FAVORABILITY GLEY CHERNOZEM FROM S.D. TIMISOARA AND THE HAPLIC LUVISOLS FROM BOZOVICI FOR CROP GRAIN LEGUMES

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Abstract

Setting favorability grain legume crops (pea, soybean and lupine) on a gleyc chernozem from SD Timisoara and a haplic luvisols administrative territory of the commune Bozovici was performed Pedology Studies (volumes I,″ ″according to methodology development Soil Taxonomy developed by″ ″II, III) (1987) and the Romanian system ICPA Bucharest in 2003.

Key words: soil fertility class, indicators and factors bonitare, peas, soybeans, lupins

INTRODUCTION

Qualitative assessment of soils under natural conditions is one of the most complex actions of familiarity with the resources of plant growth and development by establishing a floor for each crop favorabilităţii in part through a system of coefficients and bonitary notes.

To characterize these soils have been executed two soil profiles, one farm within the resort Teaching No.1 Timisoara and the second in the catchment Nera administrative territory of the municipality Bozovici, Caras Severin.

MATERIALS AND METHODS of calculation

To calculate the evaluation marks, who characterize each soil unit limited in the pedological study who were made in Bârzavei Plain, were made the most important characteristics, easy and certain measurable, who are fiind in pedological studies known as indicators of evaluation. Evaluation marks for each utilization category of soils and crop were made multiplicities with 100 the product of the coefficients (17 indicators), who participate directly to the calculus

$Y= (X_1*X_2*\text{……..}X_{17})*100$

Were:

Y= evaluation mark;

$X_1\text{…….}X_{17}$ = the value of the 17 indicators.

RESULTS AND DISCUSSION:

In order to assess the favorabilităţii chernozem gleic from SD Timisoara and the Bozovici luvosolului were chosen from the whole of the 17 indicators of environmental conditions most significant, that is determined. Based on these and value chain were extracted from Tables 1 to 3, bonitare factors, which expresses the degree of favorability of an indicator for each crop of grain legumes.

Morphological characters

Ap = 0-23 cm, medium loamy clay, dark brown with chrome disturbed by the work strong-brittle soil wet, cohesive dry, loose, contains rare thin roots, a clear passage,

Aph = 23-38 cm, medium loamy clay, dark brown with values and wet, massive structure, the soil works tasat reason is≤chromium 3.5 compact and strong, but dry is moderately cohesive, contains roots rare and thin, 2 medium wet, small and large

Am = 38-50 cm, clay loamy chrome grained structure well developed, slightly firm in the wet, slightly plastic, slightly adhesive and dry coezivîn weak, gradual transition,

A/C = 50-64 cm; lutoargilos medium, and chromium levels in wet, low-moderate polyhedral structure developed, slightly firm in wet, moderately dry cohesive, is effervescent low in points,

C/Ak = 64 to 76 cm; lutoargilos medium brown with values and 3.5 wet, is very strong, weak and hard plastic,≤chromium bruniu concrete content, efflorescence and staining of CaCO3, is weak - moderate effervescence,

Cca = 76-95 cm, medium loamy clay, with colors and shades of 10.5 wet, is very strong, weak≤YR and yellow, with values and chromium 3.5 and hard plastic, concrete content, efflorescence and CaCO3 spots, make strong effervescence,

Ccag2-3 = 95-200 cm, medium loamy clay, with colors and shades of 10.5 YR and yellow, with spots to reduce the rate of 10 to 15% oxidoreducere stains, concretions of CaCO3

Physical and chemical properties of this type of soil are given inTable 1.

Table 1

Physical, chemical and hydrophysical properties of gleyc chernozem

Horizons	**Ap**	**Aph**	**Am**	**A/C**	**C/Ak**	**Cca**	**Ccag**	**$Ccag_{2-3}$**	**$CcaGo_3$**
Depths (cm)	**0-23**	**23-38**	**38-50**	**50-64**	**64-76**	**76-95**	**95-130**	**-160**	**-200**
Coarse sand (2,0-0,2mm)%	1.9	2.1	1.3	1.6	1.3	1.2	0.8	1.5	1.7
Fine sand(0,2-0,02 mm)%	30.1	29.9	32.2	31.4	32.0	35.4	35.4	36.2	33.1
Dust (0,02-0,002 mm) %	25.6	26.0	24.1	25.4	25.0	27.3	27.6	24.6	24.7
Clay 2 (sub 0,002 mm) %	42.4	42.0	42.1	41.6	41.7	36.1	36.2	37.7	40.5
Phisical clay (sub 0,01 mm) %	56.3	55.4	54.8	54.5	53.8	50.4	49.3	49.3	52.8
TEXTURE	**TT**	**TT**	**TT**	**TT**	**TT**	**TT**	**TT**	**TT**	**TT**
Density (D g/cm^3)	2,65	2,68	2,70	2,72	2,72	2,72			
Bulk density (DA g/cm^3)	1,01	1,48	1,39	1,43	1,46	1,34			
Total porosity (PT %)	61,9	47,0	48,5	47,4	46,3	50,7			
Aeration porosity (PA %)	35,2	9,5	11,8	9,8	7,9	16,0			
Compactation degree (GT %)	-19,2	9,3	6,5	8,5	10,6	0,4			
Higroscopicity coeficient (CH %)	8,9	8,8	8,9	8,8	8,8	7,6			
Fading coeficient (CO %)	13,4	13,2	13,4	13,2	13,2	11,4			
Field capacity (CC %)	26,4	26,4	26,4	26,3	26,3	25,9			
Total capacity (CT %)	61,3	33,1	34,9	33,1	31,7	37,8			
Useful water capacity (CU %)	13,0	13,2	13,0	13,1	13,1	14,5			
Cover maximum disposal (CCD max. %)	34,9	6,7	8,5	6,8	5,4	11,9			
Hydraulic conductivity (K mm/oră)	14,0	0,96	1,20	1,0	0,95	2,20			
pH (în H_2O)	6,55	7,02	7,31	7,62	8,16	8,43	8,56	8,61	8,68
Carbonate($CaCO_3$)			0,1	0,2	2,40	17,31	20,05	17,64	18,06
Humus content (%)	3,48	2,44	1,47						
Humidity %	11,64	15,36	13,64	15,29	15,05	16,68	15,10	18,38	20,01

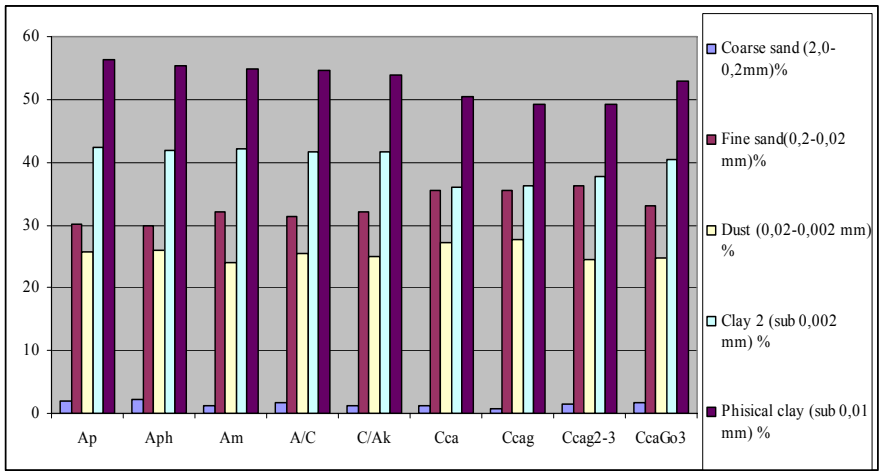

Fig 1 Graphical reprezentation of gleyc chernozem texture

HAPLIC LUVISOLS

Morphological characterization

At - 0-7 cm layer of celery in which profound mineral is about. 30% of the volume, the texture, clay-colored dust brown, with shades of yellow, very loose.

EI - 7-20 cm, clayey medium gray color yellow hue open, unsaturated structure, are clusters of mineral grains of size - fine sand, displaced by colloidal film and powdered with colloidal silica, submit patches and iron oxides bobovine , high porosity, moderately weak compactness tasat and hard when dry.

EB - 20 - 35 cm, clay-clay medium, yellowish brown, gray, large polyhedral structure, moderately developed is moderately porous, compact, moderately tasat, hard dry and presents rare large polygonal cracks.

Btyw - 35 - 105 cm, clay-loamy to loamy clay-84 cm and average up to 105 cm, yellowish color with shades of slightly to moderately mottled with rust on vineţiu and 6 to 30% of the structural elements, structure of spheroidal prismatic, well-developed, presented side by oblique slip, dry, clear and polygonal cracks bobovine ferimanganice faces structural elements.

B/Cyw - 105-130 cm horizon crossing with intermediate characters between Btyw and Cyw horizon.

Cyw - over 130 cm clay parent material inflatable medium fine and fine, yellow with purple spots and oblique slip faces.

Table 2

Physical and chemical properties of haplic luvisols

Horizons	**At**	**El**	**E/B**	**Bty**	**Btyw**	**Btyw**	**B/Cyw**	**Cyw**	**Cyw**
Depths (cm)	0-7	7-20	20-35	35-58	58-75	75-105	105-130	130-145	145-215
Coarse sand (2.0-0.2 mm)%	1.3	2.8	2.0	1.3	1.6	1.9	1.3	0.5	0.6
Fine sand (0.2-0.02 mm)%	39.1	37.9	27.1	25.7	29.7	29.9	30.7	31.5	29.7
Dust (0.02-0.002 mm)%	36.0	32.0	27.7	23.3	21.6	24.9	23.0	22.5	23.3
Clay 2 (sub 0.002 mm)%	23.6	27.3	43.2	49.7	47.7	43.8	45.0	45.5	46.4
Phisycal clay (sub 0.01mm)%	39.9	41.0	56.1	58.6	58.9	56.3	57.4	56.3	57.1
TEXTURE	**LP**	**LL**	**TT**	**AL**	**AL**	**TT**	**TT**	**AL**	**AL**
pH în (H_2O)	5,44	5,29	5,89	6,97	7,23	7,29	7,29	8,09	7,98
Carbonate ($CaCO_3$%)					0,10	0,10	0,16	1,1	1,0
Humus content (%)	2,10	1,61	0,82	0,72					
Base exchenge (SB me/100 gsol)	18,75	18,11	84,53	26,03					
Hydrogen changed (SH me/100 g sol)	5,67	5,40	3,74	2,03					
Head of cationic change (T me/100 g sol)	24,42	23,51	28,27	28,06				6,52	
Base saturation degree (V%)	76,78	77,03	86,77	92,76					
Ca^{+2} (me / 100 g sol)								0,56	
Mg^{2+} (me /100 g sol)								0,14	
Na^{+} (me/ 100 g sol)								0,17	
K^{+} (me /100 g sol)								0,006	

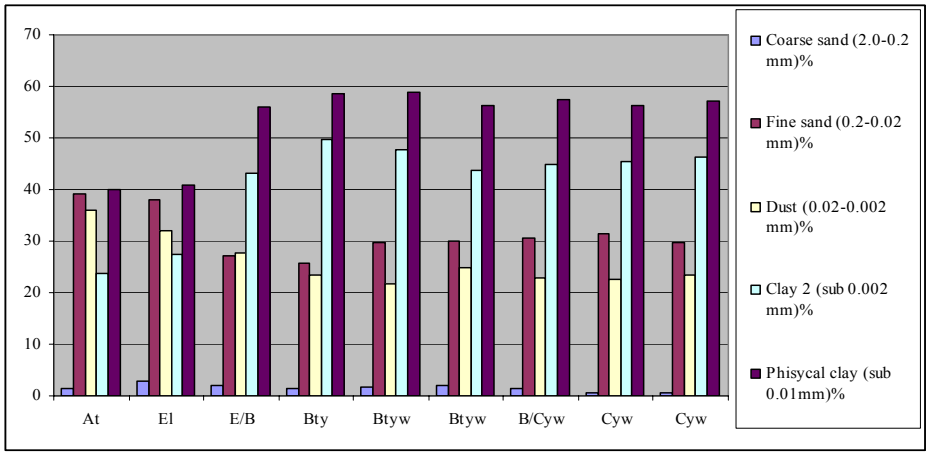

Fig 2 Graphical reprezentation of haplic luvisols texture

Based on calculated bonitary notes were within soil fertility classes, reflected as gleyc chernozem favorability from SD Timisoara and haplic luvisols from Bozovici of grain legume crops (pea, soybean and lupine)

Table 3

Gleyc chernozem favorability

Wear category	***Soil Type***			
	Gley chernozem		***Haplic luvisols***	
	Mark	***Fertility class***	***Mark***	***Fertility class***
Peas	**81**	**II**	**42**	**VI**
Soybeans	**81**	**II**	**38**	**VII**
Lupine	**72**	**III**	**43**	**VI**

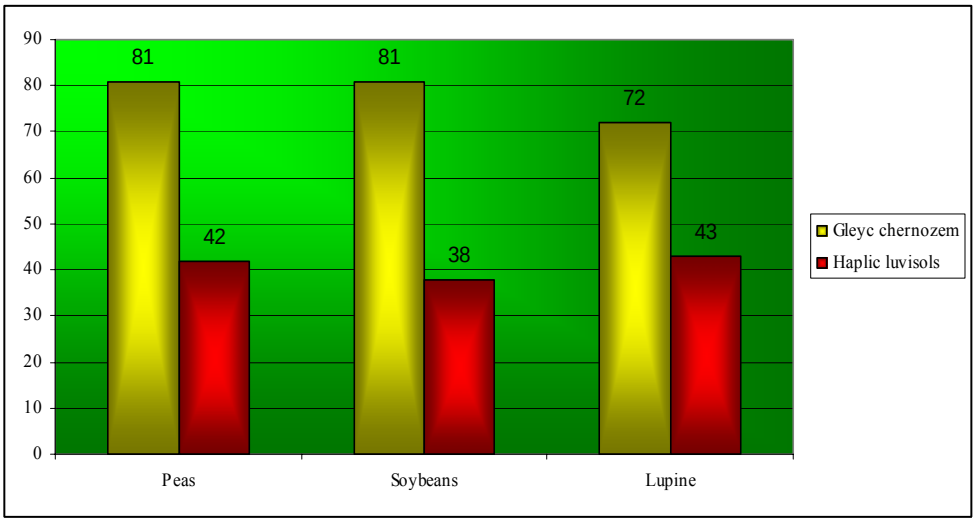

Fig. 1 Graphical representation of gleyc cehrnozem and haplic luvisols favorability for pea, soybean and lupine crops

CONCLUSIONS:

Research by the following formula to allow assessment of the favorability chernozem gleyc chernozem from SD Timisoara and haplic luvisols Bozovici commune administrative territory:

- Differentiate sharp, natural bonitary notes, given the 2 soil types are based on conditions of soil fertility for each crop;
- Differentiation values bonitary notes the same type of soil is based on the requirements of each crop plants, especially those with low fertility (luvosol);
- Gleyc chernozem of S.D. Timisoara, has physical and chemical properties that impart a corresponding high fertility requirements and crop use categories in the study (pea, soybean and lupine) fell into class II and III of fertility;
- Haplic luvisols has physical, chemical and hydro giving it a medium-low natural fertility, falling into class II and III of fertility with bonitare notes that values between 38 and 43 points.

REFERENCES

1. MUNTEANU I. - On some problems of soil-Soil Science studies, 2000, vol XXIV, no. 1, p. 19-32
2. Rusu I., Stefan V., NIȚĂ L. STROIA M., Duma-Copcea ANISOARA-Favorability soils in Timis County for the main crops - Scientific Papers, vol XXXIV, p. 35-40, Timisoara, 2002
3. TEACI D., 1980 - Bonitarea terenurilor agricole, Ceres Publishing House, Bucharest 4. Tarau D., 2003 - the theoretical and practical perspective bonitării pedological and land evaluation, Ed Solness, Timisoara
4. Tarau D., 2003-Mapping and soil bonitary, Ed Solness, Timisoara
5. XXX, 1987 - Methodology development including soil studies, vol I, II and III, ICPA Bucharest