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MECHANICAL AND MICROAGGREGATE COMPOSITION OF IRRIGATED MEADOW SOILS OF THE KARAKUL OASIS

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Annotation. The article describes the influence of anthropogenic factors of the mechanical and micro-aggregate composition of the irrigated meadow soils of the Karakul oasis. Changes in morphology in the genetic horizons of soils, in particular, mechanical and microaggregate compositions studied by methods of soil science.

Key words: anthropogenic factor, mechanical and micro-aggregate composition, medium, fine and coarse sand, coarse, medium and fine salty fractions

Introduction. Extensive research work on soil fertility, its management and other properties has been carried out in foreign countries and in our republic. Irrigated meadow soils, common in the Karakul oasis, differ from each other in their textural features not only in soil areas, but also in soil and climatic conditions.

The morphogenetic structure, geographical location and reclamation condition, agrophysical and agrochemical properties of the soils of the Karakul oasis and other territories have been studied by a number of scientists of Uzbekistan.N.Feliciano [15], K.Gafurov, S.Abdullaev [1, 4], R.K.Kuziev [8, 9], L.A.Gafurova [5], N.M.Bobomurodov [3]R.Kurvantaevo [6, 7, 10, 11], M.Umarov [13]H.T.Artikova [2]. S.M. Nazarova [12], O. Scientific research was conducted by Sharipov [14]. However, scientific studies of the agrophysical properties of irrigated meadow soils of the Karakul oasis are currently insufficiently conducted.

Irrigated meadow soils common in the Karakul oasis, located in the lower reaches of the Zarafshan River, were chosen as **objects and methods of research.**

The research was carried out in soil-field and analytical laboratory conditions, using such manuals as “Theory and methods of soil physics”, “Guidelines for conducting chemical and agrophysical analyses of soils during earth monitoring”, “Methods of conducting field experiments”, as well as the reliability of the data obtained is ensured using the Microsoft Excel program.A.Made on the basis of the Dospekhov manual “Field Opita technique".

The results of the study. The mechanical composition of soils has a significant impact on their following properties: physical, water, chemical, physico-mechanical, biological, thermal, etc. The moisture-retaining and load-bearing capacity of soils, heat transfer, physical and mechanical properties, soil resistivity during its processing, maturation time, viscosity, flexibility, subsidence, etc. directly depend on the mechanical composition. The mechanical composition of the soils in which scientific research is conducted is diverse, which is largely determined by the composition of the soil-forming parent rocks and human activity.

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The mechanical composition of soils is the main morphological indicator, and for soils of all types, and therefore for all genetic layers that make up it, a specific mechanical composition is characteristic. For example, sandy, sandy loam, sandy loam, (light, medium, heavy) and clay (light, heavy) mechanical compositions will be inherent in certain genetic layers and layers.

Of great practical importance is the mapping of meadow alluvial soils by mechanical composition, widespread and irrigated in the Karakul oasis. Meadow alluvial soils in cross section are not only sandy loam, sandy loam, loamy and clayey, but also have an extremely complex mechanical composition of layered-layered structure. As the top layer of the incision becomes heavier or lighter, there is a rapid change of layers. In such complex lithological conditions, a kind of nutrient, water-air and thermal order necessarily arises. In this regard, it is advisable not only to compile soil maps of irrigated lands in the oasis, but also to make maps on the mechanical composition of soils for each farm plot. This, in turn, makes it possible to solve on a scientific basis such a problem as improving the fertility of irrigated soils, especially their reclamation. It should be noted that the chemical composition of the soil, especially its absorption capacity, the amount of humus, etc., of course, strongly depends on the mechanical composition.

The data obtained indicate that according to the mechanical composition of soils, administrative districts and geomorphological areas with their own specifics are distinguished. The soils of the Karakul oasis belong to the soils formed in the lower reaches of the Zarafshan River and, according to their mechanical composition, are sandy loam, sandy loam, light, medium, heavy loam (Fig.).

Analysis of the data obtained shows that while medium and light loamy soils occupy the largest number of land plots (10509 ha), loamy and sandy loam soils ofmechanical composition occupy 1177-1830 hectares .

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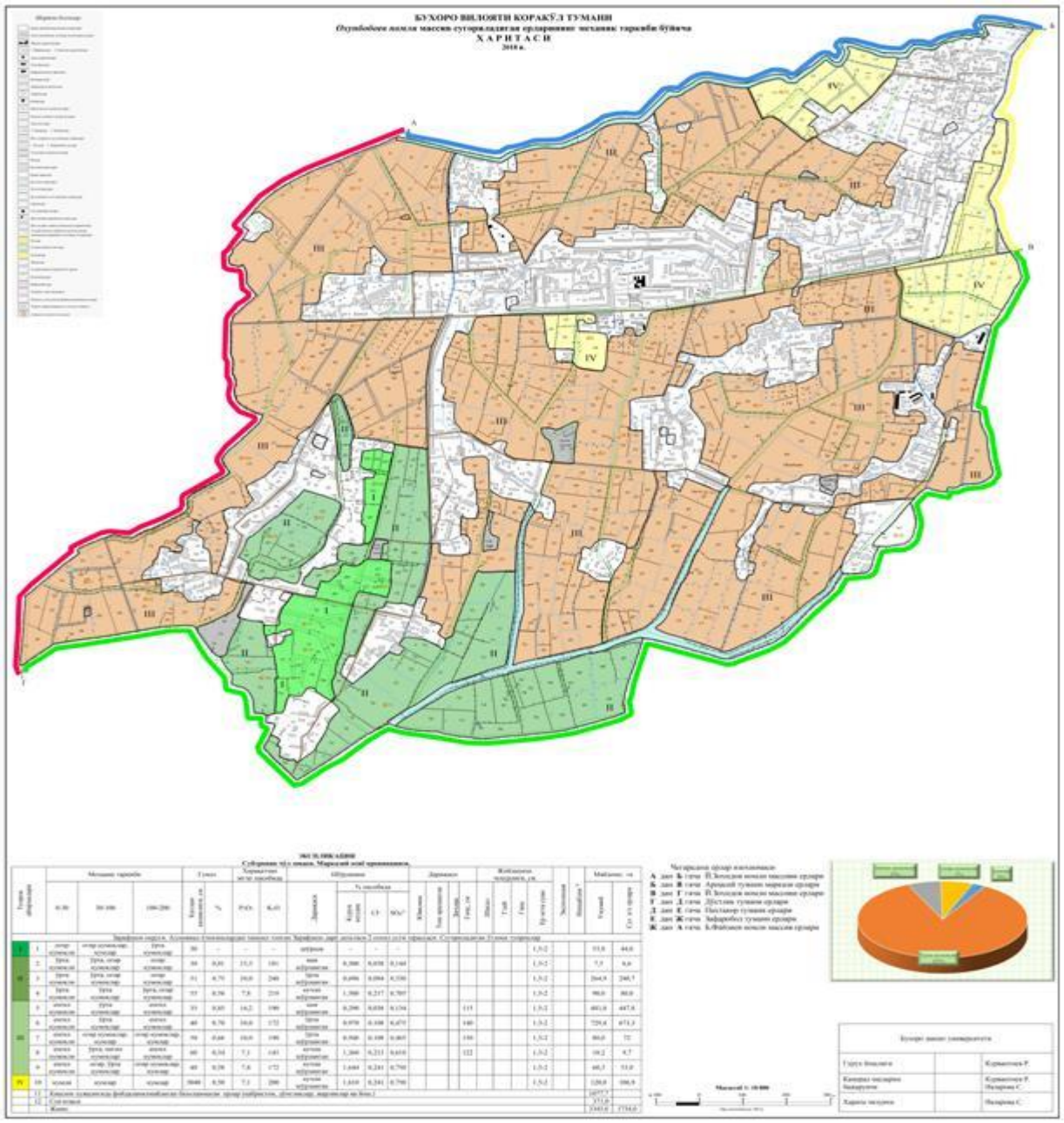

Table. The irrigated map of the mechanical composition of soils of the "Dargali" massif of the Karakul district

The soil sections of the Karakul oasis, located on the territory of the Lower Zarafshan, can be divided into 5 main groups according to their mechanical composition: uniformly light; uniformly heavy; layered, lightening from bottom to top; weighting soils of various mechanical composition from bottom to top. The change in the mechanical composition of soils in the cross section has a strong effect on the water-physical properties of soils and the salt regime.

Particles of different sizes in the soil vary widely in cross-section. The mechanical composition of irrigated meadow soils common in the Karakul oasis mainly consists of the following particles: coarse-grained sand (1-0.25 mm) up to 0.4-3.6%, medium sand (0.25-0.1 mm) 0.1-0.9%, fine sand (0.1-0.05 mm) 34.4-

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51.1%. Deposits, of which these soils consist, they also differ in a large content of fine grains of sand, the content of which in individual sections is 46.2-51.1%. The largest number of large dust particles (0.05-0.01 mm) accounts for 34.6-69.2%, the largest number of them scattered in farms is formed in layers with a clay mechanical composition, the smallest-on light soils. The cross-section between large dust particles (0.05-0.01 mm) is up to 32.2-35.6% higher than that of medium and fine dust. Il particles (less than 0.001 mm) make up to 2.7-9.6% and even in layers with heavy mechanical composition make up an insignificant amount. 2010 compared to 2017

from year to year, there is an increase in fine sand particles and a decrease in large dust particles. This is because the dust

indicates that its particles were washed out under the influence of irrigation.

The mechanical composition of soils is characterized by:

a) the complete absence of particles larger than 1 mm with a rough skeleton (pebbles) ;

b) excess of the number of particles 0.1-0.01 mm;

c) excess of large dust (0.05-0.01 mm) particles on most soils, the number of which in some cases can reach 35-69 % ;

g) very low (0.1-3.6%) content of silt particles in loamy soils.

The above data indicate that it is clear from the old ones that the mechanical composition of irrigated soils weighs a little. This, of course, occurred as a result of the impact of anthropogenic factors on the surface layers of the soil. Most of the soils common in the farms of the area adjacent to the territory of sandy deserts belong to loamy and sandy loam of mechanical composition, the state of their civilization is somewhat lower.

The number of fine grains of sand (0.1-0.05 mm), in the Dargaly massif of the Karakul district, the above number of particles is distributed unevenly across the cross section. Its number ranges from 7.8 to 41.1% in 2010 to 34.4-51.1% by 2017. It should be noted that the number of particles in the soils listed above is distributed to varying degrees. For example, large dust particles (0.05-0.01 mm) make up 34-69%.

Irrigated soils with a variety of mechanical composition are also common in the Karakul oasis. Due to the fact that irrigated soils in the farms of the Karakul oasis are diverse in mechanical composition, agrotechnical (plowing, irrigation, tillage, fertilization, etc.), reclamation (leaching, installation of a system of collector ditches, registration of the depth of groundwater, etc.) measures carried out must be differentiated by mechanical composition.

Study of the causes of natural soil fertility of the lower reaches of the Zarafshan River.Kurvantaev, 6, 7 showed that the high content of dust particles in these soils with a size of 0.05-0.01 mm and large stable microstructural elements with a size of more than 0.01 mm provides the best capillary pore formation, high moisture capacity and high water permeability.

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Meadow soils consist mainly of fine grains of sand (0.1-0.05) and large dust particles (0.05-0.01 mm), microaggregate particles, so it is microstructural, which is characterized by the mobility of high moisture capacity and nutrients that provide the soil with good capillary porosity, a high amount of moisture, which in these cases determines high soil fertility.

When assessing from an agronomic point of view, it is sufficient to know not only the size of the mechanical elements of the soil, but also the presence of micro aggregates formed from some mechanical elements in the soil is characteristic. At the same time, it is important to study the comparative ability of these mechanical elements to wash under the influence of water. The description of sandy and clay soils is one of the important aspects in assessing soil structure, especially water permeability. The global aggregate composition of the soils of the Karakul oasis is diverse, which is associated with their genesis, morphology, soil-forming maternal sex and cultural irrigation activities of people. [12, 11, 14, 8].

Ifod as a result of numerous studies, a large amount of factual data has been collected and the reasons for the formation of macroculture on irrigated soils have been studied through the use of crop rotation, siderates, additional organic and structure-forming substances. Irrigated soils of Uzbekistan are in a state of structure with alfalfa and other perennial herbs. Herbs have been found to have a positive effect.

Table 2. Mechanical and microaggregate composition of irrigated meadow soils of the Karakul oasis

Cuts №	Layer depth, cm	Fraction size, mm yes, quantity in %									
		>0,25	0,25-0,1	0,1-0,05	0,05-0,01	0,01-0,005	0,005-0,001	<0,001	Physical clay (<0,01mm)	Current number of units	Dispersion coefficient
In 2010											
8	0-46	0,8	0,2	36,7	39,4	7,8	7,9	7,2	22,9	6,7	41,6
		1,2	0,3	41,3	41,0	6,8	6,4	3,0			
		-0,4	-0,1	-4,6	-1,6	1,0	1,5	4,2			
	46-66	0,7	0,3	13,9	41,8	14,8	20,7	7,8	43,3	23,8	15,3
		1,2	0,3	26,2	48,8	18,8	3,5	1,2			
		-0,5	0	-12,3	-7,0	-4,0	17,2	6,6			
	66-85	0,4	0,1	41,1	34,6	3,6	13,1	7,1	23,8	9,3	40,8
		1,0	0,3	38,9	43,1	3,6	10,2	2,9			
		-0,6	-0,2	2,2	-8,5	0	2,9	4,2			
	85-106	0,8	0,2	17,7	69,2	5,1	4,3	2,7	12,1	7,8	66,6
		0,4	0,1	12,5	77,0	5,1	3,1	1,8			
		0,4	0,1	5,2	-7,8	0	1,2	0,9			
	106-137	0,4	0,1	7,8	60,0	8,0	18,0	5,7	31,7	22,9	14,0
		0,8	0,2	6,6	76,4	14,0	1,2	0,8			
		-04	-0,1	1,2	-16,4	-6,0	16,8	4,9			

	HCP- 613,8 P, %-0,01										
In 2017											
9	0-35	3,6	0,9	46,2	12,3	18,1	13,7	5,2	37,0	12,5	76,9
		0,8	0,2	48,4	22,6	12,4	11,6	4,0			
		2,8	0,7	-2,2	-10,3	5,7	2,1	1,2			
	35-62	0,4	0,1	43,7	26,2	10,6	9,4	9,6	29,6	11,4	43,7
		0,4	0,1	42,3	37,6	6,8	8,6	4,2			
		0	0	-1,4	11,4	-3,8	-0,8	-5,4			
	62-90	0,8	0,2	37,5	32,2	6,9	18,0	4,4	29,3	10,6	63,6
		0,5	0,1	42,4	37,9	6,7	9,6	2,8			
		0,3	0,1	-4,9	-5,7	0,2	8,4	1.6			
	90-115	0,8	0,2	34,4	25,9	9,1	23,9	5,7	38,7	22,5	59,6
		1,2	0,3	44,9	37,4	8,2	4,6	3,4			
		-0,4	-0,1	-10,5	-11,5	0,9	19,3	2,3			
	115-147	0,8	0,2	43,0	35,6	6,3	11,0	3,1	20,4	11,7	70,9
		0,4	0,1	54,7	31,2	5,3	6,1	2,2			
		0,4	0,1	-11,7	4,4	1,0	4,9	0,9			
	147-186	0,8	0,2	51,0	29,7	8,3	6,6	3,4	18,3	16,5	70,5
		1,2	0,3	40,6	39,1	5,2	11,2	2,4			
		-0,4	-0,1	10,4	-9,4	3,1	-4,6	1,0			
	HCP- 423,9 P, %- 0,01										

***Appendix:** the figure of the table shows the mechanical composition of soils, in the denominator-the composition of the microaggregate.*

It was noticed that the information we received, together with the full confirmation of the opinions of the above-mentioned scientists, was significantly divided into some aggregates as a result of irrigation and processing. Coarse sand (1-0. 25 mm) 0.4-1.2%, medium sand (0.25-0.1 mm) 0.1 - 0.3%, fine sand (0.1 - 0.05 mm) 6.6 - 41.3% in 2010 and its amount increased to 40.6-54.7% in 2017. The sediments consisting of these soils are distinguished by the abundance of fine sand particles in the stream. The largest number of large dust particles (0.05-0.01 mm) was 41.0-76.4% in 2010, and by 2017 it was observed that their volume decreased by 22.6-39.1%. It can be seen that the amount of fine dust and silt granules in soils increased by 2017. For example, in the soils of the Dargali massif of the Karakul district in 2010, the content of fine dust was 1.2-10.2% and silt 0.8-3.0%, in 2017, respectively, 2.2-4.2%. As these results show, in the areas of Karakol, an increase in the number of real aggregates can be observed, that is, the process of structuring in the soil.

In short, the mechanical composition of the irrigated soils of the Spruce Oasis is somewhat lighter, the number of microaggregates is slightly smaller, and the decomposition coefficient is high.

The change in the surface layer of irrigated soils depends primarily on irrigation deposits and the composition of these deposits, which were formed as a result of irrigation through the Zarafshan River and the Amu-Karakul channels.

As a result of irrigation with turbid waters and other factors of human activity, a layer of agroirrigation was formed in a short time. It differs from the lower layers not only by its chemical properties, but also by its physical properties.

The mechanical and microaggregate composition of the Spruce Oasis is a key factor in the management of all processes in the soil, which, in turn, serves as a key indicator in the development of necessary measures for the effective use of soils. When processing, watering, fertilizing and placing various crops in the soil, it is necessary to stratify them taking into account their mechanical composition. From these results , the following conclusion can be drawn:

Conclusion. The mechanical and microaggregate composition of soils is the main indicator of morphological, reclamation, water-physical and physico-mechanical bonitation of soils and expresses the specifics for all genetic layers of soils of various types and types. According to the mechanical and microaggregate composition of soils, geomorphological areas with their own specifics are distinguished. These soils are mechanically composed of loam, light, medium, heavy loam.

The mechanical and microaggregate composition of irrigated meadow soils is dominated by the following mechanical elements: fine grains of sand (0.1-0.05 mm), coarse-grained (0.05-0.01 mm) particles, which in the section and geomorphological areas constitute a higher content compared to coarse, medium sand and medium, fine dust. In the farms of the district, where irrigated agriculture is still conducted, one can see some severity of the mechanical composition of distributed soils. This, of course, occurred as a result of the impact of anthropogenic factors on the surface layers of the soil. Most of the soils common in the farms of the area adjacent to the territory of sandy deserts belong to loamy and sandy mechanical composition, the state of their civilization is somewhat lower.

The mechanical and microaggregate composition of soils is as follows: incomplete content of large particles from 1 mm in a rough skeleton (rocky); a large number of particles 0.1-0.01 mm; excessive content of large dust (0.05-0.01) particles in most soils, the content of which in some cases reaches 35-50%, very small (2.7-6.6%) the number of fine particles. %).

References:

1. Artikova X.T. Evolution, ecological state and soil fertility of the Bukhara oasis. Avoref. diss. Doctor of Science (DSc). Tashkent, 2019.-62 p.
2. Abdullaev S.A. Agrofizicheskaya svoystva i solevoy regime oroshchaemyx pochv oazisov Bukharskoy oblasti. Autoref. sugar diss.-Tashkent. 1975.- 34 p.
3. Kurvantaev R., Nazarova S.M.. Agrophysical condition of irrigated grassland soils of Zarafshan oasis downstream. - Bukhara. 2021. - 126 p.
4. Nazarova S.M. Current agrophysical condition of irrigated grassland soils of Bukhara oasis. Abstract of the Doctor of Philosophy (PhD) in Agricultural Sciences.-Tashkent, 2019. - 44 p.
5. Nazarova S.M., Kungirov H.N., Kurvantaev R.K., Dadamukhamedova M.R. The main factors of soil formation and their evolution in the Zerafshan valley. // In the collection: Ecological condition of the natural environment and scientific and

practical aspects of modern reclamation technologies Collection of scientific papers. Ryazan, 2016.60-66pp.

6. Nazarova SM, Kurvantaev R. Mechanical composition of irrigated soils of the Bukhara oasis. / Actual problems of modern science. Scientific journal No. 4 (101), 2018. 187-190pp.

7. Nazarova SM, Kurvantaev R. Old-irrigated meadow alluvial soils of the Bukhara oasis. // Soil science - food and environmental security of the country VII Congress of the Society of Soil Scientists named after V.V.Dokuchaev. Materials of reports. Part 1. - Moscow-Belgorod, 2016. - Pp.268-269.

8. Artikova H.T, H.Salimova. The Composition, Properties and Meliorative Situation of the Irrigated Soils in the Gijduvan District of the Bukhara Oasis. // Jundishapur Journal of Microbiology Research Article Published online 2022 January Vol. 15, No.1 (2022). Pages: 668-675

9. Hilola Khamroevna Salimova. PRODUCTIVITY OF IRRIGATED SOILS AND ITS PHYSICAL CHARACTERISTICS OF GIJDUVAN DISTRICT. // ResearJet Journal of Analysis and Inventions. Vol 3, Issue 01,Jan., 2022. Pages: 64-68

10. Hakimova N.X., Tokhirov B.B., Rakhmatova Z.B.,Sayfiyev T.F. Dynamics of enzyme activity in salted soils. / Novateur publications Journal NX- A Multidisciplinary Peer Reviewed Journal ISSN No: 2581- 4230 Volume 6, Issue 10, Oct. -2020. P.301-303.

11. Hakimova N.X., Tokhirov B., O'ktamova M., Akramova M. Mobile phosphorus and potassium in the soil determination / International Journal for Innovative Engineering and Management Research.www.ijiemr,org doi:10.48047/ijiemr/v10/104/111 .vol10 issue04, april2021.impact factor 7.819.

12. Hakimova N.X., Isroilova N.X., To'ymurodov Sh.T., Boboyev A.H. The importance of microorganisms in the saline soils of the Bukhara oasis. / Laboratorium WIEDZY Artur Borcuch Gospodarka I Innowacje Volume: 21/2022. Impact Factor: 8.01.

13. Qurvantayev R., Xakimova N., Soliyeva N. General physicalproperties of Zarafshan low and medium stream irrigated soils / International Conference on Sustainable Management of Earth Resources and Biodiversity (SERBEMA-2022) dedicated to the "April 22 - World Earth Day". SCOPUS

14. Nazarova S.M. Granulometrik composition irrigated soils of Bukhara region Journal of critical reviews ISSN-2394-5225.vol.7 ISSUE17.2020

15. Nazarova S.M. Physico-mechanical properties of irrigated meadov soils of the Bukhara region (on the example of the Zjandar dictrict) The American journal of applied sciences.AQSh. volume-02.issue. 10/2020

16. Nazarova S.M. The Use of local vegetables raw materials in the production of the soft drinks. The American journal of applied sciences. AQSh. volume-02.issue. 10/2020

ISSN 2515-8260 Volume 09, Issue 07, 2022

17. Nazarova S.M. Physico-mechanical properties of irrigated meadov soils of the Bukhara ACADEMIYA an international multidisc iplinary research journal vol. 11. issue 1.january 2021.
18. Nazarova S.M. Amount of elements in irrigated soils of Bukhara oasis.Middle europen scientific bulletin. Volume 11. April 2021
19. Nazarova S.M. Physics-mechanical properties of irrigated meadov soils in Bukhara region Middle europen scientific bulletin. Volume 11. April 2021
20. Nazarova S.M. Qorakoʻl vohasi sugʻoriladigan oʻtloqi tuproqlarning mexanik va mikroagregat tarkibi Oʻzbekiston zamini jurnali 2021 yil, 4 son. B. 54-57.
21. Nazarova S.M. Factors Of Soil Formation And Their Evolution In The South Of The Zerafshan Valley. Nat. Volatiles & Essent. Oils, 2021; 8(4): 13918-13933
22. Nazarova S.M. Buxoro vohasi sug`oriladigan o`tloqi tuproqlardagi oziqa moddalar miqdori Development issues of innovative economy in the agricultural sector. xalqaro miqyosidagi konferensiya. Samarqand. 2021 yil 25-26 mart B.631 - 635.
23. Nazarova S.M. Influence of cultivar combinations and seedling thickness on the formation of phytometric indicators and productivity of pear trees in intensive orchards Academicia An International Multidisciplinary Research Journal, 9, 2021, P.228-331
24. Nazarova S.M. Physical and chemical properties of irrigated meadow soils of Jandar Region. Proceedings global symposium on salt-affected soils Food and Agriculture Organization of the United Nations Rome, 2022 , P.70-71