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## ANALYSIS OF SOILS OF BUKHARA REGION, WAYS OF IMPROVEMENT

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**Annotatsiya:**Maqolada Buxoro vohasida tarqalgan asosiy sug'oriladigan tuproqlarning tasnifi jumladan, eskidan sug'oriladigan botqoq-o'tloqi, o'tloqi taqir, taqirsimon, taqir, taqir-o'tloqi, qumli-cho'l, bo'z-jigarrang, bo'z-jigarrang o'tloqi tuproq tiplari atroflicha bayon qilingan.

**Annotatsiya:**V state podrobno opisana klassifikatsiya osnovnykh oroshaemykh pochv, rasprostranennykh v Buxarskom oazise, v tom chisle starooroshaemye bolotno-lugovye, besplodnye, besplodnye, besplodno-lugovye, peshano-pustynnye, sero-burые, sero-burые lугovые типы почв.

**Annotation:**The article describes in detail the classification of the main irrigated soils distributed in the Bukhara oasis, including old irrigated swamp-meadow, barren meadow, barren, barren, barren-meadow, sandy-desert, gray-brown, gray-brown meadow soil types.

**Tayanch so'zlar:**o'tloqi cho'l va o'tloqi taqir tuproqlar, o'rta va engil qumoqli, agrofizika, sizot suvlar, bo'z jigarrang, gidromorf.

**Klyuchevye slova:**travyanistye pustynnye i travyanistye pustynnye pochvy, srednie i legkie peski, agrofizika, filtratsionnye vody, sero-korichnevye, gidromorfnye.

**Key words:**grassy desert and grassy barren soils, medium and light sand, agrophysics, seepage waters, gray-brown, hydromorphic.

Bukhara region is located in the lower reaches of the Zarafshan River. The entire oasis consists of areas formed by wide and short river beds. In the wide part of the river, in the lower reaches of Bukhara, the Karakul oases are located.

Irrigated meadow soils vary in salinity; from non-saline and weakly saline to strongly saline. All this is reflected in the specific land reclamation conditions, i.e. the presence of permeable and impermeable layers for the flow of runoff water and their depth, as well as the provision of collector-drainage systems.

The upper part of the Bukhara oasis has better land reclamation conditions than the middle and especially the upper reaches of the Zarafshan River tributary. The same can be said about the Karakul oasis.

Irrigated meadow soils, especially alluvial soils, differ in their mechanical composition across the entire width, as well as in vertical section.

The mechanical composition of the lands located near the irrigation sources is slightly lighter, and becomes heavier as they move away from them. The surface of the old irrigated meadow soils is covered with agroirrigation deposits, therefore their composition is the same. The thickness of the agroirrigation deposits is up to 1-3 m. According to their mechanical composition, they are usually medium and heavy loam.

Compared to other soils of the steppe zone, the content of humus (1.1-1.4%) and nitrogen (0.08-0.12%) in the old irrigated and newly irrigated meadow soils is somewhat higher. In soils formed on agroirrigation deposits, the slow and deep penetration of humus increases its reserves in the soil section. All of these are the products of many years of farming. In poorly cultivated and light mechanical soils, the organic matter content is low. Especially in meadow soils formed in the surface layers of ancient irrigated alluvial and diluvial-proluvial deposits, its content is low. Here, meadow soils were formed as a result of evolutionary changes in irrigated sandy, gray-brown or barren soils with very low natural productivity. Irrigated meadow soils contain a low content of phosphates (from 3 to 90 mg / kg) and are poorly and moderately supplied with potassium. The content of gypsum in soils is very low (0.12 -0.25 %), therefore, they cannot resist the development of salinization. Accordingly, in some cases, below the root nutrition layer, salinization processes are manifested, and sodium and magnesium ions are included in the absorption complex. Salinity reduces soil permeability, leading to soil erosion after irrigation and other unpleasant conditions.

The carbonate content of the soils is uniform across the cross-section at 8.8-9.3%. In general, irrigated meadow soils constitute a valuable land fund of the Bukhara region with high productivity.

Within the meadow soils distributed in the ancient and modern tributaries of the Zarafshan River and its coastal and first coastal terraces, small massifs of marsh-meadow soils are found, most of which are irrigated. These soils are formed in lowlands with a depth of seepage water of 0.5-1 m and under conditions of strong salinization. Therefore, these soils are prone not only to waterlogging, but also to salinization.

Formerly irrigated marsh-meadow soils were found on the first coastal terrace and were slightly saline, while the remaining irrigated marsh-meadow soils were moderately and strongly saline.

These soils are heavy and medium loamy in terms of mechanical composition, but light loamy - sandy loams are also found around the ancient Zarafshan tributary. The humus content in the upper layers of swampy-meadow soils is about 3%, poor in total phosphorus and potassium reserves.

Thus, among irrigated meadow soils, as well as in marshy-meadows, there are some dry abandoned lands on the outskirts of the oasis, where there are some strongly saline soils. They occupy low-lying areas of the relief and are therefore located in difficult land reclamation conditions. In the abandoned state, they are somewhat desalinated, but as a result of subsequent irrigation and reuse, intensive salinization occurs. Salts mainly accumulate in the upper layer of the cut. These soils are poor in humus (0.5 - 0.7%). According to their mechanical composition, they vary: from heavy loam to sandy loam.

Grassland barren soils are distributed only in the upper reaches of the Zarafshan tributary of the Bukhara region. They were formed in a slightly higher relief part of the grassland soils, which are relatively poorly moistened by the influence of seepage water, its depth is 3-4 (5) m. During the period of maximum irrigation and water use, seepage water can temporarily rise to 1-2 m. All grassland barren soils of the Bukhara oasis have been irrigated for a long time. The upper part of the cross-section of these soils is covered with agroirrigation deposits up to 1-2 m, they are medium and heavy loam. In the areas located at higher elevations, the flow of seepage water is relatively good, and the salinization process in grassland-barren soils is weaker than in grassland soils. Therefore, they are less saline and washed out. Medium and strongly saline soils occupy small areas. The salinity type is sulfate, rarely chloride-sulfate. In the plow layer of previously irrigated meadow barren soils, the content of humus and nitrogen may be 0.5 - 1.1% and 0.04 - 0.12%. Their content decreases downward along the section. They are poorly and moderately supplied with mobile phosphorus and exchangeable potassium. The content of gypsum in these soils is very low (0.08 - 0.42%). The content of carbonates varies from 7.4 to 9.2%.

Barren soils are found on the border of the irrigated territory of the ancient alluvial and proluvial plains. They are formed when the depth of their seepage water is more than 5 m. Under natural conditions, a strong layer is formed on the surface of the soil section, under the layer and a dense illuvial layer are separated. Below it is a layer of sediment that has not changed much during soil formation.

Bald soils are the product of the development of hydromorphic soils at the end of the evolutionary chain of their formation and desertification. The grasslands of the barren soils in the recent past are considered barren. The presence of blue and rust spots in the cross-section of barren soils indicates that they were previously in a hydromorphic state. Irrigated barren soils differ from gray soils in the upper layer of the cross-section, mainly due to the fact that they have not been exposed to agricultural crops for a long time, mainly due to their newly developed and irrigated nature, that is, the presence of a plow layer does not significantly differ from other irrigated and gray soils.

According to the mechanical composition, barren soils are mainly medium and heavy loams. A layered layer is located downwards, and they are somewhat lighter in composition. The humus content in the upper layer of barren soils is 0.6 - 0.8%. It indicates that it has passed the hydromorphic stage of development. The nitrogen content is 0.05 - 0.07%. The amount of carbonates varies depending on its mechanical composition and ranges from 8 to 13%. The gypsum content in these soils is low (0.136 - 2.286%).

Irrigated barren soils are mainly moderately gray-brown, strongly saline, with a salinity type of sulfate and chlorite-sulfate. As a result of repeated irrigation, the depth of groundwater increases to 3 - 5 m. This occurs either depending on the cytological and geomorphological conditions or at the end of the development period (newly developed soils are).

The classification features of newly irrigated meadow gray-brown soils are as follows: the surface of the plow layer is dry, the amount of sandy loam or light sandy loam skeletal admixtures is from 20 to 40%. The amount of fine particles decreases, sand appears. A pebble bed is formed from 1 meter below. A small amount of gypsum crystals and rust spots are found in the cross section. The transition from one layer to another is not clear, the cross section is formed with a mixture of loam, sand and gravel. The depth of the groundwater is 3-4 m. In the plow layer of newly irrigated gray-brown soils, the nitrogen content is from 0.35 to 0.78%, and the nitrogen content is from 0.036 to 0.087%. The humus content is often preserved downwards. Poorly supplied with mobile phosphorus and exchangeable potassium. The content of carbonates in the cross-section is 5-6%. The content of gypsum is from 0.23 to 0.74%. By mechanical composition, newly irrigated gray-brown soils are mainly sandy and light sandy. These soils consist of a small number of clay particles and a large number of fine sand particles. These soils are distinguished by strong stoniness and skeletalness (up to 20-40%) starting from the surface. Freshly irrigated meadow gray-brown soils with high soil permeability are slightly saline, washed out in places. The distribution of salts in the cross-section is uniform. The type of soil salinity is chloride-sulfate.

In conclusion, it can be said that the main part of the irrigated land in the Bukhara oasis is made up of meadow soils, in addition to them, old irrigated swamp-meadow, meadow-barren, barren-like, barren, barren-meadow, sandy-steppe, gray-brown, gray-brown meadow soil types are widespread, which have different mechanical composition and different degrees of salinity.

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