

RESEARCH ON PSAMOSOLS FORMED ON WIND WAREHOUSES FROM THE BLACK FIELD

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Abstract

Higher recovery of sands and sandy soils is a problem very topical, not only worldwide but also in our country. Their cultivation on increasing areas it has emerged from the need to increase agricultural production. In agronomic acceptance, these soils are at least 50 cm thick (but usually on more than 2,00m), coarse texture (sandy, sandy, with less than 12% clay below 0.002mm and relatively low humus content (usually below 2%). To unlike sand, which from the point of view of agricultural use is a made up rock usually from quartz resistant to alteration or from particles of other minerals – small white, garnets, pyroxenes, staurolite, rutile, etc. sandy soils are developed on 160 - 2.20 cm thick, with clearly differentiated horizons, containing substances nutritious and have greater capacity to retain them.

Key words: sandy soil, spreading, relief, formation of sandy soils, grouping sandy soils, solutions.

INTRODUCTION

The paper presents the Plain of the Nir River where the type of soil is intended Psamosol sand, on wind farms (sands transported and deposited by winds), characterized by a low content in fine fractions (below 12%), which print a coarse or medium-coarse texture. The plain of Nir is part of The Western Plain of Romania and covers the territory of two counties; Bihor yes Satu Mare arriving in neighboring country Hungary. In the territory of Bihor county, The plain of Nir starts in the western part of Voievoz and stretches in West of localities; Simian, Mihai Valley, continuing on the communal territories of Satu Mare county in their west; Piscolt, Sanislau, Ciumesti, Foieni and Urziceni.

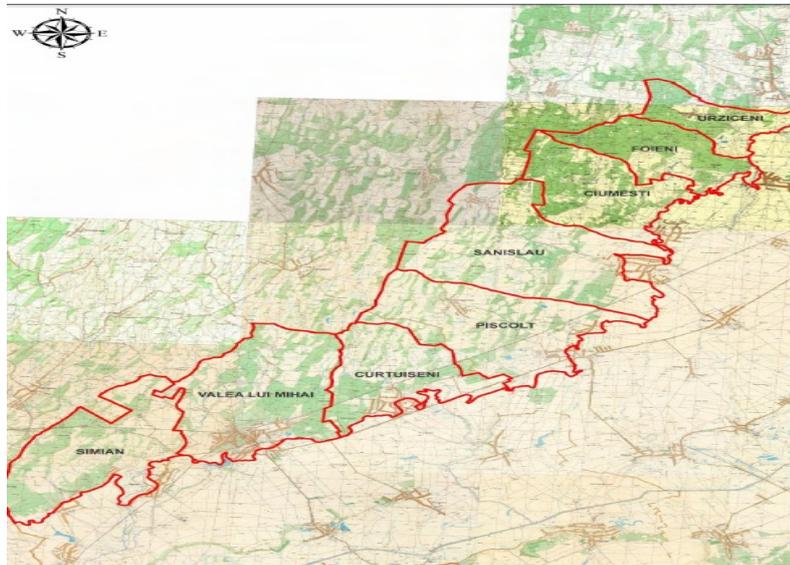


Fig. 1 Campia Nirului Map

MATERIAL AND METHOD

The research of the sandy soils of the Nir River Plain requires inventory existing surfaces as well as establishing the study perimeters. So in this case, the area of Ciumest localities was established, where a soil profile sandy Psamosol. The samples were collected at a depth 0-180c, after which they were processed in the lab. OSPA Satu Mare.

Specific to the territories with sandy and sandy soils is the relief and the distribution parental materials of different textures, as a result of transport wind or fluvial and wind sorting. The relief of these territories is corrugated, in the form of high dunes 10.-20 m or low 5-10 m and wide tens or hundreds of meters, which close between them small areas of variable width called interdune (Patrichi M., Oancea C., 1984). In the conditions of the relief wind, the texture of the sandy material changes depending on the distance source of sand and mezorelief.

The coarsest texture is encountered on the ridge of dunes, it frequently becomes sandy in the lower third of dunes and bays or even lutonisiposa with some coarse sand in wide areas.

Processes on pogenetics, specific to sandy soils in the temperate zone semiumeda - semiarida, are strongly influenced by the characteristics parental material. It determines, on the one hand, 'drying' microclimate solulus (compared to that in the atmosphere), as a result strong heating and accumulation of small water reserves, accentuating moisture deficiency with consequences in the poor carpet

development vegetation and favoring deflation, and on the other hand intensifying the circuit (mineralization) of organic matter and more active mobilization of the different constituents of the soil, intensifying the softening of substances including a nutrients due to excessive permeability and capacity reduced retention, as rats encountered in other (non-sandy) soils.

The use of sandy soils in the agricultural agricultural production is greatly influenced by the physical and chemical characteristics, determined by the texture sandy (over 88-90% sand, often with much coarse quartz sand).

Profile of Psamosol sandy soil from CampiaNirului, in the perimeter of the locality Ciumesti. Satu Mare county in fig. 2, character. physical and chemical sandy soil in tab.nr.1, and in tab.nr.2.



Fig. 2. Soil profile Psamosol UAT Ciumesti

Physical characteristics. With a small content of fine particles, soils sandy areas have a reduced surface area of sorption and large lagoon spaces. that is why they have a high permeability for air and water, but they have a capacity reduced by water retention.

I can't store large water reserves, this one losing by infiltration; a better situation is presented by the soils sandstones that are based on a slightly permeable layer above which they are can accumulate water,

situation similar to that of sandy soils with bands that can accumulate more water in the intervals.

The capacity of field for water is small and the coefficient of hygroscopicity and that of wilting are very small, make good use of summer rains (Table 1)

Table 1

The physical characteristics of Psamosol from U.A.T.Ciulesti

Crt. No	Orizont	Ap	Ao	Cn 1	Cn 2	Cn3Go
1	Depth cm	0-22	22-49	49-91	91-129	129 -180
2	coarse sand ,2-0,2mm	69,74	71,23	72,69	75,42	70,23
3	fine sand ,0,2-0,02mm	23,35	25,61	24,59	22,84	27,63
4	dust I, dust II 0,02-0,002mm	3,02	1,11	0,96	0,85	1,02
5	clay ,< 0,002 mm	3,89	2,05	1,76	0,89	1,12
6	physical clay , <0,01mm	2,24	1,45	1,30	0,95	1,14
7	Texture	NG	NG	NG	NG	NG
8	The apparent density g/cm ³	1,30	1,44	1,52		
9	Coef.dehigroscopicitate %	1,12	0,84	0,71	0,51	0,43
10	Hydraulic conductivity mm/ora	18				

Chemical characteristics.

The reduced content of clay and humus also causes poverty in other elements nutrients of sandy soils. The presence of humus, even in small quantities (0.8-1.0%) greatly improves trophic conditions, increasing their capacity of retention and implicitly the content of water and nutrients, have a potential low trophic, the natural fertility of these soils is even lower, the poorer they are in clay and humus. Aerobic microorganisms find very favorable development conditions, mineralizing strong material.

Table2

The chemical characteristics of Psamosol from U.A, T.Ciumesti.

Nr.crt	Orizont	Ap	Ao	Cn 1	Cn 2	Cn 3
1	Depth cm	0-22	22-49	49-91	91-129	129 -180
2	pH in H ₂ O	5.95	7.18	7.29	7.41	7.62
3	Humus, %	0.48	0.42	0.08		
4	Total nitrogen , %	0.026	0.013	0		
5	CaCO ₃ %	0	0	0	0	0
6	P(AL) ppm	42	35	32		
7	K(AL) ppm	56	50	47		
8	Ah(Kappen),me/100g	1.73	0.52	0.35		
9	SB(Kappen),me/100g	5.54	5.93	5.14		
10	V,%	76.20	91.94	93.62		
11	S,me/100g	5.54	5.93	5.14		
12	SH,me/100g	1.98	0.59	0.49		
13	T,me/100g	7.53	6.52	5.63		
14	V,%	73.67	90.95	91.30		

Landscaping with sandy soils For the superior valorisation of the lands with valuable sandy soils wind, the following works must be considered; modeling of dunes by uncovering and depositing material in low areas, especially on landwetlands; discovery and storage of humus-rich material, followed by modeling and leveling until the parameters provided by calculation are reached and then the covering of the land surfaces with stored humiferous material.

In the case of sandy soils with Bt horizon in strips it is good that its discovery should not be made more than 20 cm, as it is present these strips in the soil profile mean the increasing possibility of retention of soil water for a longer period of time (Patrichi, Cozos, 1992).

After these works will be done the improvement fertilization of the open surfaces, of the covered ones and of the surfaces with modified profile by mixing the layers as a result of leveling; amending the soil concerned.

To combat wind deflation in the Nirul Plain are necessary measures to prevent and combat wind erosion. The phenomenon is widespread in all sandy territories, especially on dunes. They are considered different measures of which we mention;

- a certain crop structure, in order to keep the soil covered more long time with vegetable carpet;
- practicing successive cultures;
- the smallest tillage of the soil and the failure of the autumn crops;
- establishment of protective curtains;

- the arealelo afforestation intensely affected by wind or erosion maintenance under the forest of those areas with high danger of deflation;
- creation of strips with grassy plants (rye strips), especially for legume crops;
- application of chemical fixing substances, good results being obtained in the case of bituminous substances and polymers PAM, CUSTOM, etc .;
- the establishment of the fences or the use of straw mulch.

RESULTS AND DISCUSSION

The sandy (quartiferous) material disintegrates and is slightly altered, that is why psamosols are very poor in fine fractions (clay and dust), from those several times below 10-12%. Due to poverty in organo-mineral colloids, psamosols have a low cohesion, being easily blown by the winds from it the cause of the solubilization processes are permanently interrupted.

These processes the genesis specific to the sandy areas cause the psamosols to have a profile of poorly contoured and slightly evolved soil.

Psamosols have sufficiently different characteristics, from one subtype to another to attract the need to apply technologies (or variations of technologies) differentiated from breeding and cultivation.

Although it is very easy to work, due to the fact that I do not retain water nutrients, psamosols have very low natural fertility.

In order to be cultivated it requires radical measures of improvement through;

- application of irrigation to fill the large humidity deficit. On sandy soils small water norms are recommended and often applied 2-3 days;
- organic fertilization for the growth of humus content, garbage the stable is recommended to be incorporated 30-40 cm deep, to avoid it rapid aerobic decomposition;
- chemical fertilization to fill the deficiency of nutrients. Because psamosols have a power of retaining the missing nutrients it is recommended to apply chemical fertilizers with small incantations and in several times, to avoid smoothing them towards the groundwater.

CONCLUSIONS

Psamosol sandy soils are of particular importance as a resource land for agriculture of the country, because it has certain characteristics that I make them valuable, of which we mention the following; faster heating compared to other soils, thus offering the possibility of obtaining

crops early; easier soil work and in a longer time long, with lower fuel and energy consumption; capacity high mineralization of organic waste; easier prevention a phenomena of salinization, alkalization or excess humidity in the case of irrigation.

By applying the improvement works, the productive capacity of the soil SandPsamosol from the CampiaNirului its production capacityit grows a lot, being able to obtain big and economically efficient productions. Afterimprovement is suitable for the following crops; wheat, barley, corn, flower sun, soy, vines, trees, early potatoes, watermelons, etc.All for sands are specific to certain plants such as: tobacco, melons, potato early, vines some species of trees (apricot, peach).

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