieties for the Egyptian Horticulture . Egypt .J.Hort.3 (2) : 239-243.

EL-shonbaky, M. A. (1995). Storage life of Thompson Seedless grape as affected by some field practices.Ph.D.Thesis, Fac.of Agric., Mansoura unvi., Egypt.

Farzalien, E. B.; Z. F. Gusar; A. F. Radova and V. N. Glober (1989). The amino acid composition of pyrnus communis and changes during storage Khimiya Primodnykh Soedimenii (1) :142– 143.

Kotsiol, M. I. and V. I. Ivanchenko (1989). Change in the amino acid composition of pear fruits from various ecological zones when stored in controlled atmospheres. Gosudarstvennyi Nikitskii Boranicheskii sad, 109 : 104-111.

Ghobrial, G. F; M. A. El–Shobaky and E. S. Abbas (2001) Effect of omex on yield, fruit quality and storage ability of Flame Seedless grapes. J. Agric. Sci , Mansoura Univ., 26(3) : 1563 – 1572 .

Hsia, C. L.; B. S. Luh and C.O. Chickester (1965). Amthocyanin in fresstone peaches J.food Sci ., 30.5-12 .

Magne, C. and F. Larher (1992). High sugar content of extracts interferes with colorimetric determination of amino acids and free proloin. Analytical Biochemistry 200 : 115-118.

Mccarmack, A. A. and C. V. Broum (1973). Market diease and blemiskes of florida frut,derpartment of citrus lake alfred state of fla-Dept.of citrus.

Orth, C H. F. (1990). Effect of spraying or dirring Muscat Seedless with girrerellice acid at different flowering stages on berry set and berry size. Decidious, Fruit grower , 40 (11) : 428-432 .

Rosein, H. (1957) . A modified minhydrine colorimetic analysis for amino acids . Arch . Biochem . Biofhs . (67) : 10-15

Smith, F. M.; A. Gilles ; J. K. Hamilton and P. A. Godess (1956) . Colorimetric method for determination of sugars related substances . Amal . chem. ., 26 : 235-256 .

Snedecor, G. W. and W. G Cochran (1980) . " Statistical Methods " oxford and J.B.H. Publishing com . 6th Edition .

Steel, R. G D. and J H. Torrie (1980) Reproduced from principles and procedures of statistics. printed with the permission of C.I. Bliss , PP.448 – 449 .

Wolf, E. E. H.; J. A. Viljoen; A. Nieuwenhuy, and J. T. Loubser (1994). The effect of forchlorfenthuron (cppu) on Bunch quality in table grapes international symposium on Table grape production , 50-53 .

تأثير طرق الخف على العنب الفليم سيدلس
٢- تأثير طرق الخف على جودة الثمار أثناء التخزين

عبير تحسين محسن
قسم الفاكهة – كلية الزراعة – جامعة القاهرة

أجرى هذا البحث خلال موسمي ٢٠٠١/٢٠٠٢ على كروم العنب الفليم سيدلس فى مزرعة خاصة بمنطقة الوادي الفارغ بمحافظة الجيزة .
وقد أجرى بعض معاملات الخف بعد العقد ويشمل :

١- رش جبرالين بتركيز ٣٠ جزي فى المليون + خف يدوي .
٢- رش جبرالين بتركيز ٣٠ جزء فى المليون + ازالة ٢٥% من الجزء الطرفي للعنقود .
٣- رش جبرالين بتركيز ٣٠ جزء فى المليون + ازالة ٣٣% من الجزء الطرفي للعنقود .
٤- رش جبرالين بتركيز ٣٠ جزء فى المليون + ازالة ٢٠% من عدد العناقيد الكلي + ازالة الحبات الداخليه علي الاكتاف الخمسة القاعدية.
٥- رش جبرالين بتركيز ٣٠ جزء فى المليون + ازالة ٣٠% من عدد العناقيد الكلي+ ازالة الحبات الداخليه علي الاكتاف الخمسة القاعدية.

تم جمع الثمار وتخزينها في الجو العادي ٢٥- ٣٠ درجة منوية ورطوبة ٤٠ – ٤٥ % و كذلك وضعها في التخزين المبرد علي درجة الصفر المنوي ورطوبة ٩٠- ٩٥ %
و اظهرت معاملات الخف اثناء التخزين تحسن الصفات الطبيعية للعنقود والحبات مثل (الفقد فى الوزن – نسبة التالف – نسبة الفرط – الصلابة) والصفات الكيميائية (نسبة المواد الصلبة الذائبة –الحموضة - صبغة الانثوسيانين فى جلدة الحبات – السكريات الكلية – الأحماض الأمينية الكلية) وقد وجد أن معاملة الخف باستخدام رش جبرالين بتركيز ٣٠ جزء فى المليون مع ازالة ٢٥% من الجزء الطرفي للعنقود أعطى أفضل النتائج مع العنب الفليم سيدلس خلال التخزين في الجو العادي لمدة ٩ ايام و علي درجة صفر منوي لمدة ٤٥ يوم.