

ASSESSMENT OF GENOTYPES AND ELITES OF GRAPE VINES ON FARM IDENTIFIED IN DRĂGĂȘANI VINEYARD

Sergiu Ștefan GORJAN, Mihai BOTU

University of Craiova, Agriculture and Horticulture Faculty, 19 Liberty Street, Craiova, Romania,
Zip Code 200 421, Phone 0040 251 41 84 75, Fax 0040 251 41 45 41,
gorjansergiustefan@yahoo.com; btmihai2@yahoo.com

Corresponding author email: gorjansergiustefan@yahoo.com

Abstract

The assessment was carried out between the years 2010-2013, in the private plantations from Drăgășani vineyard, for identification and conservation on farm of genotypes and elite of grape vines discovered. Have been identified, located, studied and evaluated of old grape vines varieties, autochthonous, local or cultivated by over time in the Drăgășani vineyard. From this study were selected elites that can result valuable clones of varieties identified. The study also aimed at knowing and promoting of germplasm vines existing in Drăgășani vineyard.

Key words: elites, genotypes, germplasm, on farm, *Vitis vinifera*

INTRODUCTION

On farm conservation is a very important measure for saving of local varieties from Romania vineyards, because comes to support the saving of local varieties in context in which they began to be the endangered and the default of viticultural germplasm.

In Romania, saving of viticultural germplasm on farm is very rare, the local varieties began to be very hard to find, because of rejuvenation vine plantations with new noble varieties appeared of market.

In situ conservation means the conservation of genetic diversity of traditional cultures in the environment where have developed their distinctive properties in the systems of traditional agricultural (Batir, 2009).

Conservation *in situ*, sometimes referred to as "on farm conservation", was defined as "the management and continuous cultivation by farmers of a diverse set of plants populations of a species in the agroecosystems as they have evolved" (Bellon et al., 1997).

Ex situ conservation is an action taken by man, to obtain of artificial biodiversity outside habitat that format. It emerged from the idea that genetic resources can disappear over time for various reasons. Therefore, conservation "in situ" must be supplemented by the "ex situ" for the safety and obtaining

results beneficial with a view salvation of biodiversity (<http://lori.academicdirect>, 2012).

MATERIAL AND METHOD

The study was carried out during 2010 – 2013 in private plantations from Drăgășani vineyard at old grape vines varieties and elites discovered, in order to assess the potential of agrobiological on farm of the vineyard. In the first stage were located and identified old genotypes of vines, which began to be increasingly less frequent in the Drăgășani vineyard, with GPS to determine latitude, longitude and altitude.

Have been identified and studied a number of 7109 hubs of vines from these old varieties. Have been identified the region, plantation age, the number of varieties and elites discovered, synonyms and origin of variety, the countries where it is also cultivated, ecopedological conditions, resistance to diseases and pests, color of the grapes, direction of production, after the technology of description on farms under vines.

The genotypes identified and localized as follows: 'Cârlogancă' ('Crâmpoșia'), 'Tămăioasă românească', 'Fetească regală', 'Fetească albă', 'Fetească neagră', 'Coarnă albă', 'Coarnă neagră', 'Coarnă roșie', 'Braghină roze', 'Braghină albă', 'Gordan', 'Gordin', 'Berbecel', 'Negru moale', 'Negru

vârtos', 'Slaviță', 'Moroștină', 'Românie', 'Țâța caprei albă', 'Sauvignon gros' 'Teișor', 'Bășicată' (Gorjan, 2013).

RESULTS AND DISCUSSION

In the period 2010 - 2013 were identified old varieties of vines in Drăgășani vineyard, in many lands under vines in the vineyard, in the precise points at different farmers.

The study respected the technology of description *on farm*, in the one regards old vines varieties, by discussing with the farmers on this issue and concluding about the importance of romanian germplasm viticole.

Have been identified and studied a number of 7109 hubs of vines from these varieties, resulting in a total of 261 genotypes of perspective for wine grapes and table grapes.

Parallel with the genotypes identified and studied, were studied 22 elites with very good potential agroproductive and technological in a view to selecting of new clones.

The altitudes were identified elites and genotypes of vines are between 145-321 m alt. We can observe that are meeting both in the area meadow as well as the hill, and did not suffered because frost over time, showing that they are genotypes and elites highly resistant.

Locations and the coordinates of elites and genotypes identified *in situ* in the vineyard are presented in tables 1 and 2.

Were studied grape color, age plantations in the *sites* identified. Plantations studied have aged between 40-90 years, hubs are viable and productive, this demonstrating their suitability to the ecological conditions of the vineyard. Those plantations must be conserved *in situ* and *ex situ* in order not to losing a valuable gene pool viticultural. Those

genotypes and elites identified presents a yellowish green color, black-blue, dark red, red, rosé, yellowish green/ rosé.

Direction to the production is very good in commercial purpose, for obtaining white wines, red and rosé wines for current consumption, quality and high quality as well as for the production of table grapes with consumption in fresh condition and keeping over the winter (Table 3). (Gorjan, 2013).

The Drăgășani Vineyard presents a benefic climate for the cultivation of vines namely the temperate continental with mediterranean influence, the soils are reddish brown, clays and regosols. The viability of varieties and elites discovered it very good surpassing 90% between in the years 2010 and 2011 when not were recorded the negative temperatures, the absolute minimum temperature not exceeding threshold of -16° C. In the year 2012 was registered the frost over the vines with a the absolute minimum of -24° C, registered in ianuary and february. The vines plantations existing on the valley and in the Olt meadow have suffered massive loss of eyes. The vineyards from the hill or the ones buried, mound from during autumn were mostly saved. So, during the three years studied we have medium viability of varieties and the elites discovered of 80-87%, which demonstrates that they are very resistant to frost.

The main characteristics agrobiological and physiological of genotypes and elites selected are very good, they are presented in table 4 (Gorjan, 2013).

Table 1. The distribution *on farm* of the main old varieties in the Drăgășani vineyard

Lands under vines	Variety	Point	Farmer
Gușoieni-Spârleni Sutești-Pietroasa Dobrușa	'Cârlogancă' ('Crâmposia')	point Carcadia point Bobocea point Victor	Carcadia Liviu Bobocea Ion Victor
Sutești-Pietroasa Călina Zăvideni Orlești Lunca Oltului –Drăgășani	'Tămăioasă românească'	point Bobocea point Iulia point Roxana point Miu point Măcău	Bobocea Ion Mateescu Iulia Bădescu Roxana Miu Mircea Măcău Ilie
Gușoieni-Țicleanu Lungești Crețeni Orlești Dealul-Olt Drăgășani	'Fetească regală'	point Iordache point Monastery point Nuță point Ilie point Agricultural High School	Iordache Mihail Monastery Lungești Nuță Gheorghe Gorjan Ilie Agricultural High School I.C. Brătianu Drăgășani
Gușoieni-Țicleanu Sutești-Pietroasa	'Fetească albă'	point Iordache point Bobocea	Iordache Mihail Bobocea Ion
Dealul Olt-Drăgășani Lungești	'Fetească neagră'	point Nedeluț point Burugă	Nedeluț Mircea Burugă Nicolae
Dealul Olt-Drăgășani Gușoieni-Spârleni	'Coarnă albă'	point Iordache point Mitică	Iordache Mihail Mitică
Dealul Olt-Drăgășani Mitrofani	'Coarnă neagră'	point Iordache point Ionela	Iordache Mihail Ionela
Lunca Oltului-Drăgășani Gușoieni-Spârleni	'Coarnă roșie'	point Măcău punctul Nițu	Măcău Ilie Nițu
Sutești-Pietroasa Călina	'Braghină roze'	point Bobocea point Mateescu	Bobocea Ion Mateescu Iulia
Sutești-Pietroasa	'Braghină albă'	point Bobocea	Bobocea Ion
Dealul-Olt Drăgășani Sutești-Pietroasa Amărăști	'Gordan'	point Costel point Bobocea point Ancuța	Costel Bobocea Ion Ancuța Maria
Sutești-Pietroasa	'Gordin'	point Bobocea	Bobocea Ion
Drăgășani-Momotesti	'Berbecel'	point Lungu	Lungu Paul
Sutești-Pietroasa Gușoieni-Țicleanu	'Negru moale'	point Bobocea point Iordache	Bobocea Ion Iordache Mihail
Sutești-Pietroasa Gușoieni-Țicleanu	'Negru vârtos'	point Bobocea point Iordache	Bobocea Ion Iordache Mihail
Sutești-Pietroasa	'Slaviță'	point Bobocea	Bobocea Ion
Sutești-Pietroasa	'Moroștină'	point Bobocea	Bobocea Ion
Sutești-Pietroasa Drăgășani-Bârsanu Călina	'Românie'	point Bobocea point Iulia point Mateescu	Bobocea Ion Mateescu Iulia Mateescu Ion
Mitrofani Gușoieni-Spârleni Lungești	'Țâța caprei albă'	point Ionela point Nițu point Monastery	Ionela Nițu Monastery Lungești
Dealul Olt-Drăgășani	'Sauvignon gros'	point Sandu	Sandu
Sutești-Pietroasa	'Teișor'	point Bobocea	Bobocea Ion
Sutești-Pietroasa	'Bășicată'	point Bobocea	Bobocea Ion

Table 2. Locations and coordinated identified from Drăgășani vineyard

No.	Designation genotype	The elite code	Locations in the Drăgășani vineyard	Coordinated
1.	'Cârlogancă' ('Crâmpoșia')	10-20-30	Gușoieni-Spârteni Sutești-Pietroasa Dobrușa	(44°42'18 N, 24°07'56 E, 224 m alt.) (44°40'49 N, 24°12'09 E, 218 m alt.) (44°37'16 N, 24°12'41 E, 188 m alt.)
2.	'Tămâioasă românească'	1-2-3	Sutești-Pietroasa Călina Zăvideni Orlești Dealul Olt-Drăgășani	(44°40'47 N, 24°12'06 E, 220 m alt.) (44°41'03 N, 24°15'09 E, 180 m alt.) (44°45'29 N, 24°13'31 E, 217m alt.) (44°47'59 N, 24°13'32 E, 190 m alt.) (44°39'48 N, 24°18'40 E, 145 m alt.)
3.	'Fetească regală'	4-1-4	Gușoieni-Țicleanu Lungești Crețeni Orlești Dealul Olt-Drăgășani	(44°43'43 N, 24°07'53 E, 315 m alt.) (44°34'33 N, 24°12'19 E, 239 m alt.) (44°40'41 N, 24°11'24 E, 178 m alt.) (44°48'09 N, 24°14'00 E, 223 m alt.) (44°39'55 N, 24°14'55 E, 180 m alt.)
4.	'Fetească albă'	9-2-4	Gușoieni-Țicleanu Sutești-Pietroasa	(44°43'41 N 24°07'54 E 312 m alt.) (44°40'44 N 24°12'12 E 208 m alt.)
5.	'Fetească neagră'	4-3-4	Dealul Olt-Drăgășani Lungești	(44°40'58 N 24°14'14 E 282 m alt.) (44°34'24 N 24°12'15 E 197 m alt.)
6.	'Coarnă albă'	30-40-50	Dealul Olt-Drăgășani Gușoieni-Spârteni	(44°40'24 N 24°14'12 E 290 m alt.) (44°42'17 N 24°07'59 E 207 m alt.)
7.	'Coarnă neagră'	40-30-50	Dealul Olt-Drăgășani Mitrofani	(44°40'26 N 24°14'13 E 292 m alt.) (44°44'12 N 24°12'17 E 231 m alt.)
8.	'Coarnă roșie'	1-40-50	Lunca Oltului-Drăgășani Gușoieni-Spârteni	(44°39'49 N 24°18'57 E 146 m alt.) (44°43'46 N 24°07'55 E 321 m alt.)
9.	'Braghină roze'	11-12-13	Sutești-Pietroasa Călina	(44°40'53 N, 24°12'10 E, 228 m alt.) (44°43'07 N, 24°13'38 E, 298 m alt.)
10.	'Braghină albă'	10-11-12	Sutești-Pietroasa	(44°40'47 N, 24°12'06 E, 217 m alt.)
11.	'Gordan'	8-6-4	Dealul-Olt Drăgășani Sutești-Pietroasa Amărăști	(44°40'05 N, 24°14'49 E, 208 m alt.) (44°40'49 N, 24°12'09 E, 218 m alt.) (44°46'35 N, 24°08'39 E, 223 m alt.)
12.	'Gordin'	7-5-3	Sutești-Pietroasa	(44°40'49 N, 24°12'00 E, 195 m alt.)
13.	'Berbecel'	1-3-5	Drăgășani-Momotești	(44°38'50 N, 24°15'50 E, 161 m alt.)
14.	'Negru moale'	3-2-1	Sutești-Pietroasa Gușoieni-Țicleanu	(44°40'48 N 24°12'05 E 206 m alt.) (44°43'09 N 24°07'48 E 310 m alt.)
15.	'Negru vârtos'	2-1-1	Sutești-Pietroasa Gușoieni-Țicleanu	(44°40'47 N 24°12'07 E 209 m alt.) (44°43'03 N 24°07'48 E 293 m alt.)
16.	'Slaviță'	6-4-2	Sutești-Pietroasa	(44°40'46 N 24°12'02 E 198 m alt.)
17.	'Moroștină'	4-3-2	Sutești-Pietroasa	(44°40'47 N, 24°12'02 E, 196 m alt.)
18.	'Românic'	20-21-22	Sutești-Pietroasa Drăgășani-Bârsanu Călina	(44°40'46 N, 24°12'02 E, 197 m alt.) (44°41'03 N, 24°15'07 E, 185 m alt.) (44°43'06 N, 24°13'37 E, 296 m alt.)
19.	'Țâța caprei albă'	11-10-11	Mitrofani Gușoieni-Spârteni Lungești	(44°44'12 N 24°12'17 E 231 m alt.) (44°42'19 N 24°07'59 E 215 m alt.) (44°34'26 N 24°12'20 E 214 m alt.)
20.	'Sauvignon gros'	60-70-80	Dealul Olt - Drăgășani	(44°40'58 N, 24°14'18 E, 283 m alt.)
21.	'Teișor'	5-3-1	Sutești-Pietroasa	(44°40'50 N 24°12'11 E 222 m alt.)
22.	'Bășicată'	26-27-28	Sutești-Pietroasa	(44°40'46 N, 24°12'02 E, 196 m alt)

Table 3. The main characteristics of genotypes and elites identified

No.	Designation genotype	The elite code	Color of the grapes	The direction of production	Plantation age
1.	'Cârlogancă' ('Crâmpoșia')	10-20-30	yellowish green	- high quality white wines and table grapes for fresh consumption	approximately 90 years
2.	'Tămâioasă românească'	1-2-3	yellowish green	- aromatic wines of high quality	approximately 50-90 years
3.	'Fetească regală'	4-1-4	yellowish green	- high quality white wines	approximately 40 years
4.	'Fetească albă'	9-2-4	yellowish green	- high quality white wines	approximately 60-90 years
5.	'Fetească neagră'	4-3-4	yellowish green	- high quality red wines	approximately 40 years
6.	'Coarnă albă'	30-40-50	yellowish green	- table grapes with fresh consumption and keeping over winter	approximately 50 years
7.	'Coarnă neagră'	40-30-50	dark red	- table grapes with fresh consumption and keeping over winter	approximately 50 years
8.	'Coarnă roșie'	1-40-50	red	- table grapes with fresh consumption and keeping over winter	approximately 40 years
9.	'Braghină roze'	11-12-13	rosé	- white and rosé wines for current consumption	approximately 90 years
10.	'Braghină albă'	10-11-12	yellowish green	- whites wines for current consumption	approximately 90 years
11.	'Gordan'	8-6-4	yellowish green	- whites wines for current consumption	approximately 70-90 years
12.	'Gordin'	7-5-3	yellowish green	- whites wines for current consumption	approximately 90 years
13.	'Berbecel'	1-3-5	yellowish green	- whites wines for current consumption	approximately 90 years
14.	'Negru moale'	3-2-1	black-blue	- quality red wines	approximately 40 years
15.	'Negru vârtos'	2-1-1	black-blue	- quality red wines	approximately 40 years
16.	'Slaviță'	6-4-2	yellowish green	- quality white wines	approximately 90 years
17.	'Moroștină'	4-3-2	yellowish green	- quality white wines	approximately 90 years
18.	'Românie'	20-21-22	yellowish green/ rosé	- whites wines for current consumption	approximately 50-90 years
19.	'Țâța caprei albă'	11-10-11	yellowish green	table grapes with fresh consumption and keeping over winter	approximately 50 years
20.	'Sauvignon gros'	60-70-80	yellowish green	- high quality white wines	approximately 40 years
21.	'Teișor'	5-3-1	yellowish green	- quality white wines	approximately 90 years
22.	'Bășicată'	26-27-28	yellowish green	- whites wines for current consumption	approximately 90 years

Table 4. The main traits agrobiological and physiological of genotypes and elites

No.	Designation genotype	The elite code	Time of maturation	Growth vigor	Resistance to disease, frost, drought *
1.	'Cârlogancă' ('Crâmposia')	10-20-30	medium	strong	P,O,B,F,D
2.	'Tămâioasă românească'	1-2-3	medium	strong	P,O,B,F,D
3.	'Fetească regală'	4-1-4	early	strong	P,O,B,F,D
4.	'Fetească albă'	9-2-4	early	strong	P,O,B,F,D
5.	'Fetească neagră'	4-3-4	medium	strong	P,O,B,F,D
6.	'Coarnă albă'	30-40-50	tardive	strong	P,O,B,F,D
7.	'Coarnă neagră'	40-30-50	tardive	strong	P,O,B,F,D
8.	'Coarnă roșie'	1-40-50	tardive	strong	P,O,B,F,D
9.	'Braghină roze'	11-12-13	tardive	medium	P,O,B,F,D
10.	'Braghină albă'	10-11-12	very tardive	medium	P,O,B,F,D
11.	'Gordan'	8-6-4	medium	strong	P,O,B,F,D
12.	'Gordin'	7-5-3	tardive	medium	P,B,F,D
13.	'Berbecel'	1-3-5	medium	medium	P,O,B,F,D
14.	'Negru moale'	3-2-1	medium	strong	P,O,B,F,D
15.	'Negru vărtos'	2-1-1	medium	strong	P,O,B,F,D
16.	'Slaviță'	6-4-2	medium	strong	P,O,B,F,D
17.	'Moroștină'	4-3-2	medium	strong	P,B,F,D
18.	'Românie'	20-21-22	medium	strong	P,O,B,F,D
19.	'Tăța caprei albă'	11-10-11	medium	strong	P,O,B,F,D
20.	'Sauvignon gros'	60-70-80	early	strong	P,O,B,F,D
21.	'Teișor'	5-3-1	medium	medium	P,O,B,F,D
22.	'Bășicată'	26-27-28	tardive	strong	P,O,B,F,D

* P- *Plasmopara*; O-*Oidium*; B-*Botrytis*; F-Frost; D-Drought

CONCLUSIONS

For the first time in the Drăgășani vineyard was carried out an assessment *on farm* of genetic resources existing in vineyard, purpose being salvation and promoting viticultural germplasm existing.

The conditions eco-pedological of Drăgășani vineyard offers favorable conditions to cultivate vines, of romanian varieties and foreign through mineral-rich soils and through climate the temperatures not exceeding the critical threshold of -18 °C, with the exception of year 2012 (-24 °C).

In Drăgășani vineyard there are valuable genetic resources of vines that can contribute to the restoration and enhancement of the traditional assortment of vineyards.

The resources genetic from Drăgășani vineyard were identified *in situ*, insisting especially on old varieties of vines, which are endangered, for conservation *on farm* and *ex situ* in collections ampelographic.

From the varieties and elites identified was collected of biological material with a view

their multiplication, either to reintroduction *on farm* or to conservation *ex situ* in ampelographic collections from University Craiova and S.C.D.V.V. Drăgășani.

These varieties and elites selected of vineyard Drăgășani can modernize and develop fundamental viticulture of Oltenia and implicitly from Romania (Gorjan, 2013).

REFERENCES

- Bațir Rusu D., 2009. Methodologies for *in situ* - *on farm* conservation. SEEDNet regional course on "In situ & on farm conservation of plant genetic resources for food and agriculture".
- Bellon M.R., Pham J.L., Jackson M.T., 1997. Genetic conservation: a role for rice farmers. In Plant Genetic Conservation: The *In Situ* Approach (N. Maxted, B.V. Ford-Lloyd and J.G. Hawkes, eds.). Chapman and Hall, London, p. 261-289.
- Gorjan S.S., 2013. Evaluarea potențialului agrobiologic al unor resurse genetice de viță de vie *on farm* în podgoria Drăgășani. Teză de doctorat, Universitatea din Craiova.
- **<http://ori.academicdirect.org/courses/>, 2012 - Live_BDBC_2010/Bio_Div_Bio_Con_C5.