

INFLUENCE OF BUD LOAD FOR TWO ROMANIAN TABLE GRAPES CULTIVARS IN THE CLIMATIC CONDITIONS OF STEFANESTI VINEYARD

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Abstract

*The cultivated grapevine (*Vitis vinifera* L.) is a fruit crop of enormous economic importance with over eight million hectares planted in vineyards worldwide. Table grapes and wines represent a considerable share of the economy in many grape and wine-producing countries. The purpose of this study is to evaluate the effect of bud load on qualitative and quantitative table grapevine parameters. We study the influence of bud load by implementation of three experimental variants: 22 buds/vine, 26 buds/vine and 30 buds/vine. The experimental plant material consisted of table grapes Romanian cultivars of the Victoria and Coarna Neagra. We analyzing the influence of bud load on coefficients of fertility, productivity indices, sugars accumulation in berries grape, titratable acidity of must ($\text{g L}^{-1} \text{H}_2\text{SO}_4$), glucoacidimetric index, cluster weight (g), yield per plant (kg vine^{-1}). Content of sugars was determined by refractometer. Titratable acidity (g L^{-1} sulphuric acid) was determined by titrating 0.1 N NaOH. Data is analyzed using analysis of variance (Duncan) by SPSS 16.0 for Windows programme. Differences are considered significant a 5% level of probability. The statistical analysis will be performed separately for each parameter. Regarding the results achieved for sugars accumulation at Victoria cultivars the best influence was represented by experimental variant with 22 buds/vine (149 g L^{-1}). In all variants the value of sugars was lower for Coarna Neagra than Victoria cultivar. Total acidity had a higher value for both cultivars under the influence of 30 buds/vine.*

Key words: acidity, bud load, sugars, table grapes, yield

INTRODUCTION

The grapevine (*Vitis vinifera* L.) belongs to the family Vitaceae, which comprises about 60 inter-fertile wild *Vitis* species distributed in Asia, North America and Europe under subtropical, Mediterranean and continental-temperate climatic conditions [1]. The cultivated grapevine (*Vitis vinifera* L.) is a fruit crop of enormous economic importance with over eight million hectares planted in vineyards worldwide. Table grapes and wines represent a considerable share of the economy in many grape and wine-producing countries. Fruit quality is determined by the genotypic component of the cultivar as well as environmental and cultural management conditions.

Berry size at harvest depends on many factors which modify berry growth at any stage of development, mainly environmental conditions [2], mineral nutrition [3], fruit load [4], leaf area [5] and water status [6]. Sugar

accumulation depends on many factors such as light [7], temperature, mineral nutrition [3], carbohydrate level in the permanent structures of the plant [8], leaf area [5], fruit load [4].

The aim of this work is to evaluate the effects of bud load on the vegetative growth, yield, sugars concentration in berries grapes, titratable acidity of must, grape quality in order to optimize the quality and quantity of grape yield in two Romanian cultivars, cv. Victoria and cv. Coarna Neagra grown under Stefanesti vineyard conditions.

MATERIAL AND METHOD

The purpose of this study is to evaluate the effect of bud load on qualitative and quantitative table grapevine parameters. We study the influence of bud load by implementation of three experimental variants: 22 buds/vine (V1), 26 buds/vine (V2) and 30 buds/vine (V3).

The experimental plant material consisted of table grapes Romanian cultivars of the Victoria and Coarna Neagra.

We analyzing the influence of bud load on coefficients of fertility, productivity indices, sugars accumulation in berries grape, titratable acidity of must ($\text{g L}^{-1} \text{H}_2\text{SO}_4$), *gluco-acidimetric index*, cluster weight (g), yield per plant (kg vine^{-1}). Content of sugars was determined by refractometer. Titratable acidity (g L^{-1} sulphuric acid) was determined by titrating 0.1 N NaOH. Data is analyzed using analysis of variance (Duncan) by SPSS 16.0 for Windows programme. Differences are considered significant a 5% level of probability. The statistical analysis will be performed separately for each parameter.

RESULTS AND DISCUSSIONS

The coefficient of absolute fertility had a higher value for both cultivars under the influence of 30 buds/vine (fig. 1). This indicator decreased while the bud load value increased.

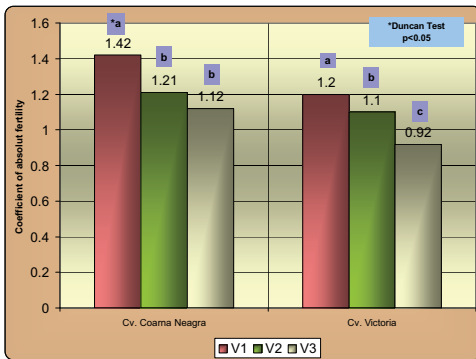


Fig. 1. Coefficient of absolute fertility

The coefficient of relative fertility had values between 0,55 and 0,64 in cv. Coarna Neagra and between 0,78 and 1,1 in cv. Victoria (Fig. 2). Statistical analyses showed that between values registered for Cv. Victoria exist significant differences ($p < 0.05$) (Fig. 2).

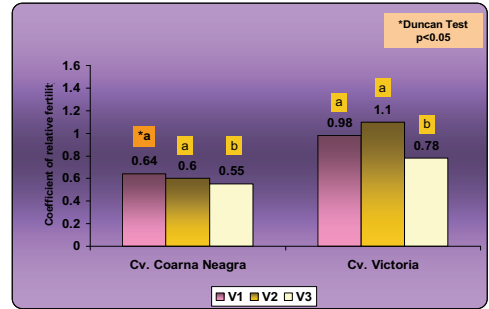


Fig. 2. Coefficient of relative fertility

Index of relative productivity decreased while the bud load value increased, the higher value being obtaining under the influence of 22 buds/vine (Fig. 3). Cv. Victoria had the higher value in case of load with 26 buds.

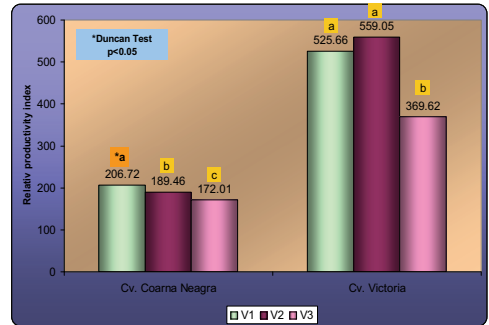


Fig. 3. Relative productivity index

The best value of absolute productivity index was registered in Cv. Victoria (663,66) for a load with 22 buds per vine (Fig. 4).

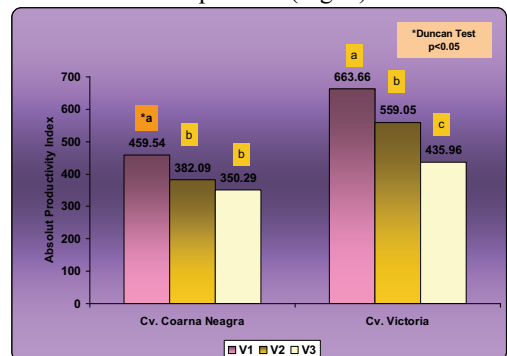


Fig. 4. Absolute productivity index

The average of cluster weight for Cv. Coarna Neagra had values between 312,76 g and 323,76 g and the statistic interpretation don't show significant differences under the influence of 26 and 30 buds per vine (Fig. 5). The average of cluster weight in cv. Victoria decreased meanwhile the load buds increased.

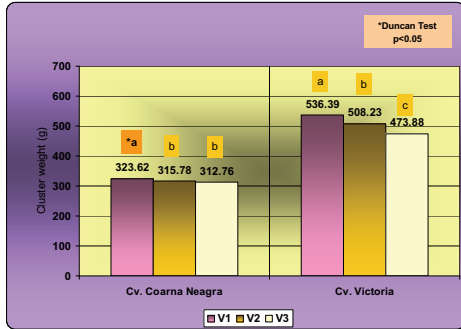


Fig. 5. Average cluster weight (g)

Yield grapes per plant (kg vine^{-1}) increased from the lower load buds to higher load buds experimental variant and the results achieved had significant differences using statistic analyse (Fig. 6). This situation was observed for both cultivars.

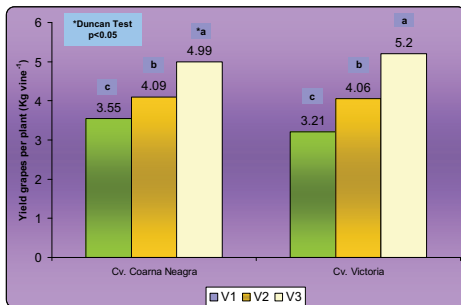


Fig. 6. Average yield grapes (kg vine^{-1})

Total titratable acidity had a higher value for both cultivars under the influence of 30 buds/vine (Fig. 7). This indicator which is responsible for quality of grape yield was increased meanwhile number of buds per plant increasing.

In all variants the value of titratable acidity was higher for cv. Coarna Neagra than cv. Victoria.

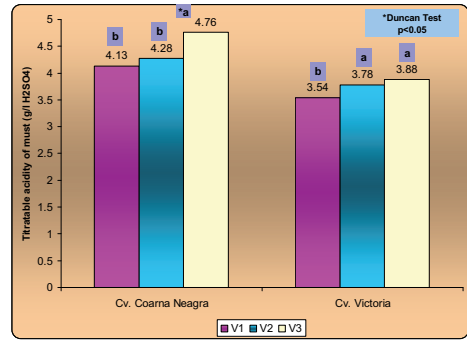


Fig. 7. Titratable acidity

The quality of grapes is influenced by the sugars concentration in berries grapes. Regarding the results achieved for sugars accumulation at Victoria cultivar the best influence was represented by experimental variant with 22 buds/vine (149 g L^{-1}) (Fig. 8).

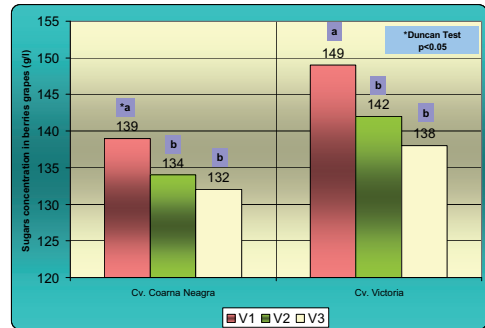


Fig. 8. Sugars concentration

Gluco – acidimetric index is given by the ratio of concentration in sugars and total acidity. This indicator has recorded the best results under the influence of experimental variant with the lowest number of buds. Increasing the number of buds led to decreased gluco – acidimetric index. Cv. Victoria recorded higher values than cv. Coarna Neagra (Fig. 9).

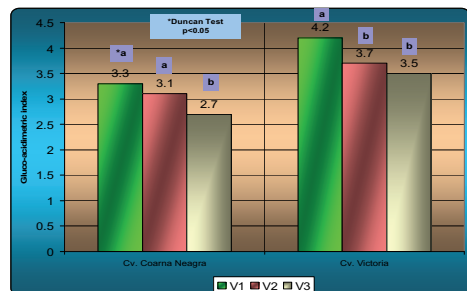


Fig. 9. Gluco – acidimetric index

CONCLUSIONS

The coefficient of absolute fertility had a higher value for both cultivars under the influence of 30 buds/vine.

Yield grapes per plant (kg vine^{-1}) increased from the lower load buds to higher load buds experimental variant and the results achieved had significant differences using statistic analyse.

Total titratable acidity had a higher value for both cultivars under the influence of 30 buds/vine.

Regarding the results achieved for sugars accumulation at Victoria cultivar the best influence was represented by experimental variant with 22 buds/vine (149 g L^{-1}).

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