THE RESEARCHES ON THE NATURAL CONDITION OF FORMING AND THE MAIN FEATURES OF THE CALCARIC STAGNIC FAEZIOM FROM THE GRECESTI ZONE, DISTRICT DOLJ

CERCETĂRI PRIVIND CADRUL NATURAL DE FORMARE ŞI PRINCIPALELE PROPRIETĂŢI ALE FAEOZIOMULUI CALCARIC STAGNIC DIN ZONA LOCALITĂŢII GRECEŞTI, JUD. DOLJ

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Abstract: *This paper has studied as soil unit the stagnic, calcaric faeoziom from Grecesti, Dolj that belongs to the Jiu River hydrografic Basin. There was established that this soil occupies in the central zone a small surface yet it is identified in large areas in the superior part of the southern versants due to the better drainage the eluviations processes have been reduced and this is the reason why a B horizon does not appear. The physic-chemical processes that characterizes the soil enframe this soil into the middle productive soils; in order to enhance its productive potential we have to make deep tillages, good fertilization. By its specific, this paper can be used by the loco farmers in order to enhance their yields.*

Rezumat: *În această lucrare a fost studiat ca unitate de sol faeoziomul calcaric stagnic de pe teritoriul localităţii Greceşti, judeţul Dolj, teritoriu ce aparţine bazinului hidrografic al Jiului. S-a stabilit că acest sol ocupă în zona centrală o suprafaţă mică de teren, fiind identificat în jumătatea superioară a unor versanţi sudici, unde, datorită drenajului exterior bun, procesele de eluviere au fost reduse, şi din această cauză pe profil nu apare un orizont B. Proprietăţile fizico-chimice ce caracterizează solul îl încadrează în grupa celor cu capacitate productivă mijlocie, pentru creşterea potenţialului său productiv, se recomandă lucrări profunde de afânare şi o fertilizare organo-minerală echilibrată. Prin specificul ei lucrarea este de folos celor două societăţi agricole din zonă pentru a obţine cel puţin pe aceste soluri producţii ridicate.*

Keywords: *faeoziom, soil profile, texture, structure, fertility*
Cuvinte cheie: *faeoziom, profil de sol, textură, structură, fertilitate*

INTRODUCTION

Geographically, the Grecesti village is located in the Western part of Oltenia, District Dolj, and administratively, at the border with the Mehedinti District. The total surface is of 1,073 ha of which:

- arable 868 ha;
- pastures 56 ha;
- vineyards 32 ha;
- hay plots 26 ha;
- orchards 26 ha;
- other 65 ha

The soil is worked by the loco inhabitants that have received their plot surfaces on the former locations with their own machinery.

MATERIAL AND METHOD

There In the present paper there was studied the natural conditions of forming and their morphological, physical and chemical features of the stagnic, calcaric faeoziom from

Grecesti zone. There have been studied the clime data, geomorphological, geological and lithological data. Also, there have been studied the vegetation, hydrographical and hydrological data. There have been dug several soil profiles and the more representative have been described morphologically and there have been taken soil samples for the laboratory analyses.

RESULTS

The researched territory is located in the South-Western part of the Getic Plateau on its subdivision called Strehaia Platform in the middle hills area. This territory looks like a plateau (piedmont field) having in the middle the Grecesti Valley that is formed on the Corzu village, District Mehedinti.

As positive forms there are encountered low forms with the following names: Dealul Morilor, Sucoaia, Daramaturi, Drocaia. The maximum altitude is 250-300m. The piedmontan field on which the Grecesti village is located is linked with the existence of older lakes that have existed at the end of Tertiary in this area.

The solidification material on the piedmontan field is formed of clays. On southern slopes there can be noticed accumulations and nodules of limestone due to the clays that have a high content of this element on which this kind of soil has formed.

The researched territory belongs to the Jiu Basin. The hydrography of the territory is represented by dry valleys where water appear by small streams excepting the Grecesti valley that is occupied by the stream with the same name which although has a low debit, it is permanent due to the sources from the base of the versant. On plateau the water table is located at depth mode than 20 m and between 10 – 15 m on versants.

Climatically, the researched territory is located in the continental temperate zone. The average annual temperature recorded at Craiova Meteorological Station is 10.8^0C. As regard the vegetation, the researched territory belongs to the forestry zone of the oak woods that in former times occupied large areas, in present days these forests are reduced as area due to massive clearings in the last 100 years. The stagnic, calcaric faeoziom is identified within the Grecesti village in the superior part of the southern versants where the external drainage is good, the eluviation processes are good and due to this fact the B horizon does not appear.

The natural vegetation under this kind of soil has formed under is represented by oak woods or natural pastures. Nowadays the majority of stagnic calcaric faeozioms are occupied by vineyards. The parental material not at a deep depth is represented by clays and the water table is located at high depth (over 10 m).

In order to illustrate the morphological, physical and chemical features of this kind of soil we present a soil profile located at North of Grecesti at a distance of 250 m, on a Southern versant with a 5-10% slope.

The soil profile formula is the following: Am – AC – Cw.

The Am horizon: 0-35 cm; black colour (10YR 2/1) in wet phase and grey very dark colour (10YR 3/1) when dry, clay-loam texture; granular structure very well formed, average porous; average compact; frequent earthworms feces; slow passing.

The AC horizon: 36-72 cm; brown-grey dark colour (10YR3/2,5) in wet stage and brown colour (10YR4/3) in dry phase; the clay-loam texture; poliedric angular structure, fine porous; rare earthworms feces; compact; frequent yellow stains or white of limestone; low effervescence; slow passing.

The Cw: under 72 cm; brown-yellow dark (10YR4/4 in wet stage and brown yellow colour (10YR5/4) in dry stage; clay – loam texture; stony structure by drying; fine porous; very compact; frequent purple stains; rare accumulations of limestone of small dimensions; moderate effervescence.

The main physic-mechanical features (table 1)

As size, the stagnic calcaric faeoziom has a low content of thick sand yet constant on the entire soil profile (0.1%) and a higher content of fine sand that in Am horizon records a 28.9% content and decrease in AC horizon to 27.3% and then it increases in the parental material to 29.1%.

The loam content is lower than the fine sand content and it is almost constant on the entire soil profile of approx. 20%.

The half of the size particles is occupied by clay that in Am horizon records 51.9% and slowly increase to 52.4% in the AC horizon and then it decreases to 51% in the parental material.

This size composition determines a clayey texture on the entire width of the soil profile. The bulk density increase on the soil profile from 1.33 g/cm^3 to 1.55 g/cm^3 and the soil density increases from 2.52 g/cm^3 to 2.69 g/cm^3. These increases emphasize the high compaction of the calcaric faeozioms in the depth that is mainly determined by the clay particles. The soil porosity is higher in the first horizon due to the better structuring and loosening by tillage.

In the depth of the soil the porosity decreases and the compaction increases. In this manner, the total porosity decreases from 48% to 42% and the aeration porosity decreases from 15% to 3%.

The main hydrophisical properties (table 2)

In correlation with the size properties, the hydrophisical have high values and approximately constant on the soil profile. In this manner, the hygroscopicity coefficient records the 11.22% value in the Am horizon and 10.98% in the parental material. The tilth coefficient has the 16.49% value in the first horizon, 17.14% in the second and 16.14% in the parental material.

The clay content and the humus supplying determine the moisture equivalent to be 33% in all three horizon. For the same reasons the stagnic, calcaric faeoziom has a high available water capacity, of about 17%.

The main chemical features (table 3)

The calcaric stagnic faeoziom is average supplied with organic material, the humus content is 3.1% in the first horizon is higher till the parental material where it is of 1.1%.

The nitrogen supplying is middle, of 0.169% in the Am horizon, of 0.110% in the AC horizon and of 0.059% in the parental material. The available phosphorus is low, between 8.5 ppm and 1.0 ppm in the last one. This soil is average supplied by soluble potash the content is from 141 ppm in the Am horizon to 99 ppm in the parental material. The soil reaction is alkaline , the pH value increase from 7.2 in Am horizon to 8.2 in the parental material.

The colloidal complex has many basic cations, the sum of the exchangeable bases increases along with the soil profile from 28.7% me/100 g of soil to 35.4 me/100 g soil. The saturation degree of the soil is high, recording 96% in the first horizon and 100% in the other two horizons.

Table 1

The main phisico-mechanical features of the stagnic calcaric faeoziom

Horizon	Depth	Size %				Texture	Bulk D g/cm^3	D g/cm^3	Total porosity %	Aeration porosity
		Thick sand 2-0.2 mm	Fine sand 0.2-0.02 mm	Loam 0.02-0.002 mm	Clay < 0.002 mm					
Am	0-35	0.1	28.9	19.1	51.9	AL	1.33	2.52	48	15
AC	36-72	0.1	27.3	20.2	52.4	AL	1.46	2.66	45	8
Cw	<72	0.1	29.1	19.8	51.0	AL	1.55	2.69	42	3

Table 2

The main hydrophisical features of the stagnic calcaric faeoziom

Horizon	Depth cm	HC%	TC%	ME%	AWC%	UC%
Am	0-35	11.22	16.49	33.65	25.03	17.16
AC	36-72	11.66	17.14	34.16	25.26	17.02
Cw	<72	10.98	16.14	33.10	24.91	16.96

Table 3

The main chemical features of the stagnic calcaric faeoziom

Horizon	Depth cm	Humus%	Total N %	P ppm	K ppm	pH H_2O	SH	SB	T	V%
							me/100 g soil			
Am	0-35	Am	3.1	0.169	8.5	141	7.2	1.1	28.7	96
AC	36-72	AC	2.1	1.110	3.5	130	7.7	-	33.5	100
Cw	<72	Cw	1.1	0.059	1.0	99	8.2	-	35.4	100

CONCLUSIONS

1. The stagnic calcaric faeoziom occupies a surface of 160 ha of 1,073 ha of the Grecesti village.

2. The soil features enframes it into the average fertility category.

3. In order to enhance the fertility potential of this soil there are needed deep tillage and balanced organo-mineral fertilization.

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