

PEDOLOGICAL, PHYSICAL AND CHEMICAL DEFINITIONS OF THE RESPECTIVE SOIL STRATA WHICH COULD BE ENCOUNTERED ALONG A SLOPE WITHIN THE VINEYARD OF DEALUL OLT - DRĂGĂȘANI UPON WHICH THE VINE KIND OF TĂMÂIOASĂ ROMÂNEASCĂ HAS BEEN PLANTED

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Abstract

Within the Drăgășani oenological realm could be encountered a multitude of soil types and this is the reason why these ought to be precisely identified and delimited so that should a new vine plantation be founded in there the most appropriate engraft-bearing vine kind could be eventually chosen.

Our scientific research investigation has thus identified its most appropriate experimental site upon a slope endowed with a slant degree of 10% and at the surface of which a plantation of the Tămâioasă Românească vine kind has been established. Three types of soil had been therefore identified along this above mentioned slope: Pseudo-rendsinian proto-soil of anthropic origin (within the slope's upside third part); Argillaceous brown illuvial slightly pseudo-glazed (within the slope's middle third part); Type-casted brown eumeso-basic (within the slope's downside third part). The purpose of the present work is thus the one of outlining the respectively pedological, physical and chemical features of these above mentioned soil types.

Key Words: *horizon, profile, withering coefficient, field capacity*

INTRODUCTION

It is a known fact that should a given zone be homogeneous throughout its local climate its soil would exert a much considerable influence upon the quality

level achieved by its vine plants' production; this is therefore the reason why the wines that are endowed with an exquisite as well as highly

distinguished quality could only be obtained from certain precisely delimited types of soils which are each of them tightly related to the respective plot's issued wine accomplished quality standard. The fact had also longtime since been known that should the vine plantations be laid upon calcareous soils the wines therefrom obtained would be for that reason endowed with a particular degree of finesse while should the concerned soils be either skeleton-shaped or ferruginous the wines therefrom obtained would certainly be gifted with a remarkable generosity and a shiny red colour.

We have as well come to ascertain the fact that should the concerned soils be endowed with a more accentuated fertility potential the respectively obtained harvests would be quantitatively larger than the ones resulted from the less fertile plots (especially when a sufficient water supply should be ensured and when the asun could offer them an adequate warmth level).

In our country as well as worldwide a lot of scientific studies have been realized through which the most righteous demonstrations have been made insofar could be concerned the naturally occurring phenomena and processes through which the quality standards eventually held by the therefrom obtained harvests do come to be effectively conditioned by the respectively involved soil types and their intrinsic features.

In the two-years'interval containing 2020 and 2021 we have therefore carried out some scientific investigations which have pertained to the respective domains of pedology as well as of the soils'physical structures and chemical compositions; we thus have found the chosen soil types along a hillock'slope within the vineyard of Dealul Olt - Drăgășani upon which a vine plantation is laid which does pertain to the kind of Tămâioasă Românească. It is upon it that we had thereby performed the scientific study and the experimental procedures which are have been established through our own currently undergone doctoral training program.

MATERIALS AND METHODS

Along the hillock'slope situated within the vineyard of Dealul Olt - Drăgășani upon which a vine plantation is laid which does pertain to the kind of Tămâioasă Românească we have therefore studied three different soil profiles respectively located upon the slope's: - upside third part; - middle third part; - downside third part. The first above mentioned soil profile has been chosen within one of the plots which do belong to the Știrbei Domain; the second has been studied at the Isărescu Wine House (as it is situated within the perimeter of a plot that is cultivated with the kind of Tămâioasă Românească) while the third has been studied under the scientific authority of the Drăgășani Research and development station for viticulture and winemaking. Those three soil profiles have been located through the GPS mechanism. For each of them

its soil type has been identified and its latter's physical and chemical features have been most accurately outlined. In view of performing the necessary field studies and investigations we have most fruitfully collaborated with the OSPA Scornicești – Olt because the technical procedures they do usually apply are indeed some unitary analysis methods which are recommended by the Romanian National Society of Soil Science.

RESULTS AND DISCUSSIONS

Insofar the scientific domain of pedology could be concerned the Drăgășani vineyard is for its most planted upon six (6) main types of soils all among which do indeed present a natural vocation for a high quality level culture of vine and these respectively are the:

- Calcium-shaped Eroded Preluvosoil;
- Skeleton-shaped Eroded Preluvosoil;
- Calcium-shaped Preluvosoil;
- Type-Casted Phaeosiom;
- Pellic-Type Phaeosiom;
- Calcareous Rhaegosoil.

Yet a certain hillock does as well exist in there (the above mentioned Dealul Oltului [Olt's Hillock]) along the slope of which a scientifically speaking most interesting case could be encountered where a certain peculiar and most intriguing succession of soil types had been created the respectively profiled genetic horizons of which are grounded into empirically perceptible orders such as hereby:

- in the upside third part of the slope we could encounter the Anthropoc Pseudorendsinian Protosoil, with horizons: AC (0-25 cm) – Cpr (25-55 cm) – Cea 1-4 (55-120 cm);
- in the middle placed third part of the slope we could encounter the Brown Illuvial Argileshaped Slightly Pseudoglazed type with horizons: A0 (0-40 cm) – Btw (45-80 cm) – Bt (80-120 cm);
- in the downside placed third part of the slope we could then encounter the Type-Casted Brown Eumesobasic with horizons: A0 (0-30 cm)– AB (30-60 cm) – Bv (60-90 cm)– BC (90-120 cm).

Table nr.1 does hereby present the gathered analytical data which do concern the studied plots' granulometric fractions.

Table 1 Performed analysis of granulometric fractions in regard to the subsequently identified soil types.

Fraction	Position held along the slope		
	Slope's upside 1/3 part	Slope's amidst 1/3 part	Slope's downside 1/3 part
	<i>Anthropic pseudo-rendsinian proto-soil</i>	<i>Argilaceous illuvial slightly pseudo-glazed brown</i>	<i>Type-casted eumeso-basic brown</i>
Sand %	70 - 94	45 - 50	56 - 71
Dust %	2 - 24	16 - 18	8 - 14
Argile %	3 - 12	33 - 37	21 - 28

Respective proportions of granulometric fractions at the soil types present in Drăgășani along a slope of Dealul Oltului [Olt's Hillock]) (apud Gh. Condei and coll., 1978).

Soil type; Granulometric fractions; Sand (%); Dust (%); Argile (%).

For the three above mentioned soil profiles due to their diverse granulometric respective structures the respective variation limits of their soil physics indexes are diverse too.

The synthesis of the obtained results is presented in Table 2.

Table 2 Variation limits of the soil physics indexes as they have been identified for the soil types encountered at the various 3 slope's levels.

Index	Position held along the slope		
	Slope's upside 1/3 part	Slope's amidst 1/3 part	Slope's downside 1/3 part
	Anthropic pseudo-rendsinian protosoil	Argilaceous illuvial slightly pseudoglazed brown	Type-casted eumeso-basic brown
Sensible density (g/cm)	1,15 - 1,43	1,40 - 1,41	1,50 - 1,60
Real porosity (%)	48 - 58	48 - 49	41 - 45
Withering coefficient	1,6 - 6,7	8,4 - 10,9	5,5 - 7,3
Field capacity (%)	7,3 - 21,9	23,4 - 24,1	22,5 - 22,9

Should we look closely at the values held by the respectively determined chemical indexes we could easily seize the specific differences which do eventually define each of the identified soil types.

Laboratory analyses have generated some results which are presented in Table 3.

Table 3 Variation limits of the soil physics indexes as they have been identified for the soil types encountered at the various 3 slope's levels

Index	Position held along the slope		
	Slope's upside 1/3 part	Slope's amidst 1/3 part	Slope's downside 1/3 part
	Anthropic pseudo-rendsinian protosoil	Argilaceous illuvial slightly pseudoglazed brown	Type-casted eumeso-basic brown
pH (in water)	8,1 - 8,5	5,2 - 6,4	6,2 - 6,4
Humus (%)	0,1 - 0,5	0,60 - 1,34	0,50 - 1,65
Total nitrogen (%)	0,002 - 0,010	0,009 - 0,080	0,030 - 1,63
Mobile phosphorus (ppm)	6 - 24	16 - 32	10 - 20
Mobile potassium (ppm)	40 - 100	110 - 120	80 - 160
V (%)	28 - 100	85 - 93	92 - 93

For each of the three above mentioned slope segments the conditions created due to the existence of their respective local ecological systems are as well different. In a future work of ours we will present some further obtained results which do concern the quantity and quality of the obtained grapes' harvests; these latter data do attest as being true the facts that in respect to the plants' position upon the slope should we descend from the upside third part towards the lowest part the harvested grapes' amounts would decrease while their respectively achieved levels of quality would follow a duly recorded inversed trend.

CONCLUSIONS

1. The anthropically generated and pseudo-rendsinian soil composition from the slope's upper side third part is clayish-argillaceous, crumbly, cohesive and sufficiently broken-up. Calcium carbonate is diffusely disseminated throughout its mass. The Cpr horizon does present a violent effervescence phenomenon. Its rough fraction is largely predominant for the detriment instead of the fine fractions. Nitrogen and phosphorus are present in minima amounts only but its supply in potassium is adequate.

2. Within the amidst third part of the slope the brown illuvial argile-shaped and slightly pseudo-glazed type of soil is present. Its texture is a clayish-argillaceous one, its compactness'degree is a mean one while it is as well poreous and enough moisted though its own capacity of retaining the water that could be useful to the vine plants does present some rather small values. Its respectively held supplies in humus and in mineral nitrogen are usually scarce towards mean ones while the ones held in phosphorus and in potassium are rather poor.

3. The downside of the above mentioned hillock'slope is made of the type-casted brown eumeso-basic type of soil. Its texture is a clayish one; it also is poreous and moisted while its compactness'degree is a quite weak one. Its respectively contained amounts of humus, nitrogen, phosphorus and

potassium are all of them scarce towards mean ones.

4. Insofar could be concerned the technological means which should be applied throughout the vine culture process we do think it ought to be necessary to apply some measures through which the currently insufficient amounts in various chemical elements could be supplied to by making use of some organic and/or mineral fertilizers. We ought as well take upon the soil itself some actions through which its respective structure and texture could be for the best improved; its humus ratio should be the most possible increased.

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