THE RELATION GLEYSOILS – HUMIDITY EXCESS IN THE TIMIŞ-BEGA PLANE

RELAŢIA GLEIOSOL – EXCES DE UMIDITATE ÎN CÂMPIA TIMIŞ-BEGA

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de Abstract:Working – out the maps for humidity excess required for the drainage works from the year 1970 was made based on the pedological studies of that period when, Gleysoils Eutric and Mollic was consider to cover very large areas. The actual studies reveal for Gleysoils Eutric and Mollic a much smaller surface and as a consequence a demand for the drainage and humidity excess works very reduced.
The paper presents the expansion, properties and causes that led to the formation of Eutric and Mollic Gleysoils in the Down Plane and also the required improving measuresumiditate necesary.

Rezumat: Elaborarea unor hărţi ale excesului lucrărilor de desecare şi drenaj din anii 1970 s-a făcut pe baza studiilor pedologice existente în această perioadă în care Lăcovişţea ocupa o suprafaţă foarte mare. Studiile actuale relevă pentru Gleiosol o suprafaţă cu mult mai mică şi în consecinţă cerinţa pentru lucrările de eliminare a excesului de apă este mult diminuată. Lucrarea prezintă extinderea, proprietăţile şi cauzele formării Gleiosolurilor din Câmpia Joasă, precum şi măsurile ameliorative specifice.

Key words: Gleysoils*, water, excess, drainage, improvement.*
Cuvinte cheie*: Gleiosol, apă, exces, drenaj, ameliorare.*

INTRODUCTION

The definition of the water excess in soil notion, knows more ways of approach. From the hydro amelioration point of view it is considered excess water, the water that exceeds the soil retention capacity and flows into the drain. In the agronomical acceptation the humidity excess appears when the humidity content is higher then 30% from the total soil volume.

In Soil Science (Rogobete 5), it is appreciated as water excess in soil the situation when the humidity content is ≥pF 1, 78 that corresponds to a capillary capacity for water of soil, situations when the soil has a plastic-adherent consistence, and water is conceded to the drain.

A second aspect that created problems in the appreciation of soil surfaces with humidity excess is represented by classification and systematization of soils that were the base of land reclamation works and respectively the drainage works. Thereby, according to the classification from the years 1970-1980, were considered soils with water excess that needed to be improved, all soils with Gr horizon in the first 125 cm, mainly Lacoviste and Gleyic Soils.

The pedological mapping at 1:200 000 scale and in some situation the 1:10 000 scale mapping have led to the appreciation for drainage of a surface of 6,7 million hectares in Romania. The improved surface with drainage works was (after Nedelcu, 4):

- 332 042 ha, drainage-pumping;
- 106 746 ha, gravitational-drainage
- Total=438 788 ha.

The Ţeba Timişaţ arrangement, located in the Down Plane Timiş-Bega, is 280 630 ha drainages and 285 ha drainings.

Execution of draining-drainage works on a surface with that size has a deep impact over the soil and over the environment in general. Between the many favourable effects we can mention also a series of negative effects. One of these effects is the phreatic depression more under the wanted limit; if previous of the draining works execution the surface with depths of 0-0.5 m and 0.5-1 m was dominant, now dominates the area with phreatic level at 5-8 m, also more under the cultures rotting depth.

MATERIAL AND METHOD

The paper purpose is the appreciation of the demand for draining-drainage arrangements, according to the actual soil taxonomy system, but also according to the actual modern conception regarding the ecosystems around the wet areas and the balance between the food demand and the environment needs.

The accomplishment of the proposed objective is based on the mapping made by the authors in 1:10 000 scales in the Foeni, Giulvăz, Uivar territory and the comparison with previous mapping made in the years 1970-1985.

RESULTS AND DISCUSSION

The mapping made between the years 2005-2007, according to SRTS – 2003, when Gleysoil represents the soil with ground water excess and Stagnic Cambisoils, represents the soil with excess of rain and floods water, both of them with the reduction horizon (Gr or W) in the first 50 cm of the soil profile, have led to the elaboration of the soil maps.

For example for the Foeni territory, with a mapped surface of 5 836, 49 ha from which 5 798, 76 ha agrarian fields, have resulted the following surfaces with the extension of the soil types:

Table 1

Soil type	AS	CZ	FZ	EC	PE	VS	GS	SG	SN	AT
Ha	173.7	3397.0	123.4	146.7	204.1	15.5	33.0	11.5	166.9	1.8
%	3.0	58.6	2.1	2.5	3.5	0.3	0.6	0.2	2.9	0.03

We observe that Hydrosoils cover a small surface, of only 33 ha of Gleysoils and 11.5 ha Stagnic Cambisoils, in a 0.76% from the total studied territory (6).

To this surface we add the gleyic soils, with the horizon $g_4$and g_5 in the soil profile, respectively high and very high gleyic.

Table 2

Gleyic soils

Soil type Gleyic subtype	Surface -ha-	Percent -%-
AS	73.06	1.25
CZ	833.59	14.52
FZ	77.06	1.33
PE	204.14	3.52
VS	15.53	0.27
SN	63.28	1.08
Total	1266.66	21.97

The representative soil profile for Hydrosoils is Soil profile 1

Soil unity taxonomy: Cernic pelic gleysoil, epigleic, uncalcaric, extremely deep, medium clay / medium clay, developed on fluvial uncarbonatic medium materials, arable, field, low water clogging.

Morphological characteristics

Am_1 0-3 cm medium clay, brown-black, layered structure, low plastic, low adherent;

Am_2 3-9 cm medium clay, brown-black dark, granular structure, low plastic, low adherent, small pores, fluffy, few fine roots, clear passing, right;

$AzGo_4$ 9-27 cm medium clay, dark brown and ferruginous violet-blue spots, polyedric, moderate plastic, low adherent, low compact, horizontal sliding faces, clear passing;

$AzGr_5$ 27-55 cm medium clay, dark brown with ferruginous violet-blue spots, polyedric, moderate plastic, moderate adherent, moderate compact, horizontal sliding faces;

$ACzGr_5$ 55-68 cm medium clay, grey violet-blue, polyedric with colloidal silica spots, very plastic, moderate adherent, moderate compact, horizontal sliding faces;

$CnGr_6$ 68-130 cm medium clay, violet-blue layered with ferruginous, monogranular with colloidal silica, very plastic, very adherent, moderate compact;

$CnGr_6$ 130-150 cm medium clay, violet-blue with ferruginous, very plastic, very adherent;

$CnGr_6$ 150-170 cm medium clay, violet-blue ferruginous;

Analytical data

HORIZON	Am_1	Am_2	$AzGo_4$	$AzGr_5$	$ACzGr_5$	$CnGr_6$	$CnGr_6$	$CnGr_6$
Depths (cm)	0-3	-9	-27	-55	-68	-130	-150	-170
Coarse sand (2,0-0,2	0.3	0.6	0.2	0.1	0.2	0.4	0.2	0.5
Fine sand (0,2-0,02	42.4	40.9	38.5	33.6	43.4	43.0	36.9	54.2
Silt (0,02-0,002 cm)	25.2	24.8	25.5	25.7	21.0	21.3	19.3	15.7
Clay 2 (sub 0,002)	31.4	33.7	35.8	40.6	35.4	35.3	43.6	29.6
Physic clay	43.7	46.8	51.8	58.1	49.0	47.3	53.7	38.1
TEXTURE	LL	TT	TT	TT	TT	TT	TT	LN
pH (in H_20)	5.80	6.05	6.56	7.14	7.67	7.39	7.43	7.21
Carbonates ($CaCO_3$	-	-	-	-	0.08	0.08	0.08	0.08
Humus (%)	6.60	4.32	2.58	1.98	-	-	-	-
N-NO_3 (ppm)	4.2	-	4.8	1.8	-	-	-	-
N-NH_4 (ppm)	5.4	-	3.9	1.2	-	-	-	-
P total (ppm)	69.8	20.0	4.0	2.0	-	-	-	-
P mobile	69.8	20.0	3.79	1.65	-	-	-	-
K mobile (ppm)	173	147	114	103	-	-	-	-
BSP	21.95	20.72	19.69	-	-	-	-	-
Exchangeable hydrogen (SH me)	6.65	5.87	3.86	-	-	-	-	-
CECs (T me)	28.6	26.59	23.55	-	-	-	-	-
Degree of base saturation V (%)	76.74	77.92	83.60	-	-	-	-	-

The pedological mapping of the Foeni territory from the year 1984 reveals for Hydrosoils (Humic Gley Soil) a surface of 743 ha (12,8 %) and the gleyic soils in a surface of 5024 ha (87,2%).

A similar situation is found at Uivar where Gleyosoil covers now 560 ha (3.13%) regarding the surface of 1430 ha (80%) covered by Hydrosoils in 1984 (Humic Gley Soil, Gleyosoil). If we ad the gleyic subtype where 16 817 ha, 94.1% is explicably the fact that the draining and drainage arrangements were executed on high surfaces.

We considered that besides the old criteria of the old classification of soils, at the recommendation of the big surfaces for drainage contributes the climatic periodicity, the years 1970-1980 being rainier.

CONCLUSIONS

Making the draining-drainage arrangements implies high costs, for projecting-execution but also for the ulterior maintenance, from the exploitation period. Considering the big impact over the environment, with the modification of the soil humidity degree and the decrease of water sources for plants due to the accentuated decrease of the phreatic level is obvious the importance of the pedological studies that establish the required drainage. Changing the comprising condition for Hydrosoil by the presence of the Gr horizon in the first 50 cm of the soil and the gleyic subtypes through g_4 and g_5, was decreased extremely the surface that needed drainage works.

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