

THE SOILS STUDY IN AVRAM IANCU COMMUNE PERIMETER, ALBA COUNTY

STROIA M.S¹., MAZĂRE V¹., MIHUȚ CASIANA¹, DUMA-COPCEA ANIȘOARA¹

¹University of Agricultural Sciences and Veterinary Medicine of Banat, Timisoara, Calea Aradului nr.119, zip code 300645, e-mail: mariusstroia76@yahoo.com

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ABSTRACT

The village is located in the depression formed by the upper course of Arieșul Mic 46°22' north latitude and 22°49' east longitude with an altitude of 750 m is surrounded by mountains Biharia in NV, Mount Gaina part of V, and Muntele Mare in the NV.

Soil studies and research synthesis that large areas of land are affected by one or more limiting factors and/or restrictive agricultural production.

Physical soil has a loamy texture and bulk density increased with control conditions aerohydric regime.

Agrochemical soil is moderately debazificated acid, following the limits concerned in correcting soil and protection of the reaction (pH). Has an average supply of humus, probably due to the application in the area exclusively manure. Soil fertility and productivity is low.

INTRODUCTION

The village is located in the depression formed by the upper 46°, low to Aries, 22° 22' north latitude, 49' east longitude, altitude is 750 m. It is surrounded by Bihor Mountain in NV, Gaina Mountain in V part, and Muntele Mare in the NV. The village is crossed by the river Arieșul Mic, which had the origin in the village. S of Bihor and is near the top axis of symmetry of the village, just beyond the area to the north, on the south. Accordingly village altitude between 750 and 1848m (Peak Curcubăta Mare), the mountainous varieties conditions in different climatic, topographic and microclimates under natural forest vegetation, interrupted by meadows and arable land, the rock Mothers processes or pedogenesis heterogeneous in space and time triggered differently creating a great diversity of soils. The soil was formed and evolved just substances and influences the flow of energy in a very long time, and always has been held in the soil inputs, outputs or losses, transformation and translocation, organization and reorganization of the compounds etc. under the action of various physical, chemical and biochemical heavily influenced by environmental factors. Synthesis of large studies and soil surveys shows that affected areas of land by one or more limiting factors and/or restrictive of agricultural soil is loamy texture production. Physically and high bulk density with aerohydric conditions regime. Agrochemical control, soil is moderately acid debazificated, enrolling land concerned within the state to redress and protection reaction (pH). Has average year supply of humus, probably due to the application in the area exclusively manure. Soil fertility and productivity is low.

MATERIAL AND METHOD

Samples were processed following analyzes were performed, and used the following methods:

Determination of physical characteristics:

Soil texture was determined by the method Cernikova (principle underlying the method is sedimentation speed pipetting different particles in a liquid, depending on their size, according to Stokes's law).

Determination of chemical characteristics:

Determination of soil humus was performed by methods tritometric respectively Tiurin method.

Principle oxidation is a humus carbonate solution or chromic anhydride potassium dichromate in sulfuric acid presence.

Determination of soil reaction (pH) was performed by the method of potentiometric pH-sensitive glass electrode, at a ratio soil: water 1:2.5;

Degree of base saturation (V) - defines the rate at which colloidal complex is saturated with basic cations.

Low values of V% reflecting strong leaching, respectively debazificated horizons acid reaction and properties of soil less favorable for the growth and development of crop plants.

RESULTS AND DISCUSSION

SKELETI-RENDZINIC LEPTOSOLS

Am - 0 - 18 cm, sandy clay, dark gray, glomelural structure, porous medium with multiple roots at the base

AR - 18 - 30 cm, sandy clay, dark gray, glomelural structure, porous medium , skeletal material frequently

Rn - 30 - 60 cm, compact limestone rock, light colored.

Rendzinic skeletal soil taxonomic unit on compact calcareous, sandy clay/clay sand.

Coarse sand shows higher values in Am orizont (24,2%), dropping to the profile base in AR orizont with the value 18,4%. Fine sand presents values more dropped in Am orizont (38,2%) those increasing in AR orizont with 44,8%. Dust has low values in Am orizont (12,9%), those increasing on the entire profile up to 20,8% in Ar orizont. Largest grain size fraction, clay, has values of 24,7% in Am orizont and 16,0% in AR orizont

Table 1.

Fizical and chemistry properties of skeleti-rendzinic leptosols soil

HORIZONS	Am	AR	Rn
Depths (cm)	0-18	18-30	30-60
Coarse sand (2,0-0,2	24,2	18,4	
Fine sand (0,02-0,02	38,2	44,8	
Dust (0,02-0,002 mm)%	12,9	20,8	
Clay 2 (sub 0,002 mm)%	24,7	16,0	
TEXTURE	LN	LN	
pH (în H ₂ O)	5,70	5,72	
Humus (%)	5,70	5,92	
P mobil (ppm)	0,9	3,9	
K mobil (ppm)	48	52	
Base excenge (SB	12,15	12,29	
Exchangeble hydrogen	3,23	2,29	
Cation excenge capacity	15,38	14,58	
Degree of base saturation	79,00	84,29	

After studying texture triunghiular diagram was determined texture that is sandy loam type the entire profile.

The reaction of the soil is acidic moderately with pH values of 5,70 in horizon Am, 5.72 in the horizon AR The content of humus has middle values with 5,70% in horizon Am, 5,92% in the AR horizon. The content of phosphorus (P) is extremely small with values in the horizon Am 0.9 ppm, the horizon AR with 3.9 ppm. The content of potassium (K) is very small given the following values: horizont Am-48 ppm, horizon AR -52 ppm.

Exchange databases (SB) presents the values: Am horizon-12,15 me/100 g soil 12,29 meV100 g soil in AR.

Exchangeable hydrogen (SH) has small values, namely: in the horizon Am-3,23 meV/100 g soil, AR-2,29 meV/100 g soil. Cationic exchange capacity (T) is more higher in the horizon Am 15,38 me values/100 g soil, dropping into the horizon AR from 14,58 meV/100 g soil.

The saturation degree in the database (V%) having values of 79,00% in horizon Am 84,29% and in the AR horizon 84,36%, we can say that we have a ground submezobazic

Limitative factors of fertility of soil for crops are: volume useful edaphic low (reduced thickness and high content), the ability for useful low water.

Skeleti-rendzinic leptosols lends itself depending on the area where they are located for meadows, groves of trees and forests. These soils are working hard; you can improve by removing fragments of skeleton, erosion and fertilizing with organic fertilizers and minerals.

Districticambosoil typical

Sequence of horizons: A_o-AB-Bv₁-Bv₂-R

Districticambosoil typical soil taxonomic unit, the conglomerates, clays, clay environment/clay dusty environment.

- A_o horizon: 0-23 cm, dark gray (10YR 4/1) when moist and brown gray (10YR 5/1) when dry, clay-medium grain structure small-medium, slightly stable on drying, loose, moderately compact, common roots, neofomation - galleries earthworms, coprolite rare, do not ferment;

- AB horizon: 24-41 cm grayish brown (10YR 4/1), gradual transition;

- Bv₁ horizon: 41-87 cm, dark yellowish brown (10YR 5/4) when moist and brown yellow (10YR 6/3) when dry, large grain structure, thin polyhedral subangular, medium dusty clay, moderately compact, rare roots;

- Bv₂ horizon: 87-120 cm, dark yellowish brown with reddish rust spots (10YR 5/6), polyhedral structure looking rough, dusty clay, moderately weak compact roots rare, frequent bone fragments;

Table 2

Physical and chemical properties of typical districticambosoil

HORIZONS	A _o	A/B	Bv ₁	Bv ₂
Depths (cm)	0-20	20-40	40-60	60-100
Coarse sand (2.0 to 0.2 mm)%	24,3	22,6	21,0	20,1
Fine sand (0.02-0.02 mm)%	42,48	41,95	42,19	44,55
Dust (0.02 to 0.002 mm)%	15,27	18,36	17,27	15,22
Natural clay (less than 0.01 mm)%	16,95	17,09	19,54	20,13
TEXTURE	LN	LN	LN	LN
Bulk density (g/cm ³ YES)	1,53	1,49	1,48	1,46
Humus (%)	3,10	2,12	1,56	1,26
pH in H ₂ O	5,17	5,23	5,37	5,27
Degree of base saturation (V%)	30,2	34,7	59,8	55,1

Of physical soil has a loamy texture and bulk density increased with control conditions aerohydric regime.

The soil is moderately debazificated, following the limits concerned in correcting soil and protection of the reaction (pH). Has an average supply of humus, probably due to the application in the area exclusively manure. Soil fertility and productivity is low.

CONCLUSIONS

Full implementation of the soil covering value will have in mind the actions intended to correct pH (soil acidity), prevent and combat soil erosion, and proper fertilization of the land.

In this type of soil are needed agro-pedo-ameliorative real work leading to improved characteristics of chemical, physical and biological. These works influence soil profile depths exceeding frequently processed layer and their effect remains, on average, 3-7 years or even more.

In order to improve amendment is required in addition to calcium and organic fertilizer application.

On the basis of thorough cartări agrochemical through application of agro-pedo-ameliorative and appropriate cultural, is considering making a aerohidnc regime, as well as balanced as far as possible the improvement of fertility of these soils.

In conclusion, one can say that according to the existing climatic conditions and soil properties of the researched range, there is the possibility of cultivation and development of most agricultural plants that are grown in the area.

BIBLIOGRAPHY

Borlan, Z., Hera, C. -1973, *Methods for assessing soil fertility status for rational use of fertilizers*, Ceres Publishing House, Bucharest.

Duma - Copcea A., Stroia, M. S. - 2007, *Soil Science*, Agroprint publisher, Timișoara.

Ianos, G. – 1995, *Soil Geography*, Part I, Soil Science, Mirton Publishing House, Timisoara.

Ianos, G. – 1999, *Pedogeographic*, Mirton Publishing House, Timisoara.

Miclăuș, V. M. - 1991, *Soil ameliorative*, Dacia Publishing House, Cluj.

Oanea, N., Rogobete, G. - 1977, *General Pedology and ameliorative*, EDP, Bucharest.

Ștefan, V., Duma Copcea, A., Mihuț, C. - 2004, *Pedology - Practical*, Lumina Dr. Tr Severin.

*** 2012 *Romanian System of Soil Taxonomy (SRTS)*, SITECH Publishing House, Craiova.