

## STUDY OF LIMITING FACTOR IN FIELD SOIL FERTILITY FROM BÂRZAVA PLAIN

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### Abstract

*This paper is a study of soil fertility improvement methods in Bârzava Plain. The different types and groups of genetic soil types existing today in the perimeter are the result of the actions sought in time and space complex pedogenetic factors (underlying rock, landscape, climate, vegetation, hydrography, hydrology, fauna) plus the influences caused by human actions from draining and drainage works to intensive agriculture today. Soils formed in these conditions are a relatively recent stage of soil formation as a result of having little time out of the water. The process of soil formation is relatively recent and their direction of development is dictated largely by the microrelief forms they occupy and thus the groundwater level in the profile, and the nature of parenta rocks.*

**Key words:** Salted, texture, compactness, unevenness, moisture.

### INTRODUCTION

Bârzava Plain has 54.250 ha and down su fan shaped Dognecei Hills area and ends rather abruptly in the plain low rate at 100 m line-Jamu Mare localities Lățunaș-Moravian-Gaius Small-Dental-Opatia-Folea-Liebling-Sacosu Turcesc -Buziaș. To the east, the limit is marked by an abrupt about. 50 m separating it from the hills. Given the lithologic uniformity believe contact slightly shifted east to west at the situation presented by Posea (1992). Although near the mountain is done within specific altitude high plain, however, advanced stage of evolution of sollurilor in Ramna or in the hills east Bocșa Berzovia, makes us appreciate that the eastern limit would correspond to a line following a route north of Fizeș - Șoșdea east - west Ramna - Vermeș west - east Nitchidorf - South Buziaș.

### MATERIALS AND METHODS

To achieve the objectives were used domain-specific research methods pedology: pedological mapping, morphological description, expedited determinations in the field, laboratory information processing soil, etc..

Thus the perimeter researched on newly available data obtained by direct observation in the field and processed in the laboratory have identified a total of 10 genetic types of soil.

The profiles were located in areas representative of the area searched so that it can be described most representative soil types and subtypes. For profiles, samples were collected on pedogenetic horizons, both natural settlement (unchanged) and the amended settlement.

Soil Sampling in natural settlement (unchanged), to characterize certain physical characteristics and hydro-cylinder was the metal of known volume, the momentary soil moisture and in cardboard boxes (especially made) to characterize its micromorphology.

Sampling the settlement as to characterize physico-chemical and biological part, was in bags, each genetic horizon.

Also for the determination of specific chemical indices were agrochemical samples (processing layer). Research conditions ecopedologic and morphological description of soil was investigated after "the Romanian system of soil taxonomy (2003), completed and/or modified by "Development methodology soil studies "(volumes I, II, III) developed by ICPA Bucharest in 1987.

Testing and other laboratory determinations were performed in Soil and Agrochemical Studies Office Timisoara, and the University of Agricultural Sciences and Veterinary Medicine of Banat Timisoara, where national rules and standards approved by the Standards Association of Romania (ASRO).

## RESULTS AND DISCUSSION

In the following, we list the categories of limitations, restrictions (limiting factors) depending on their nature and intensity which determines the limiting factors, which will group the soil and ground units found in the territory studied, according to the indicator 271, the development methodology to study the soil III, as follows:

### **Limitations due to soil salinity**

S - Salted (salinisation and / or alcalization).

Area - 3 778 ha, 6.97% of the charter

In this category of limitations (limiting factors) falls land-poor soils strong salinisation and / or alcalizare with a high content of easily soluble salts (carbonate and sodium bicarbonate), chlorides and sulphates from 0 to 100 cm, the which according to the intensity and depth that is salinisationand/or alcalizarea distinguish:

S2-saline soils and / or low alcalized

Area - 3 778 ha, 6.97% of the charter includes land with soil:

-salinisation and/or poor alcalization over 0-100 cm

-salinisation and/or moderate alcalization between 20-100 cm.

-salinisation and/or strong alcalization between 50-100 cm, which vintage cuts are below 10%.

Machines require widening preventing salinisation and / or alcalizarii, namely ensuring the maintenance node phreatic depth 1.5-2 m, by maintaining current-drain system for draining.

Limitations due to soil chemical characteristics:

-374.32 Surface ha, 0.69% of the charter.

In this group were within land with soil that presents some chemical characteristics other than Salted namely acidity, humus reserve, high content of CaCO<sub>3</sub> (danger of green-sickness).

In this group of distinguished limits:

### **M.. Limitations due to low humus reserve:**

Area - 59.67 ha, 0.11% of the charter includes land with soils that have reserves of humus in 120 t / ha in the first 50 cm. Fertilization requires radical.

### **K.. Limitations due to high content of CaCO<sub>3</sub> (danger of green-sickness).**

Area - 314.65 ha, 0.58% of the charter, includes land that have a higher CaCO<sub>3</sub> content of 16% in the first 50 cm ie. Requires chemical fertilizers acid to characterize the physiological response of Ca carbonates.

Limitations due to physical characteristics of soil:

Area - 45 081.75 ha, 83.1% of the charter, including land with soil determine the limiting factors: soil texture fine in PA, soil compactness, etc. and that the nature of the limiting factor, distinguish:

### **C. Limitations due to fine texture AP:**

Surface - 13 285.6 ha, 29.47% of the charter, including soil: medium fine texture (loamy-clay) in Ap (containing between 33-46% colloidal clay). Requires performing work at an optimal level of soil moisture to avoid compaction.

T. limitations due to soil compactation:

Area - 45 152.28 ha, 83.23% of the charter, including land with soils that have low-power degree of compaction between 20-75 cm (greater than or equal to 1%) and to improve the system aerohidric requires subsolaj and / or raising deep.

Since sflă territory is situated in a system for draining, draining the water table between 0-15 cm of water, raising can be deep because you can not descend more than that phreatic level.

Depending on the intensity compactation distinguish:

T (t4)- weak compacted soils (1-10% degree of compaction).

Area 052.8 ha, 79.36% of the charter

T (T5)-Soils strong compacted (11-18% degree of compaction).

Area 099.48 ha, 3.87% of the charter

Limitations due to land cover or ununiformity (U):

Area 20.03 ha, 29.53% of the charter, here are grouped land, located on uneven terrain with uneven over 0.29 m, usually located in Crovurilor, yarn valley rings, privaluri, pits lending and other forms microdepressionare and the microrelief of Gilgit areslele requiring modeling or smoothing capital

Limitations due to weak moisture (drainage).

Area 515.5 ha, 28.60% of the charter.

Limiting factors in this category of land with water tables falling between 0-1,5 m at mid finer-textured soils and 0-1.0 m in coarse-textured soils and control section.

Land with excessive soil moisture moderate excessive surface (soils are excessively wet periods over 5 days) that the nature of the limiting factor (excess moisture), they separated in:

Q-limitations due to excess moisture phreatic:

455.71 Surface ha, 0.84% of the charter, including land with water tables located between 0-1,5 m at mid-and fine-textured soils in the control section, with and 0-1.0 m soil coarse textured and control section that according to the depth of groundwater them separately as follows:

-Q2-soil water tables at very low depth (0.5-1 m) with medium and fine texture in the control section:

-146.48 Surface ha, 0.27% of the Charter,

-Q3-soil water tables at very low depth (1-1.5 m) with medium and fine texture in the control section:

-309.23 Surface ha, 0.57% of the Charter,

Noted that the territory is located in the draining system, drainage and the area of technical reasons could not be improved, so are now economically preameliorative.

W-Limitations stagnant due to excess moisture (surface):

Area 320.21 ha, 28.24% of the charter.

In this category of land with soil limitations falls affected by excess moisture in areas requiring drainage works agropedoameliorative superficial accommodation combined with land reclamation (smoothing or modeling capital) that depending on the intensity of expression of excess moisture, they separated as follows:

W3-limitations due to excess surface moisture moderate:

Area 886.18 ha, 21.91% of the charter.

In this category of limitations were grouped land with soils that are excessively wet years, for periods of up to 15-30 zile.Culturile suffer in these years.

Require smoothing or modeling pedoameliorative capital and works to combat excess moisture.

W4-limitations due to excess surface moisture strongly:

Area 434.03 ha, 6.33% of the charter.

In this category of limitations were within land excessively wet soils in most years, for periods of 10-60 zile. Usually cultures suffer intense.

Require smoothing or modeling and capital works to combat excess moisture agropedoameliorative

Limitations due to climate (moisture deficit):

Surface 365.6 ha, 70.72% of the charter.

Grouped soil moisture deficit than-excessive

After the intensity of expression of moisture deficit, distinguish:  
Low-moisture deficiency: soil humidity may fall in some years before fading coefficient in the upper root layer, for periods exceed 5-15 zile. In these years many cultures suffer from the lack of water, with small reductions recoltei. Irigația the need for very intensive agriculture.

Surface 036.8 ha, 41.8% of the charter.

-Moderate moisture deficiency: soil humidity decreases in many years before fading rate at the top of the root layer, for periods of up to 15-30 zile. Majoritatea crops suffer from lack of water, the reduction medium-high yield. Irrigation is necessary for high-yield agriculture and crops constant.

Surface 957.2 ha, 28.56% of the Charter,

-moisture large (strong) humidity:

Soil moisture decreases in many years before fading coefficient for the entire root thickness, for periods of up to 15-30 zile. Majoritatea crops suffer from lack of water, with high reduction is required for efficient agriculture production.

Area: -134.28 ha, 0.35% of the Charter,

## CONCLUSIONS

As an environmental factor influencing plant physiology both directly and indirectly through its many and indispensable functions for the conservation of soil productive potential amount of Ca CO<sub>3</sub> have investigated the perimeter total values (range 0-50 cm) that not exceed 12% fact which can be considered the ecological conditions it is optimal for most crops.

The characteristics of constituents, the momentum in the soil and its surface, soil humus content is one of the fundamental characteristics of its fertility status. Humus quality depends primarily on the state of that reaction in base saturation of soil.

Outcome of the dowry (lithologic) and complex physical and climatic factors and soil features in development to diverse natural or influenced by humans, soil reaction and base saturation in, present in the area investigated a variety of favorability expressed by coefficients bonitary.

As a physical attribute of stability, the composition size or soil texture (Ind. 23) present in the investigated area vary widely. Under the current methodology involved both directly by bonitare texture coefficients environmental favorability, and indirectly in the correction of some indicators such as reserves of humus or on groundwater depth. Due to the natural ecological potential good overall situation is still unsatisfactory soils, most soils are affected by the existence of one or more factors limiting or restrictive.

Also, the use of land is not always the most appropriate sustainable management of the land (simple rotation wheat-corn, monoculture, the abandonment of marginal land and even the productive, etc.).

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