

THE FAVORABILITY OF THE LANDS ON THE TERRITORY OF INCDA FUNDULEA CALARASI

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REVIEW, RESEARCH ARTICLE – ARTICLE

Abstract

The purpose of this paper is to present aspects related to some morphological properties of the Argic Chernoziom from INCDA Fundulea, Calarasi.

Based on the study, ecological and agronomic considerations were issued, but restrictive factors were also established, as well as agro-pedo-ameliorative measures to increase the productive potential of the soils in the area. Recommended agro-pedo-ameliorative measures: tilling the soil at optimal humidity, appropriate watering rules, leveling the exploitation, ameliorative fertilization, scarification.

Keywords: favorability, territory, arable.

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INTRODUCTION

Soil is the direct result of the interaction between the rock and solification factors.

Anthropogenic processes they are the main factor that can decisively influence the productive potential and ecological characteristics of lands.

The quality of the land for a particular use to a large extent depends on macro and micromorphology soil characteristics.

Land reclamation contributes to the sustainable use of soil resources and to the establishment of the best crop structures.

Credit rating of agricultural lands establishes their degree of favorability for various crops and uses with the help of credit rating notes (Chereji et al, 2022; Chiurciu et al, 2021, Chiurciu et al, 2022, Chiurciu et al, 2023; Dana et al, 2017, Dana et al, 2021; Dana et al, 2022; Dana et al, 2023).

Land valuation is carried out both at the level of the cadastral parcel and at the level of the homogeneous ecological territory (HET).

MATERIAL AND METHOD

The plots are located in the eastern Romanian Plain, south-southeast Fundulea 2.3 km (Figure 1). Representing the southwestern part of Bărăganu, the Mostiștei Plain is located

between Argeș-Dâmbovița-Pasărea, the Danube Valley and the Argoava-Vânăta valleys.

It represents a less steppe subunit compared to the other compartments of the Bărăganu Plain, registering a greater share of forests and a more varied agricultural use.

In Câmpia Mostiștei, the roofs are more numerous, and the fragmentation of the relief is stronger.

The relief has the form of a wide field covered with loess from the former terminal dejection cones of Argeș and Dâmbovița (Mostiștea sands), showing a slight inclination from west to east and from north to south.

The surface of the plain has numerous roofs, which are often included in extensive semi-endoreic areas.

The Mostiștei plains present a more attenuated degree of continentality, which means that in addition to the steppe vegetation (with mesoxerophile meadows) there are also vercine forests (aridity index, de Martonne being >25).

Average annual air temperatures are between 10.5 and 11°C, and values around 13°C are recorded at the ground surface.

The average annual amplitude of the air temperature has values of 25-26°C, and on the ground of 31-32°C.

Precipitation has average annual values of approximately 550 mm, being the highest in all of Bărăgan.

The phenomena of dryness and drought are less, compared to the rest of Bărăganu (Niculescu, 1981).

The vegetation is represented by the species specific to the forest-steppe meadows, in which a high frequency has the meadow (*F. pseudovina*, *Festuca valesiaca*), the mugwort (*Artemisia austriaca*), the sedina (*Chrysopogon gryttus*), the thick pear (*Cynodon dactylon*) and the woody species of quince (*Q. cerris*, *Q. frainetio*, *Quercus pedunculiflora*) in a mixture with elm, sycamore, ash, etc.

The representative soils are the mollisols, of the vermic cambic chernoziom type, which are predominant, have a granular structure, humus around 4%, require irrigation and fertilization.

Location of the soil profile

Ceremoziom Argic-CZar (SRTS 2003)
Udic Argiustolls (pp)-(USDA-ST,1999)
Luvic Chernozems-(WRB-SR 1998)
Typical Argiloiluvial Chernoziom/Cumulic-CIti (SRCS 1980)

Location: Eastern Romanian Plain, south-southeast Fundulea-2.3 km, Călărași (Figures 1-2);

Latitude E:026°31'15.8";

Longitude N: 44°27'17.7";

Absolute altitude: 60 m.

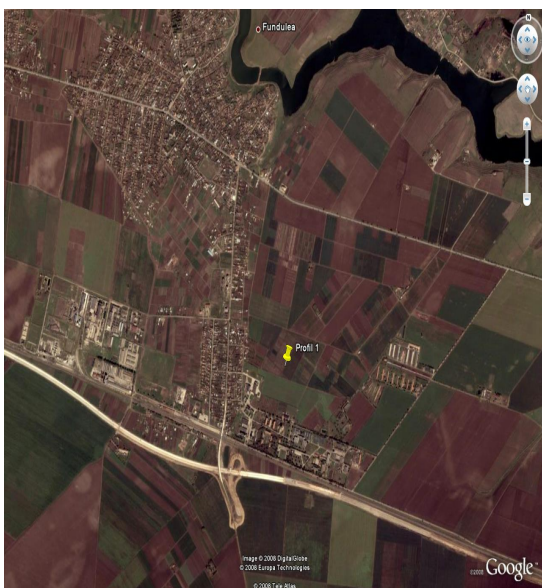


Figure 1 Location of experimental plots and soil profile from INCDA Fundulea, Calarasi (GRIFOX Project)



Figure 2 Argic chernozem, INCDA Fundulea, Calarasi (GRIFOX Project)

RESULTS AND DISCUSSIONS

Morphological characterization

Profile description:

Ap 0-18 cm; clay-dusty loam (dusty clay); very dark grey-brown wet (10YR 3/2) and dark grey-brown dry (10YR 4/2); structure disturbed by agricultural works; reawaken; friable when wet; hard when dry; roots grassy, frequent; fine and medium pores; frequencies; clear, straight passage;

Aph 18-30 cm; clay-dusty loam (dusty clay); the color is the same as in the previous horizon; compacted; compacted, lumps; grassy roots, thin; fine and medium pores, frequent; clear, straight passage;

Am 30-55 cm; clay-dusty loam (dusty clay); very dark brown-very dark gray brown in the wet state (10YR 2.5/2) and dark gray brown-brown in the dry state (10YR 4/2.5); well-developed medium-large subangular

granular and polyhedral structure; reawaken; firm when wet; very hard when dry; adhesive; plastic; weakly compact; grassy roots, thin; fine, frequent pores; gradual, undulating transition; (Figure 2);

AB 55-80 cm; loamy clay (dusty clay); very dark grey-brown in the wet state (10YR 3/2) and dark brown-brown in the dry state (10YR 33/3); large subangular polyhedral structure; reawaken; hard when wet; very hard when dry; adhesive; plastic; moderately compact; roots grassy, frequent; fine, frequent pores; punctate berries; gradual, undulating transition; Bt1 80-102 cm; loamy clay (dusty clay); very dark gray brown - dark gray brown (10YR 3.5/2) with small yellow-brown spots in the wet state (10YR 5/6) and brown (10YR 4/3) with the same spots in the dry state; prismatic structure well developed; reawaken; hard when wet; very hard when dry; adhesive; plastic; moderately compact; small, rare berries; grass roots, rare; clay films, thin, discontinuous; gradual, undulating transition;

Bt2 102-120 cm; loamy clay (dusty clay); dark brown-brown (10YR 3.5/3) with brownish yellow spots in the wet state (10YR 6/6) and yellowish brown (10YR 5/4) with the same spots in the dry state; well-developed prismatic structure (sharp edges, pressure faces but not inclined enough for vertical character); reawaken; hard when wet; very hard when dry; adhesive; plastic; moderately compact; small-medium beans; fine pores; clay films, continuous; gradual, undulating transition;

Bt3 120-150 cm; loamy clay (dusty clay); dark yellowish brown (10YR 4/4) with small, diffuse brownish yellow spots in the wet state (10YR 6/6) and yellowish brown-light yellowish brown (10YR 5.5/4) with the same spots in the dry state; moderately developed prismatic structure; reawaken; hard when wet; very hard when dry; adhesive; plastic; moderately compact; fine pores; legumes; clay films, discontinuous; gradual, undulating transition;

Bt4 150-185 cm; loam (dusty clay); yellowish brown-light yellowish brown (10YR 5.5/4) with darker clay-humic films, dark yellowish brown on structural surface in wet state (10YR 4/4) and yellowish in dry state (10YR 7/6); poorly developed prismatic structure; reawaken; hard when wet; very hard

when dry; adhesive; plastic; moderate-compact; fine, frequent pores; small-medium beans; clay films, discontinuous; gradual, undulating transition;

BC 185-210 cm; loam (dusty clay); yellowish brown (10YR 5/6) with slightly darker diffuse spots yellowish-brown in the wet state (10YR 5/4) and yellowish in the dry state (10YR 7/6); prismatic structure, very poorly developed; reawaken; hard when wet; very hard when dry; adhesive; plastic; moderately compact; fine pores; small rare berries.

Favorability of lands

Based on the analysis of credit ratings, it can be observed that the lands on the territory of INCDA Fundulea present an average favorability (classes III - V favorability) for all crops in the area (Table 1).

For the use of arable land, credit ratings vary between 52 points for H.E.T. 2 (5th favorability class), 65 points for H.E.T. 1 (4th favorability class) and 71 points for H.E.T. 3 (class the III favorability, Figure 3).

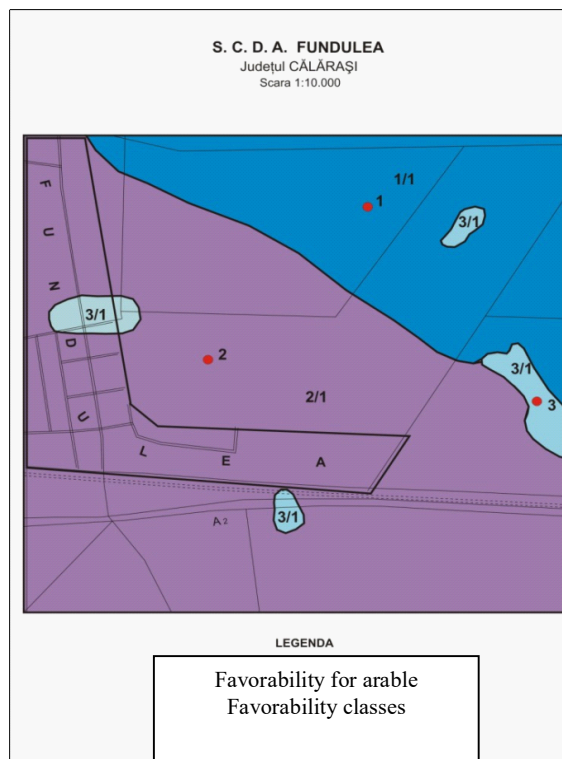


Figure 3 Favorability for arable at INCDA Fundulea, Calarasi

Source: own determination, GRIFOX Project

For the wheat crop, credit scores have the following values: 58 points for H.E.T. 2 (5th favorability class), 65 points for H.E.T. 1 (4th favorability class) and 72 points for H.E.T. 3 (3rd favorability class), (Figure 4).



Figure 4 Favorability for the wheat crop at INCDA Fundulea, Calarasi
Source: own determination, GRIFOX Project

Climatic elements (precipitation, temperature) are presented in Figures 5-6.

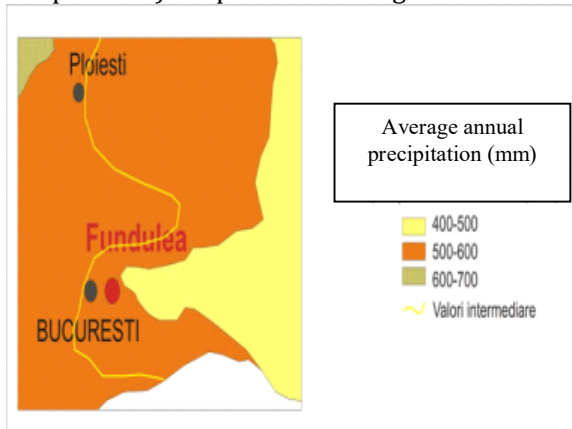


Figure 5 Climate map (average annual precipitation) of microzones in the experimental perimeter of INCDA Fundulea, Calarasi
Source: own determination, GRIFOX Project

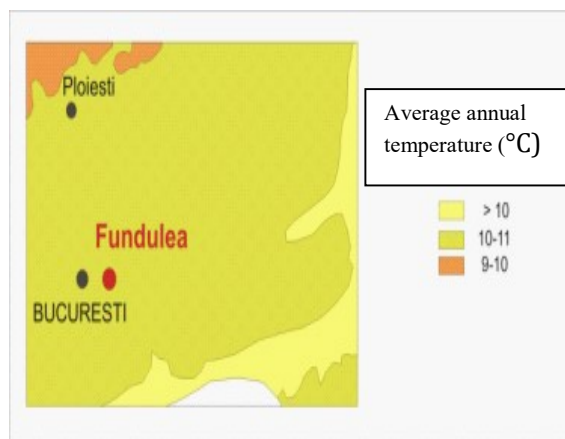


Figure 6 Climate map (average annual temperature) of microzones in the experimental perimeter of INCDA Fundulea, Calarasi
Source: own determination, GRIFOX Project

The main soil units

The map with territorial soil units is presented in figure 7 (Dana et al, 2017):

-US No. 1, MODERATELY DECARBONATED CAMPIC CHERNOSIUM, ON LOESS, LOOS-ARGILOUS;

-US No. 2, MODERATELY DECARBONATED ARGIC CHERNOSIUM, ON LOESS, CLAY/CLAY;

-US No. 3, STAGNIC ARGIC PHAEOSIUM, ON LOESSOID, CLAY CLAY / CLAY CLAY.



Figure 7 Pedological map of the microzones in the experimental perimeter of INCDA Fundulea, Calarasi
Source: own determination, GRIFOX Project

Table 1

**Credit ratings of homogeneous ecological territory (H.E.T.) for arable land at INCDA
Fundulea, Calarasi**

Source: own determination, GRIFOX Project

No.	Current H.E.T. use	GR	OR	PB	FS	CT	SZ	SO	MF	IU	IF	CN	LU	TR	LG	AR
1	Arable	65	65	65	65	47	65	65	65	72	58	65	72	-	57	65
2	Arable	58	58	46	52	32	35	52	58	65	52	52	65	-	40	52
3	Arable	72	72	72	72	52	65	72	72	72	58	72	72	-	72	71

GR-wheat; OR-barley; PB-maize; FS-sunflower; CT-autumn potato; SZ-sugar beet; SO-soybean; MF-green peas-beans; IU-flax for oil; IF-flax for fiber; CN-hemp; LU-lucerne; TR-clover; LG-vegetables; AR-arable.

Agronomic and ecological considerations

The Argic chernozem is in the II class, with good adaptability and with reduced limitations for field crops. With heavier rains, some traffic problems occur for a period of 1-2 days.

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

The grouping of lands according to the readiness for irrigation Argic chernozem is in the II class of readiness for irrigation, presenting weak limitations to the introduction of irrigation.

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

For both categories of groupings, agro-pedo-ameliorative measures are recommended: tilling the soil at optimal humidity, appropriate watering norms, exploitation leveling, ameliorative fertilization, scarification.

CONCLUSIONS

The important soils are the mollisols, of the vermic cambic chernozem type, which are predominant and require irrigation and fertilization.

The lands on the territory of INCDA Fundulea present an average favorability (classes III - V favorability) for all crops in the area.

Argic chernozem is in class II, with good adaptability and low limitations for field crops. When more abundant rains occur, some traffic problems occur for a period of 1-2 days.

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