SOIL RESOURCES OF THE DOMAŞNEA COMMUNE, CARAŞ – SEVERIN COUNTY

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Abstract. *The present paper refers to the land pertaining to the cadastral territory of the Domaşnea commune, in Caraş-Severin county, respectively the soils identified in the mentioned perimeter. It is studied in relationship with the environmental factors that condition its existance, together forming homogenous ecological territory units (UT or TEO) which display specific abilities in different agricultural or silvicultural uses and with specific amelioration technologies and requirements. The present study aims at: - identifying, outlining and inventorying soil-land units, resulting in outlining a map and the legend of the soil and land units. - characterizing the identified soil units outlined on the map morphologically, physically, hygrophobically and chemically. - assessing the lands and establishing the favour ability for the main crops - highligting the nature and intensity of the limiting and/or restrictive factors of the agricultural production. - gouping lands depending on their appropriatenss for various uses (tillable, grassland, hayland etc.). - establishing usage categories and subcategories for agriculture or forestry based on the land appropriateness. - determining the soil provision/insuring with nutrients, as well as soil reaction (agrochemical soil characterization). - identifying, outlining and inventorying soil/land degradation types, establishing land restrictions for various uses and establishing proper agropedoameliorative and antiemotional measures. The Domaşnea commune territory leas in Caraş-Severin county, at about 45 km from Caransebeş and about 60 km from Orşova. The Domaşnea commune is made upmif the villages Cănicea and Domaşnea, which is also the commune administrative center and is surrounded by: - to the north – the communal territory of Teregova - to the west – the communal territory of Luncavița - to the south-west the communal territory of Mehadica - to the south - the communal territory of Cornea - to the east - the communal territory of Cornereva. The following were determined through various calculus methods: - total porosity, PT(%) - air porosity, PA % wilting coefficient, CO % - field capacity, CC% - total capacity, CT % - useful water capacity, CU% - maximum yield capacity - compaction degree GT (%) - humus reserve (t/ha) - nitrogen index I.N. - alkali saturation degree V%*

Key words: *yield, soil type, nutrients, soil characteristics*

INTRODUCTION

The Domaşnea commune perimeter is part of the Domaşnea-Mehadia Depression, situated in the Timiş-Cerna intermontane valley, in the west of the Meridional Carpathians.

The Domaşnea-Mehadia Depression is located between the Semenic Mountains to the west, the Cernei Mountains to the east, the Oriental Gate to the North and the Almăjului Depression to the south-west. Since it is situated in the Cernei Basin, the area is also called the Cernei Depression.

The passage from mountain to depression is achieved by formations of steps crossed by various valleys. The great difference between the steps, on one hand, and the depth of the valleys of each step, on the other, lead to the formation a very wrought up relief, with the aspect of tectonic formations functioning as hills.

The part located in the centre of the depression lies on the lowest steps. The relief here is less wrought up as compared to the higher area of the depression.

The researched perimeter is situated on the side of the lower depression steps. It occupies the terminal slope surfaces, which include or form the depression or the intermontane valley

The eastern versant has generally abrupt slopes. A series of valleys oriented from east to west create a compartmentalisation aspect where secondary versants occur except for to the north and south. The northern slopes are gentle ones, while the southern slopes are more abrupt. The valleys thus formed present an asymmetric profile.

The western side of the depression, as a whole, is gentler, crossed by valleys which were originally oriented from west towards east, but on the researched territory they end up oriented from north-west towards south-east. These valleys created relief forms with longer hill aspect, with narrow ridges and versants oriented from east towards west. The ones oriented towards west are shorter with abrupt inclination, the ones with eastern orientation occupy larger widths with a generally gentle slope. Sometimes, the slope of these versants presents undulations creating a microrelief that froms rounded steps.

Some of the ridges are wide, and the versants present gentle slopes.

The relief forms from the western side of the depression present a certain degree of pleneplain formation, characterised by a slight elongation of the ridges and valleys.

Regarding the erosion, one observes that, even though the terrains are located on slopes of different sizes, the surface erosion is slow. The soils are in a balanced situation. The influence of land inclination is more obviously manifested in the podzolozation degree. However, there are also portions with deep erosion, which generated cloughs and furrows here and there. The most important part of these are inactive, some, however, are still active.

Another effect regarding relief elements occuring in the researched perimeter is landslide.

In the lot located north from the Domaşnea village centre, a land portion is affected by recent and active landslides. South of the village centre, a land portion was delimited with old, stabilised slides. These can become active if the equilibrium state of the versants is shaken.

MATERIAL AND METHOD

Agricultural land assesment represents an operation of in depth knowledge about plant growth, development and fruitition conditions and the condition for the determination of their favorability degree for certain crops (or usage categories), through a system of indices, techniques and assessment grades.

As such, assessment determines to which degree a soil is better than the other, given its fertility, reflected by the productions it ensures.

The harvest quantity obtained per surface unit, thus the agricultural land productivity, depends on the entire environment condition ensemble, as well as man's influence, which can positively modify natural factors or the planet's attributes so as to better capitalize natural conditions.

The assessment methodology (elaborated by ICPA Bucharest, 1979, 1987) is based on the definition and parametric determination of the action environmental conditions and vegetation factors exert upon the growth of plant production and the numerical determination of the favorability degree of the factor and ecologic condition ensemble.

For the assessment grade calculation, of the multitude of environmental conditions characteristic for each land unit (U.T. and T.E.O.) delimited by the pedologic study, we selected the most important ones, easier and more precise to measure, called assessment indicators:

- indicator 3C – annual average temperature – corrected values
- indicator 4C - annual average precipitations – corrected values
- indicator 14 – gleization
- indicator 15 – pseudogleization (stagnogleization)
- indicator 16 sau 17 – salinization or alkalization
- indicator 23A – texture in Ap or the first 20 cm
- indicator 29 – pollution
- indicator 33 – slope
- indicator 38 – slides
- indicator 39 – underground water depth
- indicator 40 – floodability
- indicator 44 – total porosity in the restrictive horizon
- indicator 61 – total CaCO3 content on 0-50 cm
- indicator 69 – alkali saturation degree in Ap or 0-20 cm
- indicator 133 – useful edaphic volume
- indicator 144 – humus reserve in the 0-50 cm layer
- indicator 181 – stagnant (surface) humidity excess
- indicator 271 – land improvement arrangements

The assessment grade for usages and crops is obtained by multiplying with 100 the product of the coefficients (the 17 indicators) which directly participate in the establishing of the assessment grade.

$$Y = (x1, x2, x3…..x17) \ . \ 100$$

Where:

Y = assessment grade

x1, x2, x3…..x17 = coefficient value (17 indicators)

For example, when all the indicators show a coefficient value equaling 1, the assessment grade's value is maximal, that is 100.

Even if only one of the indicators shows the coefficient 0 (zero) the assessment grade is 0 (zero) because any value multiplied by zero equals zero.

RESULTS AND DISCUSSIONS

The Domaşnea commune territory is situated in the Caraş-Severin county, at a ca. 45 km distance from Caransebeş and ca. 60 km away from Orşova. The Domaşnea commune is made up of the villages Cănicea and Domaşnea which is also the administrative center of the commune, and is surrounded by the following neighbours:

- to the north – the communal Teregova territory
- to the west – the communal Luncaviţa territory
- to the south-west - the communal Mehadica territory
- to the south- the communal Cornea territory
- to te east- the communal Cornereva territory.

The total surface of the researched territory is of 4,317.45 ha, distributed on usage categories according to the table

Surface structure for the main usage categories

Specification	Tillable	Grassland	Hayland	Vineyards	Orchards	Agricultural
Ha	422.45	1499.85	1569.38	0.1	825.67	4317.45
%	9.78	34.74	36.35	-	19.13	100.00

Within the researched perimeter, the following soils were identified:

1. CLASS PROTISOILS

- Eutric regosol
- Eutric molic regosol
- Eutric molic alluvisoil slightly gleyic
- Eutric gleyic alluvisoil, moderate gleyic
- Eutric gleyic alluvisoil, highly gleyic

2. CLASS CAMBIC SOILS

- Typical eutricambic soil
- Molic eutricambic soil
- Molic stagnic eutricambic soil
- Typical districambic soil

3. CLASS LUVISOILS

- Typical preluvosoil
- Typical preluvosoil moderately eroded by water
- Stagnic preluvosoil, moderately stagnogleyic
- Stagnic luvisoil, slightly stagnogleyic
- Stagnic luvisoil, moderately stagnogleyic
- Stagnic luvisoil, highly stagnogleyic, moderately eroded by water
- Stagnic umbric luvisoil, slightly stagnogleyic

Current agricultural land distribution on usage favorability classes

Nr. crt	Crop type	Total ha	Current agricultural land distribution on favorability classes ha / %									
			Cl. 1	Cl.2	Cl.3	Cl.4	Cl.5	Cl.6	Cl.7	Cl.8	Cl.9	Cl.10
1	TL	4317.45	--	--	--	--	26	1132.35	1476.35	1103.7	430.5	148.55
	%		--	--	--	--	0.61	26.23	34.20	25.57	9.98	3.44
2	OR	4317.45	--	--	--	26	747.35	1280.15	1187.1	641	287.3	148.55
	%		--	--	--	0.61	17.31	29.66	27.5	14.85	6.66	3.44
3	VI	4317.45	--	--	--	--	--	195.65	135.8	422.55	2107.6	1455.85
	%		--	--	--	--	--	4.54	3.15	9.79	48.82	33.72
4	HL	4317.45	--	88.50	1087.15	1974.05	817.8	58.30	143.7	121.3	26.65	--
	%		--	2.05%	25.19	45.73	18.95	1.36	3.33	2.81	0.62	--
5	GL	4317.45	--	1513	1636.70	296	672.7	51.1	121.3	26.65	--	--
	%			35.05 %	37.91	6.86	15.59	1.19	2.81	0.62	--	--

A. Limitations due to some chemical soil characteristics;
B. Limitations due to some physical soil characteristics
C. Limitations due to erosions or landslides

D. Limitations due to land unevenness, rock and boulder coverage
E. Limitations due to humidity excess
F. Limitations due to temperature (low, high)

CONCLUSIONS

The agricultural land within the researched space, covering a surface of 4,317.45 ha undergoes the following usages:

- tillable = 422.45 ha – 9.78 %
- grassland = 1,499.85 ha – 34.74 %
- hayland = 1,569.38 ha – 36.35 %
- vineyard = 0.10 ha – -
- orchard = 825.67 ha - 19.12 %

Regarding the distribution of the agricultural land in quality (fertility) classes for the "tillable" usage category, the situation is as follows:

- 3rd class = 204.80 ha – 48.48%
- 4th class = 179.45 ha – 42.48%
- 5th class = 38.20 ha – 9.04%

Limitative factors which influence the soil cover are mainly represented by: acidity, humus reserve, texture, compaction, upward force, useful edaphic volume, land rock coverage, land unevenness, underground water excess, versant humidity excess, slope, erosion, slides, climate (temperature + humidity deficit).

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