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Scientific Basis of the Effect of Groundwater Sources for Irrigation in Current Natural Conditions on the Development of Crops

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Annotation. In the Bukhara oasis, the use of low-mineral groundwater for irrigation and the use of water-efficient irrigation in the care of autumn cereals with the introduction of 50 kg of hydrogel crystals per hectare, seasonal irrigation, positive changes in the growth and development of grain, seasonal irrigation 3800- 4000 m3 / ha..

Key words: irrigation sources; underground water; temperature; water consumption regime**.**

Introduction. Groundwater is water in a liquid, solid (ice), vapor state, located in the porous cavities of 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), narrow (vein) - hard rocks and karst (cracked) (cracked-karst-lightly soluble carbonate and gypsum rocks) 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 (the first waterproof layer closest to the surface).) and interlayer (non-pressurized, pressurized, artesian, aqueous layers located between 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 condensation of water vapor in rock layers;

sedimentary rocks are subdivided into sedimentary and magmatic cooling waters, which are formed as a result of the immersion of seawater in the process of formation, or when washed out of the earth's mantle.

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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 soluble substances in water, g/l), groundwater is fresh (up to 1.0), saline (1.0-10.0), salty (10.0-50.0) and soupy (from 50). many) types. In terms of temperature, it is cold (up to 4 °), cold (4-20°C), warm (20-37°C), hot (37-42°C), boiling (42-100°C) and very hot (above 100°C). Divided into groundwater.

Infiltration water is common in nature, the rest being pure is very rare. Groundwater is used to supply water to the population, industry and pastures, to irrigate lands, in medicine (mineral waters), to provide heat (hot water), to obtain various salts and chemical elements (iodine, boron, bromine, etc.). Groundwater causes swamping and salinization of soils. To combat this, open and closed horizontal drains and drilled wells are dug. Groundwater is widely used in deserts. 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 different 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 lot.

Also, the rapid development of the agricultural sector, in turn, will lead to an increase in water consumption. 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 management development in 2020-2030. Foreign investment for the implementation of promising projects in the field of water management, active assistance to agricultural producers in the introduction of water-saving irrigation technologies, expansion of production capacity of modern irrigation systems by attracting private investment. to increase the share of irrigated lands to at least 10% of the total area of irrigated lands using technologies [4,5,].

Relevance and current status of the topic: Assuming that the total volume of water on Earth is 100%, 97.5 percent is salt water and 2.5 percent is freshwater. 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, in the United States, 40% of irrigated land is irrigated from groundwater, in the People's Republic of China - 33%, and in Uzbekistan - 5-6%. To date, the available and limited water resources in the region have been fully distributed and developed among the 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 reserves of water resources. Therefore, the development of water-saving technologies is also receiving great attention by scientists.

Part of the experiment (doing research). 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 main canal salt section.
2). Decrease in groundwater level in the irrigated area.
3). High UWC of canals due to low water wastage, canal length.
4). The mud in the canals does not sink because the water is not muddy.
5). Low risk of salinization and swamping.

Disadvantages:

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1) In some places the water is deep and there are not enough reserves.
2) Mineralization may be high.
3) Conditions for frequent mechanical lifting of water.
4) The need for multiple wells.
5) High operating costs.

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

Catchment of springs is used for self-irrigation.

Wells can be shallow, tubular. Pipe diameters range from 30-100 cm. Depth is raised to 100 m, using water pumps to 50-100 l/ s. One well can irrigate up to 200 acres. 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 reserves, they are artificially replenished with water, i.e. they act as groundwater reservoirs. For this purpose, natural groundwater flows (floods and floods), local water flows, wastewater (from irrigation, production, sewage) can be used. It is done by spontaneous infiltration or 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, calm relief lands.
2) By building a special pool with a dense channel of water-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 plate. This method is widely used against intrusion, i.e., against the addition of saline seawater to groundwater on the coast [12,13,15].

Purpose of the study: Water sources for irrigation are assessed by the following indicators: water quality, annual and vegetation flow, annual water flow, water consumption 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 debris, mineralization and chemical composition, bacteriological composition. Irrigation source for high yields from grain fields Study of its temperature dependence on the basis of experiments in the efficient use of groundwater.

Analysis and conclusion of the obtained 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 cm. pit, stem height 40-130 cm. reaches The transpiration coefficient of wheat is 231-557 (average 400-500), the coefficient of water demand for grain is 60-190 m3 / 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, and germinates when the soil temperature is 4-5 □C. An effective temperature of
2100 C is required for winter wheat and at least 1300 □C for spring wheat during the growing season..

References

1. Xamidov M. Central Asia - water resources, lakes and international relations. International Symposium, 2003 Leg, Belgium
2. Hamidov M. Kh., Nazaraliev D. V. Technology of irrigation of winter wheat and cotton along microfurrows. UzSSV, UzIICHM, UzPITI, ICARDA, IWMI, Tashkent. 2006. p. 363-366
3. Sattarov M.A., Akhmedov Sh. R. Study of the influence of thermal effects of irrigation sources on cotton productivity
4. Axmedov Sh. R. Mudulnыe issledovanie dynamics of growth and productivity of xlopchatnika metodem matematicheskogo modelirovaniya
5. Xamidov M. X., Suvonov B. U. Application of drip irrigation technology in cotton irrigation // Journal "Irrigation and reclamation". - Tashkent, 2018. - № 4 (14) .- P.9-13.

ISSN NO: 2771-8840
Date of Publication: 07-10-2022

6. Saloxiddinov A. T., Xomidov A. O., Boirov R. K., Yusupov X. Influence of strong swelling hydrogels on biometric indicators of winter wheat in the conditions of dry gray soils // Journal "AGRO ILM". - Tashkent 2018. - №5 (55). - B. Pages 76-77.
7. Juraev A et al., Growth, development and productivity of different types of fogged wheat varieties in the soil climate of Bukhara region. UzACI, UzPITI, IKARDA, Tashkent, 2004. Pages 240-242.
8. Xamidov M. The mode of growth and mineral nutrition of plants in the conditions of Khorezm. Journal "Questions of land reclamation" № 5-6., Moscow. 2000, pp. 94-96.
9. Xamidov M. Razrabotka regime orosheniya ozimoy pshenitsy dlya polucheniya maksimalnogo i kachestvennaya urojaya v usloviyax Xarezmskogo oazisa. Journal "Questions of reclamation" № 1-2., Moscow. 2000 52-58 p.
10. Xamidov M. and dr. Orosheniya selskoxozyaystvennyx kultur Khorezmskogo oasis. Agrarian Science, № 5, Moscow 2001. 43-48 p.
11. Xamidov M. Alternative water strategies. Voprosy melioratsii. Moscow, № 3-4, 2001. pp. 52-56.
12. Xamidov M. and dr. Uzbekistan water and amelioration problems and diversification of agricultural culture. Proceedings of the International Scientific Symposium "70th anniversary of the Agrarian University of Moldova", October 7-8, 2003. Chisinau
13. Jurev F. U, Amanova Z. U. Determining the degree of salinity of the soil and its types. The traditional 1st scientific-theoretical conference of professors, teachers and students dedicated to the national holiday "Year of the Healthy Child" and "Navruz" on April 15-17 in the Bukhara branch of TIMI. Bukhara 2014. 15-17 p.
14. Juraev A.Q., Juraev U.A., Qodirov Z.Z, Amanova Z.U. Effectiveness of economical irrigation technology in grain crops // Bulletin of Khorezm Mamun Academy. – Khiva, 2020 №2020-1, 71-75 p.
15. Turaev A. Use of new water-saving irrigation technologies in irrigation of agricultural crops. - Tashkent: Manaviyat, 2003. - 276 p.
16. Isayev S. X., Qodirov Z. Z., Oripov I. O., & Bobirova M. B. (2022). EFFECTS OF RESOURCE-EFFICIENT IRRIGATION TECHNOLOGIES IN IRRIGATION OF SUNFLOWERS ON LAND HYDROGEOLOGICAL CONDITIONS. British Journal of Global Ecology and Sustainable Development, 4, 95–100. Retrieved from https://journalzone.org/index.php/bjgesd/article/view/55
17. Egamberdiyev, M. S., Oripov, I. U., Hakimov, S., Akmalov, M. G., Gadoyev, A. U., & Asadov, H. B. (2022). Hydrolysis during hydration of anhydrous calcium sulfosilicate. Eurasian Journal of Engineering and Technology, 4, 76-81.
18. Egamberdiev, M. S., Oripov, I. U., & Sh, T. S. (2022). Development of a Method for Measuring the Layered Moisture State of Concrete and Various Bases. Eurasian Journal of Engineering and Technology, 4, 82-84.
19. Qodirov, Z. Z., Oripov, I. A., Tagiyev, A., Shomurodova, G., & Bobirova, M. (2022). WATER-SAVING IRRIGATION TECHNOLOGIES IN SOYBEAN IRRIGATION, EFFECT OF SOYBEAN ON GROWTH AND DEVELOPMENT. European Journal of Interdisciplinary Research and Development, 3, 79-84.
20. THE IMPORTANCE AND PROSPECTS OF DRIP IRRIGATION OF COTTON IN UZBEKISTAN
21. Z Kodirov, I Oripov, SH Avezov, M Kurbonov - Инновационные исследования в науке, 2022
22. THE IMPORTANCE AND PROSPECTS OF DRIP IRRIGATION OF COTTON IN UZBEKISTAN
23. Z Kodirov, I Oripov, SH Avezov, M Kurbonov - Инновационные исследования в науке, 2022
24. THE IMPORTANCE AND PROSPECTS OF DRIP IRRIGATION OF COTTON IN UZBEKISTAN
25. Z Kodirov, I Oripov, SH Avezov, M Kurbonov - Инновационные исследования в науке, 2022
26. THE IMPORTANCE AND PROSPECTS OF DRIP IRRIGATION OF COTTON IN UZBEKISTAN
27. Z Kodirov, I Oripov, SH Avezov, M Kurbonov - Инновационные исследования в науке, 2022