

CHARACTERIZATION OF THE CHROMIC LUVISOLS PROFILE FROM SC AGROTEHNIC SRL, PAULESTI, PRAHOVA

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Abstract

The credit rating aims to establish the favorability classes of land for different agricultural crops.

In this context, the present study aims to quantify the favorability of the Chromic Luvisols from S.C. Agrotehnic Paulesti for arable use.

Also, this study has as a main objective a morphological characterization and profile description of Chromic Luvisols.

Following the study, it can be concluded that it presents the same limiting factors as for arable suitability related to the loamy-clay texture, which implies a short interval of soil works and the appearance of the hardpan sub-horizon.

Key words: *chromic luvisols, culture, land crediting*

INTRODUCTION

Anthropic factor can influence the productive potential of the soil and their physical and chemical characteristics (Florea et al, 2014, 2015).

All the measures that can be applied for to increase the quality of the land depends on the macro and micromorphological properties of the soil profile (Chiurciu et al, 2022; Dana et al, 2017, 2022).

Land crediting is a way for to establish the classes of favorability for some crops and the classes of land with arable uses.

The certification aims to establish the rational use of the culture structures and the uses (Teaci, 1980).

MATERIALS AND METHODS

Location of the soil profile

Preluvosol reddish (EL rs);

Profile: P1 Păulești (fig.1);

Soil type: Reddish preluvosol SRTS 2003;

Typical reddish brown soil (BRti), SRCS

1980; Chromic Luvisols (LCvr), WRB-

1998, Typic Hapludolls, USDA-ST-1999;

Location: Ploieștilor Plain, S.C. Agrotehnic

Păulești S.R.L., 1.5 km, N-NW of DN 1,

Prahova (fig. 2); Latitude N: 45°0.0'19.6";

Longitude E: 25°55'11.3"; Absolute

altitude 232 m.



Figure 1. The location of the experimental plots and the soil profile from S.C. Agrotehnic S.R.L. Păulești, Prahova (GRIFOX Project)



Figure 2. The Chromic Luvisols profile from S.C. Agrotehnic S.R.L. Păulești, Prahova (GRIFOX Project)

Pedogenetic conditions

Relief: plain, flat surface, absolute altitude 232 m;

Parental material: proluvial-colluvial clay loam deposits;

Natural drainage: good-moderate, water table > 10 m;

Climatic data: (Ploiesti Meteorological Station) T_{ma} = 10.4 °C; P_{ma} = 614 mm;

Natural vegetation: mesophyll type forest *Quercus pedunculata*, *Carpinus betulus*, *Populus sp.*, *Ulmus foliaceaea*;

Current use: irrigated arable - wheat crop (*Triticum aestivum*).

RESULTS AND DISCUSSIONS

Morphological characterization

Profile description

Ap horizon, 0-10 cm; dusty clay; greyish brown (10YR 5/2) when wet; structure modified by cultivation; loose; local coprolites; thin-middle roots very common; clear straight passage;

Ao horizon, 10-32 cm; dusty clay; greyish brown (10YR 5/2) when wet; glomerular structure-small subangular polyhedral; loose-weak compact; friable; moderately cohesive; frequent thin roots; rare coprolites; straight transition;

A/B horizon, 32-54 cm; medium clay loam; yellowish brown (10YR 5/4) with dark brown spots (7.5YR 4/4) when wet; medium-large subangular polyhedral structure; friable; moderately cohesive; weakly compact; rare coprolites; thin-medium rare roots; clear straight passage;

Bt1 horizon, 54-75 cm; medium clay loam; dark brown (7.5YR 4/4) with reddish brown spots (5YR 4/4) when wet; well-developed medium-large prismatic structure; friable-firm; moderately cohesive-hard; weakly compact; rare thin roots; straight transition;

Bt2 horizon, 75-110 cm; medium clay loam; dark brown (7.5YR 5/6) with reddish-yellow spots (5YR 4/6) when wet; large prismatic structure, moderately developed; friable; hard; moderately compact;

Bt3 horizon, 110-150 cm; medium clay loam; deep brown (7.5YR 5/8) with yellowish red spots (5YR 4/6); large prismatic structure, moderately developed; friable; hard; moderately compact;

Ck horizon, ≥150 cm; loamy; massive structure; accumulations of CaCO₃.

Ecological and agronomic considerations

The Chromic Luvisols (reddish preluvosol) belongs to the II class, with good favorability and with reduced limitations for field crops.

It presents as limiting factors for arable use the loamy-clay texture below the Ao horizon, which implies a short interval of soil works and in optimal humidity conditions in order not to produce soil compaction and the appearance of the hardpan sub-horizon.

During heavy rains, there are some traffic difficulties for a period of 1-2 days.

Land grouping according to suitability for irrigation The Chromic Luvisols (reddish brown soil) belongs to class II of suitability for irrigation, presenting weak restrictions on the introduction of irrigation.

It presents the same limiting factors as for arable suitability related to the loamy-clay texture.

For both groups, agro-pedo-ameliorative measures are recommended: tilling the soil at optimal humidity, exploitation leveling, scarification, ameliorative fertilization, appropriate watering norms (tab. 1, fig. 3).

Based on the analysis of the assessment notes, it is observed that the lands

occupied by reddish preluvosols present a good favorability (2nd favorability class) for all crops in the area.

After the application of all agro-pedo-ameliorative measures, including the use of irrigation in periods of moisture deficit,



the favorability of this soil is enhanced by two rating classes exceeding 100 points.

Figure 3. The Chromic Luvisols, tilling the soil at S.C. Agrotehnic S.R.L. Păulești, Prahova (GRIFOX Project)

Table 1. Credit ratings for arable land from S.C. Agrotehnic Paulesti (GRIFOX Project)

Crop	Chromic Luvisols non-irrigated	Chromic Luvisols irrigated
GR-wheat	74	105
OR-barley	74	105
PB-maize	75	111
FS-sunflower	73	104
SO-soybean	73	104
MF-green peas-beans	73	103
LU-lucerne	65	101
AR-arable	73	106

CONCLUSIONS

The soil profile is located in Ploieștilor Plain, S.C. Agrotehnic Păulești S.R.L., 1.5 km, N-NW of DN 1, Prahova.

Chromic Luvisols has the following profile: Ao-A/B-Bt-Ck.

The lands occupied by Chromic Luvisols present a good favorability (2nd favorability class) for all crops in the area. Agro-pedo-ameliorative measures are recommended: scarification, ameliorative fertilization.

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