

CAUSES OF CHANGES IN GROUND WATER LEVELS UNDER THE INFLUENCE OF IRRIGATION AND ITS IMPACT ON THE STATE OF SOIL RECLAMATION.

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Abstract. *This article describes the factors that cause soil salinity, including changes in groundwater levels due to irregular irrigation, secondary salinization, and the use of mineralized water.*

Key words: *Secondary salinization, brackish water, mineralization level, ditch water, land reclamation*

One of the factors that negatively affects soil fertility and crop yields is soil salinity. There are several factors that cause soil salinity, the most important of which is the rise in the level of mineralized groundwater. In the conditions of Mirzachul, before irrigation, the groundwater level was deep, but the level of mineralization of the groundwater was high.

Excessive, irregular irrigation practices lead to rising groundwater levels and secondary salinization of soils. Toxic salts (mainly sulfates and chlorides) formed in the upper soil layer prevent the normal development of plants and cause their death. All irrigated soils in Central Asia, including Uzbekistan, are actually naturally saline.

Even when combating salinity, these soils remain susceptible to salinization. Experts have identified the most optimal irrigation methods. This takes into account the depth of groundwater, its mineralization, and methods of soil desalination. As is known, deep open, closed ditches or steep ditches are used to irrigate cultivated areas. The ditches reduce the pressure of groundwater and drain toxic salts dissolved in water. In the fight against soil salinity, timely and high-quality salt leaching also gives positive results.

As a result of the large-scale development of irrigated agriculture, if reclamation work is not carried out on previously reclaimed and newly developed lands, in most cases they deteriorate, and this situation leads to negative ecological processes that did not exist before. These are mainly due to the high salinity level of developed lands with low water requirements, and in some cases, due to the increase in toxic salts in the soil as a result of irrigation of crops with saline water. Therefore, one of the ecological

problems of irrigated lands is to prevent salinization by improving the reclamation state of the soil.

The effect of salinity on plants has been studied by many scientists (T.S. Zokirov, 1991). The effect of salt on cotton begins with the planting of seeds. Seeds that fall on saline soil do not germinate. Due to salt, the germination capacity of seeds decreases sharply. As a result, in strongly saline areas (on poorly washed soils), seedlings become sparse and their thickness decreases. Salinity has a comprehensive effect on the plant, disrupting biochemical and physiological processes in its body. The water and nutrient regime of the plant changes negatively. The processes of photosynthesis and respiration slow down, metabolism slows down, the accumulation of organic substances slows down, and water evaporation from the plant decreases.

In addition to the amount of salts, their composition and ratio also have a strong effect on cotton. For example, chloride salinity has a stronger effect on cotton than sulfate salinity, and can even inhibit plant growth. Low levels of chloride salinity also have a negative effect on cotton.

In saline soils, the amount and ratio of mineral elements in the cotton plant are disturbed. Silicon, chlorine, phosphorus, magnesium, sodium increase in the cotton plant body, while potassium, sulfur, manganese, and especially calcium decrease, and the cotton plant feels a need for these elements. As a result, the metabolic process worsens. Cotton is a calcium-loving plant. It absorbs nitrogen and calcium in equal amounts. However, due to the abundance of calcium in our soils, its deficiency is not noticeable. At the same time, cotton cannot absorb calcium in saline soils, which damages the plant roots. When there are a lot of toxic salts in the lower layers of the soil, the roots do not develop well.

Soil salinity not only negatively affects cotton yields but also impairs its quality. Cotton fiber grown in saline conditions shortens in length and reduces fiber maturity.

The salts contained in the water used for irrigation are also of great importance in soil salinization and salinization. Because as a result of repeated watering of the fields, salts accumulate in the cultivated areas. The water-soluble salts contained in saline soils used in irrigated agriculture mainly consist of 3 cations (Na, Mg, Ca) and four anions (Cl, SO₄, CO₃, HCO₃). The most harmful and dangerous salt is Na₂CO₃. Soda forms NaOH in aqueous solution, which is very toxic to plants. Chloride salts, which are in second place, are also extremely toxic to plants. Sodium and magnesium sulfates are not inferior to them in terms of their toxicity. Gypsum (CaSO₄) and lime (CaCO₃), which are poorly soluble in water, are harmless to plants, even if they are present in large quantities in the soil. Calcium carbonate - Ca(HCO₃)₂ is also not harmful to plants. As can be seen from the above considerations, various reasons can affect soil salinization. In this case, climatic conditions, soil type, groundwater recharge, improper use of water, and other factors may be involved.

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