

STUDIES ON THE IDENTIFICATION AND DESCRIPTION OF MAIN SOILS OF COMMON ȘIȘTAROVĂȚ, ARAD

Mihuț Casiana *, Niță Lucian, Anișoara Duma-Copcea, Okros Adalbert, LaȚo Karel

*University of Agricultural Sciences and Veterinary Medicine of Banat Timișoara. Faculty of Agriculture.
C. Aradului, no. 119. code 300645, e-mail: casianamihut@yahoo.com

Abstract

Șiștarovăț village is located in the geographical area, Lipovei Hills ". This area lies between the plain Vingăi hills to the west and north aisle Mureș southern boundary of the county of Arad in the south.

The landscape is made up of a combination of related peaks sometimes flat and wide, whose absolute altitude is between 180-350 m (peak Ciuha).

Dominant lithologic layer consists of clay marl, sand and gravel from Neogene (Pannonian) located mainly in the village Șiștarovăț.

Longer meet sandstones, shales, conglomerates, limestones net character of Lower Cretaceous detrital especially Feneș valley basins, Canus and Cusminț and macrocalcarea, limestone, silicotic in the hamlet Varnița.

Key words: soil, fertilizers, total nitrogen, phosphorus dynamics, potassium assimilated

INTRODUCTION

Șiștarovăț village was first documented in 1440 that the existing village is located in the south of Arad county at a distance of 42 km from Arad and 8 km from Lipova (the nearest town).

Șiștarovăț common borders in the north with the city Lipova in Dorgoș east of the village, south of the village Brestovăț (county Timiș) and west of the village Zăbrani.

This is common localities villages Cuveșdia, Labășinț and Varnița.

The total area of the municipality is 123 km². In total joint total land area is 12,177 hectares, divided into categories of use.

Boundaries are presented in the body of forest belonging Coast Bad hercinic orogenesis.

MATERIAL AND METHOD

Of soil physical properties were determined:

- Soil texture - Cernikova method;
- Density and bulk density in the laboratory by pycnometer, respectively metallic cylinders;
- Porosity of the soil - was determined by calculation.

Of soil chemical properties were determined:

- Humus content - Tiurin method;
- Soil reaction - by potentiometric method in aqueous extract 1:2,5;

- Total nitrogen content in% - was made by Kjeldahl method (soil mineralization is by boiling with concentrated sulfuric acid in the presence of catalyst);
- Total phosphorus and mobile content was determined by Egner-Rhiem-Domingo on a spectrophotometer UV - VIS;
- Assimilable potassium content - was extracted in ammonium acetate and lactate was determined by atomic absorption spectrophotometer.

RESULTS AND DISCUSSIONS

In natural conditions Şiştarovăţ village, in most soils, especially in the central and southern Lipovei on the tops of hills are composed of clay marl, sand and gravel.

Valley slopes, soils are eroded to varying degrees, the strongest erosion is found on the slopes of the valleys Drauţului, Şiştarovăţului, Big Creek, Camerniţa, remarry, Izvoraşul and so on and on slopes of hills that dominate the alluvial plain of the Mureş.

Degraded soils meet the requirements of woody vegetation and grasslands side all weather conditions correspond to vegetation cover, forests and flasks sky still occupying large areas, especially in the central and eastern part of the territorial unit and the southern part is oak.

The total area of the municipality is 123 km².

In total joint total land area is 12,177 hectares, divided into categories of use as follows:

- Arable - 1569 ha;
- Natural meadows - 829 ha;
- Pasture - 2258 ha;
- Living - 2 ha;
- Orchards - 381 ha;
- Forests - 6427 ha;
- Unproductive land - 15 hectares;
- Land and water reed road - 240 ha;
- Building land - 12 hectares;
- Inside - 416 ha.

Soil types found in the village are;

- Erodosol stalled;
- Luvisol albic;
- Gleysoil.

1. Erodosolul stagnic excessively eroded surface, has the following properties:

- Coarse sand content has ranged between 11,2% and 16,7%, the minimum value encountered in Ao horizon and the horizon IICW₂ maximum value;
- Sand content is higher in the upper horizons and decreases towards the lower minimum IVCW₄ horizon being respectively 33,2%;
- Dust content is 6,75% and 10,7% being the minimum and the maximum horizon to horizon IICW₃ IICW₂.
- Clay content has ranged between 32,0% and 43,6% in Ao horizon to horizon IVCW₄.
- Bulk density, recorded values between 1,26 g/cm³ to 1,32 g/cm³ in horizon C horizon IICW₂;
- Total porosity of the soil has values between 48% and 50% IICW₂ horizon C horizon;
- Aeration porosity has values between 7,80% and 11,34% is very low horizons A/C, IICW₂ and low in horizon C;
- The degree of compaction of the soil indicates a soil depth of 12-44 cm netasat the weak compacted to 44-69 cm depth.

Chemical properties of the soil are the decisive factor in determining the level of production. Soil reaction, has values between 5,80 to 6,25, ie slightly acid in the first 69 cm and between 110-150 cm and moderately acid between 69-110 cm. Humus content varies between 0,37% and 9,56% in the horizon IICW₂, that is small in the horizon C to the first 25 cm high between 25-44 cm and 44-69 cm very small between. Humus reserve is low.

Degree of soil base saturation shows mesobasic in the first 44 cm and eubasic between 44-150 cm.

In regard to supply nutrients, we can say that the soil is well stocked with nitrogen (N); extremely poorly stocked with phosphorus (P) and very sparsely stocked with potassium (K).

2. Luvisol albic plan, stagnogleic, has the following properties:

- Coarse sand content has ranged between 1,5% and 3,3%, the maximum being in the horizon it, and the minimal Bt₂W₄ horizon;
- Sand content has values of 26,3% in the horizon BTW, and 36,4% in the Ap horizon
- Content of dust has values between 9,0% and 17,3%, the minimum value recorded in IICW₃ horizon and the maximum in the horizon it;
- Clay content is minimal in the Ap horizon (43,2%) and maximum BTW horizon (60,5%).

Following the diagram data and triangular texture, soil texture has studied middle between 0-47 cm, 47-60 cm and medium fine between 127-147 cm, 60-180 cm fine between.

- Bulk density is average, with values between 1,42 g/cm³ and 1,47 g/cm³ EaW₂ the horizon the horizon it;
 - Total porosity is small, with values of 40,5% to 44,4% respectively She horizon to horizon EaW₂;
 - Aeration porosity is very low in the horizon It (6,89%) and BtW horizon (8,32%) and low in the horizon EaW₂ (11,76%);
 - The degree of compaction has values between 9% and 20% EaW₂ horizon horizon E/BW₃, poorly compacted soil is between 33-47 cm, 20-33 cm and moderately compacted between heavily compacted between 47-60 cm;
 - Soil reaction is slightly acid in the first 33 cm and between 127-147 cm, moderately acidic and neutral between 33-127 cm between 147-180 cm;
 - Humus content is low and she Ap horizons and extremely small EaW₂ and E/BW₃ horizons. Humus reserve is low.
- Supply of soil nutrients is different depending on the element studied, supply nitrogen (N) is high, the phosphorus (P) is extremely low and the potassium (K) is very small between 20-60 cm and between 127-147 cm, small between 0-20 cm, 60-127 cm and 147-180 cm.
- Degree of soil base saturation indicates mesobasic the first 47 cm, oligomezobazic between 47-60 cm, 60-127 cm and eubazic mesobasic between 127-147 cm.

3. Gley, has the following properties:

- Coarse sand content has values between 0,2 to 1,9%, the minimum is the maximum horizon and the horizon Gr₃ Ao;
- Sand content has values between 37,5 to 41,8%, the minimum is Ao horizons and AoG₂ and the maximum in Gr₃ horizon;
- Content of dust has values between 12,1 to 17,6%, the minimum is A/Go₃ horizon and the maximum in Ao horizon;
- Clay content has values ranging from 41,4 to 46,3%, the minimum is Gr₃ horizon and the maximum in Ao horizon.

Following these analyzes and by studying the texture triangular diagram was determined that this type of soil texture is fine medium (loamy) size fits the profile.

- Apparent density in Go₄ middle and small AoG₂ values between 1,39 g/cm³ and 1,41 g/cm³ AoG₂ the horizon the horizon Go₄.
- Total porosity has values between 43,2% and 45,5% in the horizon Go₄ AoG₂ the horizon, the middle;
- Aeration porosity is very small;
- The degree of compaction is 7% in AoG₂ horizon indicating that poorly compacted soil and 12% in Go₄ horizon, ie compacted soil is moderate;

- Soil reaction is moderately acidic and weakly acidic first 9 cm between 9-100 cm;

- Humus content is low in the first 21 cm and drops from 21-65 cm. Humus reserve is low.

Nutrient supply is different, that the nitrogen is very high, the phosphorus (P) in the first 9 cm medium, small and very small between 9-21 cm between 21-100 cm and the potassium (K) is extremely low during the first 9 cm and smaller between 9-100 cm.

Degree of soil base saturation indicates mesobasic the first 9 cm and eubazic between 9-100 cm.

CONCLUSIONS

Șiștarovăț village has a total area of 123 km², of which total land area is 12,177 ha, spread over different categories of use.

The main soil types identified within the village are: Erodosol stalled; luvisol albic and gley soil.

1. Erodosolul stagnated, the reaction is slightly acid in the first 69 cm and between 110-150 cm and moderately acid between 69-110 cm. Humus content is low in the first 25 cm high between 25-44 cm and 44-69 cm very small between. Humus reserve is low. Soil is mesobasic in the first 44 cm and eubazic between 44-150 cm. Nutrient supply is good nitrogen (N), very low phosphorus (P) and very low in potassium (K).

2. Luvisol albic, has a slightly acid reaction in the first 33 cm and between 127-147 cm, moderately acidic and neutral between 33-127 cm between 147-180 cm. Humus content is low and she Ap horizons and extremely small EaW2 and E/BW3 horizons. Humus reserve is low. Supply of soil nutrients is high in nitrogen (N), extremely low phosphorus (P) and very low in potassium (K). Soil is mesobasic in the first 47 cm, 60-127 cm respectively; oligomezobazic between 47-60 cm and 127-147 cm eubazic between.

3. Gley soil, the moderately acidic reaction in the first 9 cm and slightly acid between 9-100 cm. Humus content is low. Humus reserve is low.

Nutrient supply is very high nitrogen (N), medium phosphorus (P) and extremely low potassium (K). Soil is mesobasic the first 9 cm and eubazic between 9-100 cm.

REFERENCES

1. Blaga Gh., I. Rusu, S. Udrescu, D. Vasile, 1996, Pedology. Didactic and Pedagogic Publishing House, Bucharest.
2. Borlan Z., et al., 1994, Fertility and land use (Compediu of Agrochemistry), Edit. Ceres.

3. Bunescu V., et al., 1988, Course of Soil Science, Tipo, Agronomic Institute Cluj Napoca.
4. Canarache A., 1990, Soil Physics, Ceres Publishing House, Bucharest.
5. Chiriță C.D., 1974, Ecopedological with general soil science base, Ceres Publishing House, Bucharest.
6. Chiriță CD, 1976, loam soil, Scientific Publishing House, Bucharest.
7. Conea A., 1977, Glossary of soil science, Scientific Publishing House, Bucharest.
8. Drăgan I., 1981, Pedology, Lito IAT, Timișoara.
9. Drăgan I., I. Rusu, 1990, Course of Soil Science, Lito IAT, Timișoara.
10. Drăgan I., 1990, Soils Romania, Lithography USAMVB Timișoara.
11. Ehrler, II, 1986, banned from origins to now. Publisher Facla Timisoara.
12. Ianoș Gh, 1995, Soil Geography, Part I, Soil Science, Ed Mirton, Timișoara.
13. Kacinski N.A. - Soil and attributes his State Ed scientific literature, Bucharest, 1953
14. Mihuț Casiana, Iaroslav Lațo, 2007, Pedology. Methods of analysis. Gutenberg Publishing Universe Arad.
15. Niță Lucian Dumitru, 2007, Pedology, Eurobit Publishing House, Timișoara.
16. Obrejanu Gr, Șt. Puiu, 1972, Pedology, Didactic and Pedagogic Publishing House, Bucharest.
17. Rogobete Gh, 1993, Soil Science, Volume I, Fundamentals of soil science, Ed Mirton, Timisoara.
18. Rusu I., M. Goian, Gh Ianoș, I. Borza, V. Ștefan, 1994, anthropogenic influence on some physical properties of soils in Banat, publications SNRSS no. 28 A Bucharest.
19. Șorop Gr., 1991, Soil Science, Univ Lito. Craiova.
20. Puiu Șt. et al., 1983, Pedology. Edit. Did. and Ped., Bucharest.
21. Ștefan V., 2000, Ecopedological. Edit. Marineasa, Timisoara.
22. Țărău D., 2003, Theoretical and practical aspects of land evaluation bonității and pedological perspective, Ed Solness, Timisoara.
23. Varga, E., 2002, Statistics census as mother tongue or nationality, Arad County from 1880 to 2002.