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Researches on High Recovery, Through Appropriate Technology of Local Varieties and Biotypes from the Western Part of Romania

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Abstract. Researches were conducted between 2008-2010 and were applied to over 100 local varieties and biotypes from Western part of Romania; 10 biotypes of those were retained as being valuable for research: Mustoasă de Măderat, Negru de Mâsca, Frumoasă albă de Paulian, Coadă de Vulpe, Aromat alb de Silagiu, Frumoasă albă de Măderat, Alb verzui de Ghiroda, Pătrujarcă de Buziaş, Fragă albă de Silagiu, Ruginiu de Silagiu. Observations and measurements were performed on these cultivated biotypes by using both a minimal and an elaborated technology. The following results were analyzed, as opposed to a reference variety (Chasselas dore): buds viability, production per vine and per hectare, average weight of a bunch, resistance to diseases and pests, sugar content and acidity of the grapes. The results revealed suitability of these varieties for sustainable viticulture, and quantitative and qualitative increrase is realized when applying advanced technology.

Keywords: local varieties and biotypes, sustainable viticulture, quality

INTRODUCTION

In the west of Romania, long tradition in vines cultivation is also apparent from the abundance of local varieties and biotypes found in yards and population gardens in the area. (Dobrei *et al.,* 2008). Most of these varieties can be grown using a minimal culture technology, however, in some cases, significant results can be obtained (Dobrei *et al.*, 2007).

These varieties are fully respecting the principles of sustainable viticulture, given good harvests in the absence of phytosanitary treatments (Dobrei *et al.*, 2010).

MATERIALS AND METHODS

During the years 2008-2010, the research was conducted with CNCSIS, under a framework research contract, and targeted over 100 local varieties and biotypes from the Western part of Romania. These varieties were identified in private vineyards, gardens, courtyards of people in the area. Of these, for the present researches were chosen 10 cultivars with valuable properties, could that have enough vines to organize comparative research? Researchers compare the culture minimal technology practiced by owners with a technology elaborated by the research team of the department of Viticulture, taking into account the characteristics of the variety and culture conditions. Were chosen for research both the table grape varieties and varieties with mixed traits and varieties with specific characteristics of wine varieties.

For the names of varieties it was used the local name, when known, or given the locality name where they were identified, or depending on the organoleptic or ampelographic characteristics of grapes. Within developed technology, the following works were practiced: differentiated cuts, green works and operations, fertilization with organic foliar fertilizers and

four spraying with copper sulfate and sulfur for disease control.

Because these varieties are poorly known, the results were analysed and compared with those of a proven variety - Chasselas doré.

RESULTS AND DISCUSSION

In terms of character ampelographic, local varieties and biotypes studied are characterised by beautiful, showy grapes, which is very important especially for table varieties knowing that "grapes are the fruit that is consumed first with the eyes " (Tab. 1)

Tab.1

Ampelographic description of varieties

Variety / biotype	Area	Leaf	Grape bunch	Berry grape
Varieties and biotypes with specific features for table grape varieties				
Frumoasă albă de Măderat	Măderat	Middle-large, tri or penta lobed	Cylindro-conical, with first ramifications developed	Spherical, yellow-greenish peel, translucent
Coadă de vulpe	Buziaş	middle-low, cuneiform, pentalobed	Large to very large , cylindrical and bifurcated at the top	Middle, spherical, reddish thin peel
Frumoasă albă de Paulian	Paulian	small, round, whole	Middle, cylindric elongated, with rare baccas	Middle to large, not uniform ,spherical-ovoid, translucent golden-yellow peel
Negru de Mâsca	Mîsca	Middle pentalobed, cordiform	Large to very large , cylindro-conical, with first ramification very developed	Middle to large, easy ovoid, black-bluey peel
Varieties and biotypes with mixed features				
Aromat alb de Silagiu	Silagiu	Middle, cuneiform	Middle, cylindro-conical	Middle, spherical-ovoid
Alb verzui de Ghiroda	Ghiroda	middle-low, round, whole	Middle, cylindrical,compact	Middle, spherical, easily deformed, yellow-greenish peel,
Varieties and biotypes with specific characteristics of wine grape varieties				
Mustoasă de Măderat	Măderat	Middle cordiform, pentalobed	Big, cylindro-conical , pummeled, with very dense baccas	Small to middle, spherical deformed , greenish-golden peel,with dense pruin
Pătrujarcă de Buziaş	Buzias	Lower-middle, pentalobed, with very deep sinuses	Middle, conical, with slightly bent tip	Lower-middle, inverse ovoid
Fragă albă de Silagiu	Silagiu	Middle, cuneiform, trilobed	Small to very small, berry suitable rare	Small, spherical, yellowish green
Ruginiu de Silagiu	Silagiu	Middle-large, cuneiform, pentalobed	Middle-low, wing sometimes, often placed berry	Middle, almost spherical, with golden-yellow peel.

Regarding the viability of buds, none of the studied varieties raised special problems, percentage of viable eye is enough to practice the usual fruition cut. By practicing appropriate culture, technology to local varieties increased the percentage of viable eye.

As for the resistance to diseases and pests, local varieties exceeded completely those

of Chasselas doré, which is a resistant plant to diseases and pests. By applying only four treatments with substances (copper and sulfur) accepted by sustainable viticulture, diseases and pests were combated with high efficiency, all varieties showing tolerance or even resistance. Exception made for Măderat Mustoasă the variety that has proven to be sensitive to gray rot this year under a difficult climate, as was 2010 (Tab. 2).

From this point of view, cultivation of these varieties fully respects the principles of sustainable viticulture on the use of pesticides in the vineyard ecosystem.

Tab.2

Buds viability and resistance to disease

Variety / biotype	Viable buds (%)		The resistance to:		
	The minimal technology	Technology elaborated	Plasmopara viticola	Oidium Sp.	Botrytis cynerea
Frumoasă albă de Măderat	76	84	Tolerant	Tolerant	resistant
Coadă de vulpe	78	90	Tolerant	Resistant	Tolerant
Frumoasă albă de Paulian	73	82	Tolerant	Resistant	resistant
Negru de Mâsca	74	86	resistant	Resistant	resistant
Aromat alb de Silagiu	78	92	Tolerant	Tolerant	Tolerant
Alb verzui de Ghiroda	74	85	Tolerant	Resistant	Tolerant
Mustoasă de Măderat	72	80	Tolerant	Sensitive	sensitive
Pătrujarcă de Buziaş	74	83	Tolerant	Tolerant	Tolerant
Fragă albă de Silagiu	76	88	resistant	Resistant	Tolerant
Ruginiu de Silagiu	78	92	Tolerant	Tolerant	Tolerant
Chasselas doré (CT)	-	86	Very sensitive	Tolerant	Tolerant

Achieved production was calculated by weighing effectively grape vine, after which it was expressed per hectare, taking into account the planting distances and the number of gaps in the plantation. For all varieties there is a clear increase in production of grapes per vine hub when applied an elaborated technology, although a minimal technology has great productive potential (Tab.3). The most productive of local varieties research was Mustoasă de Măderat (6,8 kg/vine), being followed by Negru de Mâsca (5,4 kg/vine), Frumoasă albă de Măderat (4,5 kg/vine) and Frumoasă albă de Paulian (3,8 kg/vine).

Although the reference variety compared is a table grape variety with a relatively high potential production, most local varieties and biotypes have exceeded net the reference variety, only exception being varieties Pătrujarcă de Buziaş and Alb verzui de Ghiroda which gave slightly lower yields.

Regarding the quality of grapes, we referred to a bunch of average weight, sugar content and acidity. Regarding the average weight of a cluster that is important for grapes intended for fresh consumption, the following varieties are distinguished by a great-looking:

Coadă de Vulpe, Negru de Mâsca, Frumoasă albă de Măderat and Alb aromat de Silagiu, who have large and very large grape, preferred by consumers.

Tab.3

Production obtained

Variety / biotype	Kg/vine		Reported production(kg/ha)	
	The minimal technology	Technology elaborated	The minimal technology	Technology elaborated
Frumoasă albă de Măderat	3,6	4,5	14400	18000
Coadă de vulpe	2,6	3,4	10400	13600
Frumoasă albă de Paulian	3,2	3,8	12800	15200
Negru de Mâsca	4,5	5,4	18000	21600
Aromat alb de Silagiu	2,3	2,9	9200	11600
Alb verzui de Ghiroda	2,2	2,6	8800	10400
Mustoasă de Măderat	5,5	6,8	22000	27200
Pătrujarcă de Buziaş	2,2	2,8	8800	11200
Fragă albă de Silagiu	2,4	3,2	9600	12800
Ruginiu de Silagiu	2,5	3,8	10000	15200
Chasselas doré (CT)	-	3,0	-	12000

All local varieties and biotypes belonging to the group of table varieties and those with mixed features clearly exceeded under this aspect the reference variety Chasselas dore.

As for the accumulation of sugars in the grapes, the following varieties were noticed: Pătrujarcă de Buziaş, Ruginiu de Silagiu, Fragă albă de Silagiu and Frumoasă albă de Măderat (Tab.4).

Tab.4

Production quality

Variety / biotype	The average weight of bunch (g)		Sugar g/l		The acidity g/l H_2SO_4	
	The minimal technology	Technology elaborated	The minimal technology	Technology elaborated	The minimal technology	Technology elaborated
Frumoasă albă de Măderat	324	340	192	198	3,1	2,98
Coadă de vulpe	570	610	186	190	4,0	3,6
Frumoasă albă de Paulian	135	180	139	143	4,1	3,8
Negru de Mâsca	460	540	128	131	4,2	3,84
Aromat alb de Silagiu	182	205	187	190	4,7	4,4
Alb verzui de Ghiroda	143	169	188	190	4,9	4,6
Mustoasă de Măderat	270	315	170	173	6,9	6,6
Pătrujarcă de Buziaş	197	238	232	236	4,3	3,8
Fragă albă de Silagiu	75	93	201	204	4,5	3,9
Ruginiu de Silagiu	169	193	214	217	3,5	3,1
Chasselas doré (MT)	-	158	-	165	-	4,4

CONCLUSIONS

Reference area distinguishes itself by its many local varieties and biotypes which are unfortunately very little known, sometimes only by those who cultivate them. Under the

conditions of a minimal technology, these local varieties and biotypes give results more than satisfactory.

By rationalising technology culture, all the local varieties have registered quantitative and qualitative production increases.

Given the tolerance or resistance to diseases and pests of most of these varieties, they are suitable for sustainable viticulture, which is increasingly practiced.

Local varieties and biotypes are an inexhaustible source to obtain healthy and authentic wine products.

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