SOME PHYSICAL AND CHEMICAL CHARACTERISTICS OF THE SOILS FROM LIPOVU-DOLJ COUNTY

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ABSTRACT

The purpose of this paper is to present some physical and chemical characteristics of a soil profile from Lipovu, Dolj County. The soil is Eutricambosol molic, proxicalcaric, strongly deep, moderately skeletal, with a clay / loamy-clay texture formed on disaggregation-alteration materials. In this paper, the physical and chemical characteristics of the soil profile were analyzed.

INTRODUCTION

Through its specific functions, as a support and the source of life of higher plants, soil is one of the essential factors of the biosphere, on which the physical existence of man depends, as well as the possibility of its development. For the cultivated plants the soil constitutes a support for the growth of the root system, reservoir of nutrients and intermediary for the application of fertilizers and amendments (Dodocioiu,2007).

The quality of the agricultural land assumes both the soil fertility and the influence of other environmental factors on crops (Dodocioiu, 2012).

Maintenance of good soil quality is of prime importance for sustainable agriculture. Soil quality plays a vital role in soil fertility and primary production through organic matter decomposition and nutrient cycling (Buzatu, 2015).

Soil quality is determinate by the limiting factors of agricultural production, of which the most important are: soil through its physical, hydro-physical and agrochemical properties, topography (size slope and its orientation, or the presence of landslides), groundwater and climate (Buzatu, 2015).

MATERIALS AND METHODS

The geographical location of Lipovu commune is determined by the coordinates, latitude 44.10 and longitude 23.6333

The topometric elevations relative to the sea level are in Lipovu village of 75 m.The climate is temperate-continental, plain, with an average annual temperature of 11 degrees Celsius.

The average annual rainfall is between 500 - 550 mm.The groundwater is, on average, 10 m.The areas of arable land were in Lipovu commune in 2002 of 4076 ha, of which 2995 ha arable land, 313 ha vineyards, 245 ha pastures and 523 ha non-agricultural.

For the purpose of this paper a soil profile was developed in Lipovu commune, Dolj county.

The name of the territorial unit of the soil is Eutricambosol molic, proxicalcaric, strongly deep, moderately skeletal, with a clay/loamy-clay texture formed on disaggregation-alteration materials.

Agrochemical properties of soils are a key factor in determining the degree of fertility, so their productive potential and also to develop measures to improve agrochemical and increasing fertility through the use of chemical and organic fertilizers (Dodocioiu, 2013).

From this soil profile, samples were taken and analyzed from a chemical and physical point of view:

-total nitrogen (%) by Kjedahl method;

- humus (%) by wet oxidation after Walkey and Black method modified by Gogoasa;

-pH potentiometric in aqueous suspension in a ratio of 1: 2.5;

- mobile phosphorus by the Egner-Rihm-Domingo method;

- mobile potassium by flame photometry;

The analysis methods are the methods developed by the National Institute of Pedology, Agrochemistry and Environmental Protection in 2011 (Dumitru & Manea, 2011).

RESULTS AND DISCUSSION

Name: Eutricambosol molic, proxicalcaric, strongly deep, moderately skeletal, with a clay / loamy-clay texture, formed on slope by disrupting–alteration, materials represented by deluvial - colluvial slopes consisting of medium materials, eubasic rocks, arable, with moderate erosion surface area.

Formula: EC-mo-K1-d5- LL(42)/TT(52) Sp- t- NB-A-E11

Supraface:38.80ha;0.82%.

Profile coordinates:

Spread: in the central part of the territory, Lat. 44^0 28' 35.80" N and Long. 23^0 37' 45.46" E.

Surface appearance: hillsides, slope 10%

Altitude: 109 m

Natural conditions in which it appears, hillsides with a slope of 10-15%.

Morphological characteristics:

Horizon Ao= 0-26, gradual passage, dark gray color,(10YR4/3), clay texture, subangular polyhedral structure, low effervescence, plastic, adhesive, compact, dry.

Horizon A/B=26-40 cm,gradual passage, gray-brown color, (10YR 5/2), clayey texture, poorly developed subangular polyhedral structure, weak effervescence, plastic, adhesive, compact, dry.

Horizon Bv = 40-64 cm, gradual passage, gray-brown color, (7.5YR6 / 2), clayey texture, subangular polyhedral structure, low effervescence, plastic, adhesive, compact, dry.

Horizon B/C=64-85cm, gradual passage, brown - gray, (7.5 YR5 / 2), clayey texture, subangular polyhedral structure, moderate effervescence, plastic, adhesive, compact, radish.

Physical characteristics are presented in table 1.

On the Ao horizon, the apparent density is low, the total porosity is high, the soil is not cleared, the wilting coefficient is moderate, the permeability is medium.

On the A/B horizon, the apparent density is high, the total porosity is low, the soil moderately compacted, the wilting coefficient is high, the permeability is low.

On the horizon Bv, the apparent density is high, the total porosity is low, the soil is moderately tared, the wilting coefficient is high, the permeability is low.

Chemical characteristics are presented in table 2.

For the Ao horizon, the soil reaction is weakly basic, the total nitrogen content is moderate, the mobile phosphorus content is very low, the mobile potassium content is low, the nitrogen index is moderate, the humus content is moderate.

On the A / B horizon, the soil reaction is weak basic, the total nitrogen content is

very low, the content in mobile phosphorus is very moderate, the content in mobile potassium is very low, the nitrogen index is low, the humus content is very low.

For the Bv and B/C horizons, the soil reaction is weak basic. In Bv horizon, the total nitrogen content is very low, the mobile phosphorus content is very low, the mobile potassium content is low, andthe humus content is moderate.

Table 1

Physical properties

Horizons	Depth	Thick sand	Fine sand	Silt I	Silt II	Clay
	cm	(2-0.2mm)%	(0,2-0,02mm) %	(0,02- 0,01mm) %	(0,01- 0,002mm) %	<0.002mm) %
Ao	0-26	4	100	9.7	13.4	40
A/B	26-40	3.8	32.2	9.8	11.3	42.9
Bv	40-64	3.3	29.5	10.4	13.2	43.6
B/C	64-85	3.8	38.3	11.4	11.1	35.4
Horizons	Depth	Da	D	Pt	CO	EU/CC
	cm	gr/cm.c.)	gr/cm.c	(%)	%	%
Ao	0-26	1.28	2.66	51.9	9.8	23.2
A/B	26-40	1.33	2.69	50.5	10	23.4
Bv	40-64	1.52	2.71	43.9	9.8	22.6
B/C	64-85	-	-	-	-	-

Table 2

Chemical properties of the soil from Lipovu

Horizons	Depth cm	pH	Humus %	Nt %	P_{AL} ppm	K_{AL} ppm
Ao	0-26	7.11	2.82	0.138	116	214
A/B	26-40	7.44	1.34	0.072	111	116
Bv	40-64	7.67	1.06	0.06	63	131
B/C	64-85	7.82				

CONCLUSIONS

For physical and chemical characterization of the soil, a soil profile has been studied in the field and in the laboratory. In field the morphological description has been made, on soil horizons and depths as well as micro morphological characterization and, after this process, the soil type has been established, after SRTS (Soil Romanian Taxonomical System, Florea and Munteanu, 2012). In the laboratory agrochemical properties of soils were determined as they are a key factor in determining the degree of fertility, so their productive potential and also to develop measures to improve agrochemical and increasing fertility through the use of chemical and organic fertilizers.

On the Ao horizon, the apparent density is low, the total porosity is high, the soil is

not cleared, the wilting coefficient is moderate, the permeability is medium.
On the A/B horizon, the apparent density is high, the total porosity is low, the soil moderately compacted, the wilting coefficient is high, the permeability is low.
On the horizon Bv, the apparent density is high, the total porosity is low, the soil is moderately tared, the wilting coefficient is high, the permeability is low.
For the Ao horizon, the soil reaction is weakly basic, the total nitrogen content is moderate, the mobile phosphorus content is very low, the mobile potassium content is low, the nitrogen index is moderate, the humus content is moderate.
On the A / B horizon, the soil reaction is weak basic, the total nitrogen content is very low, the content in mobile phosphorus is very moderate, the content in mobile potassium is very low, the nitrogen index is low, the humus content is very low.
For the Bv and B/C horizons, the soil reaction is weak basic. In Bv horizon, the total nitrogen content is very low, the mobile phosphorus content is very low

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