

BEHAVIOR OF SOME VARIETIES FOR WHITE WINES CREATED AT R.D.S.V.O ODOBEȘTI IN THE CLIMATIC CONDITIONS OF THE WINE YEAR 2019 - 2020

COMPORTAREA UNOR SOIURI PENTRU VINURI ALBE CREATE LA S.C.D.V.V. ODOBEȘTI ÎN CONDIȚIILE CLIMATICE ALE ANULUI VITICOL 2019-2020

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Abstract. *The diversification of wine assortments with valuable varieties with qualitative and productive potential, with better tolerance to diseases and stress factors, is one of the main concerns of Romanian wine research. In this paper are presented data on the agrobiological and technological potential of some varieties for white wines created at R.D.S.V.O. Odobești (Șarba, Băbească gri, Miorița and Vrancea), in the climatic conditions of the wine year 2019-2020. In the Odobești vineyard the wine year 2019-2020 was characterized by a severely deficient rainfall regime, having as effect the atmospheric drought followed by the diminution of the water reserve in the soil and the gradual installation of the pedological drought. The Șarba variety showed a more accentuated sensitivity to the atmospheric and pedological drought, which generated a stagnation of the sugar accumulation process in the grains. The grape production varied between 5.19 kg/vine for the Miorița variety and 6.17 kg/vine for the Băbească gri variety, values close to the productive potential of these varieties. Qualitatively, the production was characterized by superior accumulations of sugars between 188.5 g/l for the Miorița variety and 212.9 g/l for the Băbească gri and Șarba varieties, with values of the total acidity of the must between 7.34 g/l acid tartaric to the Băbească gri variety and 5.17 g/l tartaric acid to the Vrancea variety.*

Key words: variety, drought, tolerance

Rezumat. *Diversificarea sortimentelor viticole cu soiuri valoroase cu potențial calitativ și productiv, cu toleranță mai bună la boli și factorii de stres, reprezintă una din principalele preocupări ale cercetării viticole românești. În această lucrare sunt prezentate date privind potențialul agrobiologic și tehnologic al unor soiuri pentru vinuri albe create la S.C.D.V.V. Odobești (Șarba, Băbească gri, Miorița și Vrancea), în condițiile climatice ale anului viticol 2019-2020. În podgoria Odobești anul viticol 2019-2020 a fost caracterizat de un regim pluviometric sever deficitar, având ca efect seceta atmosferice urmată de diminuarea rezervei de apă din sol și instalarea treptată a secetei pedologice. Soiul Șarba a manifestat o sensibilitate mai accentuată la seceta atmosferică și pedologică, care a generat o stagnare a procesului de acumulare a zaharurilor în boabe. Producția de struguri a variat între 5,19*

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kg/butuc la soiul Miorița și 6,17 kg/butuc la soiul Băbească gri, valori apropiate de potențialul productiv al acestor soiuri. Calitativ producția s-a caracterizat prin acumulări superioare de zaharuri cuprinse între 188,5 g/l la soiul Miorița și 212,9 g/l la soiurile Băbească gri și Șarba, cu valori ale acidității totale a mustului cuprinse între 7,34 g/l acid tartric la soiul Băbească gri și 5,17 g/l acid tartric la soiul Vrancea.

Cuvinte cheie: soi, secetă, toleranță

INTRODUCTION

Global warming has caused many disturbances in ecosystems viticultural, the vine varieties having to change their cycle annual vegetation, often with negative consequences for quality and the quantity of grape production, including the resulting wines. Productivity, quality and adaptability of vine varieties are very complex characteristics that depend on the genetic traits (inherited genotype or dowry) of each variety, environmental conditions and the interaction between genotype and environment (Sestraș, 2004). In this context at R.D.S.V.O. Odobești were obtained vine varieties with superior productive and qualitative properties, which capitalize on local natural resources in the context of sustainable viticulture (Popescu *et al.*, 1974, 1976; Bosoi *et al.*, 2017; Pușcalău *et al.*, 2018).

MATERIAL AND METHOD

The biological material studied was represented by 4 varieties for white wines created at R.D.S.V.O. Odobești: Șarba, Băbească gri, Miorița and Vrancea (fig. 1). The research was carried out on a 10-year-old plantation, established on a leached chernozem type soil, located in the biological field of R.D.S.V.O. Odobești. The varieties studied were grafted on the rootstock Berladieri x Riparia Selection Oppenheim 4, clone 4 (SO4-4). The cutting system practiced was Dr. Guyot with the fruit load between 40 - 44 eyes / vine, distributed on 8-9 eye fruiting cane and 2 -eye spur. The planting distance is 2.2m x 1.2m, returning 3787 but / ha.

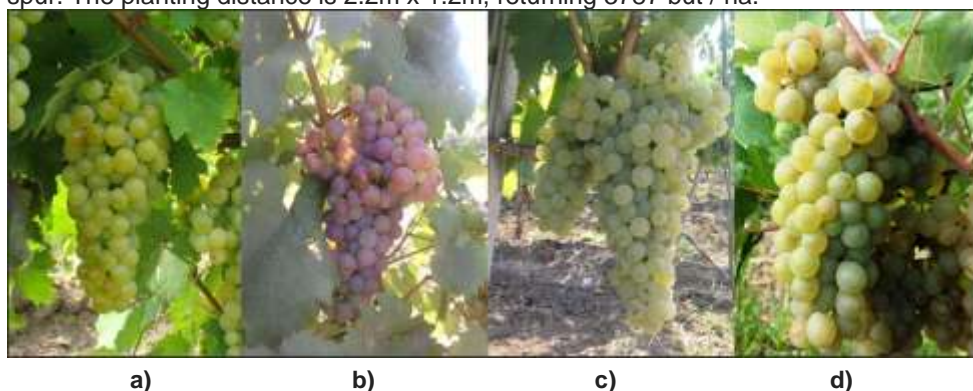


Fig. 1 The vine varieties studied (a) Șarba; b) Băbească gri; c) Miorița; d) Vrancea)

Observations and determinations were made regarding the agrobiological and technological potential of the varieties studied under the conditions of the wine year 2019-2020.

RESULTS AND DISCUSSIONS

Climatic conditions. The research period was characterized by high heliothermal availability of 2542.5 hours compared to the multiannual average of 2143.0 hours (tab. 1). The average annual air temperature (13.1 °C) was well above the multiannual average (10.7 °C). The annual rainfall regime was severely deficient (385.0 mm) compared to the multiannual average (622.1 mm). During the vegetation period the amount of precipitation recorded was 215.0 mm, well below the multiannual value of this period (391.4 mm), and the number of days with maximum temperatures > 30°C was 67 compared to the multiannual average (48 days), in these conditions manifesting pedological and atmospheric drought.

Table 1

The main climatic data from the study period (Odobești, 2019-2020)

Climate indicator	Multiannual (1946 -2018)	Wine year 2019-2020
Annual		
The average temp., °C	10.7	13.1
Temp. max. abs. °C	39.4	37.0
Temp. min. abs., °C	-22.8	-9.8
Amount degrees useful temp ($\Sigma^{\circ}tu$), °C	1624.9	1950.0
The amount heatstroke, hours	2143.0	2542.5
Precipitation amount, mm	622.1	385.0
On the vegetation period		
The average temp., °C	17.1	19.7
Temp. max. abs. °C	35.8	37.0
Temp. min. abs., °C	-8.2	-0.6
Amount degrees useful temp ($\Sigma^{\circ}tu$), °C	1550.0	1793.4
The amount heatstroke, hours	1492.7	1719.0
Precipitation amount, mm	391.4	215.0
Number of days with maximum $t > 30^{\circ}C$	48	67

As the amount of precipitation recorded during the grape ripening period (72.6 mm) represented only 39.6% of the multiannual value for this period (183.3 mm), against the background of high air temperatures (over 30 °C), towards the end during the ripening period of the grapes, the phenomenon of atmospheric drought was installed, followed by the installation of pedological drought, with repercussions on the normal development of the physiological processes in the plant (fig. 2).

Vegetation phases. The evolution of the vegetation phenophases at the studied varieties, as well as the sum of the useful temperature degrees ($\Sigma^{\circ}tu$, °C) that conditioned each vegetation phase are presented in table 2.



Fig. 2 The effects of atmospheric and pedological drought on vines

Table 2

The phenological spectrum of the grape varieties (Odobești, 2020)

Variety	Disbudding		Flowering		Grapes ripping		Technological maturity	
	Date	$\Sigma^{\circ}\text{tu}$, °C	Date	$\Sigma^{\circ}\text{tu}$, °C	Date	$\Sigma^{\circ}\text{tu}$, °C	Date	$\Sigma^{\circ}\text{tu}$, °C
Șarba	13.04.	60.3	3.06.	248.1	4.08.	811.5	14.09.	568.5
Băbească gri	12.04	56.4	4.06.	259.9	9.08	884.4	17.09.	515.6
Miorița	14.04.	60.3	5.06.	268.5	11.08.	903.9	16.09.	483.6
Vrancea	13.04	60.3	4.06.	256.0	3.08.	790.2	10.09.	528.0

Fertility and productivity. The main elements of fertility and productivity of the studied varieties, assessed by the percentage of fertile shoots, fertility coefficients (absolute and relative) and productivity indices (absolute and relative), are presented in table 3.

Table3

The fertility and productivity elements of grape varieties (Odobești, 2020)

Variety	Fertile shoots %	Fertility coefficients		Productivity indices	
		absolute	relative	absolute	relative
Șarba	60.9	1.09	0.66	275	168
Băbească gri	62.1	1.13	0.70	303	188
Miorița	61.6	1.14	0.70	237	145
Vrancea	83.8	1.58	1.32	233	194

The percentage of fertile shoots was between 83.8% for the Vrancea variety and 60.9% for the Șarba variety. The fertility coefficients had high values for the Vrancea variety c.f.a. = 1.58; c.f.r. = 1.32 and lower for the Șarba variety c.f.a. = 1.09; c.f.r. = 0.66.

Vegetative growth of shoots. The climatic conditions specific to 2020 have influenced the growth and development processes of the shoots (fig. 3).

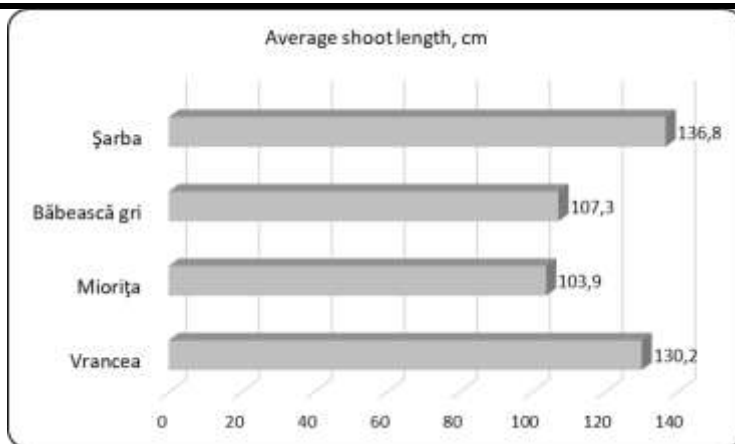


Fig. 3 Average length of shoots

Analyzing the values obtained for the length of the shoots, for the varieties Băbească gri (107.4 cm) and Miorița (106.2 cm) there were smaller increases compared to the years considered normal from a climatic point of view. However, there is a correlation between the total number of shoots/vine and the minimum, maximum and average length of shoots (tab. 4).

Table 4

Vegetative growth of shoots

Variety	Total shoots/stump	Shoot length, cm		
		minimum	maximum	average
Șarba	35.8	67.5	206.2	136.9
Băbească gri	37.0	43.7	171.0	107.4
Miorița	39.6	47.0	165.4	106.2
Vrancea	29.6	45.3	215.2	130.2

Quantity and quality of grape production. The grape production varied between 5.19 kg / stem for the Miorița variety and 6.17 kg / stem for the Băbească gri variety, values close to the productive potential of these varieties (tab. 5).

Table 5

The quantity and quality of grape production (Odobești, 2020)

Variety	Average weight of grape (g)	Total grape production		Sugars g/L	Total acidity g/L tartaric acid	Gluco-acidimetric index
		Kg/vine	To/ha			
Șarba	254	5.338	19.75	212.9	5.55	38.4
Băbească gri	268	6.168	22.82	212.9	7.34	29.0
Miorița	208	5.193	19.21	188.5	6.29	30.1
Vrancea	147	5.745	21.26	205.5	5.17	39.7

The quality of grape production was evaluated by determining sugar accumulations (g/l), total acidity (g/l $C_4H_6O_6$) and glucoacidimetric index. In the

conditions of the wine year 2019-2020, the varieties with high acidimetric potential such as Băbească gri and Miorița accumulated a large amount of sugars (212.9 g/L, respectively 188.5 g/L), superior to the biological potential of these varieties, maintaining a good total acidity of 7.34 g/L tartaric acid, respectively 6.29 g/L tartaric acid.

The Vrancea variety is within the limit of the qualitative potential of the variety that accumulates 205.5 g/L sugars with a total acidity of 5.17 g/L tartaric acid, instead the Șarba variety was below the qualitative potential of the variety with a quantity of sugars accumulated in grains of 212.9 g/L under conditions of a total acidity of 5.55 g/L tartaric acid.

CONCLUSIONS

1. In the Odobești vineyard the wine year 2019-2020 was characterized high heliothermal availability and a severely deficient rainfall regime, having as effect the atmospheric drought followed by the gradual installation of the pedological drought.

2. The grape production obtained for the varieties studied had values close to the productive potential of these varieties.

3. Due to the climatic conditions during the ripening period when there was a slowdown in the process of sugar accumulation in the grains, the Șarba variety was below the qualitative potential of the variety with a quantity of sugars accumulated in the grains of 212.9 g/l and a total acidity of 5.55 g /L tartaric acid.

4. The varieties Băbească gri and Miorița accumulated a large amount of sugars (212.9 g/L, respectively 188.5 g/L), superior to the biological potential of these varieties, maintaining a good total acidity.

5. The Vrancea variety presented a quantitative and qualitative potential close to the biological potential of this variety.

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