THE ASSESSMENT AND CHARACTERIZATION OF THE AGRICULTURAL LANDS FROM BECHERECU MIC FOR PASTURE AND HAYFIELD USAGE

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Abstract: *The land assessment means to estimate it performances for specific purposes, involving the comparison between lands for a certain usage and/or the comparison of the usage variants. This is an essential, central activity of the land management, a major, increasing importance field in the last period worldwide and in our country too, especially considering the transition conditions to a functional market economy (Ianoş Gh. et al., 1997; Ianoş Gh., 2006; Teaci D., 1980). During the time, there was appealed to different expressions to define the field of land assessment: land classification, site classification, site quality classification, soil resources classification, soil graduation (ranking), site evaluation, technical potential rating of soils, soil/land potential assessment etc. Against the aspects already mentioned, it is obvious that the field of land assessment comprises both the technical dimension with all its attributes and characteristics and the economic aspect with its laws and not in the last place the social perspective with all the defining elements of the sustainability. According to this conception, the determination of yield capacity of the lands and also the settlement of their improvement technologies can be realized only by a good cognition of the soil cover for a specific territory of interest, with all physical, chemical, biological and respectively agro-productive features of the favorable and limitative productivity factors. The pedological settlement of the assessment operations highlights that earth is extremely differentiated within a territory because of diversity of the environmental factors and conditions. As well, the plants that grow within a certain territory are very different and each of them requires specific conditions to develop and give appropriate crops. The determination of the vegetation factors and of environmental conditions existing on each land area for a certain plant or usage represents the capacity to correctly establish by soil potential rating notes and fertility classes (capability) or, more exactly, the yield capacity of that homogenous land area. The soils within the territory of Becicherecu Mic are the result of the interaction between all pedogenetic factors, among which the predominant are the clime, the relief, the water, the parent rock, the vegetation, and the human being. The whole surface is 4668,5 ha, whence: pastures 428 ha-9,16%, hayfields 510 ha-10,9%. The soil genesis and evolution in this territory manifest during the time several stages, reflected by the two existing geomorphological units themselves. Thus, the high plain, the oldest form, presents evaluated soils as follows: chernozem, cambic chernozem, phaeozem, calcic luvisol, gleysol and eroded soils (erodosol, SRCS 2003). Where the underground water is at 2-5 meters, there were observed gleysation processes from moderate (in the case of valley lines) to wet-phreatic. In the case of the negative land forms, the pluvial water caused low processes of pseudo-gleysation. The sloping lands were affected by low to strong surface erosion processes, directly correlated to slope inclination. By analysis and data interpretation we can enounce that the soils within this commune could be classified for pasture and hayfield usage as follows: Fluvisol (class IV – pastures, class VI - hayfields); Anthropic regosol (class III – pastures, class VI – hayfields); Chernozem (class VII - pastures, class V - hayfields); Eutric cambisol (class VII – pastures, class VIII - hayfields); Haplic and calcic luvisol (class V- pastures, class VII - hayfields); Vertisol (class V- pastures, VI – hayfields); Gleysol (class VI - pastures, class VIII – hayfields); Solonetz (class X – pastures, X – hayfields); Eroded soils (class IX- pastures, X – hayfields).*

Key words: *land assessment, environmental factors, potential rating notes, land usage categories.*

INTRODUCTION

For a better knowledge of the land usage types and of the expense optimization it is studied the land production capacity. The mathematical analysis and calculus provide data about the possibility that a certain plant give maximal or minimal output in a specific soil type. As well, the factors with significant role in this process are also important because they qualitatively and quantitatively influence the yields. As a result of these studies it can be taken improvement measures of the agricultural land on a specific propagation area.

MATERIAL AND METHODS

Soil sampling was made according to the methodology of pedological study elaboration, vol. I, II, III – ICPA Bucharest-1987 in natural position. The preparation for analysis was made within the Office of pedological and agrochemical studies Timişoara. The analysis methods were according to the required STAS.

RESULTS AND DISCUSSION

The soils within the territory of Becicherecu Mic are the result of the interactions between all the pedogenetic factors, among which predominated the clime, the relief, the water, the parent rock, the vegetation, and the human being.

The soil genesis and evolution in this territory manifest during the time several stages, reflected by the two existing geomorphological units themselves.

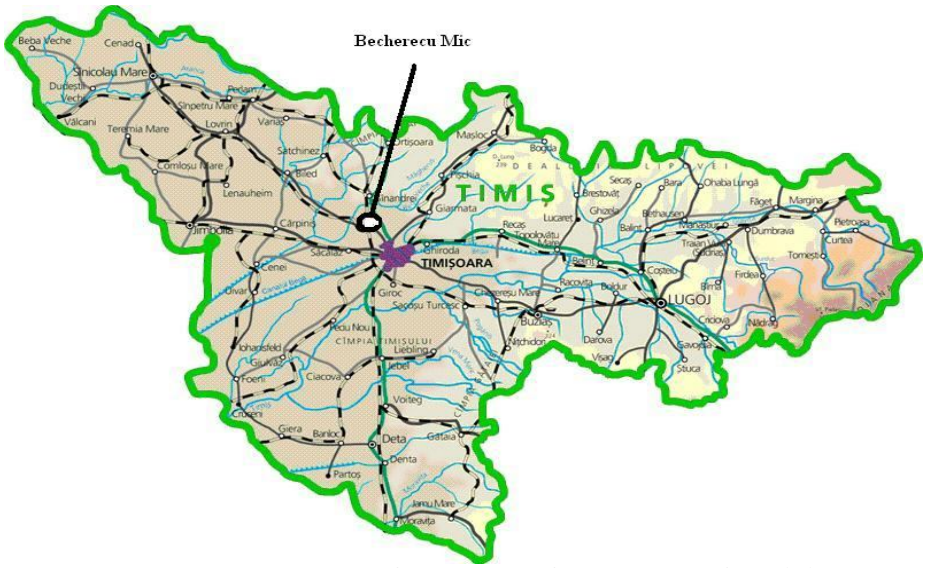

Figure 1. The geographical placement of the Commune of Becicherecu Mic from Timiş County

Thus, the high plain, the oldest form, presents evaluated soils as follows: chernozem, fluvisol, anthropic regosol, eutric cambisol, haplic and calcic luvisol, vertisol, gleysol, solonetz and eroded soils. Where the underground water is at 2-5 meters, there were observed gleysation processes from moderate (in the case of valley lines) to wet-phreatic. In the case of the negative land forms, the pluvial water caused low processes of pseudo-gleysation. The sloping lands were affected by low to strong surface erosion processes, directly correlated to slope inclination.

It must be noticed the presence of small amounts of harmful salts (CO_3) at the basis of soil profiles, fact that determined depth or low intensity salinization. This process is obvious in the eroded areas or in the transition zone between the high plain and low plain.

The low plain, the youngest geomorphological form in the territory presents three great well distinct stages of soil formation and evolution.

1. Stage of swamp and swamping, which started with the last submergence that took place in Holocene, after what were formed lacustrian extended and swamp zones. This stage is characterized by an almost permanent process of humidity excess which led to hydromorphic soils, soils which can be found even today especially in the lands with negative forms of microrelief.

2. Stage of semi-wet fallow, when in the zone started the drainage because the basal level of the underground water decreases and allows the installation of hygrophile or mesohygrophile luxuriant vegetation. In this stage started the drainage of the hydromorphic soils and the formation of the soils such chernozems and cambic chernozems grounded on loess deposits and recent loams, on elevated terrains.

3. The stage after the starting of hydro-improving works (approximately 200 years ago) when the level of the underground water was much lower than the anterior stages but not sufficient to stop the negative influence caused by the humidity excess in the soil.

It must be specified that the drainage action of the area has been continued more intense in our days, the last being the realization of the draining system put into function approximately 10 years ago. There were noticed until present a decrease of the underground water level with about 50 cm than 20-25 years ago. It is recommended the permanent monitoring of the phreatic level downs under the critic level by continuous improvement of the actual draining system.

In the low plain, in the context of permanent oscillations of the underground water level, of its quality, of the microrelief and climate conditions, of the granular composition and of the other pedogenetic factors, there were found: chernozem, fluvisol, anthropic regosol, eutric cambisol, Haplic and calcic luvisol, vertisol, gleysol, solonetz and eroded soil.

Characteristic to these soils are the gleysation processes by different intensities, corrected by the level of underground water.

Of great importance are the secondary salinization processes and especially those of secondary alkalization. It is estimated that in the last time the soil surfaces affected by salinization and alkalization increased, because both of concentration augmentation of harmful salts in the underground water, of the permanent oscillation of these waters and sometimes of their utilization in irrigations. For these processes there are required and adequate control of the water circulation and the accomplishment of the restrictions enounced by the technologies specific to these soils.

As a result of the performed studies it could be said the following: the whole surface of the researched perimeter is 4668,5 ha, whence: arable lands 3710,3 ha-79,49%, pastures 428 ha-9,16%, hayfields 510 ha-10,9%, vineyards 1 ha-0,03%, orchards 3 ha-0,06%, forests 2 ha-0,05%, waters 13,7 ha-0,29%, non-productive lands 0,5 ha-0,02%.

By analysis and data interpretation we can enounce that the soils within this commune could be classified for pasture and hayfield usage as follows:

Fluvisol (class IV – pastures, class VI - hayfields); Anthropic regosol (class III – pastures, class VI – hayfields); Chernozem (class VII - pastures, class V - hayfields); Eutric cambisol (class VII – pastures, class VIII - hayfields); Haplic and calcic luvisol (class V- pastures, class VII - hayfields); Vertisol (class V- pastures, VI – hayfields); Gleysol (class VI - pastures, class VIII – hayfields); Solonetz (class X – pastures, X – hayfields); Eroded soils (class IX- pastures, X – hayfields).

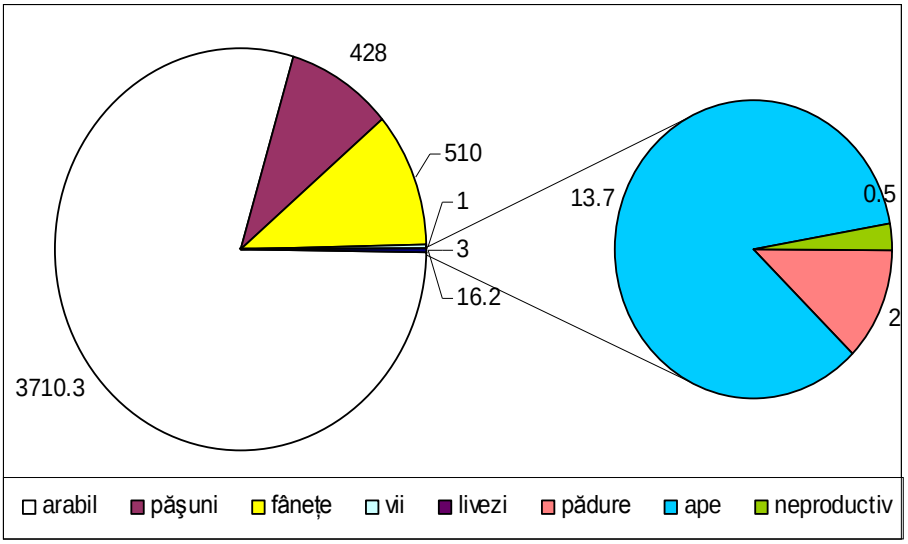

Figure 2. The graphic distribution of the land surfaces (ha)

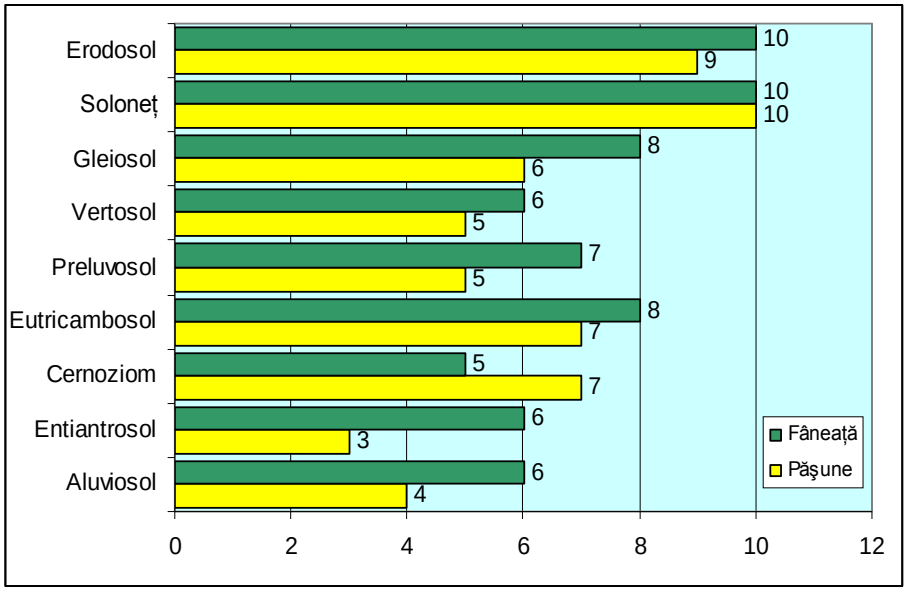

Figure 3. Classification based on capability classes for pastures and hayfields

CONCLUSIONS:

The agrotechnical measures require a specific system of soil working with large restrictions of mechanization because of soil compactness associated with moderate restrictions caused by the carrying capacity.

- energy content is high, and the optimal period of working is short.

- requires a common fertilization system, the fertilizer amounts are in accordance to fertilization plan.

- the capability to irrigations presents moderate restrictions because of rain humidity excess.

- in the low productive lands must be cultivated only the plants having an optimal output enounced by the potential rating notes.

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