

ASSESSMENT OF QUALITY OF WINE GRAPES OF VINE VARIETIES GROWN IN IASI COPOU WINE CENTER

EVALUAREA CALITATII STRUGURILOR PENTRU VIN A UNOR SOIURI DE VITĂ DE VIE CULTIVATE ÎN CENTRUL VITICOL COPOU IAȘI

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Abstract. Grape quality in terms of composition and their chemical composition is essential for obtaining quality wines, able to cope with increasingly fierce competition. The research was conducted on some varieties recommended and authorized culture from viticultural area Copou Iasi: six varieties for white wine (Aligoté, Chardonnay, Fetească albă, Fetească regală, Riesling italian and Sauvignon blanc), a variety for red wines (Cabernet Sauvignon) and two aromatic wine varieties (Busuioacă Bohotin and Muscat Ottonel). The researches were focused on the evolution of ripening grapes, quantity and quality achieved. The grape harvests from 2012 and 2013 where of good quality varieties reaching specific parameters analyzed for DOC wine production type, IGR, and VM, not necessary approval enrichment operation sugar musts.

Key words: grapes, ripening, climatic factors, quality

Rezumat. Calitatea strugurilor sub aspectul alcătuirii și compoziției lor chimice este esențială pentru obținerea unor vinuri de calitate, capabile să facă față unei concurențe tot mai acerbe. Cercetările s-au efectuat asupra unor soiuri recomandate și autorizate în cultură în arealul viticol Copou Iași, și anume: șase soiuri pentru vinuri albe (Aligoté, Chardonnay, Fetească albă, Fetească regală, Riesling italian și Sauvignon blanc); un soi pentru vinuri roșii (Cabernet Sauvignon) și două soiuri pentru vinuri aromate (Busuioacă Bohotin și Muscat Ottonel). Acestea au vizat aspecte referitoare la evoluția maturării strugurilor, cantitatea și calitatea producției obținute. Atât în anul 2012 cât și 2013, recolta de struguri a fost bună calitativ, soiurile analizate atingând parametrii specifici pentru producția de vinuri de tip DOC, IGR, și VM, nefiind necesară aprobarea operației de îmbogățire în zaharuri a musturilor.

Cuvinte cheie: struguri, maturare, factori climatici, calitate

INTRODUCTION

The potential quality of different varieties grape depending on the area where it is grown, largely influenced by culture technology used and climatic conditions (Pomohaci et.al., 2000). Recommended varieties in a certain area are those that exploit in the highest degree both environmental conditions within a wine center and the with a potential corresponding qualitative objective pursued (Cotea et.al., 2009). Grape quality is the determining factor for achieving balanced

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wines, ensuring maximum efficiency of use of the existing resources given vineyard ecosystem, regardless of the technology used (Dobrei et.al., 2011). This paper analyzed how it affected the quality of the grapes from the main vine varieties grown in the viticultural area Copou Iași by climate change that affect ecosystems in the last period.

MATERIAL AND METHOD

For evaluation of the quality of the grapes at harvest were studied during two years (2012 and 2013) new varieties, namely: six white wine grapes (Aligoté, Chardonnay, Feteasca alba, Feteasca regala, Riesling italian and Sauvignon blanc), a red wine variety (Cabernet Sauvignon) and two wine grapes flavored (Busuioaca de Bohotin and Muscat Ottonel). The dates by which grapes can be harvested, maximum yields qualitative and quantitative analysis was effected under physicochemical aimed mainly sugar concentrations (g/L), acidity (g/L tartaric acid) and weight of 100 grains (g). Mechanical composition analysis was performed to calculate grapes technological indices that characterize the quality of the grapes, as well as technological efficiencies that can be achieved. The grape harvest on every variety were determined following parameters: the weight of the grapes (g), the volume of grape (mL), grain weight in grapes (g), number of grains and rachis weight (g).

RESULTS AND DISCUSSION

In order to obtain quality wine grape harvest timing is particularly important, as determined by numerous parameters of a particular importance are the concentrations of sugars, acidity and weight of 100 grains. Quality grape production achieved varieties studied was influenced by the action of climatic factors during maturation, correlated with genetic specificity of each variety. To support this statement we bring into question the number of days with maximum temperatures exceeding 30 °C (table 1), recorded in July and August 2012 (25 and 16 days).

Table 1
Climatic factors during maturation grape in the viticulture Copou centre, 2012 – 2013

Month	air temperature				Precip. mm	No. day with T>30°C	Time of sunshine (hours)	Index chilly nights	
	Temp. average, °C	Temp. min (°C) average	Temp. max (°C) absolute	Temp. max (°C) average					
VII 2012	25,4	18,6	14	32,8	38,0	29,5	25	334,4	-
VIII 2012	22,6	16,8	10,6	29,3	40,1	33,9	16	227,3	-
IX 2012	18,6	13,2	8,4	25,3	30,5	46,4	4	217,6	13,2
VII 2013	20,5	15,4	10,8	26,0	33,7	57,2	3	282,1	-
VIII 2013	21,2	15,5	11,3	27,3	32,9	41,3	9	279,9	-
IX 2013	14,2	10,2	5,0	19,5	25,6	82,0	-	145,4	10,2

In this context, associated with very little precipitation , justified the high values of sugar content, acidity and light weight of the grapes (table 2).

Climate during the maturation of 2013 was colder than the previous year, registering average maximum temperatures of 27.3°C in August and September 19.5°C and larger amounts of precipitation.

Table 2

The quality of the grapes at harvest

Variety	Physico-chemical characteristic					
	Sugars, g/L		Acidity, g/L tarttric acid		Weight 100 grains, g	
	2012	2013	2012	2013	2012	2013
Aligoté	188	180	5,1	7,3	112	163
Chardonnay	200	211	6,6	8,9	129	175
Feteasca alba	192	209	4,6	7,3	168	172
Feteasca regala	187	202	4,9	7,2	153	192
Riesling Italian	175	204	7,5	7,7	122	170
Sauvignon blanc	191	215	4,6	7,0	123	186
Cabernet Sauvignon	202	204	7,0	8,3	96	130
Busuioaca Bohotin	204	204	5,2	7,9	132	250
Muscat Ottonel	191	188	6,9	5,1	177	225

After analyzing the mechanical composition of grapes (table 3) was noted that in 2013 in a context of year rich in rainfall, grain weight, implicitly of grape was higher than in 2012 For all varieties except Riesling Italian and Cabernet Sauvignon which were decreased by 20% and 14%. The average weight of the rachis in 2013 was higher than in 2012 in all varieties analyzed.

Table 3

Mechanical analysis of the grapes at harvest

Variety	Harvest time	Weight of a grape (g)	Volume of grapes (mL)	Weight of a graine (g)	No. grains	bunch weight (cob) (g)
Aligoté	11.09.2012	101,52	93	93,18	96	4,13
	13.09.2013	145,25	140	133,45	91	6,04
Chardonnay	05.09.2012	118,85	118	105,21	94	4,14
	17.09.2013	153,17	150	139,57	96	7,82
Feteasca alba	03.09.2012	115,44	127	107,42	94	6,07
	01.09.2013	120,81	118	104,62	94	6,07
Feteasca regala	04.09.2012	125,00	132	117,25	74	5,87
	09.09.2013	181,22	180	159,5	107	8,62
Riesling Italian	08.09.2012	122,67	116	105,85	111	6,87
	23.09.2013	93,63	90	84,15	62	5,29
Sauvignon blanc	08.09.2012	113,75	100	108,91	86	4,16
	19.09.2013	157,81	150	141,16	80	7,27
Cabernet Sauvignon	13.09.2012	100,76	100	95,78	137	6,17
	26/09/2013	87,69	80	81,65	83	3,93
Busuioaca Bohotin	14.09.2012	181,3	164	164,89	150	11,05
	24/09/2013	235,16	230	214,96	93	8,43
Muscat Ottonel	10.09.2012	104,27	95	98,56	67	4,87
	20/09/2013	154,51	150	144,24	67	6,39

Technological characteristics of grape varieties analyzed were evaluated based on index values grape composition index beans, grain composition index, the weight of a grain, grain structure, must yield index return and report FS / FL (solid phase /liquid phase) .

Grape index structure (grain weight / weight cluster) in climatic condition of year 2012 showed values close to the minimum (12.5) which shows that grapes were perfectly formed and yielded lower returns (table 4). In 2013, this index was higher than the normal values presented in the literature, namely from 18.6 to 23.1 for white wine varieties, 23.2 to 26.9 for aromatic wine varieties and 21.3 at varietal Cabernet Sauvignon red wine (table 5).

Index of grain (grain number / weight of grapes) had values that fall within the minimum and maximum of 100 only 40. Only in 2012 when Cabernet Sauvignon, the maximum value of 100 was exceeded leading to 136 .

Index composition of the grain (pulp weight / weight skins + weight seed) varieties analyzed had values lower than the limit of five, ie values between 2.1 to 4.5. These index values of grain composition indicates a higher proportion of skins and seeds that will adversely affect the yield of must.

Decreased in the yield grape must in 2012 results from **the average weight of a grain**. Thus, by comparing the average weight of a specific grain variety and the average weight of a grain achieved in 2012, we see that in all varieties analyzed were recorded very low values. In 2013, the average weight of a grain varieties analyzed was close to the values listed in ampelographic studies.

In the literature the minimum and maximum grain components are: 5-10% skins, 3-5% seed and 73-95% pulp. Parameter values that characterize the **grain structure** for all varieties exceed the maximum the skin analyzed both in 2012 and 2013. If seed values are close to those specific varieties, being close to the maximum limit 5, except for varieties Feteasca alba, Riesling italian, Cabernet Sauvignon and Busuioaca de Bohotin. As the quantity of pulp, the values expressed in percentages are close to the limit of 73%, except for varieties Sauvignon Blanc and Cabernet Sauvignon with 68.8% and 67.5%.

In the year 2012 **grape must yield** values were lower than normal due low weight of the grains. The best yields we grape must appreciate as having been made from varieties Feteasca regala (75,1%), Busuioaca de Bohotin (74,2 %), Feteasca alba (72,3 %), Chardonnay (71,4%) and Sauvignon blanc (72,1 %). The year 2013 best yields were achieved grape must varieties Aligoté (77,8%), Chardonnay (74,1%), Feteasca alba (72,3), Feteasca regala (76,8%), Riesling italian (71,8%) and Busuioacă de Bohotin (71,8%).

In the normal climatic conditions, the index yield is low at small grain varieties with thicker skins, such as the Cabernet Sauvignon. In the year 2012, there were low levels not only in Cabernet Sauvignon (2.4), and the Aligoté (1.6), Sauvignon blanc (2.9), Riesling italian (2.2) and Muscat Ottonel (2.7). The highest value, 4.0, was recorded at the varietie Fetească regală. In the year 2013 value of the yield was low both Cabernet Sauvignon (1.7) and the Sauvignon blanc (1.6).

Table 4

Technological indices of the grapes at harvest in 2012

Variey	Index composition of grape	Index grains	Index composition of grain	Weight of grain (g)	Grain structure			Grape must yield (%)	Yield index	FS/FL
					% skins	% seeds	% pulp			
Aligoté	18,0	81,1	3,2	1,14	18,0	5,5	76,4	72,3	3,5	0,308
Chardonnay	20,3	59,5	4,5	1,58	14,2	4,0	81,8	75,1	4,0	0,222
Feteasca alba	27,7	78,8	4,0	1,12	15,1	4,8	80,1	71,4	3,2	0,248
Feteasca regala	26,4	75,9	4,5	1,27	11,9	3,5	84,5	72,1	2,9	0,183
Riesling Italian	16,8	90,5	2,8	0,95	20,5	6,1	73,4	68,5	2,2	0,362
Sauvignon blanc	23,6	94,2	3,4	0,97	17,8	5,0	77,2	65,5	1,6	0,296
Cabernet Sauvignon	15,3	136,3	3,3	0,7	15,3	7,8	76,9	69,4	2,4	0,301
Busuioaca Bohotin	15,4	82,9	2,9	1,1	20,1	5,3	74,6	74,2	3,5	0,34
Muscat Ottonel	20,4	66,2	3,7	1,47	16,5	4,6	78,9	71,8	2,7	0,267

Table 5

Technological indices of the grapes at harvest in 2013

Variey	Index composition of grape	Index grains	Index composition of grain	Weight of grain (g)	Grain structure			Grape must yield (%)	Yield index	FS/FL
					% skins	% seeds	% pulp			
Aligoté	23,1	62,9	2,7	1,47	23,0	4,2	72,8	77,8	3,5	0,373
Chardonnay	18,6	62,5	2,9	1,45	21,4	4,2	74,5	74,1	2,9	0,343
Feteasca alba	18,9	77,5	2,4	1,11	23,0	6,2	70,9	72,3	2,6	0,411
Feteasca regala	20,0	58,9	4,2	1,49	16,8	2,6	80,7	76,8	3,3	0,240
Riesling Italian	16,7	65,9	2,8	1,36	21,1	5,0	73,8	71,8	2,5	0,354
Sauvignon blanc	20,7	50,9	2,2	1,76	28,3	2,9	68,8	61,1	1,6	0,453
Cabernet Sauvignon	21,3	95,4	2,1	0,98	27,3	5,2	67,5	62,4	1,7	0,482
Busuioaca Bohotin	26,9	39,8	3,8	2,31	18,2	2,7	79,1	71,8	2,5	0,264
Muscat Ottonel	23,2	43,6	3,5	2,15	19,0	3,3	77,7	66,6	2,0	0,287

High values were recorded varieties Aligoté (3.5) and Feteasca regala (3.3). The other varieties analyzed this index had values from 2.0 to 2.9.

Based on the data presented we can say that production of grapes in 2012 and 2013 in the area of Iași Copou wine center was good qualitative reaching specific parameters analyzed varieties for wine production type DOC, IGR and VM is not necessary approval enrichment operation sugars musts.

CONCLUSIONS

1. The climate of the ripening period in 2012 can be considered canicular, dry, and in 2013 the normal heat, but moist

2. Analysis of mechanical composition of grapes in 2012 shows that in general, the weight of the grapes slightly exceeded the limit specified minimum average each variety. Because of the drought conditions, mechanical parameters of the structure of the grapes had lower values than normal, which resulted in a lower yield of grape must. In 2013, all varieties were classified in terms of mechanical composition within ampelographic average values, showing higher values than those obtained in the previous year.

3. Quality characteristics of the grape harvest in 2012 and 2013 in the area of wine center Copou Iași were different in the nature of assortment variety and wine have led to type DOC, IGR, și VM.

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