Assiut J. of Agric. Sci., 38 (3) (65-79)

EFFECT OF DEFOLIATION AND DORMANCY BREAKING AGENTS ON BUD BREAK, YIELD AND FRUIT QUALITY OF RED ROOMY GRAPEVINES

Aiman K.A. Mohamed

Department of Horticulture, Assiut University, Egypt

Aimanmohamed@hotmail.com

Abstract: The experiment was conducted at Horticultural Orchard, Assiut University during two successive seasons of 2004/2005 and 2005/2006 on 6 years old of Red Roomy grapevines. The study aimed to investigate the effect of defoliation alone or combines with HC or thiourea on bud burst, yield and fruit quality of Red Roomy grape cultivar. The defoliation treatments were manually executed on four successive dates, November 1st, November 15th, December 1st and December 15th each season by removing all the vine leaves on each date. The pruning was done after each defoliation date then the spraying solution was added. The dormancy breaking agents used were hydrogen cyanamide at 1.47 % (Dormex at 3 %) and thiourea at 2%. The present study revealed that defoliation enhanced bud break, yield and fruit quality. The effectiveness was increased when it combined with HC or Thiourea.

Abbreviations: Def = defoliation, HC = hydrogen cyanamide, Thio = Thiourea

Key words: Dormancy, dormex, hydrogen cyanamide, *Vitis vinifera*

Introduction

Prolonged dormancy of Red Roomy grape cultivar is a condition, which buds are delayed in starting beyond the usual time for opening in the spring, even though favorable growing temperatures occur. The other problem encounters Red Roomy grape cultivar is irregular bud break resulting in a very prolonged blossoming season. The clusters produced later, which suffering from prolonged dormancy may encounter unusual environmental conditions. Such conditions may lead to lower fruit set than expected.

Investigators and pomologists from a long time were used the dormancy breaking agents for hastening bud break of deciduous fruit species. Grapevines have been found to be less responsive to dormancy breaking chemicals than other deciduous fruit trees (Nir and Lavee, 1993). The most effective compound among all the tested compounds for breaking dormancy in grapevines is hydrogen cyanamide. Gabrial and Abdel-Fattah (1993), El-

Sayed (1994), Isis-Risk *et al*., (1994), Mohamed and El-Sese (2004) and Gouda (2005), agreed upon the effectiveness of this compound on grape cultivars.

Among chemicals which have been used to haste bud break is thiourea. It was used to control prolonged dormancy of many deciduous fruit trees. This compound was used to enhance and increase bud break percentage of grape cultivars (Sourial *et al* 1993 a,b and Gouda 2005). It also has proven effective on bud opening of peach trees (Erez *et al* 1971 and Escobar and Martin, 1987) and sour cherry (Felker and Robitaille, 1985).

Apart from chemical spraying, many cultural practices can be used to stimulate bud break. Defoliation has been used on a wide range in tropics and subtropics. The effectiveness of this practice depends upon the date of it is application (Spiers 1972, Lloyd and Couvillon 1974, Mielke and Dennis 1978, Walser *et al* 1981 and Lloyed and Firth 1990).

This study aimed to investigate the effect of defoliation and spraying with HC or thiourea on bud burst, yield and fruit quality of Red Roomy grape cultivar.

Materials and Methods

The experiment was conducted at Horticultural Orchard, Faculty of Agriculture, Assiut University during two successive seasons of 2004/2005 and 2005/2006. Thirty nine grapevines of Red Roomy cultivar were chosen. They were 6 years old and planted in a heavy loam soil at 2.5x2.5m apart. They were pruned as traditional head training system. The trunk was 80 cm high and had 3-4 arms distributed well at different directions. Seven fruiting spurs each containing 3 buds were left on each vine. Three replacement spurs were left on each vine with removal all the clusters (if present) formed on them to avoid interfering with vine yield and/or to insure that the new shoots produced from them will vigorously grow.

The defoliation was manually executed on four successive dates, November 1st, November 15th, December 1st and December 15th each year by removing all the vine leaves on each date. The pruning was done after each defoliation date by 2-3 days then the spraying solution was added after pruning by two days. The dormancy – breaking agents used were hydrogen cyanamide at 1.47 % (Dormex at 3 %) and thiourea at 2 %. A surfactant superfilm at 0.1 %

was added to the spraying solution.

Horticultural practices such as irrigation, soil management and fertilization were applied as recommended.

The following measurements were taken on each vine:

1–Date of bud burst onset, fruit set start and end.

The time of fruit set start was considered when 2-3 clusters on each vine started to set (30-40% of caps fall); while the end of fruit set, was considered when all the clusters on the vine were set.

2–Total number of bursting buds was counted then they relative to the total number of buds (21 buds/vine) and expressed as a percentage of bud burst.

3 – To determine the chemical properties of the berries, samples of them were collected two times each season. The first sample was taken on August 20th and 27th, while the second one was taken on September 15th and 20th during the first and second season, respectively.

The following parameters were determined:

a) Total soluble solids (TSS) using the hand refractometer.

b) Total acidity using titration by NaOH at 0.1 N and phenolphthalene as an indicator then expressed as tartaric acid.

c) TSS/acid ratio was then calculated.

4–At picking date the following parameters were recorded:

a) Number of cluster per vine.

b) Yield (Kg/vine).

c) Cluster weight g.

d) Weight of 100 berries g.

The experiment was set up as a complete randomized design. The differences were tested by analysis of variance (ANOVA) according to the methods described by Snedecor and Cochran (1972). Means were compared using the least significant differences (LSD) values at 5 % level of the probability.

Results

A – Effect of treatments on date of bud burst and fruit set:

Tables 1 and 2 show the effect of treatments on the date of bud burst onset and fruit set of Red roomy grapevines. Def on Nov.1st and 15th + HC were the most effective treatments on the speed of bud burst. Bud burst of Def on Nov.1st + HC was the earliest treatment. It occurred during the first season on Jan. 15th for such treatment while it occurred on Jan. 31st of Def on Nov.15th + HC. However, during the second season, bud burst of

Def on Nov. 1st and 15th + HC occurred on the same time (Jan. 30th). Bud burst of the remained treatments occurred during Feb. and Mar. every season.

During the first season, the earliest testaments respecting fruit set start were Def on Nov.1st + HC, Def on Nov.15th + Thio then defoliation on Nov.1 + Thio. Fruit set start occurred on March 12th, March 19th and March 26th, respectively. Fruit set end of previous treatments occurred on Apr. 3, 10 and 13th, respectively. During the second season, these stages approximately took the same trend of the first season. On the other hand, in the control, various stages occurred on April 5th, May 7th and June 4th in the first season and on April 5th, May 10th and June 7th in the second one, respectively.

Table(1): Effect of defoliation either with or without hydrogen cyanamide or thiourea on the date of bud burst onset and fruit set start & end of Red Roomy grapevines during 2004/ 2005 season.

Treatment	Defoliation date.	Bud burst	Fruit set start	Fruit set end
Def	Nov. 1	Mar. 17	Apr. 22	May 16
	Nov. 15	Feb. 20	Apr. 6	Apr. 27
	Dec. 1	Mar. 2	Apr. 13	May 4
	Dec. 15	Mar. 20	Apr. 27	May 21
Def + Thio	Nov. 1	Feb. 15	Mar. 26	Apr. 13
	Nov. 15	Feb. 7	Mar. 19	Apr. 10
	Dec. 1	Feb. 14	Mar. 31	Apr. 18
	Dec. 15	Mar. 15	Apr. 22	May 12
Def + HC	Nov. 1	Jan. 15	Mar. 12	Apr. 3
	Nov. 15	Jan. 31	Mar. 28	Apr. 15
	Dec. 1	Feb. 10	Mar. 27	Apr. 17
	Dec. 15	Mar. 8	Apr. 15	May 9
Control	-	Apr. 5	May. 7	June 4

Def = defoliation, HC = hydrogen cyanamide, Thio = Thiourea

Table(2): Effect of defoliation either with or without hydrogen cyanamide or thiourea on the date of bud burst onset and fruit set start & end of Red Roomy grapevines during 2005/ 2006 season.

Treatment	Defoliation date.	Bud Burst	Fruit set start	Fruit set End
Def	Nov. 1	Mar. 20	Apr. 27	May 21
	Nov. 15	Feb. 15	Mar. 28	Apr. 18
	Dec. 1	Feb. 20	Mar. 31	Apr. 21
	Dec. 15	Mar. 15	Apr. 20	May 14
Def + Thio	Nov. 1	Feb. 9	Mar. 26	Apr. 13
	Nov. 15	Feb. 9	Mar. 30	Apr. 20
	Dec. 1	Feb. 19	Apr. 2	Apr. 20
	Dec. 15	Mar. 17	Apr. 25	May 16
Def + HC	Nov. 1	Jan. 30	Mar. 23	Apr. 13
	Nov. 15	Jan. 30	Mar. 23	Apr. 13
	Dec. 1	Feb. 7	Mar. 22	Apr. 12
	Dec. 15	Mar. 1	Apr. 7	May 1
Control	-	Apr. 5	May 10	June 7

Def = defoliation, HC = hydrogen cyanamide, Thio = Thiourea

B-Effect on bud burst percentage and yield components :

The effect of various treatments on bud burst percentage, number of clusters/ vine, yield (kg/vine), cluster weight g and 100 berries weight g is shown in Table 3.

1 – Bud burst %:

Table 3 shows that all the treatments exceeded the control concerning the effect of them on bud burst percentage. The most effective treatments were Def. on Nov.15th + HC and Def. on Dec.1st + Thio. The percentage of bud burst for these treatments was 88.89 during the two seasons of study.

2 – Cluster number / vine:

The effect of treatments on clusters number was presented in Table 3. The results indicated that the most effective treatment was Def. on Nov.15th + HC followed by Def. on Dec.1st + Thio then Def. on Nov. 15th +

Thio. These treatments produced 20.67, 19.67 and 19.67 clusters/vine, respectively in the first season while the values during the second season were 19.33, 20.33 and 20.00 for such treatments, respectively. The number of clusters per vine in the control was 17.67 and 16.67 in the first and second season, respectively.

3 – Yield (kg/vine):

In respect of yield weight, during the first season of study, the most effective treatment was Def. on Dec. 15th + Thio. It gave 7.42 kg/vine. Defoliation on Nov. 15th + HC, Def. on Dec. 1st + HC and Def. on Dec. 15th + HC gave the same value of yield weight (7.33 kg/vine). During the second season, Def. on Dec. 1st + Thio, Def. on Dec. 15th + thio, Def. on Nov. 15th and Def. on Dec. 1st + HC produced the highest yield. They produced 8.83, 8.17, 8.08 and 8.00 kg/vine, respectively. As an average of the two seasons of study, it appears that the most effective treatment was Def. on Dec. 1st + Thio, which it gave 7.97 kg/vine followed by Def. on Dec. 15th + Thio, which it produced 7.80 kg/vine.

4 – Cluster weight (g):

Concerning the effect of treatments on average cluster weight(g), Table 3 shows that most of treatments significantly exceeded the control. During the first season of study, the most effective treatment was Def. on Dec. 15th + HC followed by Def. on Dec. 15th + Thio then Def. on Dec. 1st + HC and Def. on Dec. 15th. The cluster weight of these treatments was 406.7, 397.0, 393.8 and 392.3 g, respectively. During the second season the above-mentioned treatments gave also the highest values. They gave 407.0, 415.0, 410.6 and 416.2 g, respectively. The average data of two seasons showed that the previous treatments gave 406.9, 406.0, 402.2 and 404.3 g, respectively. However, the cluster weight of the control was 354.2 and 360.5 g for the first and second season, respectively.

5 – Weight of 100 berries:

Table 3 shows that all the treatments caused a significant increase of 100 berries weight compared to the control. During the first year, Def. on Dec. 1st, Def. on Nov. 15th and Def. on Nov. 15th + Thio gave the highest values (512.9, 511.1 and 507.0 g, respectively.). During the second season, the most effective treatments were Def. on Dec. 1st + HC, Def. on Nov. 15th + Thio and Def. on Nov. 15th. They gave 509.1,505.7and502.9g, respectively. The control gave 476.6 and 481.5 g of 100 berries weight for the first and second season, respectively.

C- Effect on chemical proprieties:

The effect of treatments on various chemical properties of Red Roomy grape cultivar during 2004/2005 and 2005/2006 seasons is presented in Tables 4 and 5.

Table(4): Effect of defoliation either with or without hydrogen cyanamide or thiourea on various chemical properties on the first sampling date of Red Roomy grapevines during 2004/2005 and 2005/2006 seasons.

Treatment	Defoliation date.	TSS %		Acidity %		TSS/Acid ratio	
		2005	2006	2005	2006	2005	2006
Def	Nov. 1	15.0	14.6	0.612	0.601	24.2	24.4
	Nov. 15	15.6	14.9	0.585	0.609	26.7	24.4
	Dec. 1	14.4	13.6	0.596	0.612	24.1	22.3
	Dec. 15	13.8	14.4	0.632	0.647	21.9	22.3
Def + Thio	Nov. 1	14.8	14.9	0.492	0.514	30.1	29.0
	Nov. 15	15.1	15.2	0.475	0.471	31.8	32.3
	Dec. 1	14.7	15.1	0.562	0.551	26.2	27.4
	Dec. 15	13.7	14.8	0.592	0.603	23.2	24.6
Def + HC	Nov. 1	15.8	16.3	0.416	0.524	37.9	31.4
	Nov. 15	16.2	16.1	0.431	0.519	37.6	31.0
	Dec. 1	14.9	15.1	0.549	0.532	27.2	28.3
	Dec. 15	14.8	15.4	0.612	0.601	24.2	25.7
Control	-	12.8	12.3	0.691	0.715	18.5	17.9
LSD 5%	-	0.8	0.9	0.041	0.043	3.4	2.6

Def = defoliation, HC = hydrogen cyanamide, Thio = Thiourea

Table 4 shows the chemical properties of the first sampling date (August 20 and 27 during the first and second season, respectively).

All attributes significantly enhanced by defoliation treatments. Concerning the percentage of total soluble solids (TSS %) during the first season, the most effective treatments were Def. on Nov. 15^{th} + HC, Def. on Nov.1^{st} + HC and Def. on Nov. 15^{th}. They gave 16.2, 15.8 and 15.6%, respectively. During the second season of study, the most effective treatment was Def. on Nov. 1^{st} + HC (16.3%) then Def. on Nov. 15^{th} + HC (16.1%).

In respect of acidity percentage during the first season, the lowest values obtained from Def. on Nov. 1^{st} + HC followed by Def. on Nov. 15^{th} + HC then Def. on Nov. 15^{th} + Thio and Def. on Nov. 1^{st} + Thio. The acidity percentages of such treatments were 0.416, 0.431, 0.475 and 0.492 respectively. During the second season, the above-mentioned treatments gave also the lowest percentages (0.524, 0.519, 0.471 and 0.514, respectively).

The ripening time or picking date of grape cultivars primarily depends on the ratio of TSS and acidity. The ratio varied among various grape cultivars but it reaches over 30/1 of Red Roomy cultivar when the cluster ripens. Under the conditions of this experiment, it was found that Def. on Nov. 1st + HC, Def. on Nov. 15th + HC and Def. on Nov. 15th + Thio reached the ripening stage on the first sampling date. The ratio of them was 34.7, 34.3 and 32.1 (two season's average), respectively. Defoliation on Nov. 1st + Thio, Def. on Dec. 1st + HC and Def. on Dec. 1st + Thio reached near the ripening on this sampling date. The ratio of them was 29.5, 27.8 and 26.8, respectively.

The previous attributes in the control were 12.8 and 12.3% for TSS, 0.691 and 0.715 for acidity and 18.5 and 17.9 for TSS/acid ratio during the two seasons, respectively.

Chemical properties of the second sampling date (September 15th and 20th during the first and second season, respectively) were presented in Table 5.

Data concerning the percentage of TSS revealed that all treatments significantly exceeded the control. Total soluble solids of all treatments except of the control reached over 16 during the two seasons of study. The most effective treatments were Def. on Nov. 1st + HC and Def. on Nov. 15th + HC, which they gave 17.5 % in the first season and 17.6 and 18.0 % in the second one, respectively. However , the percentage of TSS in the control was 14.9 in the two seasons of study.

The previous two treatments gave also the lowest acidity percentage during the two seasons of study. The values were 0.379 and 0.374 for Def. on Nov. 1st + HC and 0.395 and 0.377 for Def. on Nov. 15th + HC in the first and second season, respectively.

During such date of sampling, all the treatments including the control reached their ripening stage where TSS/acid ratio reached over 30/1 however, all treatments significantly exceeded the control in this respect.

Discussion

The present study revealed that defoliation enhanced bud burst, yield and fruit quality. The effectiveness was increased when it combined with HC or Thiourea. Defoliation on Nov. 15th gave the best results concerning bud burst earliness comparing to other defoliation dates. Bud burst in relation to this treatment occurred on Feb. 20th and 15th in the first and second season, respectively.

Table(5): Effect of defoliation either with or without hydrogen cyanamide or thiourea on various chemical properties on the second sampling date of Red Roomy grapevines during 2004/2005 and 2005/2006 seasons.

Treatment	Defoliation date.	TSS %		Acidity %		TSS/Acid ratio	
		2005	2006	2005	2006	2005	2006
Def	Nov. 1	16.5	16.6	0.423	0.412	39.1	40.4
	Nov. 15	16.7	16.4	0.413	0.415	40.6	39.6
	Dec. 1	16.1	16.5	0.408	0.420	39.5	39.4
	Dec. 15	16.2	16.3	0.419	0.423	38.7	38.7
Def + Thio	Nov. 1	16.6	16.5	0.403	0.385	41.2	42.9
	Nov. 15	16.7	16.5	0.420	0.418	39.9	39.5
	Dec. 1	16.5	16.7	0.408	0.408	40.5	41.0
	Dec. 15	16.2	16.7	0.419	0.428	39.0	39.0
Def + HC	Nov. 1	17.5	17.6	0.379	0.374	46.3	47.4
	Nov. 15	17.5	18.0	0.395	0.377	44.4	47.8
	Dec. 1	16.3	16.5	0.413	0.408	39.7	40.7
	Dec. 15	16.3	16.5	0.420	0.415	39.1	39.7
Control	-	14.9	14.9	0.473	0.463	31.6	32.2
LSD 5%	-	0.6	0.6	0.002	0.001	3.8	3.1

Def = defoliation, HC = hydrogen cyanamide, Thio = Thiourea

On the other hand, using HC or Thio combined with Def. on Nov. 15th or 1st increased the effectiveness on bud burst earliness. During the first season, defoliation + HC on the previous dates led to that bud burst occurred on Jan. 15th and 31st, respectively, while it happened on Jan. 30th during the second season. The results indicated that the fruit set started in the abovementioned treatments (which led to earliness in bud burst such as Def on Nov 1st or 15th + HC) 56 and 52 days after bud burst onset during the first and second season, respectively. Since, it occurred after 32 and 35 days, respectively, in the control although bud burst occurred later (on April 5th). On the other hand, the remained treatments took days between these extremes. This result explains the finding reported by El-Sese and Mohamed (2004) which they found that fruit set start related with heat requirements (growing degree hours GDH). These GDHs were plentiful early when bud burst occurred later on March or April and the number of days increased by two weeks in case of early bud burst (on Jan or Feb). Data also indicated that the period between fruit set start and end took a long time in the control (approximately 4 weeks) in the two seasons. While in the early bud burst this period took only 18 to 21 days. This finding clearly indicated that the control have irregular bud burst leading to extended of fruit set period while the early bud burst caused regularity of bud burst.

The data also indicated that the increment percentage of bud burst for Def on Nov 15th + HC and Def on Dec 1st + Thio was 27.3 and 33.3 over the control in the first and second season, respectively. However, the increment percentage of cluster number for such treatments was 17 and 11.3 in the first season and 16 and 22 in the second one, respectively. It is clear that, the increment percentage of cluster numbers resulted from the abovementioned treatments was less than such increase of bud burst percentage. This state may be due to bud fertility depression on the basal portion of the spur. This finding is in agreement with those reported by Attia (1998), Saleem (2001) and El-Sese (2004).

The effect of defoliation on earliness and enhancement of bud burst was observed by many investigators. Spiers 1972, Lloyd and Couvillon 1974, Mielke and Dennis 1978, Walser *et a.,l* 1981 and Lloyd and Firth 1990 agreed upon the effectiveness of this practice. They explained the effect of defoliation by that ABA production in the leaf may be stimulate by stress during leaf senescence and/or abscission or the ABA may arise elsewhere (e.g. in the roots) and defoliation prevents translocation of ABA from leaves to buds. They also noted that the effectiveness of this treatment mostly depends on the date of it is application. If it done very early it detriments the buds and limbs or had no effect on bud break. Some workers (Lloyd and Couvillon 1974 and Mohamed 2003) found that defoliation of individual shoots totally inhibited bud break. This inhibition might be due to that growth inhibitors could have been translocated from the shoots with leaves to the defoliated ones, thus preventing bud break.

The effectiveness of HC on deciduous fruit trees was noted by many workers, Dozier *et al* (1990), Nee and Fuchigami (1992), Cepeda *et al* (1992), Lloyd and Firth (1993), Wood (1993), Jackson and Bepete (1995), Mohamed (1999) and Mohamed and El-Sese (2004). They found that HC application enhanced bud break. Thiourea was also effective on increasing bud break percentage and yield of many deciduous fruit trees (Sourial *et al* (1993 a, b, c) and Gouda (2005) on grape cultivars, Erez *et al.*, (1971) and Escobar and Martin (1987) on peach trees and Felker and Robitaille (1985) on sour cherry). They found that Thiourea was effective on bud break and obtaining good yield with best fruit quality.

References

Attia, M.F. 1998. Effect of foliar nutrition, different vine-bud-load and spur length on some vegetative and fruiting characters of Red Roomy grapevines. M.sc. Thesis Fac. Agric. Minia Univ., Egypt, 85 p.

Cepeda, J.H.S; L.H. Fuchigami and T.H.H. Chen 1992.

Hydrogen cyanamide induced budbreak and phytotoxicity in "Redhaven" peach buds. HortScience, 27:874-876.

Dozier, W.A; Jr.A.A. Powel; A.W. Caylor; N.R. McDaniel; E.L. Carden and J.A. McGuire 1990. Hydrogen cyanamide induces budbreak of peaches and nectarines following inadequate chilling. HortScience, 25:1573-1575.

El-Sayed, M.A. 1994. Selecting the proper date and concentration of dormex (hydrogen cyanamide) responsible for improving bud break and productivity of Red Roomy grapevines. Agric. Sci. Mansoura Univ., 20 (2): 855-868.

El-Sese, A.M. 2004. Effect of bud load and fertility on yield and fruit quality of Red Roomy grapevines. Assiut J. Agric. Sci. 35(4): 117-130.

El-Sese, A.M. and A.K.A. Mohamed 2003. Chilling, heat requirements and hormonal control in relation to bud dormancy in Red Roomy and Thompson Seedless grape cultivars (*Vitis vinifera* L). Assiut J. Agric. Sci. 34(6): 221-236.

Erez, A; S. Lavee and R.M. Samish 1971. Improved methods for breaking rest in the peach and other deciduous fruit species. J. Amer. Soc. Hort. Sci., 96:519-522.

Escobar, R.F. and R. Martin 1987. Chemical treatments for breaking rest in peach in relation to accumulated chilling. J. Hort. Sci. 62:457-461.

Felker , F.C and G.C. Robitaille 1985. Chilling accumulation and rest of sour cherry flower buds. J. Amer. Soc. Hort. Sci., 110: 227-232.

Gabrial, S.K. and S.E. Abdel-Fattah 1993. Effect of dormex on bud burst and yield of Roumi Red grapevine cultivar. Minia First Conf. Hort. Crops, 15 (2): 1003-1014.

Gouda , F. El-Z. M. 2005. Effect of training system and application of hydrogen cyanamide (Dormex) and mineral oil on bud break, vegetative growth and fruiting of King Ruby grapevines under Assiut conditions. Ph.D. dissertation, Assiut University, 120 p.

Isis,Rizk, A.; N.A. Rizk and R.H. Fouda 1994. Effect of hydrogen cyanamide on bud behavior, yield, fruit quality and rate of wood maturity of Roumi Red grapevines. Egypt J. of Applied Sci. Vol 9 (2): 795-813.

Jackson, J.E. and M. Bepete 1995. The effect of hydrogen cyanamide (Dormex) on flowering and cropping of different apple cultivars under tropical conditions of sub-

optimal winter chilling. Scientia Horticulturae, 60:293-304.

Lloyd, D.A. and G.A. Couvillon 1974. Effects of date of defoliation on flower and leaf bud development in the peach (*Prunus persica* (L) Batsch.

Lloyd, J. and D. Firth 1990. Effect of defoliation time on depth of dormancy and bloom time for low chill peaches. HortScience 25:1575-1578.

Lloyd, J. and D. Firth 1993. Effect of hydrogen cyanamide and promalin on floweing, fruit set and harvest time of Flordaprince peach (*Prunus persica* (L) Batsch) in subtropical Australia. Journal of Hort. Sci. 68:177-183.

Mielke, E.A. and F.G. Dennis, Jr. 1978. Hormonal control of flower bud dormancy in sour cherry (*Prunus cerasus* L.). III Effects of leaves, defoliation and temperature on levels of Abscisic acid in flower primordia. J.Amer.Soc.Hort.Sci. 103 :446-449.

Mohamed, A.K.A. 1999. Physiological studies on bud break, vegetative growth and fruiting of some apple cultivars under Assiut climatic conditions. Ph.D. Dissertation, Assiut University, 117 p.

Mohamed, A.K.A. 2003. Effect of some horticultural practices on budbreak and flowering of Anna apple cultivar. Assiut J. Agric. Sci. 34 (2): 169-182.

Mohamed, A.K.A. and A.M. El-Sese 2004. Effect of some chemical compounds and growth regulators on regularity of bud break, flowering and fruiting of Red Roomy grapevines (*Vitis vinifera* L). Assiut J.Agric.Sci. 35(2): 165-181.

Nee,C.C and L.H. Fuchigami 1992. Overcoming rest at different growth stages with hydrogen cyanamide. Scientia Horticulturae, 50:107-113.

Nir,G. and S. Lavee 1993. Metabolic changes during cyanamide induced dormancy release in grapevines. Acta Horticulturae 329:271-274.

Saleem, B.M. 2001. Productivity improvement of Roomy Red grape under Assiut conditions. Ph.D. Dissertation, Assiut University, Egypt, 124p.

Snedecor, G.W. and W.G. Cochran 1972. Statistical methods. 6th. Ed. The Iowa State University Press, Ames, Iowa, USA.

Sourial, G.F.; M.H. El-Kholi ; A.S. Abdel-Aziz ; T.A. Abou Sayed-Ahmed and A.A. Tawfic 1993a. Response of Banati grapevines to some Thiourea treatments. I - time of bud burst, flowering and berry ripening. Zagazig

J.Agric.Res. 20 (5): 1595-1599.

Sourial, G.F.; M.H. El-Kholi ; A.S. Abdel-Aziz ; T.A. Abou Sayed-Ahmed and A.A. Tawfic 1993b. Response of Banati grapevines to some Thiourea treatments. II – Bud behavior. Zagazig J.Agric.Res . 20 (5): 1601-1607.

Sourial, G.F.; M.H. El-Kholi ; A.S. Abdel-Aziz ; T.A. Abou Sayed-Ahmed and A.A. Tawfic 1993c. Response of Banati grapevines to some Thiourea treatments. III – Yield and fruit quality. Zagazig J.Agric.Res . 20 (5) : 1609-1617.

Spiers, J.M. 1972. Effects of defoliation and bud-scale removal on bud activity in Tung. J. Amer. Soc. Hort. Sci. 97:277-279.

Walser, R.H; D.R. Walker and S.D. Seely 1981. Effect of temperature, fall defoliation and gibberellic acid on the rest period of peach leaf buds. J. Amer. Soc. Hort. Sci. 106:91-94.

Wood, B.W. 1993. Hydrogen cyanamide advances pecan budbreak and harvesting. J. Amer. Soc. Hort. Sci. 118(6): 690-693.

تأثير إزالة الأوراق والكيماويات الكاسرة للسكون على تفتح البراعم والمحصول وجودة الثمار في كرمات العنب الرومي الأحمر

أيمن كمال أحمد محمد

قسم البساتين – كلية الزراعة – جامعة أسيوط

أجريت الدراسة خلال موسمين متعاقبين 2005/2004 ، 2006/2005 على صنف العنب الرومي الأحمر المزروع في مزرعة أبحاث قسم البساتين – كلية الزراعة – جامعة أسيوط بهدف التغلب على مشكلة تأخير وعدم انتظام تفتح البراعم والعمل على زيادة المحصول ورفع خصائص جودة الثمار وذلك في تجربة تامة العشوائية.

للوصول إلى هذا الهدف تمت إزالة جميع الأوراق يدويا من على الكرمات وذلك في أربعة مواعيد متعاقبة هي 1 و 15 نوفمبر ، 1 و 15 ديسمبر أعقبها تقليم الكرمات فقط أو التقليم ثم الرش بسينامايد الهيدروجين (الدورمكس) بتركيز 1.47 % (3%) أوالثيويوريا بتركيز 2%.

أوضحت النتائج أن معاملات إزالة الأوراق أدت إلى تبكير تفتح البراعم مع زيادة ملحوظة في نسبة تفتح البراعم وزيادة في المحصول وحسنت من خصائص الجودة للحبات. أوضحت أيضا النتائج أن فعالية إزالة الأوراق تزداد عندما يعقبها الرش بسينامايد الهيدروجين أو الثيويوريا.