AGROMELIORATIVE STATE OF IRRIGATED GRAY-MEADOW SOILS

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Annotation: This article is based on the data obtained on the water-physical and agrochemical properties and reclamation status of irrigated grasslands, based on a detailed study and monitoring of the reclamation of soils in the region, recommendations for the development and implementation of scientifically based measures and recommendations for their improvement. given.

Key words: Land and water resources, reclamation, mechanical elements, humus, nitrogen, phosphorus, leach water, salinity, salts reserve, monitoring.

Introduction

In order to ensure the implementation of the decision of the Cabinet of Ministers of the Republic of Uzbekistan “on additional measures to ensure unconditional implementation of the state program on improvement of land reclamation status of irrigated lands in the period of 2017-2021 and rational use of water resources” in 2018, a number of activities are being carried out on the rational use of land plots and water resources along the banks of water resources.

The rational use of land and water resources in irrigated areas, the restoration of soil fertility, the regular increase in the yield and productivity of agricultural crops by storing and increasing is one of the pressing issues of today. Due to this, all agrotechnical and land reclamation activities in areas require the proper and timely implementation, for this purpose the development of scientifically based proposals and recommendations, through the study and re-analysis of soil properties, its reclamation-ecological status [2].

Selected object, research goal and methods

Scientific-research works are carried out for monitoring and rational use of water-physical and agrochemical properties of irrigated gray-meadow soils of Mirzaabad District of Sirdarya region located on low plains of the foothills.

The research is proposed for 2021-2023 years, water-physical and agrochemical properties and meliorative status of soil in the main soil sections laid in irrigation fields of the farm were studied in the initial year. Here were used field methods of experiment and laboratory.

Main part.

With the crushing of the size of the mechanical elements contained in the soil, their properties also change. Especially well expressed on the border of fractions “physical clay” (<0.01 mm) with such drastic changes “physical sand” (>0.01 mm). Therefore, in the study of the mechanical composition of the soil, special attention was paid to the amount of these particles.

According to the mechanical composition of gray-meadow soils distributed in irrigated areas of Mirzaabad district, the blowing sand consists of layers with light and medium sandblasting depending on the lower layers, and the amount of physical clay (particles smaller than 0.01 mm) is 16.2-20.4%. For these soils, the haracteristic property is the predominance of the amount of large dust fractions in them (0,05-0,01 mm), the amount of which in the soil profile ranged around 30,4-52,2%, this property is characteristic for all soils of Mirzachul. The main reason for this is that the soil was associated with the fact that the native genus lyossli, and the myth of il granules was 2,4-6,1% (Table 1).

Table 1

Content of the soil of chosen area for research.

Depth of the layer, cm.	Measure of the fraction, mm, Фракциялар ўлчами, мм., миқдори, %.							Физик лой	Тупроқнинг механик таркибга кўра номи
	қум			чанг			ил		
	>0,25	0,25-0,1	0,1-0,05	0,05-0,01	0,01-0,005	0,005-0,001	<0,001	<0,01	
0-28	5,5	0,5	8,2	52,2	2,1	10,7	3,4	16,2	қумлоқ
28-45	2,5	1,0	10,1	50,8	4,3	11,4	6,1	19,8	қумлоқ
45-96	1,0	10,0	10,4	45,3	2,6	11,0	2,4	16,0	қумлоқ
96-128	0,5	8,0	17,9	30,4	5,1	10,4	3,0	18,5	қумлоқ
128-167	0,5	6,0	10,5	37,0	3,8	14,0	2,6	20,4	енгил қумоқ
167-197	1,0	8,0	10,7	43,3	14,5	19,5	3,0	37,0	Ўрта қумоқ

It is known in the literature that the presence of large dust particles in the soil impairs the permeability and water permeability of the soil, as well as increases the capillary capacity of the soil (i.e, the rise of water through the capillaries). According to U. Toshbekov and A. Altmishev, the rise of water through the capillaries rises from the sand, through the sand to the clay sand [1]. This, in turn, accelerates secondary salinization when groundwater is close.

The content of humus in the soil of this farm is 0.99-1.38%, while it is low in mobile nitrogen (18-29 mg/kg) and phosphorus (13-25 mg/kg), and exchangeable potassium (105-176 mg/kg). and moderately provided (Table 2).

Table 2

Agrochemical index of the soils of the fields selected for the study

Depth of sampled layer), cm	The amount of nutrients			
	The amount of humus in the soil, %	N, mg/kg	P_2O_5, mg/100 gr. or mg/kg	K_2O, mg/100 gr. or mg/kg
0-28	0,99	22	20	175
28-45	0,86	19	18	146
45-96	0,66	18	13	105

The influence of groundwater on soil formation, especially salinization, is significant, which determines the degree of formation of salt-water regimes in the salinity of the soil. relocation and redistribution.

The closer the groundwater table is to the surface and the higher their salinity, the more rapid the accumulation of salt in the soil and the processes of secondary salinization. This process, in turn, depends on the condition of existing land reclamation systems, the severity of the area and irrigation standards, in short, the critical depth of groundwater.

While the level of groundwater in the study area fluctuated widely during the growing season, it decreased to 210-240 cm before irrigation and increased to 140-170 cm after irrigation. When the irrigation works are completed in autumn, the groundwater level will be 250-300 cm. a decrease in escape was observed. The amplitude of seasonal vibrations was 110-130 cm.

Groundwaters are mainly sulfate and chloride-sulphate by anions, and magnesium-calcium and sodium-calcium salts by cations.

Gray-grass soils distributed in the study area are saline to varying degrees, with varying salinity distribution and salinity in the soil layers. Occasionally, almost uniform, high distribution of salts is observed in all layers of profile salinity or groundwater up to the groundwater table (Table 3).

Table 3

The composition of the field soils selected for the study water-soluble salts, gypsum and CO_2-carbonates, %

Depth of layer, see	Dry residue	HCO_3^-	Cl^-	SO_4^{2-}	Ca^{2+}	Mg^{2+}	Na^+	Salinity type	Gypsum	CO_2-carbonates	pH
0-28	1,260	0,027	0,049	0,669	0,245	0,012	0,058	с-н-к	5,20	3,84	7,53
28-45	1,275	0,027	0,049	0,683	0,126	0,018	0,087	с-н-к	6,20	2,27	7,59
45-96	1,268	0,024	0,035	0,728	0,260	0,012	0,059	с-н-к	8,91	4,97	7,64
96-128	1,305	0,018	0,042	0,701	0,203	0,024	0,091	с-н-к	7,65	9,56	7,61
128-167	1,340	0,027	0,045	0,763	0,272	0,021	0,053	с-н-к	3,80	8,77	7,67
167-197	1,383	0,024	0,049	0,776	0,253	0,024	0,076	с-н-к	5,97	6,33	7,68

Note: c - sulfate; n-k - sodium-calcium.

The total amount of salts (dry residue) in the top 0-200 cm layer of the soil was 1.26-1.38%. Of these, chlorides accounted for 0.035-0.049% and sulfates for 0.669-0.776%. According to the salinity chemistry of these soils, they are mainly composed of sulfate-sodium-calcium salinity. The content of gypsum was 3.80-8.91%, carbonates - 2.27-9.56%, and the general pattern of distribution in the soil profile was not observed. In terms of the quality of salts, the main place is occupied by CaSO4, followed by $MgSO_4$ and Na_2SO_4. $MgCl_2$ and $CaCl_2$ were present in very small amounts in the soil layers. NaCl was 0.058–0.091% (Table 3).

The salt reserves in the topsoil of the irrigated glacial soils, which are widespread in the study area, amounted to 49.9 t//ha. In the 0-100 cm layer, it is 173.8 t/ha, the main part of which consists of sulfates (95.9 t/ha) and chlorides (5.9 t/ha). In the 0-200 cm layer, these figures are proportional to 365.1; 202.5 and 1265 t/ha (Table 4).

Table 4

Water-soluble salts in the studied soil quantity and reserve

Depth of layer, see	Volume weight, g/cm³	Amount of salts,%			Reserve of salts, t / ha		
		Dry residue	Cl	SO_4	The sum of the salts	Cl	SO_4
0-30	1,32	1,260	0,049	0,669	49,896	1,940	26,492
30-50	1,36	1,272	0,047	0,697	34,598	1,278	18,958
50-100	1,40	1,275	0,039	0,722	89,250	2,730	50,540
0-100	1,36	1,269	0,045	0,696	173,744	5,949	95,991
100-150	1,42	1,327	0,045	0,737	94,217	3,195	52,327
150-200	1,40	1,388	0,048	0,774	97,160	3,360	54,180
0-200	1,39	1,328	0,046	0,736	365,121	12,504	202,498

In summary, irrigated gray-grass soils distributed in the study area are mostly moderately saline and highly prone to salinization. Therefore, it is necessary to carry out regular reclamation activities in the area. To do this, first of all, on the basis of a detailed study and monitoring of the reclamation of soils in the region, it is necessary to develop scientifically based measures and recommendations for their improvement, and apply them in practice.

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