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**Abstract:** *This article describes the results of field and laboratory studies on the main physical properties of irrigated meadow-alluvial soils in Nukus district, i.e. the volume weight, specific weight and porosity of the soil. The obtained results showed that the general physical properties of irrigated meadow-alluvial soils in Nukus district changed under the influence of their degradation processes, which affected soil fertility and physical properties. The physical properties of the soil have a major impact on the nutrient, water, air, salt and biological regimes in the soil and on the productivity of agricultural crops.*

**Key words:** *irrigated meadow-alluvial soils, general physical properties, volume weight, specific weight, porosity, degradation, biological regime, stationary point.*

**Introduction.** Nukus district is located in the central part of the Republic of Karakalpakstan. The area is mainly irrigated meadow-alluvial soils, in some places grizzly brown desert soils and bald-meadow soils.

The physical properties of the soil are important in determining its fertility, allowing it to determine the most important processes that take place in it. Deterioration of the physical properties of the soil under the influence of salinity complicates the supply of plants, water, nutrients and air, as well as tillage processes in the soil. Professor Kuziev in his research works on the main morphogenetic, physical, water-physical, agrochemical, physicochemical properties of irrigated soils of Uzbekistan and the impact of these properties on the salinization process, changes in the morphological and micromorphological structure of soils as a result of human farming, changes in granulometric, mineralogical composition the current humus, physical and reclamation conditions of soils and the scientific basis of measures to improve them.

Professor Kuziev R.K., in his scientific work studied the main morphogenetic, physical, water-physical, agrochemical, physicochemical properties of irrigated soils of Uzbekistan and the impact of these properties on the salinization process, changes in the morphological and micromorphological structure of soils as a result of human farming, changes in granulometric, mineralogical composition the current humus, physical and reclamation conditions of soils and the scientific basis of measures to improve them. The role of the desertification process taking place around the Aral Sea in the formation of the modern soil layer, the issues of these strong ecological conditions of common irrigated arable lands are reflected. Particularly noteworthy are the works of Professor R.K.Kuziev on the genesis of saline soils [7].

Gafurova L.A., and her students conducted a comprehensive study of the soils of the Aral Sea, which created favorable conditions for the growth of microorganisms at optimal values of agrochemical and agro-physical properties. The study found that as salinity increases, their activity decreases to a minimum, and the nature of the seasonal dynamics of biological activity peaks in spring, gradually decreases in summer, and rises in autumn [3,1].

Many researchers have proven that the physical properties of soils are the leading factors in fertility. They revealed the peculiarities of the agrophysical, water physical and physico-mechanical properties of the soils of Uzbekistan, it should be noted that most of this work is devoted to the study of the physical properties of desert soils. We also examined some physical and water-physical properties of the soils of the investigated object were studied [4,2,5].

**Materials and methods.** The research was conducted on the soils of selected key areas in the conditions of irrigated meadow-alluvial soils of Nukus district. The volumetric weight of the soil was determined by the N.A.Kachinsky method (using a cylinder V-100 cm<sup>3</sup>) [6], the specific weight of the soil was determined by the pycnometer method and by calculating the porosity of the soil.

The physical properties of soils are the most important criterion in assessing the degree of their fertility or degradation, while expressing the essence of the processes that take place in the soil. It is known that the study of the general physical properties of the soil is of great importance in the development of the scientific basis of highly efficient and rational farming. Because the physical properties of the soil have a great influence on the nutrient, water, air, salt and biological regimes of the soil and its fertility, the occurrence of degradation processes and the yield of agricultural crops.

**Results.** Our study was conducted in rice field soils, and at stationary point 1, the volume weight ranged from 1.26 g/cm<sup>3</sup> to 1.59 g/cm<sup>3</sup>, the specific weight ranged from 2.65 g/cm<sup>3</sup> to 2.74 g/cm<sup>3</sup>, and the porosity was from 41.9% to 52.4%, volume weight at stationary point 2 from 1.36 g/cm<sup>3</sup> to 1.49 g/cm<sup>3</sup>, specific weight from 2.66 g/cm<sup>3</sup> to 2.70 g/cm<sup>3</sup>, porosity from 44.9% to 49.2%, at the stationary point 3 the volume weight ranged from 1.28 g/cm<sup>3</sup> to 1.56 g/cm<sup>3</sup>, the specific weight from 2.64 g/cm<sup>3</sup> to 2.70 g/cm<sup>3</sup>, and the porosity from 42.4% to 51.6%. It was observed that the porosity, volume and specific weight varied accordingly (Table 1).

**Table 1.** General physical properties of irrigated meadow-alluvial soils of Nukus district

Soil cross-section number	Depth of layer, cm	Volume weight, g/cm <sup>3</sup>	Specific weight, g/cm <sup>3</sup>	Porosity, %
Stationary point 1	0-15	1,59	2,74	41,9
	15-26	1,54	2,70	42,9
	26-37	1,56	2,72	42,7
	37-42	1,42	2,69	47,2
	42-55	1,26	2,65	52,4
	55-70	1,49	2,68	44,3
Stationary point 2	0-23	1,36	2,67	48,9
	23-40	1,48	2,69	45,0
	40-50	1,35	2,66	49,2
	50-60	1,49	2,70	44,9
Stationary point 3	0-28	1,33	2,66	50,1
	28-42	1,33	2,65	49,8
	42-48	1,56	2,70	42,4
	48-58	1,28	2,64	51,6

	58-65	1,28	2,64	51,6
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In the conditions of irrigated meadow soils, the agrophysical properties of the soil changed depending on the farming system, ie the predecessors in the scheme of crop rotation.

**Conclusion.** It was found that the general physical properties of irrigated grassland soils in the Nukus district of the Republic of Karakalpakstan also vary depending on the nature of the soil degradation and soil formation processes.

In Nukus district, it was observed that the general physical properties of irrigated grassland soils have changed under the influence of degradation processes, which affects soil fertility and agronomic properties. Specific weight varies along the profile from 2.64 to 2.74 g/cm<sup>3</sup>, volume weight from 1.26 to 1.59 g/cm<sup>3</sup>. Porosity varied from 41.9% to 51.6%, respectively, according to specific weight and volume weight. At the same time, difficult reclaimed irrigated grassland soils are characterized by high specific weight and low porosity due to the fact that they are composed of various large sand particles, low humus content.

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