

GENERAL PHYSICAL PROPERTIES OF IRRIGATED SIEROZEM-MEADOW SOILS

Abdukhakimova Husnidakhon Abdullayevna

Fergana State University, p.d.b.s.

<https://doi.org/10.5281/zenodo.7652333>

Abstract. *The article describes the general physical properties of irrigated sierozem-meadow soils formed on alluvial-proluvial deposits of the Shakhimardansay removal cone. In sierozem-meadow soils, the bulk density increases down the profile depending on the prescription of irrigation, and the humus content also decreases down the soil profile. In general, in the gray earth zone, the volumetric mass of the arable layer decreases from the beginning of the alluvial fan to its low-lying part.*

Keywords: *removal cone, sierozem-meadow soils, volumetric, specific gravity, porosity, humus, fertility.*

Physical factors of gray soil fertility are determined by their genesis. Treatment of soils used for irrigation in agriculture under the influence of anthropogenic factors, in particular, land reclamation, has a positive and negative effect on the physical, chemical and other properties of the soil and changes the genesis properties of the soil to a certain extent.

Today, in the conditions of the Fergana Valley, rational and effective use of irrigated lands, protection, and further improvement of the productivity of these lands are among the most important and pressing problems. Plants take nutrients and water from the soil necessary for growth and production. This indicator of the soil is determined by many properties and characteristics and shows its level of productivity. In this regard, its general physical properties are the main indicator, and the study and analysis of soil properties is the guarantee of abundant harvest from plants in agriculture. Therefore, it is necessary to pay attention to the general physical properties of the soil when squating the land.

Gray soils formed on the alluvial-proluvial deposits of the Shohimardonsoi cone spread, where the research work was carried out, and the irrigated gray-meadow soils of different levels in the belt of the region were developed in different periods. The basis of the research methods is the standard methods in field, laboratory and chamber conditions generally accepted in soil science. V.V. Dokuchaev's morphogenetic, cross-sectional method was adopted as the main research method.

Man uses land, plants crops, irrigates, cultivates, applies organic and mineral fertilizers to the soil, radically changes its morphological structure, physical properties, and chemical composition. As a result of exploitation of natural soils, soil-forming factors: climate, topography, parent rock, time, the influence of flora and fauna also change. Changes in agrochemical, agrophysical properties and meliorative conditions of soils are observed under the influence of anthropogenic factor, i.e. development of gray lands, use of various mineral fertilizers, irrigation.

It is the formerly irrigated gray-meadow soil in the massif "Damkol Oktom Guliston" of Fergana district of Fergana region, where we conducted research, the land of the farm named "Rakhmonali Kenjaev", the area was formed on alluvial-proluvial and loess deposits, the mechanical composition is medium and heavy sand, non-saline, belongs to the group of formerly

irrigated medium cultured soils according to the level of exploitation. Agricultural soils belong to the group of formerly irrigated moderately cultivated soils according to the level of exploitation.

Soils have unique general physical properties, including specific gravity, bulk density, and porosity. These properties, like its chemical and physico-chemical properties, are studied as an important indicator of soil fertility. The absorption of water and respiration of air by the root system of plants is closely related to the general physical properties of the soil. The lightness or severity of tillage is also related to its physical properties. The static density of the arable layer of soils composed of microaggregates reaches 1.31 g/cm³, and the total porosity is 46.3-50.8%. In soil and its parent rocks, the volume mass fluctuates between 1.39-1.46 g/cm³. The relative mass varied in the range of 2.66-2.72 g/cm³ depending on the mechanical composition of the soil, the amount of humus and the level of cultivation, while the porosity of the soil was equal to 46.3-51.0% depending on the mechanical composition and the amount of humus. In order for agricultural crops to grow and develop normally, it is necessary to have certain physical conditions in the soil layer where its main roots are spread. From this point of view, the compaction process can be said to be a phenomenon that negatively affects the physical properties of the soil.

Table 1

General physical properties of formerly irrigated gray-meadow soils

Cross section t/r	Depth, sm	Weight, g/sm ³		Total porosity, %
		volume	comparison	
Formerly irrigated gray-meadow soil				
6/AX	0-25	1,31	2,66	50,8
	25-35	1,37	2,68	48,9
	35-66	1,42	2,69	47,2
	66-98	1,45	2,71	46,5
	98-140	1,46	2,72	46,3

According to the data, in the last 30 years, as a result of the intensive use of heavy, high-power equipment and aggregates in the fields and the effect of its compaction, the processes of degumification in the plowed and subsoil layers, as well as in the soil, these parameters have undergone significant changes and require their correction.

Currently, the scientists of the Research Institute of Soil Science and Agrochemistry have developed an assessment classification of the subsoil density for the soils of Uzbekistan, if we compare with this data, it was observed that the average density is evident in the subsoil of the studied former irrigated gray-meadow soils of the cone area. It can be concluded that the lower layers of the soil become denser as the duration of irrigation increases in the studied area.

Conclusion. Knowing and managing the general physical and physical-mechanical properties of the soil during irrigation is of great practical importance in maintaining and increasing soil fertility. The consumption of soil water, the order and absorption of the amount of nutrients, the quality of agrotechnical measures are determined on the basis of the physical properties of the soil. Volumetric mass of formerly irrigated gray-meadow soils gradually increased downward in the genetic layers. The specific mass of the soil is reduced depending on the level of absorption and mechanical composition of the soil.

REFERENCES

1. Юлдашев Ф., Сотиболдиева Г., Абдухакимова Х. “Суғориладиган бўз тупроқлар минтақасида калций ва стронцийларнинг биогеокимёвий хусусиятлари”. НамДУ-Илмий ахборотномаси. Н. 2020. № –5. Б. 61-66.
2. Isagaliev M., Yuldashev G., Abdukhakimova Kh. Geochemistry of biotrace elements in irrigated serozems of the south of Fergana. European Sciences review. Scientific journal. Vienna. Volume. 2, 2018. № 11–12. 25-28 pp.
3. Абдухакимова Х., Исағалиев М. Геохимия мышьяка и тяжелых металлов в почвах конуса выноса Шахмардансая. Научное обозрение. Биологические науки. [science review.ru](http://science-review.ru). М. № 4, 2020. 16-21 с.
4. Юлдашев Ф., Сотиболдиева Г., Абдухакимова Х. Суғориладиган кольматажланган тупроқларда камёб элементларнинг биогеокимёвий хусусиятлари. НамДУ илмий ахборотномаси - Научный вестник. НамГУ. 2020 йил 11-сон. 105-110 б.
5. Абдухакимова Х., Сотиболдиева Г., Юлдашев А., Маматов Ж. Суғориладиган бўз тупроқларининг агрокимёвий хусусиятларини деҳқончилик таъсирида ўзгариши. “Агроилм” жур. Т., №4. 2022 й. 57-58 б.
6. Абдухакимова Х.А. Шохмардонсой конус ёйилмаси суғориладиган тупроқларининг геокимёси. Б.ф.ф.д. дисс. автореф. Фарғона. 2021. 42 б.
7. Исағалиев М., Абдухакимова Х., Мирзажонов И. Суғориладиган ўтлоқи саз тупроқларининг агрокимёвий хоссалари //“Фаннинг долзарб масалалари” мавзусидаги илмий-амалий анжумани материаллари. –Ф.: ФДУ, 2018 й. 84-86 бет.
8. Isagaliev M., Abakumov E., Turdaliev A., Obidov M., Khaydarov M., Abdukhakimova Kh., Shermatov T., Musaev I. *Capparis spinosa* L. Cenopopulation and Biogeochemistry in South Uzbekistan. “Plants” j. <https://doi.org/10.3390/plants11131628> 21 June, 2022 y. 11, 1628.
9. Юлдашев Г., Исағалиев М.Т., Абдухакимова Х.А., Исомиддинов З.Ж. Проблемы мониторинга элементов в орошаемых почвах. Аграрная наука – сельскому хозяйству: сборник материалов: в 2 кн. / XV Международная научно-практическая конференция (12-13 марта 2020 г.). – Барнаул: РИО Алтайского ГАУ, 2020. – Кн. 1. 429-432 с.
10. Исағалиев М.Т., Абдухакимова Х.А. Жанубий Фарғона бўз тупроқларида мышьяк ва оғир металллар микдорининг ўзгариши. НамДУ илмий хабарномаси. Научный вестник. НамГУ. № 4. 2021.
11. Obidov M., Isagaliyev M., Turdaliyev A., Abdukhakimova Kh. Biogeochemistry Properties of Calcisols and *Capparis Spinosa* L. International Journal of Modern Agriculture, Volume 10. No.1. 2021. Pp.94-101. (Web of sciences).
12. Sotiboldiyeva, G., Abdukhakimova, K., & Niyozov, Q. (2021). About digital mapping of biotrace elements: <https://doi.org/10.47100/conferences.v1i1.1366>. In *RESEARCH SUPPORT CENTER CONFERENCES* (No. 18.06).