THE AGROBIOLOGICAL AND TECHNOLOGICAL EVALUATION OF SOME PICKS CLONE OF MAIN VARIETY RIGHTS CENTER GROWN IN THE PIETROASA VINEYARD, TO EXTEND IN CULTURE

EVALUAREA AGROBIOLOGICĂ ŞI TEHNOLOGICĂ A UNOR SELECŢII CLONALE ALE PRINCIPALELOR SOIURI CULTIVATE ÎN CENTRUL VITICOL PIETROASA, ÎN VEDEREA EXTINDERII ÎN CULTURĂ

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Abstract: *Taking into account the demands on the market, but also to meet the requirements of the European Union, a phase of modernization by means of restructuring the types of varieties, by extending into production of the valuable clones and selections of these sorts in order to diversify the vine-viticulture products and to improve their quality. In this context, the present study is a preliminary indication of the cloned selections of varieties behaviour, Grasa de Cotnari, Tamaioasa romaneasca, Babeasca neagra, Busuioaca de Bohotin, Muscat d'Adda, Muscat de Hamburg– in ecopedoclimatic conditions from Pietroasa vineyard. The study will determine the improvement and completion of current range, in terms of quantity and quality, because each clone, by cultural and quality skills for which it was selected (quantity, quality, mixed), contribute in a complementary manner to achieve quality production in order to obtain wines with denomination of origin.*

Rezumat: *Ţinând cont de cerinţele pieţii, dar şi pentru a putea raspunde cerintelor Comunitatii Europene se impune în viticultura românească o etapă de modernizare, prin restructurarea sortimentelor de soiuri, prin extinderea în producţie a selecţiilor valoroase a acestor soiuri în scopul diversificării produselor viti-vinicole şi a îmbunătăţirii calităţii acestora. În acest context, lucrarea de faţă reprezintă un studiu preliminar-orientativ al comportării selecţiilor clonale ale soiurilor Grasa de Cotnari, Tamaioasa romaneasca, Babeasca neagra, Busuioaca de Bohotin, Muscat d'Adda, Muscat de Hamburg - în condiţiile centrului viticol Pietroasa. Studiul va determina îmbunătăţirea şi completarea actualului sortiment, sub aspectul cantităţii şi calităţii producţiei, deoarece fiecare clonă, prin aptitudinile culturale şi de calitate pentru care a fost selectată (cantitate, calitate, mixtă), contribuie în mod complementar la obţinerea unei producţii de calitate superioară, în vederea obţinerii vinurilor cu denumire de origine controlată.*

Key words: *selection clonals, quality, quatity;*
Cuvinte cheie: *clone, calitate, cantitate.*

INTRODUCTION

In this context, the present study is a preliminary indication of the cloned selections of varieties behavior, *Grasa de Cotnari*, *Tamaioasa romaneasca*, *Babeasca neagra*, *Busuioaca de Bohotin*, *Muscat d'Adda*, *Muscat de Hamburg* – in ecopedoclimatic conditions from Pietroasa vineyard. The experience has been achieved during 2006-2008, having the main purpose to determine the adaptability degree of these cloned selections, in an area characterized with moderate weather conditions, the value and then obtaining and autochthon multiplication of biological material, justifying the need to introduce and expand them in culture.

MATERIAL AND METHOD

In order to reach the proposed goal one has taken into the study the *Grasa de Cotnari* (4 Pt, 45 Pt), *Tamaioasa romaneasca* (36 Pt, 5 Pt), *Babeasca Neagra* (94 Pt), *Muscat d'Adda*

(5 Pt), *Muscat de Hamburg* (4 Pt), *Busuioaca de Bohotin* (26 Pt) varieties. They can be found in the Ampelographic collection of the Pietroasa vineyard center. Regardless of the selection, the type of cutting was Guyot on the semi high, with 28 buds/vine. In order to determine the agro biological and technological potential of the experimental variants taken in the study one has analyzed the following indicators – the percentage of viable buds/vine, the fertility absolute and relative coefficients, the productivity indices (absolute and relative ones), the average weight of a grape, the mass of 100 grapes, the production assessed from a quantitative (kg/vine) point of view and from a qualitative point of view, the sugars concentration (g/l), the contents of total acidity (g/l tartaric acid). The issues mentioned above for the proposed preliminary study were analyzed as the average two-year wine.

RESULTS AND DISCUSSIONS

To analyze the behaviour of these cloned selections in the vineyard Pietroasa centre is needed to assess the climate data were extracted from the database of the Meteorological institute, presented synthetically in Table 1, compared with the average, determined as being the multi annual average. Under the climate issue, considering only the mean annual air temperature and rainfall amount, the institute is the second moderately to warm, basically belonging to the second favourable tier as regards the cultivation of vines. The active heat balance (Σ t° a) registered 3604,5°C, the thermal useful balance registered 1714,5 °C, the amount of hours of insolation reaching up to 1717,9, and also the distribution of heat during the year, allows economic crop varieties with early-ripening middle, and in the terms of the synthetic indicators is observed that the vineyard resources heliothermal record high, which corresponds to a low fluid resources. Of the four indicators, is the most sensitive bioclimatic index whose spectrum falls within the limits outlined 7,56-10,4 showing that there are favourable conditions to achieve high quality wines.

Average agro biologic skills of cloned selections studied by the force of growth, the percentage of viable buds, the fertility coefficients, the productivity index (Table 2) shows that the studied clone selections have a medium-normal production potential and that the genotype has a direct connection with this index and their average values are also influenced by climatic conditions. The analysis obtained from an output quantity and quality perspective - will be presented on data listed in table 3, taking into account the particularities of each cloned selection of skills, and the production direction.

The clone selections of *Grasa de Cotnari 4 Pt* and *45 Pt* register an average weight of a grape within the normal limits specific for the sort, that is 165 g (4 Pt) and 160 g (45 Pt). Regarding the selections of the *Tamaioasa romaneasca (36 Pt, 5 Pt)* sort some differences were observed among them, differences which will also be felt in the obtained production. Thus the clone *36 Pt* has the average weight of a grape of 120 g and the clone *5 Pt* weights 133 g. For the selection *Busuioaca de Bohotin 26 Pt* this parameter does not register values that differ from the population of the sort, the weight being practically classified within the limits of the sort (90 g). Analyzing the results obtained for the *Babeasca neagra 94 Pt* selections one notes that there are no values registered as different for the population of the sort, the weight being classified practically within the limits of the sort (120 g). In the case of the clone selections of *Muscat de Hamburg 4 Pt and Muscat d'Adda 5 Pt*, the values of this parameter are also registered within the limits of the average values obtained by the populations of the two varieties, 178 g for the *Muscat de Hamburg sort* and for the *Muscat d'Adda* sort, 197 g.

The mass of 100 grapes (g). In this sector one has noted significant differences only for *Grasa de Cotnari sort*, an the comparison was possible due to the existence of the two selections (*4 Pt* and *45 Pt*), and in the case of the other selections one can make the mention they classify within the average limits of the sorts from which they have been selected.

Tabel 1

The synthesis of climatic elements

Climatic elements		Multiannual value	The viticulture year 2006-2007	The viticulture year 2007-2008
The period of active growth Number of days with active temperature		01.04.-03.10.186	01.04.-19.10.202	5.04. - 27.10.205
Heat sum °C	active effective	3588,7 1656,1	3604,5 1717,4	3568,5 1578,5
Total sunstroke		2146,4	2407,6	2269,9
The hours blaze		1599,4	1717,9	1707,2
Precipitations (mm)	Total in vineyard	557,7	499,7	446,9
	Total during the growing season	346,3	281,2	311,7
	March	28,3	86,6	8,3
	April	43	10,3	71,9
	May	67,7	62,6	44,3
	June	78,2	25,3	39,9
	July	72,1	35,7	41,4
	August	54,8	107,4	6,5
	September	30,5	39,9	31,6
	October	38,2	49,0	67,8
Absolute maximum temperature °C		38.0^{0}C, 10.07.	41,1^{0}C, 23.07.	37.0^{0}C,27.07. 08.
Absolute minimum temperature °C		-14,0^{0}C-13.02.	-15^{0}C- 24.02.	-19,4^{0}C – 5.01.
Thermal coefficient °C		17,66	17,63	16,59
sunstroke coefficient		7,84	8,50	9,94
Precipitation coefficient		1,73	1,44	1,46
Helio thermic real index		1,43	1,49	1,13
Hidro thermic effective index		1,07	0,61	0,88
Bioclimatic index wine		7,56	10,40	9,02
Oenoclimatic ability index!		4880	5072	4876
Average yearly temperature °C		11,4	12,2	10,7

*The sugars (g/l tartric acid).*The study selects the particularities of the main parameters which define the quality of the grapes, under the influence of the climate elements as well as the assessment of the qualitative value of the production. The *Tamaioasa romaneasca* sort is recognized from the point of view of its production quality, registering high accumulations of sugars accompanied by an average production, favourable for obtaining white aromatic wines of superior quality. For this wine growing year the clone selections of the *Tamaioasa romaneasca* sort accumulated great quantities of sugar, ranging from 246 g/l for *36 Pt* and 244 g/l for *5 Pt*, followed by *Busuioaca de Bohotin*, 245 g/l and at a very short distance the selections of the *Grasa de Cotnari* sort, 238 g/l for *4 Pt* and 240 g/l for *45 Pt*.

It is also noticed that the selection of the *Babeasca neagra 94 Pt* sort has accumulated sugars at the superior limits of the sort, 219 g/l allowing obtaining a wine with a rather high alcoholic potential. In the case of the clone selections of *Muscat de Hamburg 4 Pt* and *Muscat d'Adda 5 Pt* table sorts, the values of this quality parameter were also classified within the limits of the average values obtained for the populations of the two sorts, 188 g/l for the *Muscat de Hamburg* sort and a little lower for the *Muscat d'Adda* sort, that is 185 g/l.

However for all the selections it can be observed that practically there is a decisive influence of the genotype on the accumulations of sugars in the grapes, being practically a hereditary characteristic.

Table 2

The synthesis of the main fertility elements of clone selections study

The viticulture Year	Experimental variants (clone selections)	% viable buds	Growth vigour	% Fertile offshoots	The fertility coefficients		Productivity index	
					CFA	CFR	IPA	IPR
2007-2008 (average)	Clones for superior white wines							
	Grasa de Cotnari 4 Pt	80,6	xxx	75	1,0	0,85	165	140
	Grasa de Cotnari 45 Pt	81	xxx	76	1,0	0,88	160	141
	Clones for aromatic wines							
	Tamaioasa romaneasca 36 Pt	82,7	xxx	70	1,0	0,64	130	83
	Tamaioasa romaneasca 5 Pt	81,6	xxx	71	1,06	0,72	138	94
	Clones for rose wines							
	Busuioaca de Bohotin	82	xxx	71	1,04	0,84	125	101
	Clones for red wines for current consumption							
	Babeasca neagra 94 Pt	77	xxx	73	1,0	0,73	169	123
	Clones for table grape sorts with medium maturity							
	Muscat de Hamburg 4Pt	80,1	xx	71	1,0	0,70	178	125
	Muscat d'Adda 5 Pt	79,8	xxx	70	1,0	0,68	197	134

The acidity (g/l). The contents of acidity present a special importance for obtaining some finite products of superior quality. The level of acidity has been correlated with the quantity of sugar accumulated in the grapes of the experimental variants, one noting that the acidity values were lower than sugar value of the experimental variants. There were minimal differences which did not surpass 0,1 g/l.

The production (kg/ grape vine, t/ha). The grape production was influences by the climate conditions, but also by the productive potential of these cloned species, as well as by the aspect of the health condition. Comparing the average values one observed differences from one year to another, in 2008 all cloned selections get higher yields compared with 2007, noting that they fall within the normal average of varieties from which they were selected. One noticed that at the experiment variants which are very close from the genetically agro biological and technological parameters, posting a selection may be done only by sugar value concentration. Concerning the quality of the production from the point of view of the state of health one notes that the production was healthy 100%, the degree of attack of *Botrytis cinerea* being equal to zero.

Table 3

The synthesis regarding the quantitative and qualitative production obtained with the 8 clones selections in the Pietroasa viticulture centre

The viticulture year	Experimental variants (clone selections)	Average weight of grape (g/l)	Weight of 100 grapes (g/l)	Sugars g/l (H2SO4)	Acidity g/l	Production kg/grape vine	Production t/ ha	The degree of attack (Botrytis cinerea)
	Clones for superior white wines							
2007/ 2008 * The average of 2 years wine	Grasa de Cotnari 4 Pt	130/165 147,5*	120/270 195	239/238 238,5	3.44/5.5 4,47	0.700/2,4 1,55	2.91/8.9 5,90	0
	Grasa de Cotnari 45 Pt	140/160 150*	125/266 195,5*	237/240 238,5*	3.46/5,4 4,43*	0.810/2,250 1,53*	3.37/8,5 5,93*	0
	Clones for aromatic wines							
	Tamaioasa romaneasca 36 Pt	120/130 125*	110/145 127.5*	238/246 242*	3.44/5,5 4.47*	0.770/1,7 1,23*	3.2/7,2 5,2*	0
	Tamaioasa romaneasca 5 Pt	133/138 135,5*	115/153 134*	237/244 240,5*	3.45/5,5 4,47*	0.800/1,820 1,31*	3.33/7,6 5,46*	0
	Clones for rose wines							
	Busuioaca de Bohotin 26 Pt	90/120 105*	80/132 106*	234/245 239,5	3.52/5,14,31*	0.600/1,8 1,2*	2,49/7,5 4,99*	0
	Clones for read wines for current consumption							
	Babeasca neagra 94 pt	120/169 144,5*	110/165 137,5*	198/219 208,5*	4.00/5,8 4.9*	0.880/2,940 1,91*	2.93/12 7,4*	0
	Clones for table grape sorts with medium maturity							
	Muscat de Hamburg 4 Pt	186/178 182*	143/290 216,5	187/188 187,5*	4.6/5,6 5,1*	1.00/2,8 1,9*	4.1/10,3 7,2*	0
	Muscat d' Adda 5 Pt	195/197 196*	154/325 239.5	183/185 184*	4.5/5,755,1*	1.10/2,9 2, 0*	4.58/10,8 7,69*	0

CONCLUSIONS

The physical geographical frame specific for the Pietroasa viticulture centre allows the economical culture of the clone sorts and selections with early-medium and medium maturity, as the selection of varieties made in the study.

The success of integration of the clone selections studied in the ecosystem of the viticulture centre of Pietroasa is favoured in its entirety by the total of the active thermic balance as well as by the quantities of fallen precipitations which allow the meeting of the main requirements, necessary for obtaining some superior quality wines of the DOC type.

The total obtained results from the point of view of the agro biological and technological behaviour lead to the idea that the clone selections taken for the study can be multiplied with success in order to obtain an autochthon certified biological material, at the same time justifying the necessity of their introduction and extension in the culture.

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