

STUDY OF PEDOLOGICAL FACTORS THAT CHARACTERIZES THE VITICOL AREA FROM BRABOVA

RADU VALERIU LUCIAN

University of Craiova, Faculty of Horticulture, PhD student,

Keywords: viticulture, soil, profile.

Abstract

This paper emphasized some characteristics of the Eutricambosol from Brabova, regarding the relief, the morphological characters of the soil, the parental material, the ground level and the texture on the horizons. The soils are brown and podzolic brown, favorable to the development of vegetable crops, large agricultural crops and fruit trees and viticultural plantations, moderately podzolic argillo-luvial soils, alluvial soils.

INTRODUCTION

The structure of the land on usage categories in Romania is the following: 9.42 million ha (63.9%) arable land, 3.36 million ha as pastures (22.92%), 1.51 million ha as hay fields (10.18%), 0.22 million ha vineyards (1.52%) and 0.21 million ha orchards (1.48%)(Dodocioiu, 2012).The soil exerts a major influence on the growth, yield and quality of the production in the vine. Unlike other cultivated species, vines are less demanding than the soil, easily adapting to difficult soil conditions such as sands and rocky soils (Irimia, 2012).

The influence of the soil on the vine is due to its physical and chemical properties.

In Romania, the vine is cultivated on the following soil types (Oslobeanu et al., 1991): psamosols (Sadova, Corabia, Ivești, Mihai Valley), auburn soil/kastanoziomuri, rendzinas (Murfatlar, Istria, Babadag), regosols, vertisols, pseudorendzinas, argillo-luvial browns

(Târnave, Alba, Sebeș), cambial cernozyms, cernozyms, gray soils / greyphaeosomes (Cotnari, Panciu, Nicorești), clay-iluvial / argic chernozems, pregloves, luvic brown soils, plane soils (Dealul Mare, Sîmburești, Drăgășani, Dealurile Craiovei), alluvial soils and alluvial protosols (Panciu, Odobești, Cotești).

Viticulture is a very important agricultural practice in many countries. In order to control vine diseases caused by fungi, different fungicides, especially Cubased have been applied intensively to soils. The intensive use of agrochemicals with Cu and Zn in their composition may pollute the soil (Dodocioiu,2009) Historical and current applications have resulted in Cu accumulation in the soil, and total Cu quantities have been measured in vineyards worldwide(Buzatu & Dodocioiu, 2015).

MATERIALS AND METHODS

The name of the territorial unit of soil: typical eutricambosol, proxicalcaric, strongly deep, with a clay/clay texture,

formed on slope-alteration materials of slope represented by deluvial materials - colluvial slopes consisting of medium

materials, eubasic rocks, arable, with moderate surface erosion.

Sampling on soil profile, in the field:

- determinations and observations were made of the relief, the morphological characters of the soil, of the parental material, of the ground level, of the texture on the horizons, of the presence of alkaline-earth carbonates by direct determinations with HCl 1/3 and a preliminary diagnosis was made and classification of the soils according to the official classification (SRTS, 2012);

- collecting soil samples on genetic horizons;

- packing and labeling of samples;

- physical-chemical analyzes in the laboratory:

- humus (%) first Walklei-Black method in donut modification;

- size determination SB - Kappen method;

- particle size analysis (5 fractions) - Kacinski method;

- determination of the hygroscopicity coefficient - Micherlich method.

RESULTS AND DISCUSSION

Brabova commune is located in the north-western part of Dolj county, in the hilly plain of Bălăcița, the southern subunit of the Getic Plateau, characterized by steep terrain, with narrow fields separated by deep valleys. Being in the hilly plain area, it has a high platform relief, with altitudes of over 200 meters, strongly fragmented by the direct and indirect tributaries of the river Jiu.

Due to the fragmentation of the relief, there are hilly hills oriented towards the west-east and north-west-south-east direction, in the sense of draining the streams in the area.

The Brabova River springs from the territory of the village of Veleni, passes through Brabova, has a length of 23 km and the surface of the hydrographic basin of 123 km and throughout it is fed by several streams: Urdinița and Merețelu on the territory of Sopot commune, Bogdănel stream, Valea stream Quickly, the Răchita stream and smaller ones. The groundwater is located at a depth of 15-30 meters.

The soils are brown and podzolic brown, favorable to the development of vegetable crops, large agricultural crops and fruit trees and viticultural plantations, moderately podzolic argillo-luvial soils,

alluvial soils and alluvial soils that are frequently gelled (along the valleys). Before 1989 the hilly hills were terraced and planted with fruit trees and vines and cereals were cultivated on the plateaus.

The vegetation of the commune is represented by clumps of forests, agricultural crops and meadows and the fauna is represented by rodents (mice), birds, insects, rarely the wolf and the fox.

The administrative territory of the commune is within the temperate-continental plain climate zone, with the average annual temperature of 10-11 °C.

The average annual temperature of the coldest month (January) is between -3.9°C and -2°C. The average temperature of the hottest month (July) is 20.1-22 °C.

The average amount of precipitation is 500-550 mm/year. The average rainfall in the hottest month (July) is between 50.1 and 60 mm and in the coldest month (January) between 40.1 and 50 mm.

The first frost appears in the latter part of October and the last in the first part of April, resulting in a frost-free period of about 200 days/year.

The prevailing winds have the direction of VNV-ENE.

Description of soil profile:

Relief:

- major unit: the southern extremity of the Getic Piedmont;

- elements of the main relief form: paved terrain;

Profile coordinates: Lat. 44°31'11.67" N and Long. 23°36'04.24"E.

Elevation: 171 m.

Aspect of the land surface: slope, slope 15%.

Depth of groundwater between 15-30 m.

Global natural drainage: good.

Land use: viticulture.

Surface appearance: soil with cracks during dry periods and the land is uneven.

Soil profile: the soils are brown and podzolic browns, moderately podzolic clayey soils, alluvial soils and alluvial soils that are frequently gelled.

Climatic data: hot and dry summers, long and warm autumns, mild winters and early spring.

The average annual temperature is 10.9 °C and the average annual rainfall is 531,7 mm.

Morphological characterization:

Horizon Ao = 0-38 cm, gradual passage, light gray color, (10YR7/2), clay texture, subangular polyhedral structure, weak effervescence, plastic, adhesive, compact, dry.

Horizon A/B = 38-75 cm, gradual passage, gray-brown (10YR5/2), clay texture, poorly developed subangular polyhedron structure, weak effervescence, plastic, adhesive, compact, dry.

Bv horizon = 75-122 cm, gradual passage, gray-brown (7.5YR6/2), clay texture, subangular polyhedral structure,

weak effervescence, plastic, adhesive, compact, dry.

B/C horizon => 122 cm, gradual passage, gray-brown (7.5YR5/2), clay texture, subangular polyhedral structure, moderate effervescence, plastic, adhesive, compact, wet.

Physical characteristics:

On the Ao horizon, the apparent density is low, the total porosity is high, the soil undisturbed, the weaning coefficient is small, the permeability is medium.

On the A / B horizon the apparent density is moderate, the total porosity is moderate, the soil is poorly tared, the wilting coefficient is medium, the permeability is moderate.

On the horizon Bv and B/C the apparent density is moderate, the total porosity is moderate, the soil is poorly tared, the wilting coefficient is moderate, the permeability is moderate.

Chemical characteristics:

On the horizon Ao the soil reaction is weak basic, the total nitrogen content is low, the content in mobile phosphorus is moderate, the content in mobile potassium is moderate, the nitrogen index is low, the humus content is low.

On the A / B horizon the soil reaction is poorly basic, the nitrogen content is very low, the content in mobile phosphorus is very low, the content in mobile potassium is low, the nitrogen index is low, the humus content is very low.

On the horizon Bv and B/C, the soil reaction is weak basic, the total nitrogen content is very low, the content in mobile phosphorus is very low, the content in mobile potassium is small, the nitrogen index is low, the humus content is very low.

Table no. 1

Physical properties

Horizons	Depth	Thick sand	Fine sand	Silt	Clay	Textural	Carbonates
----------	-------	------------	-----------	------	------	----------	------------

	cm	(2-0.2mm)%	(0,2-0,02mm) %	(0,02- 0,01mm) %	<0.002mm)%	class	%
Ao	0-38	3.8	45.5	8.7	30.2	LL	6.5
A/B	38-75	2.3	36.9	10.6	35.4	TT	14
Bv	75- 122	0.8	9.7	6.7	51	AP	38
B/C	>122	0.2	70.3	8.1	15.8	SF	20.8

CONCLUSIONS

Following the agrochemical and physical study on the Eutric cambosol from Brabova establish the quality status, the following conclusions are obtained:

-Soil profile: the soils are brown and podzolic browns, moderately podzolic clayey soils, alluvial soils and alluvial soils that are frequently gelled.

-On the Ao horizon, the apparent density is low, the total porosity is high and in the A / B horizon the apparent density is moderate, the total porosity is moderate.

-On the horizon Bv and B/C the apparent density is moderate, the total porosity is moderate.

-On the horizon Ao the soil reaction is weak basic, the total nitrogen content is low, the content in mobile phosphorus is moderate, the content in mobile potassium is moderate, the nitrogen index is low, the humus content is low.

-On the A/B, Bv and B/C horizon the soil reaction is poorly basic, the nitrogen content is very low, the content in mobile phosphorus is very low, the content in mobile potassium, the nitrogen index is low, the humus content is very low.

BIBLIOGRAPHY

1. Buzatu Gilda Diana, Dodocioiu Ana Maria. 2015. Research regarding agrochemical characteristics and heavy metals content in a vineyard soil, *Journal of Horticulture, Forestry and Biotechnology*, Volume 19(1), pp. 201- 206.
2. Dodocioiu Ana Maria, Romulus Mocanu and Marian Dobre, 2012-The Long Term Evolution of Phosphates from the Cambic Chernozem at ARDS Caracal, Romania, *Journal of Life Sciences* 6 (2012) 557-562.
3. Dodocioiu Ana Maria, Mocanu R., 2007-Agrochimie, Editura Sitech, Craiova.
4. Florea N., I. Muntean, 2012-Sistemul Roman de Taxonomie a Solurilor din (SRTS) Editura Sitech Craiova
5. Irimia Liviu Mihai, 2012-Biologia, ecologia si fiziologia vitei de vie Editura Ion Ionescu de la Brad.
6. Oșlobeanu M., Macici M., Georgescu M. and Stoian V., 1991. Zonarea Soiurilor de Viță de Vie în România. Ed. Ceres, București.