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MORPHOGENETIC, AGROPHYSICAL, MECHANICAL COMPOSITION AND PROPERTIES OF SOILS OF THE DRIED BOTTOM OF THE ARAL SEA

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ANNOTATION

The article presents the climatic conditions of the soil, groundwater level and other factors influencing the morphological characteristics, mechanical composition and agrophysical properties of the soils of the dried bottom of the Aral Sea.

KEY WORDS: *Sand, loam, humus, fraction, soil, horizon, grunt*

The agrophysical properties of experimental soils have a long history of analysis of the fertility elements affecting it and their origin. The morphogenetic characteristics of the dry bottom soils of the Aral Sea were mainly formed during the soil formation process.

As a result of studying the morphological characteristics of the soils of the dried bottom of the Aral Sea, we determined the origin of these soils, first of all, their connection with the regime of lake sediments, as well as the terrain, as well as with the nature of the soil-forming rocks, vegetation cover, climatic conditions, depth and mineralization of filtration waters .

Groundwater is characterized by relatively high mineralization. Also, this situation creates favorable conditions for the development of salinity in the soil.

In order to determine the characteristics of soil formation in the region and to create a possibility to include the soils in a certain type or group, we studied the morphological characteristics of the dried bottom soils of the Aral Sea.

When analyzing the morphological structure of the studied soils, it was established that one of the morphological features of the soil profile in the morphological section of soils distributed in the study area is a sandy (Ar) 0-30 cm light sandy layer. This layer is gray light-dark, light brown, dry or in small quantities, low quality, no plant remains were found.

The accumulative-humus horizon sometimes corresponds to the thickness of the agro-irrigation horizon; in most cases, its formation is observed to the lower layers up to 30 cm deep. These horizons contain alluvial deposits, which are less involved in soil formation processes. In terms of their mechanical composition, they consist of sharp layers. This part of the section shows signs of modern gluing, mainly in the form of rust and dark spots.

Now we can consider the morphological classification of the obtained sections. Section 1 (point 0) 43°52'20.4"N 59°01'13.3"E-contour in the soil of the “Drained bottom of the Aral Sea” in a layer of 0-9 cm of light gray color, salt compounds and silicon oxide are present, according to mechanical the composition is sandy, the structure is powdery, the arrangement is dense, there are dark spots, the transition to the next layer is gradual.

9-19 cm. The color is brown, the humidity is low, salt compounds are found, the mechanical composition is medium sandy, the structure is coin-shaped, the location is highly compacted, there are rust spots, there are a lot of shell residues in the seams, the transition to the next layer is abrupt.
19-27 cm. The color is brown, the humidity is moderately humid, the mechanical composition is medium sand, the structure is loose, the arrangement is less compacted, there are rust spots, the transition to the next layer is slow.

27-46 cm. The color is light gray, the humidity is average, the granulometric composition is heavy sandy, the structure is powdery, the arrangement is less dense, there are rust spots, there are small remains of shells, the transition to the next layer is slow.

46-60 cm. The color is light bluish-gray, the moisture is medium-humid, the mechanical composition is sandy, the structure is dusty, the arrangement is medium-dense, the new crack is powdery gypsum, there is a small amount of shell deposits, the transition to the next layer is slow.

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60-78 cm. Color brown, iron residues, medium-humidity, heavy sandy in mechanical composition, thin in structure, like a coin, medium-dense arrangement, no traces of insects, inclusions in the shell often leave faded residues, the transition to the next layer is slow.

78-128 cm. The color is bluish-gray, consists of yellow ribbon-like lines, the humidity is moderately humid, the mechanical composition is medium sandy, the structure is fine-powdery, there are rust spots, the migration is dense, there are many gypsum crystals in new cracks, the transition to the next layer is sharp.

The solid part of the soil consists of mechanical particles of different sizes. These are rocks, mineral fragments, as well as various mineral, organic and organomineral compounds formed during the process of soil formation.

Different fractions of mechanical particles in the soil each have their own characteristics, which describe the most important (porosity, heat capacity, structural properties of the soil, water-physical properties, biological activity, absorption capacity, chemical composition, agrochemical properties and fertility) properties of the soil.

1 – Table
Mechanical composition of soils of the Aral Sea

Soil section	Soil cover sm	Soil particles, mm							Names according to mechanical composition
		0,25-0,10	0,10-0,05	0,05-0,01	0,01-0,005	0,005-0,001	<0,001	<0,01	
1	0-13	1,8	11,2	61,7	3,0	7,8	14,5	25,3	Legkiy peschannyy
	13-21	1,1	8,4	52,6	8,3	9,5	20,1	37,9	Medium sandy
	21–31	0,9	12,5	67,9	2,6	6,1	10,0	18,7	Sandy
	31-36	1,1	12,0	50,4	8,8	12,1	15,6	36,5	Medium sandy
	36-44	1,4	8,4	52,6	8,3	9,5	20,1	38,3	Medium sandy
	44-53	0,9	9,7	69,9	4,6	5,3	9,6	19,5	Sandy
	53-58	1,8	11,2	61,7	3,0	7,8	14,5	25,3	Legkiy peschannyy
	58-71	0,9	12,5	58,6	7,3	9,7	11,0	28,0	Legkiy peschannyy
	71-86	0,9	12,5	58,6	7,3	9,7	11,0	28,0	Legkiy peschannyy
2	0-9	2,4	3,1	28,8	11,5	4,3	5,0	23,1	Legkiy peschannyy
	9-19	0,6	0,4	18,2	7,4	14,1	4,5	27,2	Legkiy peschannyy
	19-27	2,8	0,8	20,2	18,1	7,2	10,2	34,5	Medium sandy
	27-46	0,6	0,6	30,2	12,2	11,4	9,9	35,1	Medium sandy
	46-60	1,5	0,3	35,4	10,7	3,6	1,4	15,3	Sandy
	60-78	3,8	1,0	40,3	3,9	4,1	3,0	11,2	Sandy
	78-128	1,3	2,0	32,5	11,0	8,0	8,9	25,1	Legkiy peschannyy

In terms of mechanical composition, there is a predominance of sands of medium and light composition; in some layers there are also heavy sands and a sandy composition.

Bulk density, specific gravity and porosity of soil are one of the most important physical properties of soil. The specific gravity, bulk density and porosity of this soil are unique compared to other soils. According to the mechanical composition of the land, the volume weight has increased and the soil is compacted.

When sampling from the dried bottom of the Aral Sea in autumn and spring, the lowest moisture content ranged from 7.9% to 11.1% in the 0-10 cm layer, and the average moisture content in the 0-30 cm layer was 11.0%. up to 12.2%, in layers 0-100 cm, soil moisture 15.49-15.5%, humidity decreases as temperatures rise in the spring months. It has been established that the highest percentage of moisture in the soil is observed in layers of 90-100 cm and increases to 22.2% in the autumn months and 22.8% in the spring months.

We can observe that the volumetric weight of the sampled soils varied from 1.41 g/cm3 to 1.43 g/cm3 in the 0-10 cm layer and from 1.76 g/cm3 to 1.77 g/cm3 in the 70-80 layer cm. It has been established that the volumetric weight of soil in layers of 0-50 cm in the autumn months is 1.44 g/cm3, in the spring - 1.46 g/cm3, in layers - from 1.57 g/cm3 to 1.58 g /cm3. 0-100 cm. During the survey, it was found that the specific gravity of soil samples taken from experimental plots in the autumn and spring months was in the range of 2.60-2.80 g/cm3.

If the total porosity of soils used for agricultural work is less than 50%, such soils are considered low-density. It turned out that in the autumn months of our soil research, 45.8% was in a layer of 0-10 cm, 39.2% in a layer of 10-20 cm, but reached 53.3% due to the remains of shells in a layer of 20-30 cm The average soil porosity was 46.0% in layers 0-30 cm, 45.8% in layers 0-50 cm, 41.6% in layers 0-100 cm.

As a result of studies carried out at the second experimental site, we see that soil porosity increased to 46.0% in the 0-10

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cm layer, 44.7% in the 0-50 cm layer and 41.1% in the 0-50 cm layer layer 0-100 cm. As soil density increases, air exchange processes decrease, which negatively affects the growth and development of plants.

LITERATURE

1. *Dospekhov B.A. Methods of field experiment (Moscow: Agropromizdat, 1985)*
2. *Bekbanov B.A., Mambetnazarov A.B., Oteuliev Zh. Sesame navlarining birlamchi uruqchilik tizimi (https://interonconf.org/index.php/usa/article/view/2904)*
3. *Mambetnazarov. B.S.. Oteuliev J.B.Improvement of irrigation regime of cotton varieties depending on soil and climate conditions of the republic of Karakalpakstan (https://www.indianjournals.com/ijor.aspx?target=ijor:aca&volume=11&issue=4&article=106)*
4. *Oteuliev Zh.B. The problem of soil degradation in the Republic of Karakalpakstan. (https://cyberleninka.ru/article/n/problema-degradatsii-pochv-v-respublike-karakalpakstan/viewer)*
5. *Oteuliev Zh.B. Ecological features of soils in the arid territories of the Aral Sea region (https://cyberleninka.ru/article/n/ekologicheskie-osobennosti-pochv-v-aridnyh-territoriyah-priaralya/viewer)*
6. *Oteuliev Zh.B. The influence of soils and grounds on plants (https://cyberleninka.ru/article/n/vliyanie-pochv-i-gruntov-na-rasteniya/viewer)*
7. *Oteuliev Zh.B. On the issue of environmental education and upbringing using a systematic approach (https://cyberleninka.ru/article/n/k-voprosu-ekologicheskogo-obrazovaniya-i-vospitaniya-s-ispolzovaniem-sistemnogo-podhoda/viewer)*
8. *Oteuliev J.B., Aytbaeva K.The effect of different stimulators on the germination and growht of halophytic plants seeds. (https://karsu.uz/wp-content/uploads/2023/01/2022-3-2-%D1%81%D0%B0%D0%BD%D1%8B.pdf)*
9. *Oteuliev Zh.B., U.B.Kunnazarov, K.Zh.Doszhanov, N.K.Uralbaev. Kurigan Orol dengizi shirlangan tuproklarida ekilgan gallofit ўsimlik urugi va kўchatlariga hydrogel tasiri(https://api.scienceweb.uz/storage/publication_files/3471/15735/656ea7cdde2e0___3-%D1%81%D0%BE%D0%BD%20 2023.pdf #page=61)*
10. *Allamuratov M., Xojasov A., Oteuliev J., Genjemuratov K. Agrotechnical affairs for the production of local corn sorts in the case of salted soils of the Republic of Karakalpakstan. (https://api.scienceweb.uz/storage/publication_files/170/1270/61bee5ca8c7de___2021-%D0%B9%D0%B8%D0%BB-2-%D1%81%D0%BE%D0%BD.pdf #page=23)*
11. *Oteuliev J.B., Adilov S. Effect of cotton fertilizer rate on soil agrochemical properties. https://www.researchgate.net/profile/Nokisbaj-Akimov/publication/367090883_2022-3-2-sany/links/63c110754804ba12ffc1ce18/2022-3-2-sany.pdf#page=27*