

## **THE IMPORTANCE OF RESOURCE-SAVING IRRIGATION TECHNOLOGIES IN COTTON GROWING**

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**Annotation:** The importance of water-saving irrigation technologies is significantly increasing nowadays. This is due to climate change and natural disasters contributing to a sharp decrease in water resources. In agriculture, water usage is extensive, and some crops receive improper water distribution. Our water supply networks are not up to standard, resulting in high water consumption. In such situations, it becomes necessary to seek innovative solutions. To conserve water, we need to utilize resource-efficient irrigation methods and technologies.

**Keywords:** water, air, salt, soil, regime, irrigation methods, water consumption, nutrients, heat, salinization, regional conditions, discrete, economical, innovative solutions, technology, water consumption, slope, furrow length, distance, groundwater level, crop type,

**Аннотация:** в настоящее время значимость водосберегающих технологий орошения существенно возрастает. Это обусловлено изменением климата и стихийными бедствиями, которые приводят к резкому сокращению водных ресурсов. В сельском хозяйстве вода используется экстенсивно, а некоторые культуры получают неравномерное распределение воды. Наши водопроводные сети не соответствуют стандартам, что приводит к высокому потреблению воды. В таких ситуациях возникает необходимость поиска инновационных решений. Для экономии воды нам следует применять ресурсоэффективные методы и технологии орошения.

**Ключевые слова:** вода, воздух, соль, почва, режим, методы орошения, водопотребление, питательные вещества, тепло, засоление, региональные условия, дискретные, экономичные, инновационные решения, технология, водопотребление, уклон, длина борозды, расстояние, уровень грунтовых вод, тип культуры.

**Annotatsiya:** Hozirgi vaqtda suvni tejaydigan sug'orish texnologiyalarining ahamiyati sezilarli darajada ortmoqda. Bu iqlim o'zgarishi va tabiiy ofatlar tufayli suv resurslarining keskin kamayishi bilan bog'liq. Qishloq xo'jaligida suv keng miqyosda ishlatiladi, ba'zi ekinlar esa suvni notekis taqsimlaydi. Suv ta'minoti tarmoqlarimiz standartlarga javob bermaydi, bu esa suv sarfining yuqori bo'lishiga olib kelmoqda. Bunday vaziyatlarda innovatsion yechimlarni izlash zaruriyati tug'iladi. Suvni tejash uchun resurs samaradorligiga ega sug'orish usullari va texnologiyalarini qo'llashimiz lozim.

**Tayanch so'zlar:** suv, havo, tuz, tuproq, rejim, sug'orish usullari, suv iste'moli, ozuqa moddalar, issiqlik, sho'rlanish, mintaqaviy sharoitlar, diskret, tejamkor, innovatsion yechimlar, texnologiya, suv iste'moli, qiyalik, egat uzunligi, masofa, yer osti suvlari sathi, ekin turi.

**Introduction.** Currently, one of the factors limiting the increase in cotton yield in various soil and climatic conditions of the republic is the water deficit that occurs during the growing season, and on the other hand, in most regions, when irrigating cotton, local soil and climatic conditions are not taken into account, in particular, the water and physical properties of the soil, the actual water demand at different stages of cotton growth and development. Therefore, the complete satisfaction of the water requirement at each stage of plant development is the key to obtaining a high yield. Of this, 20 percent came from rivers and streams within the republic and groundwater reserves, while 80 percent was sourced from transboundary rivers formed in the territories of neighboring republics. The average annual volume of water used in the republic was 53.9 billion cubic meters in 2019, 51.2 billion cubic meters in 2020, and 43.2 billion cubic meters in 2021. In simple terms, due to water scarcity, the amount of water used by Uzbekistan has decreased even below the levels calculated for the republic in the 1980s. Constant irrigation water will not be enough to fully provide plants with water. Therefore, finding non-traditional irrigation methods and consistently meeting the plant's water needs is one of the important factors.

The purpose of the research is to study the scientific basis of irrigation of cotton varieties by dissolving nitrogen fertilizers in water and their influence on the growth, development, and yield of crops in the conditions of medium loamy, meadow-sierozem soils of the Bukhara region.

Research objectives: application of economical irrigation technologies; determination of compliance with agrotechnical requirements in cotton cultivation; study of the influence of irrigation water on the growth, development, and yield of cotton; study of the economic efficiency of resource-saving irrigation.

When conducting field experiments, biometric measurements and soil samples were determined based on the methodologies "Methods of Field Experiments" [Dospekhov, 1985], "Methods of Conducting Field Experiments" [2007].

### **1. Mineral fertilizer application rates and timing, kg/ha.**

Mineral fertilizer types	From sowing before	With sowing together	Cotton budding during	During the cotton flowering period	Annual standard
Nitrogenous		30	90	80	200
Phosphorus	140	-	-	-	140
Potassium	100	-	-	-	100

After chiseling, plowing, and harrowing, the field was harrowed twice crosswise with a heavy harrow. High-quality seeds with a germination rate of not less than 90-95%, moisture content of 8-10%, and mechanical damage of not more than 7-8% were prepared for sowing. On April 20, when the soil temperature at a depth of 0-10 cm reached 12-14 degrees, fuzzy cotton seeds were sown. Thinning was carried out on May 21-22, when cotton seeds were sown, fully germinated, and 1-2 true leaves appeared on cotton seedlings. For efficient water use, weed control, and uniform growth and development of plants, timely and high-quality inter-row cultivation was carried out. We started the first inter-row cultivation when 75-80% of cotton seedlings had sprouted and the rows were visible. During the first cultivation, we tried to ensure high-quality soil cultivation to ensure the rapid emergence of 20-25% of seedlings that have not yet sprouted. When cultivated, the soil becomes fine-grained, air aeration in the cultivated layer

improves, and the plant's roots grow.

**1.1. Seasonal variations in the content of soluble harmful salts**

Soil layers, cm	In spring				Autumn			
	HCO <sub>3</sub>	Cl	SO <sub>4</sub>	From this harsh	HCO <sub>3</sub>	Cl	SO <sub>4</sub>	From this harsh
<b>1- point</b>								
0-20	0.038	0.012	0.052	0.112	0.031	0.029	0.070	0.170
20-40	0.036	0.015	0.051	0.120	0.030	0.031	0.065	0.200
40-60	0.035	0.014	0.054	0.127	0.028	0.030	0.087	0.180
60-80	0.030	0.012	0.052	0.111	0.029	0.018	0.044	0.144
80-100	0.032	0.013	0.053	0.128	0.028	0.015	0.036	0.134
0-100	0.034	0.013	0.052	0.120	0.029	0.025	0.064	0.166
<b>2- point</b>								
0-20	0.346	0.019	0.071	0.150	0.031	0.022	0.080	0.182
20-40	0.030	0.016	0.086	0.200	0.030	0.020	0.068	0.170
40-60	0.030	0.022	0.092	0.207	0.025	0.017	0.028	0.132
60-80	0.033	0.024	0.080	0.183	0.027	0.018	0.020	0.120
80-100	0.035	0.020	0.076	0.178	0.030	0.021	0.033	0.136
0-100	0.036	0.020	0.081	0.184	0.029	0.020	0.046	0.148

In conclusion, it is worth saying that if applied in Uzbekistan with an innovative approach to water-efficient irrigation techniques and technology, we clearly implement the procedure for supplying water to agricultural crops, depending on the needs of each person, I think we will have achieved a certain level of water efficiency. When irrigating agricultural crops with water-saving irrigation methods, for example, using discrete irrigation at 20%, drip irrigation at 35-40%, and other methods, the economic efficiency increases compared to traditional irrigation methods.

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