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Properties of Irrigated Boz-Meadow Soils of Syrdarya Region

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Abstract. The article analyzes the current state of the mechanical composition, agrophysical and agrochemical properties of irrigated gray-meadow soils of the Syrdarya region. Under the conditions of irrigated agriculture, the physical, water-physical, thermo physical and physical-mechanical properties of soils are of great importance in increasing the productivity of soils. The consumption and mobility of soil moisture and the assimilation of nutrients are determined by physical and water-physical properties, and the quality of soil cultivation is determined by physical and mechanical properties. The presence of these factors within acceptable limits leads to better growth and development of crops, as well as increased yields. According to the data obtained, it was found that the volumetric mass of the soil is 1.39-1.45 g/cm^3, and the presence of an arable layer at a low level is due to the effect of cultivation.

Key words: water-physical properties, specific gravity, volume weight, total porosity, field moisture capacity, capillary moisture

Introduction. Mirzachul is located on the Left Bank of the middle reaches of the Syrdarya River and covers an area of 10 thousand km2, including the Syrdarya, Jizzakh regions of Uzbekistan, the southern regions of the Republic of Kazakhstan and the Zafarabad districts of the Republic of Tajikistan. It declines from southeast to Northwest, and in the southeast it ranges from 385 meters to 273 meters in height above sea level. Mirzachul is a sloping plain, descending to the North and Northwest, and the northern part is 240 meters high above sea level and 230 meters around the shores of Tuzkon-Aydar Lake and upper Arnasoy lakes to the West. It borders the Syrdarya River in the Northeast and the foothill plains of Turkestan and Nurota mountains in the South. In the West, it is slowly adjacent to the Kyzylkum [1].

On the issue of the formation of the waters of the grunt of this territory and their nutrition, G.I.Arkhangelsk, V.A.Kovda, A.N.Rozanov, V.V.Egorov, B.S.Konkov, M.A.Pankov, N.A.Genesarin, S.A.Khasanov, M.U.Omarov, A.K.Various opinions have been expressed by many scientists, such as Komilov, according to which the first main source in the formation of grunt waters, in the case of groundwater and upper waters flowing from the Turkestan mountain ranges, the second source consists of waters coming along the Syrdarya core, which converge in the area and move towards the North-West (Kyzylkum).

A very slow natural flow of grunt Waters was formed in the mirzachul Plains before the development and irrigation farming activities were carried out. S.P.According to Suchkov [3], the level of saline grunt water in the dry and lalmikor lands, consisting of deep-saline, top-salinated light-colored gray soils, developed over Sandy-saline deposits of the central Mirzachul plain, is located at 10-15 meters, and in salty Meadow chalk soils in Achagat, Yettisoy and Sardoba Oaks, boggy and lowlands at 3-5 meters.

For the first time the soil cover of mirzachul N.A. Dimo made an initial soil map of the area by examining it in 1907-1909. N.A.Dimo made some changes to the initial structured soil map in 1911-1916, carrying out a re-examination in the Southeastern and eastern areas of Mirzachul [4].

N.A.Dimo described on this soil map the soils of the Mirzachul region in terms of their suitability for assimilation into three categories A, V and D and eight soil types, of which category a divided into four. The Sardoba and white gold district is located in the central part of Mirzachul and has a soil cover before watering N.A.Belonging to paragraph 1-2 of Category A of the Dimo map:

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- unsalted soils that are light to watering, do not require special reclamation measures, the waters of which are located in a pit of 6-20 m or more. This category belongs to the soils of the central and entire Western and Northern Territory of Mirzachul and the Arnasoy swamp;

- open soil of the Central Mirzachul plain with porous sand, loamy and loamy beds, with a fine and heavy loam over clayey layers;

-the gravel bed of the central and southern Mirzachul plain is composed of layers of sandy loam and light gray loamy soil with heavy loam over the same loams, as well as light loamy soils with light loam over heavy loamy loam.

The rise in salinity sizot waters to varying degrees led to increased vertical water exchange in soil layers. This situation in turn gave rise to a hydromorphism in the soil profile, that is, a process of intense hydration. As a result of the intensification of hydromorphism and the transition of the water regime into an irrigation regime, the exchange of the general law of soil formation and development into private laws, transitional Gray-Meadow soils with different levels of salinity, irrigation water regime appeared from the dry and lalmikor light-tinged Boz soils of a large part of the Mirzachul plain.

Gray-Meadow soils are considered the best of the regional land reserves, since they make up the main part of the territory of the region, consisting only of 761 hectares of abandoned land. In the region, Boz-Meadow soils are more common in Sardoba, Okholtin and Khovos districts [2].

Object and methods of research. As an object of research, irrigated Gray-Meadow soils were selected, which were distributed in the Syrdarya region. Soil research was carried out on the basis of generally accepted methods in the Republic.

Results and discussions. In our study, we analyzed the morphological structure and agrophysical, agrochemical properties of the soils of the irrigated Boz-meadow of the Syrdarya region at the present time.

The morphological structure of the incision is as follows: medium-loamy, moderately saline Boz-Meadow soil with fresh watering. Saihunabad district Pakhtakor is located 2 kilometers from the south side of the center of the MFY area.

Ahey. 0-26cm. Gray-gray color, dry upper part, weakly moistened downward side, medium-lumpy, moderately compacted, finely porous, chiseled-powdery structure, plant roots are abundant, pass through the next layer with color and density.

Ah / a 26-48 CM. The Bush is yellowish-gray, moistened, medium-loamy, strongly compacted, with a chiseled structure, small root hairs and carbonate spots are found, changing color to the next layer.

B 48-87 CM. The Bush is yellowish-gray, moistened, medium-loamy, without a strongly compacted structure, a small number of small root hairs and carbonate spots are found, passing to the next layer with a change in color and salt stains.

B1 87-128 CM. Gray dark-spotted yellowish color, strongly moistened, medium-loamy, strongly compacted, without structure, very few small root hairs and a large amount of carbonate grains and salts are found, passing into the next layer with a change in color, moisture and granulometric composition.

The mechanical composition is important in maintaining soil moisture, providing plants with nutrients. The mechanical composition of the soils of this area is medium-loamy, the amount of physical clay in the haydov bottom layer is 47.7%, and downward its amount is reduced from 37.2 to 35.6%. Large dust particles have a minimum amount in the haydov layer compared to the lower ones-43.6%, in the lower ones its amount goes from 50.4 to 56.8%. In relation to all particles, large dust is the largest amount. In general, all (large, small, medium) sand has a small amount of particles, relatively medium dust and slightly more il particles. The most part of the gray-Meadow soils consists of large dust fractions, and the least amount is in the undercut layer of plough, slightly decomposed under the influence of processing techniques (Table 1). In irrigated farming conditions, the physical, water-physical, heat-physical and physical-mechanical properties of soils are important in increasing soil fertility.

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Table 1.
Mechanical composition of irrigated boz-meadow soils

Layer depth, sm	Particles, mm							
	>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
0-26	0,6	0,9	7,2	43,6	11,7	18,2	17,8	47,7
26-48	0,4	0,6	9,5	50,4	11,8	17,1	10,2	39,1
48-87	1,2	2,5	3,9	56,8	13,8	8,9	12,9	35,6
87-128	1,6	2,8	6,4	52,0	12,3	15,4	10,5	37,2

The consumption and mobility of soil moisture, as well as the assimilation of the amount of nutrients, determine the physical and water-physical properties, and the quality of soil treatment-physical and mechanical properties. The density of the soil solid kismi i.e. the specific weight will depend on its mineralogical composition and the amount of organic matter. The specific weight of irrigated Boz-Meadow soils (SO) in the upper part is 2.64 g/cm3, increasing downward to 2.66-2.67 g/cm3.
Many scientists have carried out scientific research work on the optimization of agrophysical properties of irrigated soils in Uzbekistan. As a result of this scientific research work, it was determined that the optimal density of the main soils irrigated is in the range of 1.2-1.4 g/cm3. In our analysis, the volume weight of Boz-Meadow soils was 1.39-1.45 cm3.
Soil porosity is of great importance in giving up water and substances dissolved in water, in retaining water, in ensuring air exchange in the layer where the root is located. The total porosity (UG) is 47-45%. The maximum hygroscopicity humidity was 4.6-5.8% for its relatively high content of water-soluble salts (Table 2). To assess the level of fertility of newly irrigated Gray-Meadow soils of the Syrdarya region, to create their optimal reclamation and irrigation standards, order, one of the most important factors determining soil fertility is water properties (Table 2).

(Table 2).
Water-physical properties of irrigated Boz-Meadow soils

Layer depth, sm	CO, g/sm^3	HM, g/sm^3	UG‘, %	MG, %	DNS, %	KNS, %	TNS, %
0-26	2,65	1,39	47	5,8	21,9	36,2	40,5
26-48	2,66	1,42	47	5,2	19,8	34,5	39,3
48-87	2,67	1,45	45	4,9	20,1	30,6	36,4
87-128	2,66	1,44	45	4,6	24,9	34,0	38,6

The capacity of the driven layer capillary moisture (KNS) is 36.2%, and its amount in the driven bottom layer is only 34.5%. The full wet capacity decreases in the lower layers compared to the upper layers by 40.5-36.4%. Field wet capacity (DNS) in the upper lower layers of the haydov layer, its amount is somewhat reduced to 21,9-19,% (Table 2).
The field wet capacity of Boz-Meadow soils is deeper than 1m that is, at a depth close to the sizot water, its indicator approaches the capillary wet capacity, and the amount of water-resistant macroagregates is 3.14% in the haydov layer of soils, 3.30% in the haydov ostki layer. In the lower layers, however, its amount varies from 3.08 to 3.36%.
Humus is of great importance in the nutrition of agricultural crops. In the composition of humus, large nutrients are converted, as a result of the decomposition of certain components of organic matter, the plant goes into a absorbing mobile State. In addition to the quality of the nutrient source of organic matter, it acts on the growth of the plant and biologically active substances in the root system, activating biological processes in the soil.
According to the results of laboratory analyzes, the water-physical properties of Boz-Meadow soils are inextricably linked with their agrochemical properties, especially to the amount of humus as well. The humus

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content is not so high in the haydov layer and haydov subsoil in the experimental area soils 0.98-0.64%, the gross nitrogen content is slightly more than 0.088-0.062%. Gross phosphorus is equal to 0.295% in the haydov layer. The amount of mobile phosphorus is 10.5-15.7 mg kg (Table 3).

Table 3.

Chemical composition of irrigated Boz-Meadow soils

Layer depth,sm	Gumus, %	Gross nitrogen ,%	Fosfor		Kaliy		Gips, (SO_4), %	CO_2 Karbonatlar,%
			all,%	Active,mg/kg	all, %	exchanger, mg/kg		
0-28	0,98	0,088	0,295	10,50	1,00	310	0,255	9,24
28-52	0,64	0,062	0,260	15,70	1,35	290	0,380	9,72
52-85	0,52	0,050	0,258	10,60	1,28	200	1,550	9,33
85-110	0,44	0,042	0,040	12,10	1,12	94	2,800	9,42

The gross potassium content in the haydov layer is generally less than 1.0 to 1.35% by cross section. Moderately supplied with mobile potassium.

The amount of CO2 carbonates by soil cross-section is around 9%, while the amount of gypsum was 0.255% in the haydov layer of Boz-Meadow soils, while in the lower layers it increases especially below the haydov bottom layer of 1,550-2,800%.

In conclusion, it is ensured that the soil contains enough nutrients, absorbs a lot of the amount of nutrients from the plants and makes them develop well.

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