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# PROCEEDINGS GLOBAL SYMPOSIUM ON SALT-AFFECTED SOILS

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**GLOBAL SYMPOSIUM ON**

**SALT-AFFECTED**

**SOILS**

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# Physical and chemical properties of irrigated meadow soils of Jandar Region

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*Key words: irrigated meadow soils, lowest moisture capacity, granulometric composition, water properties, reserves of humus and nutrient elements*

## Introduction, scope and main objectives

A number of scientific studies are being carried out in the Republic, aimed at further developing agriculture, preserving, reproducing and increasing soil fertility, efficiently using land resources, optimizing the ecological state, assessing the water-physical, technological, agrochemical properties and the reclamation state of soils.

The morphogenetic structure, geographical distribution, reclamation state, agrophysical and agrochemical properties of the soils of the Bukhara oasis and other regions have been studied by many scientists, such as X.T. Artikova (Artikova, 2005; Artikova, 2019), R. Kurvantaev (Kurvantaev, 2000; Kurvantaev and Nazarova, 2019), S.M. Nazarova (Nazarova, Kungirov, Kurvantaev, 2016; Nazarova and Kurvantaev, 2018), N. Hakimova (Hakimova and Kurvantaev, 2020) and others. However, scientific research on the study of the current ameliorative state, and the physical and mechanical properties of irrigated meadow soils in the Jandar region have not yet been carried out sufficiently.

## Methodology

The studies were carried out in soil-field and analytical-laboratory conditions. The reliability of the data obtained was carried out using the Microsoft Excel program based on *Methodology of field experiments*.

## Results and discussion

The irrigated meadow soils of the Jandar region are heavy and medium loamy. In terms of the content of water-soluble salts, not saline (dense residue 0.150–0.375 percent), or in some places can be slightly (mainly chloride) saline (0.014–0.031 percent). In the studied soils, the humus content in the arable and subsoil layers is between 0.94–0.63 percent. At the same time, in the lower layers, no sharp differences are observed in the humus content, and along the sections, the humus content is between 0.41–0.30 percent. The influence of the irrigation's age on the content of nutrient reserves (nitrogen, phosphorus and potassium) is clearly seen. In the irrigated meadow soils of the Jandar region, nitrogen is 1.9–3.2 t/ha, phosphorus is 6.5–14.5 t/ha, and potassium is 51.4–106.5 t/ha.

Physical, mechanical properties of irrigated soils in the Jandar District are distinguished mechanical composition by their originality in the administrative and geomorphologic regions formed on alluvial deposits of the lower part of the Zarafshan river. Basically, the mechanical composition consists of the following particles: coarse sand (1–0.25 mm), medium sand (0.25–0 mm) and fine sand (0.1–0.05 mm). In irrigated meadow soils in the district of the lower reaches of the Zarafshan river, the specific weight is 2.58–2.66 g/sm<sup>3</sup>.

Volumetric mass is a variable and different unit depending on various processes occurring in the soil. In the top, arable soil layer, the bulk density varies between 1.27–1.63 g/sm<sup>3</sup> depending on humus content, texture, salinity and other properties. Among the upper layers, the highest density (1.53–1.63 g/sm<sup>3</sup>) is observed in the soils of the Jandar region. In irrigated soils, the



movement of water, the content of soluble salts, the preservation of moisture, and the provision of air to the root system is directly related to the porosity of the soil. In the studied meadow soils, the total porosity, depending on the duration of irrigation, varies widely across the genetic layers of the profile (42–51 percent).

### Conclusion

According to the content of water-soluble salts in different periods, irrigated meadow heavy loamy and medium loamy soils are classified as non-saline and in some places slightly saline. In 2010, the content of solid residue and chloride amounted to 0.320-0.585 and 0.021-0.028 percent, and in 2017 respectively 0.215-0.280 percent and chloride ion decreased to 0.014-0.031 percent, due to agrotechnical measures. The humus content in the arable layer of the Jandar region is insignificant (0.94–0.63%), in the lower horizons their content (0.41–0.31%) sharply decreases.

Soils of geomorphologic regions are characterized by their peculiarity in the mechanical composition of soils and consist of sandy loam, of light, medium and heavy-loamy varieties, mainly consisting of coarse, medium and fine sand. The specific gravity in the genetic layers varies in the range of 2.56–2.67 g/sm<sup>3</sup>. Soils on the genetic horizons have different density (1.27–1.63 g/sm<sup>3</sup>) The total porosity in the upper layer is satisfactory (47–51 percent), while the porosity in the lower layers is less so (38–42 percent).

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