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ASSESSMENT OF THE EFFECT OF GROUNDWATER TEMPERATURE ON CEREAL CROPS

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ABSTRACT

When autumn crops were cared for by using underground water sources for irrigation with a low level of mineralization in the Bukhara valley and using water-saving irrigation, positive changes were observed in the development of grain growth during seasonal irrigation by adding 50 kilograms of gravel crystals to the soil.

KEY WORDS: ***irrigation sources; underground water; temperature; water consumption regime.***

GROUNDWATER is a liquid, solid (ice), vaporized water located in the porous cavities of the rock layers in the upper part of the earth's crust. Groundwater is part of the total water resources and is of great importance to the national economy as a source of water supply and irrigation. The reclamation condition of irrigated lands is determined by the condition of groundwater. Groundwater is studied by hydrogeology. Water can be in a gravitational or free state that is bound by molecular forces and moves under the influence of gravity or pressure difference. Layers of rock that are saturated with unconnected water are called aquifers, and they form aqueous complexes. Groundwater is divided into porous (soft rocks), the gorge (vein) - hard rocks and karst (cave) (cave-karst-lightly soluble carbonate and gypsum rocks) water, depending on the nature of accumulation in water-retaining rocks. Depending on the location, groundwater collects on top of groundwater (see soil water regime), seasonal water (surface water; precipitation or absorption of irrigation water on aeration zone aquifers), groundwater (first waterproof layer closest to the surface), and interlayer (aqueous layers between non-pressurized, pressurized, artesian, waterproof layers).

According to its origin, groundwater is an infiltration formed as a result of the absorption of atmospheric precipitation, river and irrigation water; condensation formed by the condensation of water vapor in rock layers; sedimentary rocks are divided into sedimentary and magmatic cooling waters formed as a result of the immersion of seawater in the process of formation, or wash water released from the earth's mantle. The natural outflow of groundwater to the surface is called a spring, and is divided into flowing and boiling (hot spring).

Groundwater is a natural solution that contains almost all known chemical elements. In terms of mineralization (total amount of solutes in water, g / l), groundwater is fresh (up to 1.0), saline (1.0-10.0), saline (10.0-50.0) and saline (from 50). many) types. In terms of temperature, it is cold (up to 4 °C), cold (4-20 °C), warm (20-37 °C), hot (37-42

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°C), hot (42-100 °C) and extremely hot (Above 100 °C) is divided into groundwater.

Infiltrative water is common in nature, the rest being very rare in its pure form. Groundwater is used in water supply of the population, industry and pastures, irrigation of lands, medicine (mineral waters), heat supply (hot water), extraction of various salts and chemical elements (iodine, boron, bromine, etc.). Groundwater causes swamps and salinization of soils. To combat this, open and closed horizontal drains and boreholes are drilled. Groundwater is widely used in deserts. The Karakum, Kyzylkum and Ustyurt pastures are mainly supplied with groundwater.

More than 150 large groundwater deposits have been identified in Central Asia. Their annual renewable operational reserves are more than 1,500 m/s, the share of fresh water is about 1,000 m/s, and the rest is mineralized at various levels (2-3 to 15 g/l). There are more than 40,000 used boreholes in Central Asia, of which about 5,000 are artesian wells; most of them are used to irrigate crops (see Artesian waters) [1,2,3,].

After the independence of the Republic of Uzbekistan, our country has undergone rapid changes in all areas and achieved a number of achievements.

Also, the rapid development of the agricultural sector, in turn, will lead to an increase in the consumption of water resources. Radical innovations have been introduced in the implementation of a unified policy in the field of water resources management, as well as in the field of rational use and protection of water resources, prevention and elimination of harmful effects of water. Consistent and sustainable development of agriculture is to ensure the food security of the country. Development of the concept of water development in 2020-2030 Water saving through the implementation of promising projects in the field of water management, foreign investment, active assistance to agricultural producers in the introduction of water-saving irrigation technologies, expansion of production capacity of modern irrigation systems through private investment to increase the share of irrigated lands using technologies to at least 10 % of the total area of irrigated lands [4,5,].

RELEVANCE OF SCIENTIFIC RESEARCH

If we take the total volume of water on Earth as 100 percent, it is 97.5 percent saline, while freshwater is 2.5 percent. Groundwater sources are one of the most inexpensive and convenient sources when close to an irrigation area. That is why it is widely used in foreign countries. In particular, 40 % of irrigated land in the United States is irrigated from groundwater, 33 % in the People's Republic of China and 5-6 % in Uzbekistan. To date, the available and limited water resources in the region have been fully distributed and developed between countries. Under the current circumstances, the growing demand for water in the region can be met mainly through the rational use of available water resources and the discovery of internal water resources. Therefore, the development of water-saving technologies is also receiving great attention by scientists.

In addition to groundwater resources, surface water is also used to irrigate and water pastures. Currently, 7% of the total groundwater resources are used. It is mainly used in Crimea, Moldova, Ukraine, the Volga region, Kazakhstan, Kyrgyzstan, Turkmenistan, Armenia, Georgia, Azerbaijan, USA, India, Algeria, Italy and other countries. When groundwater is used, its dynamic reserve is used, otherwise it is lost.

The advantages of using groundwater are:

1) Proximity to the irrigation area and shortness of the salt part of the main canal.

2) Decrease in groundwater level in the irrigated area.

3) High UWC of canals due to low water wastage, canal length.

4) No mud settling in the canals as the water is not turbid.

5) Low risk of salinization and swamping.

Disadvantages:

1) Deep waters and lack of reserves in some places.

2) Mineralization may be high.

3) The temperature is low.

4) Conditions for frequent mechanical lifting of water.

5) Lack of useful gel and other particles in water.

6) The need for multiple wells.

7) High operating costs.

Groundwater is used for irrigation as follows: through springs, through mine wells, through a water collection gallery [8,9,10].

Capture springs are used for self-irrigation.

Wells can be shallow, tubular. Pipe diameters range from 30-100 sm. Depth is up to 100 m, up to 50-100 l/s using water pumps. One well can irrigate up to 200 hectares. When groundwater is used, aquifers are often used. They increase the size of the irrigation area, helping to heat the water.

If the water intake costs exceed the recovery of groundwater resources, they are artificially replenished with water, i.e. they act as groundwater reservoirs. For this purpose, natural groundwater flows (floods and mejenes), local watercourses, wastewater (from irrigation, production, sewage) can be used. It is done by spontaneous infiltration or by infiltration under pressure. The first is done in the following ways:

1) Flooding of the area, which takes up a lot of space, gives good results on low-slope, quiet terrain.

2) By constructing a special pool with a dense

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network of permeable bubble and egat, small channel (in difficult terrain conditions).

3) Permanent and temporary watercourses, wells, mines, quarries, natural quarries are used.

Pressure infiltration is the delivery of water under pressure through wells built into a water intake. This method is often used against intrusion, i.e., against the addition of saline seawater to groundwater on the seashore.

One of the factors negatively affecting the current increase in grain yield is the shortage of water during the growing season, and the second is that most farms do not take into account local soil and hydrogeological conditions, real water requirements during the transition phases of their growth and development. Some of the toxic chemicals applied to the soil, weeds and insects applied to the soil during the irrigation of grain are washed into groundwater, leading to the deterioration of their ecological and reclamation status. The above reasons include the efficient use of water resources allocated to irrigated lands, a system of agro-technological measures that do not adversely affect the environmental situation, irrigation methods using hydrogel artificial polymer crystals to create opportunities for rational use of groundwater in the cultivation of cereals [12,13,14].

THE PURPOSE OF THE STUDY

Water sources for irrigation are assessed by the following indicators: water quality, the amount of water flow during the annual and growing seasons, the variation of water flow over the years, water flow regime, level and pressure regime, location relative to the irrigated area.

It is characterized by the quality of water, its temperature, the amount of mechanical leaks, mineralization and chemical composition, bacteriological composition.

Study of the source of irrigation in the case of high yields from grain fields in relation to its temperature on the basis of experiments on the efficient use of groundwater.

LEVEL OF STUDY OF RESEARCH RESULTS

Wheat is an annual plant. Its root system is a poplar root, the main part of which develops in the drive layer of the soil, some roots are 100 sm. pit up to 40-130 sm in height. reaches The transpiration coefficient of wheat is 231-557 (average 400-500), the coefficient of water demand for grain is 60-190 m^3 / ts. is formed. These indicators vary depending on climatic conditions, type and variety of wheat, water supply, the amount of nutrients in the soil. Depending on the natural conditions of the cultivated areas, its autumn or spring varieties are planted on irrigated lands. Autumn wheat is more resistant to cold and drought than spring wheat, it germinates when the soil temperature is 4-5 °C. During the growing season, an effective temperature of 2100 °C is required for winter wheat and at least 1300 °C for spring wheat.

The effect of the temperature of irrigation sources on autumn cereal crops is in fact little studied scientifically.

THE TASK OF THE RESEARCH

Based on the experiments conducted, the study of the source of irrigation depends on its temperature in the efficient use of groundwater to create clear guidelines. Water-saving technologies go through certain periods (phases) during the growth and development of cereals, that is, from seed germination to formation. During the developmental stages, morphological changes occur in plants and new organs are formed. Wheat goes through the following phases: germination, accumulation, germination, germination, flowering and ripening, as well as observations and study of the effectiveness of its yield [18,19,20].

OBJECT OF RESEARCH

The farm "Oqil Alisher" was chosen as an experimental plot for the rational use of groundwater in the cultivation of grain crops. Oqil Alisher farm is located in Pakhtaabad district of Gijduvan district of Bukhara region.

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