

AGROPHYSICAL PROPERTIES OF IRRIGATED SOILS OF BUKHARA REGION

S.M.Nazarova¹, E.S.Sayfiyeva, M.D.Zayniddinova², Z.P.Avliyoqulov³,

¹Doktor of Agricultural Sciences (PhD), magistr Bukhara State University, Uzbekistan.

E-mail: sevara_nazarova1984@mail.ru

Abstract. *The article describes the characteristics of common soil types and their particle size distribution in the Bukhara oasis. In the Bukhara oasis, various types of automorphic, hydromorphic, and semi hydromorphic soils, which differ in grading composition, are mainly distributed. In the old irrigated zone of the oasis, old-irrigated meadow heavier and medium loamy soil varieties are common.*

Key words: *oasis, soil, irrigated meadow, meadow-bog, salinization, mechanical composition, fraction, soil formation.*

1.Introduction. Scientific research works are carried out in the world in a number of priority areas devoted to the study of the state of soil fertility, its indicators and their relationship with other factors, modeling the processes of changes in soil fertility. In addition, when studying the agrophysical characteristics of soils and their assessment, modern geoinformation technologies are used, on the basis of which measures for soil fertility management are developed and implemented in production in order to increase it. Today, in the development of agriculture in Uzbekistan, it is of particular importance to increase soil fertility, cultivation of agricultural land and the use of agro technical measures taking into account their specific properties. Some progress has been made in this direction in the republic, but research on the use of modern geoinformation systems has not been given sufficient attention. "The third direction of the new Uzbekistan development strategy for 2022-2026, consisting of seven priorities

Bukhara and Karakul oases in the south of the Zarafshan valley in the north and west border the Kyzyl Kum desert, and in the south and southeast the Karshi steppe. The Zarafshan Valley, located in contact with the Pamir-Alai ridges and the KyzylKum desert, has a very diverse surface structure. Irrigation zone The Zarafshan valley is a part of the subtropical desert zone, the Central Asian desert province, Zarafshan district. Features of the surface of the valley are determined by the geological structure, development history, and the diversity of the relief-forming factors in the territory. [1].

2.Methods. Old-irrigated meadow soils formed on alluvial deposits were chosen as the object of research. The studies were carried out in soil-field and laboratory

conditions, according to the methodology "Guidelines for conducting chemical and agrophysical soil analyses during land monitoring" [9], the reliability of the results obtained was evaluated using Microsoft Excel based on B.A. Dospekhov's manual.

3.Results and Discussion. In recent years, due to a deficit in oasis land reserves development began to involve in irrigated agriculture unsuitable soils located in the north of the Bukhara region. Here, on the deluvial-proluvial deposits, gray-brown soils are formed in combination with sand. By grading composition, these soils are predominantly light loamy and sandy-sandy. Humus in these soils is small from 0.2 to 0.6%. Carbonates 3-6%. Virgin gray-brown soils from the surface are not saline, but saline. The salt content at a depth of 0.3-0.6 m reaches 1-2%. The development of these lands, accompanied by vegetative and irrigation, causes a rise in groundwater up to 3-4 m and the evolution of automorphic gray-brown soils at the first stage of development in semi-hydromorphic gray-brown-meadow. By grading composition, newly irrigated gray-brown-meadow soils are light loamy on light loamy-loamy and sandy skeletal deposits. According to the profile, gypsum crystals and rare rust spots are found in them. The humus content in the arable horizon of newly irrigated gray-brown-meadow soils varies from 0.4 to 0.8%, nitrogen 0.036-0.087%. The availability of soils with mobile forms of phosphorus and potassium in the arable horizon is low: 12-27 and 50-200 mg / kg of soil, respectively. Carbonates in the profile of 5-6%. Soils are slightly salted, washed out in places. The type of soil salinization is chloride-sulfate. Irrigated soils in the lower river valley. Zarafshan, within the Bukhara region, it should be noted that a stable tendency of soil hydromorphization prevails here. The availability of soils with mobile forms of phosphorus and potassium in the arable horizon is low: 12-27 and 50-200 mg / kg of soil, respectively. Carbonates in the profile of 5-6%. Soils are slightly salted, washed out in places. The type of soil salinization is chloride-sulfate. Irrigated soils in the lower river valley. Zarafshan, within the Bukhara region, it should be noted that a stable tendency of soil hydromorphization prevails here. At the current level of land reclamation of the lower reaches of Zarafshan, the above trends will continue in the future and lead to desertification of soils. Hydrogeological conditions in the lower river valley. Zarafshan, where the extra arid climate dominates, and are characterized by a stable high standing in varying degrees of mineralized groundwater (1-3m), soil changes occur mainly at the generic, species, and less often under typical levels. A very tense reclamation situation is formed here. Soil salinization, as one of the factors of their desertification, is manifested to a higher degree than in the middle part of the Zarafshan valley, which requires the use of a range of land reclamation measures.

The general watering of the territory, as well as vegetation and irrigation contribute to the formation of a soil-water horizon at a depth of 1-3-5 m. In this regard,

gray-brown soils eventually evolve first into gray-brown meadow soils, and then into meadow. Gray-brown-meadow soils, like gray-brown soils, have different particle size distribution and salinization.

The grading composition of the irrigated soils of the Bukhara region mainly consists of heavy loamy, medium loamy, light loamy, sandy loam and sandy ones, their area in the region is respectively heavy loamy-22,798 hectares, medium loamy-73750 hectares, light loamy-sandy sand-sandy, 115,332 hectares, 115,331 hectares, sandy loam ha.

The variety of grading composition of soils in the Bukhara region depends on their genesis, morphology, parent rocks and cultural and irrigation activities of humans. The results obtained show that, compared with other areas, the largest areas are heavy loamy soil differences in Karavulbazar (7371 ha), Vabkent (3905 ha), Kagan (2665 ha), Bukhara (2414 ha) and Gijduvan (1879 ha) areas. The largest areas are occupied by medium- and easy-loamy varieties and between the districts the Romitan (11535 ha), Bukhara (10300 ha), Gijduvan (10123 ha), Vabkent (8269 ha) medium loamy areas, Zhandarsky (11565 ha), and Karakul (10509 ha) are diverse.)Alat, (8963 ha), Shafirkan (7113 ha) districts of sandy and sandy varieties.

Basically, the particle size distribution consists of the following particles: coarse sand (1–0.25 mm) 0.4–17.6%, medium sand (0.25–0.1 mm) 0.1–3.6%, fine sand (0.1–0.05 mm) 10–47.2%, in some sections it makes up 30–47%. Soils of the Vabkent region according to the grading composition consist of sandy, light, medium, heavy loams. Jandar area covers sandy, sandy loam, light, medium, heavy loam. In the Kagan region, sandy, sandy, sandy, light, medium, and loamy soils are widespread. The soils of the Karakul region in terms of particle size distribution consist of sandy loamy sand, light, medium, and heavy loam. From the foregoing, it can be seen that in the farms of districts from ancient times engaged in agriculture in old soil, there was an increase in the grading composition of soils. This shows the results of the influence of anthropogenic factors. On the borders of the region, desert-sandy areas of farms are widespread in many cases of sandy and sandy soil differences, their state of cultivation is very low

4. Conclusion. In the Bukhara region, various types of irrigated meadow, bog-meadow, takyr, meadow-takyr, gray-brown, meadow-gray-brown, desert-sandy soils are widespread. particle size distribution is actively involved in soil processes, the use of soil resources in its turn, and when developing the necessary measures, is the main indicator. In the Bukhara region, various types of soils are distinguished by grading composition. Depending on the particle size distribution, it is necessary to conduct differentiated tillage, irrigation, land washing, applying mineral and organic fertilizers and placing various crops.

References:

1. Gafurov K., Abdullaev S. Characterization of the soil cover of the irrigated zone of the Bukhara region. -Tashkent: "Fan" 1982, - 132 p.
2. Dokuchaev V.V. Collected Works.- M.- L. : An SSR, 1951 4. V. 6. - 595 p.
3. Kimberg N.V. Zarafshan valley. Cotton, vol. 2., Tashkent: AN UzSSR. - 1957. P.3-102.
4. Kurvantaev R., Nazarova S. Evolution and forecast of the development of irrigated soils in the middle of the Zerafshan valley. // Collection of articles 1-part. IX International Conference "The Development of Science in the XXI Century." - Kharkov Ukraine, 2015. - P.125-129.
5. Nazarova S., Kurvantaev R. Irrigated soils of the Bukhara oasis. // Agricultural science-agriculture VII international scientific and practical conference. Digest of articles. Book 2.- Barnaul, 2012, - P. 182-183.
6. Nazarova S., Kurvantaev R. Evolution and development forecast of irrigated soils in the lower part of the Zerafshan valley. // V International scientific-practical conference "Actual problems of science of the XXI century." Collection of articles 1-part .- Moscow, 12/15/2015. - P.111-116.
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.Dokuchaeva. Materials of reports. Part 1. - Moscow-Belgorod, 2016. - P.268-269.
8. Soil map of the Bukhara region of the Uzbek SSR. Scale 1: 200000 (100000). - Tashkent: "Uzgiprozema", 1967. - P.1-4
9. Umarov. M.U., Kurvantaev. P, Improving the fertility of irrigated soils by regulating their physical properties. - Tashkent: "Fan", 1987.- 106 p.
10. Felician I.N., Konobeeva G.M., Gorbunov B.V., Abdullaev M.A. Soils of Uzbekistan (Bukhara and Navoi region) .- Tashkent: "Fan" 1984, - 152 p.
11. Nazarova S., Kurvantoev R. Evolution and the forecast of development of the irrigated soils of Bukhara region. // Proceeding of the III Tashkent international innovation forum-2017. Forum Innovative Ideas to Innovative Economy. - Tashkent, 2017. 210-216pp.
12. Kurvantaev, R. & Nazarova S.M. 2019 .Agrophysical characteristics of irrigated meadow soils of the Bukhara oasis. Modern trends in scientific support of the agro-industrial complex: Collective monograph. [editorial board: L.I.Ilyin and others; otv for issue V.V Ogorkov]. Ivanovo, 91-95 pp. 13.Nazarova, S.M., Kungirov, H.N., Kurvantaev, R.K. & Dadamukhamedova, M.R. 2016. 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, 60-66 pp.
- 14.Nazarova, S.M. & Kurvantaev, R. 2018. Mechanical composition of irrigated soils of the Bukhara oasis. / Actual problems of modern science. Scientific journal. No. 4 (101), 187-190 pp.