AGRO-BIOLOGICAL CHARACTERISTICS OF THREE SAUVIGNON BLANC (*Vitisvinifera* L.) CLONES, GROWING IN R. MACEDONIA

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ABSTRACT

In the period of 2007/2009, 3 clones of the Sauvignon blanc variety (242,316 and 297) grown in the wine area in Skopje, Republic of Macedonia, were studied for their agro-biological characteristics.

Certified seedling was introduced in 1999/2000 from France, and the same was planted in the collectable plantings of the Agricultural Institute.

The purpose was comparative examination of the fertility of the buds and realized crop from the 3clones of Sauvignon blanc grown in same agro-ecological conditions and application of optimal agro-technical and ampelo-technical measures.

Different values have been procured mostly because of the variety specifications and the ecological conditions in the years of examination.

In the years of examination, the percentage of grown buds among all clones is very stable and with insignificant varies. The coefficient of variation is from 1.83 (clone 316) to 7.96 (clone 242).

The average number of bunches per native tendril (absolute coefficient) is with significant variation among the clones 242 (17.17) and 297 (20.66).

With highest yield of 4.870 kg/vine, the average for the period of examination is realized among the 297 clone, and also with greatest variation (13.21) in the years of examination.

Key words: *Sauvignon blanc clones, fertility of buds, yield, sugar, total acids*

INTRODUCTION

In the last 10 years, the vineyards in R. Macedonia were being rebuilt and the assortments with certified planting material with clones of more qualitative varieties, such as Chardonnay, Sauvignon blanc, Semillon, Traminner, Merlot, Cabernet sauvignon, Cabernet franc and others, were being improved. Studying the clones and getting a more realistic understanding of their agro-biological and technological characteristics are of great importance for the legitimacy of their breeding and further spread. Clones of one variety differ from the population in better features of the grape and better quality of wines obtained (Hubscher, P.V. 1988). Thus, clones differ in some properties, such as yield, mass of the cluster, sugar content, total acids, which are mostly the result of varietal specificity, and less of the impact of cultivation conditions (ENTAV-INRA, 1995). Selected clones of the Sauvignon blancvariety that are characterized by higher yield and clusters with greater mass, give lower quality of wine compared to the lower-yield clones of Sauvignon blanc (Hubscher, P.V. 1988). A great number of Chardonnay clones, wines with distinctive fruit aroma, higher content of extract, etc. are produced in France (ENTAV-INRA,1995), Australia (Nelson-Kluk, Susan, 2002) and other countries.

Selected clones produce wines with distinctive taste of fruit and vegetable flavors (Victoria A Carey, E. Archer, at al.,2008), specific terms and conditions of cultivation (soil, air, applied agro-technical andampelo-technical measure,etc.).

MATERIALS AND METHODS

Three French clones (242, 316 and 297) were cultivated in same agro-ecological conditions with application of regular agro-technical and ampelo-technical measures. The seedling was raised

in 2000 with a certified antivirus material from France. The process of cultivation was a fruit-wall with two legged Gio's way of pruning, distance of planting of 2.5m between the lines and 1.3m between the grapevines in line with an optimal strain of 22 buds by grapevine. During the vegetation, regular agro-technical and ampelo-technical measures were applied. Thirty grapevines of each clone were included in the studies (three repetitions of 10 grapevines).

Fertility of buds, from the agro-biological characteristics, was analysed through the following elements:

√percentage of developed buds on tendrils;
√percentage of native tendrils;
√number of bunch on developed tendril (relative coefficient) and
√number of bunch on native tendril **(**absolute coefficient).

The amount of wrinkled grapes is thus determined by each clone grapes collected from all 30grape vines, and the time is mathematically calculated yield per vine order unit area (ha).

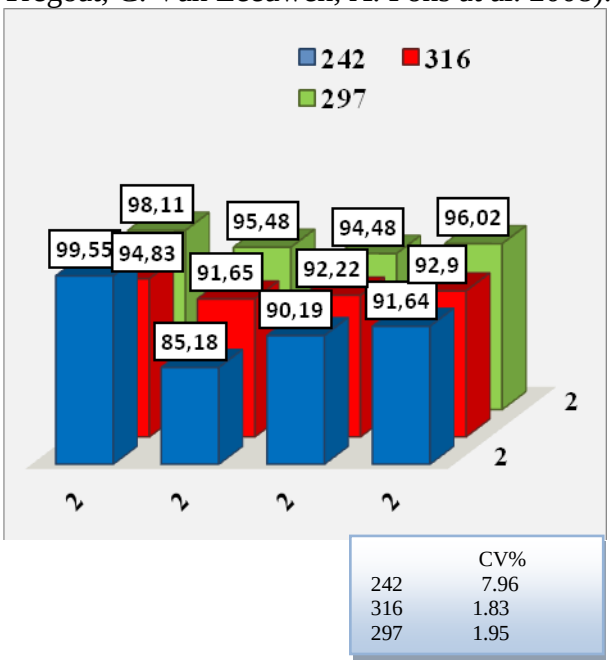
In the stage of technological maturity of each clone and each repetition is measure sugar content and the total must and taken values average.

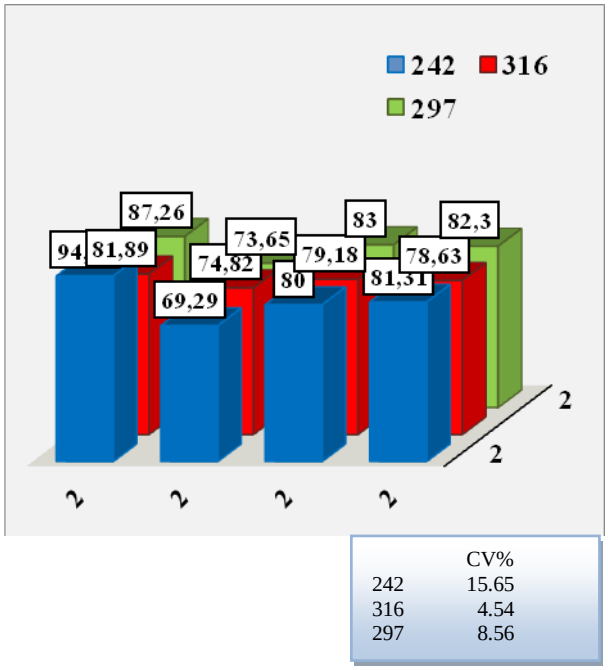
The content of sugar in the must was determined by help of Oechsle Scale, and the composition of total acids was determined by titration method using solution of N/4 NaOH with factor 1.0000.

REZULTS AND DISCUSSION

Knowing the fertility of eyelets varieties of vine important feature of agrobiology that depends on the yield and quality of grapes (Maigre D. 2004).

Fertility depends on the genetic characteristics of the variety, but independs more on farming systems, the method of cutting, climatic conditions (Victoria A Carey, E. Archer, G. Barbeau, D. Saayman.2008), and the type, quantity and time of fertilization of the grapevine (Lacroux, O. Tregoat, C. Van Leeuwen, A. Pons at al. 2008).





Graph. 1 Developed buds on tendrils (in %) **Graph.2 Native tendrils (in %)**

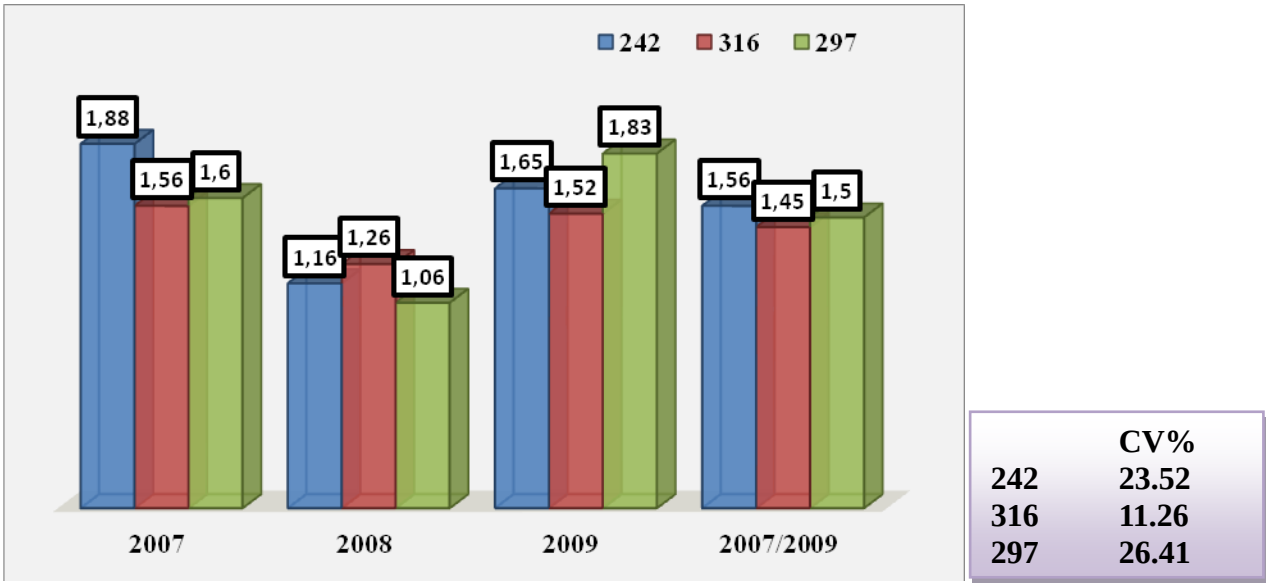
In our research we got different values of the examined elements of the fertility of the eyelets. It is a result of the specific breeding and the conditions of cultivation. The values of the percentage of the developed eyelets into tendrils is shown in grapheme no.1. In the period of examination

(2007/2009), the clones (242, 316,297) from the breeding Sauvignon blanc characterize with high percent of eyelets, but the variation through the years showed to be insignificant. The average percent of developed eyelets is between 91.64% in the clone 242 to 96.02% in the clone 297. The coefficient of variation is within the limits of 1.83 (316), 1.95 (297) to 7.96 (242).

The percentage of fertile tendrils is always smaller than the percentage of developed tendrils, because the flowers do not appear on a certain number of the former tendrils.

The largest percent of fertile tendrils in the examined period (2007/2009) had the clone 297, and the smallest percentage (78.63%) had the clone 316 (graph. 2). After years, the statistically significant variation was found within the clone 242 (15.65) and the smallest with in the clone 316 (4.54).

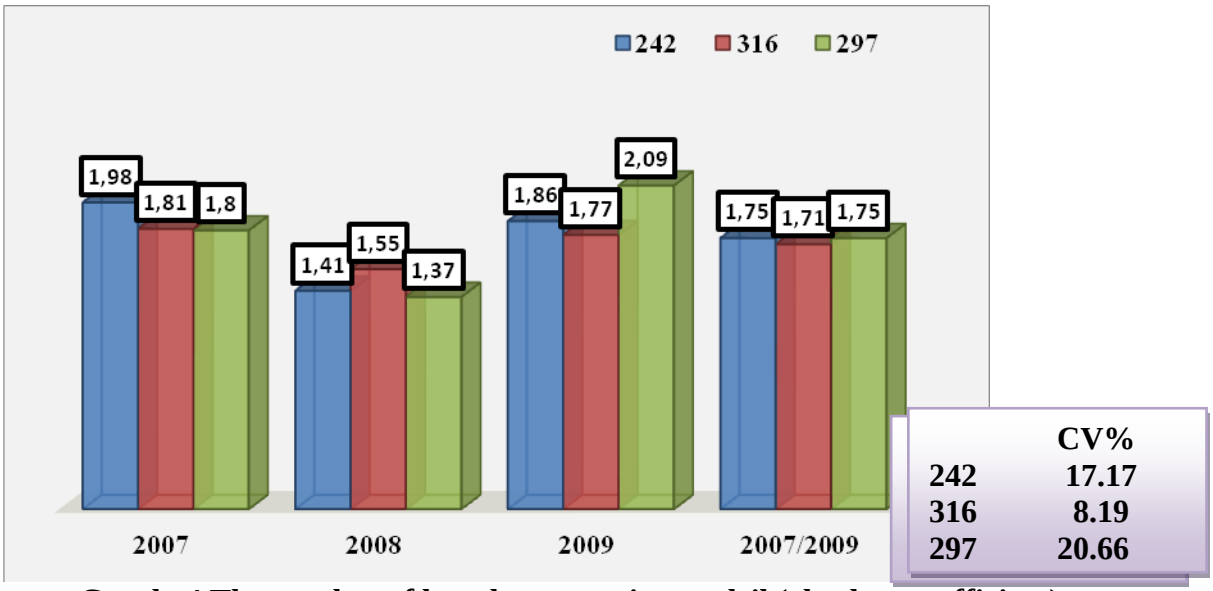
The results that we got about the relative coefficient i.e. the number of bunch of grapes per developed tendril, clones and years, are presented in the graph. 3.



Graph. 3 The number of bunches on developed tendril (relative coefficient)

During the period of examination (2007/2009), the percentage of the relative coefficient was high and there weren't any differences among the examined clones. Statistically important differences were found between the years of the examination. The largest variation with coefficient of 26.41 was in the clone 297, then we have clone 242 with coefficient of 23.52 and the clone 316 with 11.26. This was as a result of the low temperature (year 2008) that led to freezing of about 20% of the winter eyelets, and the developed tendrils are from the buds on the sides that are usually unfertile.

On graph 4 are shown the results about the number of bunch of grapes per fertile tendril, which is actually the absolute coefficient per years and is an average about the examined period 2007/2009).



Graph. 4 The number of bunches on native tendril (absolute coefficient)

After years of examining, the smallest number of the bunch of grapes per a tendril was noted in all the clones in 2008. The average of the examined period shows that there isn't a large difference in the value of the absolute coefficient. The clones 242 and 297 had 1.75 and the clone 316 had 1.71 grapes per fertile tendril. Statistically significant variation was noted within the clones 297 (20.66) and 242 (17.17). This was as a result of the low temperature (year 2008) that led to freezing of about 20% of the winter eyelets smaller yield of grapes.

Table 1 Yield of grape (kg/vine)

Clone	Y e a r				
	2007	**2008**	**2009**	**2007/2009**	**CV%**
242	4.090	4.150	3.530	3.920	8.72
316	3.990	3.620	3.890	3.830	5.00
297	4.320	4.720	5.580	4.870	13.21

Yield is an important agro-biological characteristic that depends on agro-ecological conditions, substrate, especially on the genetic potential of a variety.

Clones 242and 316 (Bledsoe, A.M at al. 1988) with average yields and fall in group B, and 297in group C,varieties with high yield.

Table 1 shows the results of the quantity of handpicked grapes of the examined Sauvignon blanc clones. Under the same conditions of cultivation, during the test period 2007/2009, the highest average yield was obtained with clone 297 (4.870 kg/vine) and with the greatest variation in years, with a coefficient of variation of 13.21. In the years of examination, the slightest variation was found in clone 316 (5.00) and it was characterized by lowest average yield of 3.830 kg/vine.

The content of sugar and total acids and their ratio are among the important parameters based on which the quality of one variety or clone is assessed. The results for the sugar content and total acids in the must are presented in Table 2.

Compared by years, the sugar content in the must in all clones was significant variation with the coefficient of variation from 11.4 (clone 242) to 11.6 (clone 297). During the period of study, the average sugar content ranged from 194 g/L (clone 297) to 215 g/L (clone 242), which enabled producing of medium strong wines. The freshness of the wines depends on the content of total acids in the must. The average content of total acids ranged from 7.6 g/L (clones 242,316), to 7.8 g/L

(clone 297). No significant changes of the content of total acids in the must of all clones were observed during the period of three years. The coefficient of variation ranged from 0.1 for the clone 297, to 0.4 for the 242 and 316 clones.

Table 2 Content of sugar and total acids in the must (g/L)

Clone	2007		2008		2009		2007/2009		CV%	
	sugar	TA	sugar	TA	sugar	TA	sugar	TA	sugar	TA
242	231	7.1	228	7.8	187	7.8	215	7.6	11.4	0.4
316	211	7.8	231	7.2	183	8.0	208	7.6	11.5	0.4
297	182	7.8	220	7.7	180	7.9	194	7.8	11.6	0.1

Legend: T/A – total acids, CV%- variation factor

CONCLUSION

On the basis of the results from the fertility of buds,the yield, sugar content and total acids in the must, and their balance during the examination period, the clones from the Sauvignon blanc (242,316,297) should be included in assortments of varieties producing white wines. With this clones we will improve the quality of white wines in R. Macedonia with usage of the proper technology.

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