

SOIL PREPABILITY IN THE RECAȘ VINEYARD CENTER FOR VINEYARDS

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Abstract Along with other wine-growing centers in Romania that are consecrated (Murfatlar, Segarcea, Drăgășani, Dealu Mare, etc.), Recașul is part of the oenoclimatic point of view, of the areas producing red and aromatic wines and white wines. The purpose of this work refers to the suitability of the soils in this wine-growing center for vines. The studied material is represented by the soils identified within the studied territory and which are typical leached eutricambosol, typical preluvosol and weakly carbonate gleiosol. The categorization of these soils is different for vines, namely: eutricambosol, falls into favorability group C (favorable I), with 60 points, both for wine and table varieties; the preluvosol falls into favorability group D (favorable II), with 40 points and the gleiosol, in favorability group E (slightly favorable), with only 12 points. Gleiosol is a less fertile soil that raises serious problems for this culture, due to the processes of glaciation, due to the presence of groundwater at a shallow depth, and which requires a series of amelioration measures. The average productions achieved in the studied years are in the following order: Cadarcă, Blauerzweigelt, Merlot, Pinot noir, Cabernet Sauvignon, Oporto and Burgund mare. During the studied period, productions were reduced due to the delay in harvesting, a delay that is directly dependent on the variety, the climatic conditions during the harvesting period and their sensitivity to rot. The highest losses per day (0.9-1.1%) were observed in Cadarcă, Pinot noir and Oporto and lower in Merlot and Cabernet Sauvignon varieties, but these losses can reach 50% if the harvest is not done at maturity but the harvesting of the grapes is delayed by more than 10 days.

Keywords: soil, suitability, production, Recaș Wine Center

INTRODUCTION

The beginnings of vine cultivation in this area merge with the beginnings of the Romanian people. Even centuries and millennia before, it was found that some areas are favorable for the cultivation of black varieties, while other areas are favorable for the cultivation of white varieties, which attests to specialization in certain directions, since ancient times.

The vine culture has roots in our country that are lost in the mists of history. The geographical position in the northern hemisphere, the favorable landforms, the favorable climate, represent all the premises for obtaining wines from those for current consumption to those with designation of origin.

The effective exploitation of the geographical and climatic resources of this area, interwoven with the adoption of superior culture and processing technologies, to satisfy the demands of internal consumption, but especially external, are the priorities of modern viticulture in the Banat area.

I. Poenaru and collaborators (1977) note the influence of the climate and the culture system on the production and profitability of the Merlot variety.

In the west of the country, the large Burgundy variety equals the anthocyanin potential of the Merlot variety, Oporto is close to that of the Pinot noir variety, and Sauviovese to that of the Băbeasca neagra variety. In 1984, in a new wine typification work, Cadarcă is proposed as a pure variety for the VSO wine category, in the Miniș and Recaș vineyard. For the VSOC category, next to Cabernet Sauvignon, there is the "Roșu de Miniș" assortment made of Cabernet Sauvignon 60% + Cadarcă and Merlot 40%, only for the Miniș vineyard (Al. Mihalca, 1987).

Vine culture in Romania is part of the future of world viticulture, but with particularities imposed by the social-economic situation we are going through, the objectives pursued in the

immediately following and later stages, intended to give shape to viticulture at the beginning of the the third millennium.

Due to its physical and geographical location, the city of Recaș falls, according to Romania's 1983 geography treaty, in the temperate continental climate sector with a slight Mediterranean influence, with generally mild winters, warm summers, long autumns and sudden transitions from winter to summer (short springs).

The ecological framework supports integration within collaborative environments among scholars from a wide diversity of fields related to the life/natural sciences for educational benefits (Dragoescu URLICA & STEFANOVIĆ, 2018, p. 753). (2)

MATERIAL AND METHODS

The material used is represented by the three soils identified in the Recaș Viticulture Center, respectively: typical strongly leached Eutricambosol; Typical Preluvosol and Weak Carbonate Gleiosol.

These soils are studied in relation to the environmental factors that condition their existence. In the paper, the properties of the three types of soil in the Recaș Viticulture Center and their suitability for the vine are determined, both in terms of wine and table varieties and the productions obtained.

The collection of soil samples was carried out on genetic horizons, in modified settlement and in natural settlement.

RESULTS AND DISCUSSIONS

Following field trips and laboratory research, three types of soil were identified, totally different both in terms of properties and fertility and in terms of classification in the soil class, namely:

1. Typical strongly leached Eutricambosol;
2. The typical preluvosol;
3. Weak carbonate gleiosol (Gleic soil).

1. Typical heavily leached Eutricambosol. The physical, hydrophysical and chemical properties of this soil are:

- the texture is loamy-dusty in the Ao and transitional AB horizons and towards depth in the Bv and BC horizons it becomes medium loamy-clay;
- the soil reaction is slightly acidic, with a pH between 6.05 and 6.25;
- humus content: it is 2.43% between 0-22 cm and 1.37% between 22-41 cm;
- the mobile phosphorus content is low;
- the mobile potassium content is medium;

Regarding the suitability of eutricambosol for vines, the situation is as follows (table 1):

Table 1

Grup C of favorability or Favorable I		
Crops	Points	Favorability class
VV	60	Favorabilă I
VM	60	

Table 1 shows the favorability zone: favorable I, with a score of 60 points both for the vine in general and for the table vine.

2. The typical preluvosol. Physical, hydrophysical and chemical properties of preluvosol are:

- the texture is medium between 0-45 cm (loamy-dusty and loamy) and in the horizons found below 45 cm it is loamy - clayey due to the increase in the content of illuviated clay.
- density (D) and apparent density (DA) show low values, which indicates that this type of soil is not compacted;
- soil reaction: it is acidic between 0-24 cm and weakly acidic between 24-115 cm;
- the humus content is average, being 2.25% in the Ao horizon and 2.13% in the AB transition horizon;
- the mobile phosphorus content is medium;
- the mobile potassium content is low.

Table 2 shows the less favorable situation of vine cultivation, both for table and wine.

Table 2

Grup D of favorability or Favorable II		
Crops	Points	Favorability class
VV	40	Favorabil II
VM	40	

From table 2, it follows that in the area of favorability: favorable II with a credit score of 40 points, there are vines for wine and for table, which determines the obtaining of low productions, but considering that the land is in a hilly area, the best solution to obtain the maximum production from this favorability class is to use these two crops.

3. Weak carbonate gleisol (Gleic soil). Physical, hydrophysical and chemical properties of gleisol are:

- the texture is fine, clay-clay and clay-clay-dusty between 0-52 cm (TT and TP) and between 52-83 cm it is loamy and clay-dusty (LL;LP).
- soil density (D) has values between 2.45 - 2.59 g/cm³;
- apparent density (DA), has values between 1.39 and 1.43 g/cm³;
- the soil reaction is neutral between 0 - 38 cm; moderately alkaline between 38 - 83 cm;
- the humus content is high but humus inaccessible to plants;
- the mobile phosphorus content is medium;
- the mobile potassium content: it is medium;
- the degree of saturation in bases is over 93%, the soil being eubasic.

Following the calculation of credit scores for this type of soil, the following results were obtained:

Table 3

Grup E of favorability or less Favorable II		
Culturi	Puncte	Clasa de Favorabilitate
VV	12	Puțin favorabil
VM	12	

Table 3., highlights the situation in which the vine is grown on a less fertile soil and which raises serious problems for this culture considering the fact that it is formed in conditions of glaciation, due to the groundwater that is found at a shallow depth and which it has a negative influence on the formation and evolution of this soil and implicitly on the cultures established or found on it.

In the case of this soil, the vine obtained low marks, namely 12 points, thus falling into the area of favorability: slightly favorable.

After establishing the suitability/favorability class of the soils in Centru Viticol Recaș, we also calculated the productions obtained from the seven varieties of grapes for red wines in the period 2018-2020, namely: Burgund mare, Cabernet Sauvignon, Cadarcă, Blauerzweigelt, Merlot, Port, Pinot noir. For these varieties, the productions and losses caused by overripening were determined and the phytosanitary status of the crop was established.

For harvesting, establishing the optimal moment is done by following the ripening of the grapes, the dynamics of the weight of the berries and the content of anthocyanin substances. In the Recaș viticultural center, the grapes are harvested routinely and taking into account the above, 10 - 14 days after full maturity, when the anthocyanin content is maximum.

Table 4 shows the productions by varieties, in the years of cultivation.

Table 4

Grape production on varieties and years in Recaș Viticultural center
- regular harvesting -

Nr crt	Variety	Production kg/ha			Average
		2018	2019	2020	
1	Burgund mare	6980	4540	5535	4666
2	Cabernet Sauvignon	5320	5550	5490	5396
3	Cadarcă	6820	7220	7830	7172
4	Blauerzweigelt	7110	6850	7325	6923
5	Merlot	6890	6910	4010	4065
6	Oporto	5530	5050	5620	4724
7	Pinot noir	6420	6825	7050	6720

The cause that led to obtaining a great diversity of types of wine, in most cases inadequate, was the deliberate delay in harvesting. This process results in crop losses in all cases.

From the data in table 4, it can be seen that the most productive varieties are: Cadarcă, Blauerzweigelt and Merlot. The lowest production is recorded for the large Burgund variety. By delaying the picking, the harvest decreases differently, depending on the variety. The reduction of the harvest is related to the sensitivity of the varieties to the attack of diseases and pests, with special reference to gray rot.

CONCLUSIONS

From an oenoclimatic point of view, Recaș is part of the areas producing red and aromatic wines and white wines, secondarily alongside other established centers: Drăgășani, Dealu Mare, Segarcea, Sarcica Niculițel, Murfatlar, etc.

From a climatic point of view, the Recaș Winery Center is characterized as follows:

□ The amount of average annual precipitation oscillates between 650–800 mm, and average temperatures vary between 7.2–10.4°C. annual aridity indices are between 35-45, and evapotranspiration is lower than average precipitation.

□ The water regime is percolative, favoring demineralization and clay migration on the profile.

The soils identified within the researched territory are different both in terms of their classification into soil classes, as well as their properties and fertility.

Following field trips and laboratory analyses, within this Viticultural Center, the following types of soil were identified: typical poorly leached Eutricambosol; Typical Preluvosol and Weak Carbonate Gleiosol.

The classification of these soil classes is different for vines, namely:

- Eutricambosol, belongs to favorability group C or favorable I, obtaining 60 points, both for wine and table varieties;

- Preluvosol, was placed in group D of favorability or favorable II, with 40 points;

Gleiosol, was placed in favorability group E or Slightly Favorable, obtaining only 12 points.

The vine grown on this less fertile soil, raises serious problems for this crop considering the fact that it is formed in conditions of glaciation, due to the groundwater that is found at a shallow depth, water that has a negative influence on the formation and evolution of this soil and implicitly on the cultures established on it.

In order to improve these soils, a series of agrotechnical and agrochemical interventions are necessary: plowing to alleviate the temporary excess of moisture, calcareous amendments to correct the reaction conditions, organic fertilizers to increase humus reserves and chemical fertilizers.

The main limiting factors of production are of edaphic nature.

Due to the high slopes and specific stationary regional climatic conditions, bioaccumulation is reduced, which determines a low humus content and a poor supply of nitrogen.

The humus content is 2-3%, dominated by fulvic acids. The reaction is slightly acidic with a pH of 6.5 - 6, the degree of saturation in bases is 55 - 70% and the cation exchange capacity varies between 20 - 50 me/100 g soil. The state of supply in fertilizing elements is deficient, and the existing reserves are difficult to mobilize due to the deficient aero-hydric regime and weak microbiological activity.

The average productions achieved in the studied years are in the following order: Cadarcă, Blauerzweigelt, Merlot, Pinot noir, Cabernet Sauvignon, Oporto and Burgund mare. Large losses are recorded in Cadarcă, Pinot noir, Oporto and lower in Merlot and Cabernet Sauvignon.

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