

# RESEARCH ON THE VARIABILITY OF QUALITY AND PRODUCTIVITY TRAITS IN SOME VINE VARIETIES IN VÂNJU MARE WINE AREA - OREVIȚA

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## ABSTRACT

Vânju Mare-Orevița viticultural area has a special reputation in viticulture and vinification in our country. The climatic and soil conditions specific to this viticultural area present a high degree of favourability for the production of high quality wines, being from this point of view one of the most favourable areas in our country for this production direction.

The factors that contribute to the quality of grapes for vinification are related to both the characteristics and particularities of the cultivated varieties and the viticultural agrotechniques..

## INTRODUCTION

Vizitiu et al., 2015, show that in Romania the vine culture occupies an important place and would not be possible without a high-quality propagating material. Organic agriculture can be considered a viable solution that solves the negative impact of agriculture on the environment and the quality of production, and the replacement of pesticides with organic substances and natural minerals is an alternative to traditional agriculture (Bucur, 2007).

As Țârdea and Dejeu, 1995, point out, in modern viticulture the optimization of the viticultural ecosystem must aim at maximizing production, quality, profit and minimizing costs and labour force, but also the rational use of ecological and economic resources and habitat conservation against pollution. The average weight of the grapes is a very important character that constitutes both an element of productivity and an element of quality in the vine (Sestras, 2004) being one of the determining factors in achieving the production of grapes on the

stump and implicitly the production of grapes in surface unit (Dumitriu, 2003). Based on the values recorded in terms of the average weight (g) of the grapes, we consider that the type of soil did not influence the average weight of the grapes in each cultivar in part from the point of view of this productivity element.

The quality of grapes for wine production is affected by the environment, genotype but also by agricultural management. The typicality of the wine, which depends on the grain content and is controlled by the factors mentioned above, can be negatively affected by global climate change. The new advances made in the molecular physiology of grain growth and maturation, have offered new perspectives for the development of predictive models that would be very valuable for a perennial plant, which can take several years to achieve optimal fruit quality (Dai ZW etc., 2010).

## MATERIAL AND METHOD

The researches were carried out within the company S.C.Vie Vin Vânu Mare S.R.L., Orevița farm, in three wine years (2016, 2017, 2018), on four varieties: *Cabernet Sauvignon* cultivated on an area of 12 ha (fig.2), *Fetească neagră* which occupies an area of 7 ha (fig.1), *Tămâioasă românească* cultivated on an area of 7.3 ha (fig.4) and *Sauvignon blanc* on an area of 8 ha (fig.3).



**Fig.1.Fetească neagră (original)**



**Fig.2.Cabernet Sauvignon (original)**

The determination of the quantity of grapes was made by the quantitative reception carried out at the vinification complex by weighing each grape kettle coming from the plantation and registered in the company's documents.



**Fig.3.Sauvignon blanc (original)**



**Fig.4.Tămâioasă românească (original)**

Each year, the grapes were harvested separately, by variety, for a clear record of the data for each variety. The quality of the grapes was evaluated in the company's laboratory based on a qualitative analysis performed on the studied grape varieties.

This consisted in determining the sugar contents (g / l) and total acidity (g / l H<sub>2</sub>SO<sub>4</sub>), analysis performed in the analysis laboratory from the vinification complex. The sugar content was determined by the densiometric method, and the total acidity was determined by the titration method with an alkaline NaOH solution, 0.1 N.

## RESULTS AND DISCUSSIONS

The quality of the grapes is decisively influenced by three elements: the qualitative potential of the variety, the potential of the viticultural area that includes the climatic conditions specific to

the viticultural year, but also by the applied viticultural agrotechniques.

The data presented in Table 1 on grape production show great variability, primarily depending on the productive potential of the studied varieties.

Thus, for the varieties, *Tămâioasă românească* and *Sauvignon blanc*, the productions increased from year to year, being a constant increase, while for the varieties for red wines the increases were different from one wine year to another.

*Table 1*

**Grape production (t / ha) during 2016-2018**

Variety	Cultivated area (ha)	Production in t / ha		
		Year		
		2016	2017	2018
<i>Tămâioasă românească</i>	7,3	6,2 t/ha	7,3 t/ha	10,7 t/ha
<i>Sauvignon blanc</i>	8	3 t/ha	3,9 t/ha	4,2 t/ha
<i>Cabernet Sauvignon</i>	12	6 t/ha	4,8 t/ha	6,2 t/ha
<i>Fetească neagră</i>	7	3,7 t/ha	2,7 t/ha	7,2 t/ha

For the *Tămâioasă românească* variety, the production was between 6.2 t / ha in 2016 and 7.3 t / ha in 2017, and for 2018 the production was 10.7 t / ha.

The *Sauvignon blanc* variety registered a constant increase in production, from 3 t / ha for 2016 to 4.2 t / ha for 2018.

The *Cabernet Sauvignon* variety stood out with an increase in production in 2016 of 6 t / ha, and 2018 of 6.2 t / ha, compared to 2017 when production decreased, being 4.8 t / ha.

There was also a variety whose production had unwanted evolutions, this being *Fetească neagră* which registered in 2017 a production of 2.7 t / ha.

These contradictory developments of productions have only one explanation, related to the climatic accidents that occurred during the wine year. Thus, in 2017 the varieties were affected by hail, which led to a decrease in production.

The losses were also amplified by the fact that no grapes with a large number of affected grains were harvested.

Tables 2 and 3 present data on the quality of grape production based on sugar content and total acidity.

*Table 2*

**Quality parameters for white wine varieties**

Variety	2016		2017		2018	
	Sugar g/l	Acidity total g / l tartaric acid	Sugar g/l	Acidity total g / l tartaric acid	Sugar g/l	Acidity Total g/l tartaric acid
<i>Cabernet Sauvignon</i>	244	5,3	240	5,5	238	5,7
<i>Fetească neagră</i>	236	5,6	230	5,6	230	5,6

*Table 3*

**Quality parameters for red wine varieties**

Variety	2016		2017		2018	
	Sugar g/l	Total acidity g / l tartaric acid	Sugar g/l	Total acidity g / l tartaric acid	Sugar g/l	Total acidity g / l tartaric acid
<i>Tămâioasă românească</i>	222	6,1	233	6	232	6,1
<i>Sauvignon blanc</i>	233	5,9	230	5,8	226	6,2

As can be seen from the data presented in Table 2, the varieties for white wines showed a high capacity for sugar accumulation in the grains, all the more so as they were harvested each year before the varieties for red wines.

In 2016, the highest sugar content among white varieties was *Sauvignon blanc* (233 g / l) and in 2017 and 2018, the *Tămâioasă românească* variety had slightly higher sugar contents (233 g / l, respectively 232 g / l). For these varieties, the acidity ranged between 6 g / l tartaric acid and 6.1 g / l tartaric acid for the *Tămâioasă românească* variety and for the *Sauvignon blanc* variety between 5.9 g / l tartaric acid and 6.2 g / l tartaric acid.

Table 3 shows that the variety with the highest sugar content at harvest in

each of the 3 years of study is *Cabernet Sauvignon*. The average sugar content in 2016 was 244 g / l, higher than in 2017 (240 g / l) and 2018 (238 g / l).

This was the highest sugar content of all varieties in all years but also the lowest total acidity, also of all varieties and in all years of the study (5.3 g / l tartaric acid), compared to the variety *Fetească neagră* at which the sugar content was 236 g / l in 2016, and for the years 2017 and 2018 respectively it remained constant with a value of 230 g / l. In this variety the total acidity was constant during the three years, having a heat of 5.6 g / l tartaric acid.

The results are normal, due to the fact that the *Cabernet Sauvignon* variety is the most important and valuable variety for red wines, these high sugar contents are explained only by the ability of the variety to accumulate carbohydrates during ripening but also by the fact that it is the last harvested variety. being intended for obtaining high quality wines.

## CONCLUSIONS

- Vânu Mare-Orevița wine-growing area has favourable conditions for the cultivation of varieties intended for the production of high quality wines.

- The varieties cultivated in this area are of quality, so that the interaction of the viticultural variety area is a determining factor of the quality of the obtained wines.

- The *Tămâioasă românească* variety had the highest production of 10.7 t / ha for 2018, and the lowest production

was recorded by the *Fetească neagră* variety of 2.7 t / ha for 2017.

- The *Cabernet Sauvignon* variety presented the highest value of sugar content of 244 g / l, and the lowest was registered for the *Tămâioasă românească* variety of 222 g / l.

- The results of the quantitative and qualitative analysis highlight in particular the *Cabernet Sauvignon* variety.

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