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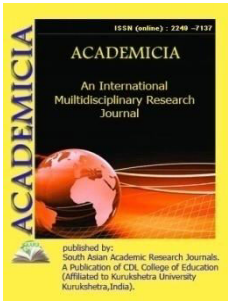

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PRODUCTIVITY AND MORPHOGENETIC DESCRIPTION OF IRRIGATED SEMI-AUTOMORPH SOILS OFLIGHT SEROZEM SOIL ZONE

Bobomurodov Sh.M*; Bobonorov B.B; Ismonov A.J***; Tursunov Sh.T****; Baxodirov Z.A*****

[1,5]Research Institute of Soil Science and Agrochemistry,
Ministry of Agriculture of Uzbekistan,
Tashkent, UZBEKISTAN
Email id: shuhrat_bm@irbox. rubekzodbobonorov427@gmail.com, abduvahob60@mail.ru,
tursunov.sodmon.1976 @gmail.com, zafarbahodirov@gmail.com

ABSTRACT

The article provides information on non eroded and eroded irrigated serozem-meadow and meadow-serozem soils, which are illustrated by some examples of the Ak Altyn district, which is part of the flooded area of the Sardoba Reservoir in the Syrdarya region. Soil samples taken from these floodplains and floodplains were widely covered based on the results of analysis and field research, the amount of humus and nutrients, mechanical composition, carbonate and gypsum are analyzed, which determine soil fertility. It should also be noted that a detailed description of the morphological structure of genetic horizons is given. Irrigated serozem-meadow soils are moderately eroded by flooding and have a medium, light, heavy loamy and sandy mechanical composition, with physical clay particles of 31.8-42.1% and fine sand (7.9-51%), coarse dust (18.3-51.7%), il particles occur in the amount of 10.3 to 15.1%, of which fine sand and coarse dust particles predominate. In irrigated meadow-serozem soils, humus decreases along the cross-sectional profile, ie towards the parent rock, according to a certain pattern (0.118-0.278%). The mobile phosphorus is 297 mg/kg in the arable layer and the exchangeable potassium is 7.4 mg/kg. It was noted that these soils are very poorly supplied with humus and nutrients and in some cases moderately. Irrigated serozem-meadow soils are moderately eroded, with humus content in the arable layer ranging from 0.246%, mobile phosphorus from 79 to 136 mg/kg, exchangeable potassium from 0.6 to 2.2 mg/kg.In the semi-automorphic soils studied, the dry residue content ranged from 0.132% to 0.655% in both soils,

mainly belonging to the chloride-sulphate and sulphate salinity types, and they were dominated by sulfate (SO4-) ions (0.063 to 0.402%).

KEYWORDS: *Irrigated Serozem-Meadow Soil, Non Eroded, Eroded, Mechanical Content, Humus, Mobile Phosphorus, Exchangeable Potassium, Salinity, Dry Residue, Gypsum, Carbonate*

INTRODUCTION

Effective use of irrigated lands involved in agriculture in the country requires protection of irrigated lands by maintaining and restoring the current state of fertility and productivity. To this end, continuous monitoring of irrigated soils, including the development of proposals and recommendations based on a scientific study of the soils of the disaster area is relevant today. It has also been reported that degradation processes in soils are accelerating, salinization is occurring, and humus and nutrients are greatly depleted.

The purpose of the study - The purpose of our work is to characterize the data of field and laboratory studies on the condition of irrigated serozem-meadow and meadow-serozem soils of the Akaltin district of the Syrdarya region.

Object of the research and methods of implementation. As objects of the study irrigated serozem-meadow and meadow-serozem soils of the flooded area Sardoba Reservoirwere selected. These soils are intermediate phase soils that move from serozem soil to meadow soil or from meadow soil to serozem soil according to movement of groundwater level in time.

The basis of the research methodology includes field soil, laboratory-analytical, cameral-analytical work. It was carried out at the Research Institute of Soil Science and Agrochemistry and on the basis of generally accepted national guidelines [1; 2; 3].

Research results and their discussion. The mechanical composition of soils, the scope of its influence on properties of soilsisimportant, water retention, water permeability is also directly related to the mechanical composition. In addition, it is important for vital moisture content for plants, in determining quantitative criteria and balances of heat regimes [4; 5; 6;].

According to the results of soil analysis of irrigated soils of the studied area, non eroded area with medium and light loamy mechanical composition includes irrigated serozem-meadow soils (sample 21) with 30.2-37.4% in medium loamy, 24.6% in light loamy, coarse and fine dust particles and coarse sand particles predominate, 6.4-18.3% of clay particles (respectively 4.8-38, 2%, 10.3-19.9%, 18.5-69.8%).

Irrigated serozem-meadow soils (sample 20) are moderately eroded by flooding, with medium, light, heavy loamy and sandy loam mechanical composition along the profile, with physical clay particles 31.8-42.1%, respectively, 22, 3-23.9%, 19.1%, fine sand (7.9-51%), coarse dust (18.3-51.7%), clay particles from 10.3 to 15.1%, fine sand and large dust particles predominate.

The selected irrigated meadow-serozem soil (sample 21) is provided with a moderate content of (1.081%) arable layer of soil with humus, and it decreases along the profile, ie towards the parent rock, according to a certain pattern (0.118-0.278%). The mobile phosphorus is 297 mg/kg in the arablr layer, the exchangeable potassium is 7.4 mg/kg, and they decrease to the bottom of the soil

profile (64-110 and 1.2-3.8 mg/kg respectively). It was noted that these soils are very poorly supplied with humus and nutrients and in some cases moderately. Carbonates (CO_2) occur in the form of 5.30-6.44%, gypsum crystals in the amount of 0.697-4.198%.

Irrigated serozem-meadow soils (sample 20) were moderately eroded, with humus content in the arable layer 0.246%, gradually decreasing towards the bottom of the profile (0.064-0.182%), mobile phosphorus occurs 79 to 136 mg/kg, exchangeable potassium ranging from 0.6 to 2.2 mg/kg, these soils very poor, sometimes poorly supplied with humus and nutrients. Carbonates (CO_2) are 4.08-6.09%, in the form of gypsum crystals in the range of 0.401 to 1.567%, in some layers of the soil are washed (5.87-9.553%) and observed as non-gypsum soils.

Taking into account the susceptibility of irrigated serozem-meadow and meadow-serozem soils to salinity, the movement, redistribution and accumulation of water-soluble salts along the soil profile, as well as the analysis of salt accumulation and secondary salinization processes plays an important role [7; 8; 9; 10].

Irrigated meadow-serozem soils are low salineat the arable and subsoil layer, moderately saline towards the bottom of the section, the dry residue content of water-soluble salts is 0.132-0.655%, mainly belongs to the chloride-sulfate salinity type, chlorine (Cl^-) ion 0.028-0.063%, sulfate (SO_4^-) ion is 0.063-0.402%.

Irrigated serozem-meadow soils are low-saline, 140-171 cm layer is not saline, mainly belongs to the type of sulfate salinity. The dry matter content of water-soluble salts is 0.132% in the unsalted layer, 0.345 to 0.445% in the low-saline layer, chlorine (CI^-) ion 0.007-0.014%, sulfate (SO_4^-) ion 0.063 to 0.200% (Figure 1).

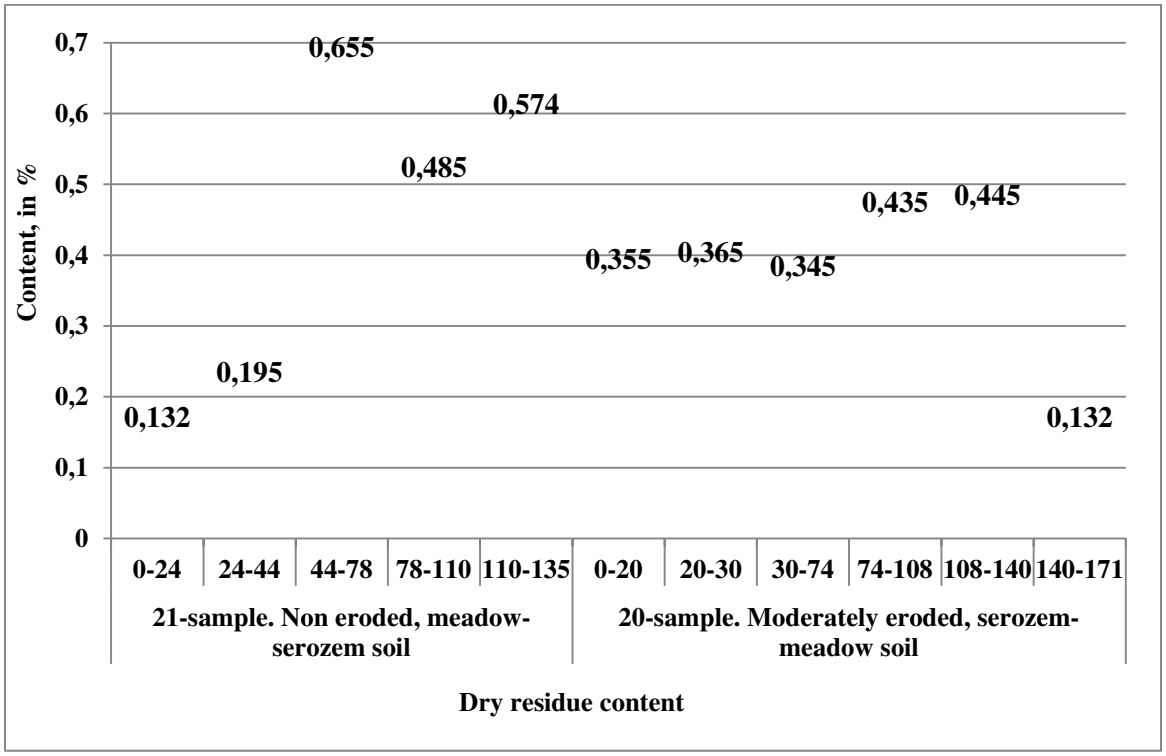

Figure 1. Content of dry residue in irrigated meadow-serozem and serozem-meadow soils

Field soil studies identifiedareas that were not flooded (sample 21) and moderately eroded (sample 20), from which separate soil samples were excavated and divided into genetic horizons. In the soils of this area, groundwater is located at a depth of 2.5 meters. The morphological structure of the studied sections is given.

21-sample. Bobonorov B.B. 09.04.2021. Sardoba massif of Akaltin district (non-flooded area), Central Mirzachul plain consisting of proluvial and lake deposits, irrigated meadow-serozem soils.

A_a 0-24cm. Light gray, dry bottom moisture increases, medium loamy, large and fine-grained structure, soft, less dense, salts vascular, abundant insect traces and plant roots, semi-rotten plant remains are common, the transition to the next layer depends on the abundance of roots;

A_{sa} 24-44cm. Light gray, moderately moist, moderately loamy, fine and in some cases large-celled structure, semi-rotten plant remains are abundant, plant roots are abundant, insect remains and traces are moderate, vascular salts are occasionally visible, the transition to the next layer is gradual depending on color;

B_1 44-78cm. Compared to the top layer, light gray, moisture increases moderately downward, medium loamy, fine-grained structure, soft, salts occur in the form of fine crystals, gypsum crystals, decaying plant remains and roots are low, underground insect traces are low, the transition to the next layer is obvious according to mechanical composition and humidity;

B_2 79-110cm. Light gray, very moist, slightly sandy, in a granular structure, soft, very few plant roots and insect traces, salts occur in the form of small crystals and gypsum crystalline state, according to the mechanical composition of the transition to the next layer;

C 110-135cm. Light gray, with a high moisture content, moderately sandy, fine-grained structure, soft, plant roots are sparse, insect traces are very rare, gypsum crystals are poorly expressed.

This soil sample is irrigated meadow-serozem soils with non eroded area, mainly due to the uniformity of mechanical composition, their exchange in some lower layers, moderate increase in humidity from the upper part to the dry lower part, the increase in humidity from 79-110 cm. The roots of the plant towards the bottom are sparse and the traces of insects are rare.

20-sample. Bobonorov B.B. 09.04.2021. Musamuhamedov massif, moderately eroded floodplain, Central Mirzachul plain consisting of lake-proluvial deposits, irrigated serozem-meadow soils.

A_a 0-20cm. Light gray, the surface rises to the bottom of dry moisture, sandy, dusty structure, soft and less dense, salts in the form of small crystals, gypsum in small quantities, abundant semi-rotten plant remains, insect traces and remains moderate, according to the mechanical composition of the next layer ;

A_s 20-30cm. Light gray, moderately moist, slightly sandy, with a fine-grained and dusty structure, less dense, occurs in the form of fine crystals of salts from new formations, plant roots are abundant, insect traces are moderate, according to the mechanical composition of the transition to the next layer;

$B_1$30-74sm. Compared with the previous layer, it has a light gray color, less moist, medium sandy, fine-grained granular structure, low density, plant roots are sparse, insect traces are low, small crystals of salts and gypsum crystals are abundant, according to the mechanical composition of the transition to the next layer;

$B_2$74-108sm. Very light gray, low moisture, heavy sandy, coarse structure, low density, very few insect traces, few fine crystals of salts and gypsum crystals, the transition to the next layer according to the mechanical composition;

C_1-108-140cm. Very light gray, low moisture, medium sandy, granular structure, low density, gypsum crystals low, salts in the form of fine crystals, according to the mechanical composition of the transition to the next layer;

C_2-140-171cm. Very light gray, low moisture, slightly sandy, dusty structure, low density, low gypsum crystals.

The erosion of the soil sections studied at the study site was relatively shortened, the mechanical composition varied, i.e., light - medium - heavy - light sand exchange, mainly low density, very light color from the subsoil (30-74 cm), salts occurring in the form of small crystals, its relative increase to the bottom of the section and a sharp decrease in plant roots and insect traces, the change of layers is sharply dependent on the mechanical composition.

In conclusion, it should be noted that both soils studied differ in mechanical composition (i.e., medium-heavy, light loamy), the intensity of exchange in some cases, irrigated meadow-serozem soils with humus and nutrients are very low (0-0.5%), (0-15, 0-100mg/kg) and low (0.5-1%), (100-200mg/kg) moderate in some cases (1.1-2%), (200-300 mg/kg), carbonates (CO_2) 5.30-6.44%, gypsum content 0.697-4.198%, irrigated serozem-meadow soils are very poor in humus and nutrients, sometimes poorly supplied, carbonates (CO_2) 4.08-6, 09% [11], in the form of gypsum crystals in some layers of soil washed (5.87-9.553%) and observed non-gypsum soils.

The amount of dry residue in both soils ranges from 0.132% to 0.655%, mainly belonging to the type of chloride-sulphate and sulphate salinity, the wide range of anions, ie chlorine (Cl^-) ion from 0.007% to 0.063%, sulfate (SO_4^-) ion from 0.063 up to 0.402% were recorded.

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