

EFFECT OF CROP LOAD ON CRIMSON SEEDLESS GRAPES:

B) EFFECT OF BERRY THINNING

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ABSTRACT

A study was conducted in 2002 and 2003 to disclose the effect of berry thinning on yield, physical and chemical characteristics of clusters and berries of Crimson Seedless grapevines. The vines were 5-year-old grown in a private vineyard. The treatments were applied as follows: 8, 9, 10 shoulders per cluster and control.

The results showed that the quality of Crimson Seedless grapes could be easily improved by berry thinning. However, vines thinned with leaving eight shoulders per cluster can be recommended as the best effective treatment. The decrease in the yield obtained from this treatment could be compensated by improving physical properties of berries as well as achieving a higher percentage of TSS, better colouration and a lower percentage of acidity in the juice.

INTRODUCTION

Berry thinning consists of removing parts of clusters after shatter of impotent flowers (Combe, 1959, 1962). Winkler et al, (1974) mentioned that the increase in berry weight in Tokay variety is greatest when the thinning is done immediately after berry set. The greater effectiveness of the early thinning (after set) arises from the fact that it coincides with the still – active cell division in the pericarp of the berries coincides with the rapid normal berry growth, and with the summer maximum content of carbohydrates in the shoot (Combe 1960). Uniformity of coloring in the Tokay variety (Winkler, 1930) and Red Malaga (Weaver, 1952, Weaver and Mc Cune, 1959) is enhanced by berry thinning at any time up to the beginning of ripening.

Berry weight increased by berry thinning (Dhillon et al 1992, Shehata and El Barbary 1996 and Abd El Wahab 2000).

Nick Dokoozlian et al (1993) reported that in Crimson seedless variety, large, heavily shouldered clusters should be tipped to 5 – 6 rachis laterals or cluster branches following fruit set. Many clusters may set too many flowers resulting in tight bunches with small berries at harvest. Berries with shoulders should be removed from the compact regions of well-set cluster to reduce cluster tightness. They also mentioned that 1996 in Autumn Royal variety untipped clusters may weigh up to 4 pounds at harvest, making them difficult to harvest and pack. Cluster tipping is therefore used to reduce cluster size and decrease crop load.

Some berry thinning or shoulder removal may also, be necessary if berry set is excessive. The cluster tipped to 7 or 8 shoulders typically weigh between 2.0 to 2.5 pounds at harvest.

Berry thinning enhanced ripening and improved fruit quality (Winkler et al (1974), Chouhan (1985) and Sanjay (1995).

Reducing berries/cluster increased soluble solids and anthocyanine concentration in grape berries (Weaver (1953), Winkler et al (1974), Kaps and Cahoon (1989), Sanjay (1995), Shehata and El Barbary (1996), Echenique et al (1998) and Abd El Wahab (2000) and reduced acidity Sanjay (1995).

The purpose of the present study is to disclose the effect of berry thinning as a possible means for improving bunch and berry quality on yield/vine, bunch and berry characteristics of Crimson Seedless grapevines.

MATERIAL AND METHODS

This study was carried out during 2002 and 2003 seasons on Crimson seedless grapevines in a private vineyard located in El-Nubariya-region, El-Behera governorate.

The vines were five years old, supported by gable system. Distance was 1.5 m between vines and 3 m between rows. Sixty uniform Crimson seedless vines grown in a sandy soil were chosen (4 treatments x 3 replicates x 5 vines per replicate). Each vine was pruned to six canes of 10 buds each. The design was randomized complete blocks. All vines were similar in vigor and received the same cultural practices already applied in the vineyard. The treatments were 8 shoulders/ clusters, 9 shoulders/ cluster, 10 shoulders/ cluster and control.

At harvest time, when bunches attained their technical ripening phase (Halime, 1981), representative samples of bunches were taken to the laboratory for physical and chemical analysis which included the following parameters:

Yield/vine (kg), average cluster weight (g), cluster dimension (length and width in cm), berry weight (g) and berry size (cm³). Percentage of total soluble solids determined by a hand refractometer, total acidity % (expressed as g. tartaric acid/100 juice) according to the procedures out lined in A.O.A.C. (1969), TSS / Acid ratio and total anthocyanin at O .D 530 nm were calculated (Hisa et al., 1965) .

The statistical analysis of the present data.

Mean separation was determined using Duncan s test (Snedecor and Cochran, 1980).

RESULTS AND DISCUSSION

1. Yield/vine and cluster characteristics

Yield/vine:

Data in Table (1) show that yield/ vine was higher in unthinned vines (control) in the two seasons of the investigation. However, significant differences were found among the treatments. The highest values were shown unthinned vines where the yield/vine amounted to (13.92 & 13.03 Kgs) while, the 8 shoulders / cluster treatment gave the lowest values (11.60 & 11.85 kegs) in the two seasons respectively.

T1

These results are in agreement with those obtained by Kaps and Cahoon (1989) who stated that berry thinning reduced total fruit yields and unthinned vines had the greatest yield while, Sanjay (1995) mentioned that berry thinning increased the yield/vine in Perlette cv.

Cluster weight:

Cluster weight was significantly and greatly decreased in the berry thinned vines as compared to the unthinned ones (control) (Table1). Maximum values of cluster weight were obtained with the control at the two seasons of the investigation. Results showed, no significant differences in cluster weight for 9 and 10 shoulders/cluster thinned treatments, while the treatment 8 shoulders/cluster showed the lowest cluster weight. These results are in parallel with those obtained by: Dhillon Et Al (1992) and Moon and Lee (1996) who stated that berry thinning decreased weight of the cluster. Sanjay (1995) on the contrary mentioned that Perlette cluster weight was increased by berry thinning.

Cluster dimensions:

As shown in Table (1), cluster length was significantly increased in the unthinned vines (control). The results showed no significant differences in cluster length for vines thinned to 8, 9 and 10 shoulders/ cluster.

2. Physical berry characteristics

Berry weight and size:

As shown in Table (2), berry weight and size were significantly increased in 8 and 9 shoulders/ cluster treatment in comparison with 10 shoulders/cluster treatment and control. The heaviest and largest berries were produced by cluster thinning to 8 shoulders/ cluster.

The increase in berry weight and size arises from the fact that the still-active cell division in the pericarp of the berries coincides with the rapid normal berry growth, and with the summer maximum content of carbohydrates in the shoot. These results are in agreement with those obtained by Kaps and Cahoon (1989), Dhillon et al. (1992), Shehata and El-Barbary (1996) and Abd El-Wahab (2000), and who mentioned that berry thinning/cluster increased the individual berry weight.

Berry dimensions:

Berry dimensions as expressed by berry height and diameter were also significantly increased in 8 shoulders/ cluster treatment as compared with the other treatments and control, Table (2). It is interesting to note that the great increase in berry dimensions was achieved by the higher intensity of berry thinning. These results could be explained by the beneficial effect of berry thinning/cluster that coincides with the still active cell division in the pericarp of the berries with the rapid normal berry growth, and with the summer maximum content of carbohydrates in the shoots. These results are in line with those obtained by Winkler (1953, 1962), Howell et al (1987), Clark et al (1989), Rizk and Hassan (1996) and Rizk-Alla (2006) who cleared out that berry dimensions were maximum in vines where thinning was carried out.

T2

3. Chemical berry characteristics:

Data presented in Table (3) indicate that all berry chemical characteristics; i.e. total soluble solids%, TSS/Acid ratio and anthocyanin contents of berry skin were significantly increased by berry thinning treatments except for acidity which was decreased by berry thinning treatments.

Treatment 8 shoulders/cluster increased TSS% significantly than the other treatments. Berry thinning reduced the number of berries/cluster without any change in the number of leaves. With increase the number of leaves to cluster ripening was accelerated with Echenique et al (1998) and Abd El-Wahab (2000).

From the obtained results, it can be concluded that the quality of Crimson Seedless grapes could be easily improved by berry thinning. However, vines thinned with leaving eight shoulders per cluster can be recommended as the best effective treatment. The slight decrease in the yield obtained from this treatment could be compensated by improving physical properties of berries as well as achieving a higher percentage of TSS, better colouration and a lower percentage of acidity in the juice.

T3

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تأثير حمولة المحصول على عنب الكريسون سيدلس

(ب) تأثير خف الحبات

فيكتور حبيب جرجس

معهد بحوث البساتين – مركز البحوث الزراعية بالجيزة - مصر

أجرى هذا البحث خلال موسمي 2002 ، 2003 بهدف دراسة تأثير معاملات خف بعض حبات العنقود على كمية المحصول والصفات الطبيعية والكيمائية للعناقيد والحبات مقارنة بالكنترول لكرمات عنب الكريسون سيدلس. والكرمات نامية في احدى المزارع الخاصة وعمرها خمسة سنوات. تم إجراء المعاملات بترك عدد مختلف من الأكتاف: 8، 9، 10 أكتاف لكل عنقود بالإضافة إلى الكنترول.

أشارت نتائج الدراسة إلى أن جودة عنب الكريسون يمكن تحسينه من خلال عملية خف الحبات حيث يمكن التوصية بترك ثمانية أكتاف لكل عنقود وأن حدوث انخفاض في المحصول يمكن تعويضه من خلال تحسين الصفات الطبيعية للحبات بالإضافة إلى زيادة نسبة المواد الصلبة الذائبة الكلية في عصير الحبات والحصول على أفضل درجة تلوين للحبات كما إنخفضت الحموضة في عصير الحبات.