



GROUNDWATER CONSUMPTION AND COTTON PRODUCTIVITY

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Abstract

find and use additional sources of irrigation are the urgent issues in irrigating cotton. At present, it is safe to say that the task of saving runoff as much as possible through the proper use of ditch and collector water is cross-cutting. Additionally, the yield was 36.5 ts / ha. In a certain sense irrigation of cotton with alternating irrigation with 2 flowing water and 2 water in peace had a certain effect on productivity. In the second variant, the cotton yield was 29.2 ts / ha, and finally in the third variant, 33.6 ts / ha.

Keywords: lake, collector, underground, mineralized, irrigation, reclamation, ecological, cotton, yield, salt effect.

Relevance of the Topic

In recent years, when water shortages are significantly increasing, there are changes in the development of the water sector of the country, especially in existing water resources and irrigation systems, as well as increasing water use. Almost 90% of agricultural products grown in the country come from irrigated lands. The use of artificial irrigation and proper use of irrigation systems in the irrigation of agricultural crops is of particular importance for the Republic of Uzbekistan.

Nowadays it is important to find additional sources of irrigation in the irrigated lands of Central Asia, including Uzbekistan. In this regard, the use of groundwater, lakes and groundwater for water supply, irrigation and saline leaching has great hydro-





ameliorative and ecological significance. Therefore, we consider it necessary to develop a method of efficient use of lake-collector water.

Method of experiment: Vegetative irrigation was carried out using flowing and water in peace. When irrigating cotton with water in peace, manure is poured at the head of the ditch where water comes to the field and it is drained as juice. To do this, at the beginning of the field, a 4x4x2.5 m² juicer is dug in a juice trench and manure is poured into the trench to make juice. Stir the juice constantly before pouring. The water norm given to the field was taken into account using a Chippoleta-50 cm water meter.

Field experiments were conducted on the farm "Israel Tora" in Bukhara district of Bukhara region. In the experiment, Bukhara-8 variety of medium-fiber cotton was planted in this area. Depth of groundwater is 3.0-3.2 m. The field experiment was conducted in 3 variants.

Option 1 (control). Cotton in this variant was irrigated only with clean flowing water.

Option 2. 1- irrigation from clean flowing water, 2- from water in peace and 3- irrigation from clean flowing water, 4- from water in peace; total 4 times.

Option 3. 1,2,3- irrigation from clean flowing water, 4- from water in peace; total 4 times.

Results of the Experiment

In the experiment the first vegetative irrigation started with the cotton showing the 1st flower. During the flowering period, each option was watered 3 times. Cotton was irrigated a total of 4 times during the growing season.

In the experiment, during the growing season, the cotton was irrigated by giving a mixture of water in peace and flowing water. To do this, using a water intake pump in the area, water is discharged into the lake where the water flows. Irrigation of cotton lasted 16 hours.

Option 1 of the experiment in the production control, irrigation was carried out four times during the growing season. The cotton was irrigated four times according to the 0-3-1 scheme. The crop was irrigated once during the ripening period; the seasonal irrigation norm was 3200 m³ / ha.

Soil moisture is the main indicator in the process of irrigating cotton. Before each irrigation, soil samples were taken from the experimental field and the cotton was irrigated according to the soil moisture obtained. Soil moisture was determined by the marginal field moisture capacity (MFMC) and calculated as a percentage. In the first, second, and third variants, the next watering was given when the soil moisture of the



cotton was 70 per cent before flowering to 80 per cent during the flowering-harvesting phase and 60 per cent during the opening of the pods.

In all variants of the experiment, pre-irrigation soil moisture was maintained in a single regime relative to MFMC. Pre-irrigation soil moisture was 70–80–60% relative to MFMC.

In all studied variants, 800 m³ / ha per hectare in the first irrigation of cotton irrigated with water. In the second-third irrigation, 900 m³ / ha was irrigated per hectare, respectively, and finally in the fourth irrigation, 800 m³ / ha was applied due to soil moisture. water was given. In all variants, cotton was irrigated at the rate of 3400 m³ / ha during the season. (Table 1).

Number and rate of cotton irrigation in the experimental field, in m³ / ha.(2020).

Options	Number and rate of irrigation of cotton				Seasonal irrigation rate
	1	2	3	4	
Irrigating with flowing water	800	900	900	800	3400
Irrigating with mixed water	800	900	900	800	3400
Irrigating with mixed water	800	900	900	800	3400

Finding and adequate use of additional irrigation sources in irrigating cotton in years of water scarcity is one of the most pressing issues today. The following table provides information on the amount of water saved by irrigating cotton at the expense of water in peace by options (Table 2). Analyzing the options studied, we have to pay attention to the following situation. In the second option, cotton is irrigated at the expense of irrigation water and mixed water at a rate of 1700 m³ / ha, and finally in the fourth option at 800 m³ / ha saved up to clean flowing water. This is a water-saving factor, creating the possibility of additional irrigation when irrigating cotton in low water years.

Measurements of plant height were performed 4 times in the experimental field. The first measurements were made on June 1, the second on July 1, the third on August 1, and the fourth on September 1. At the time of the first measurements of the height of the cotton, it was observed that its height was the same in all variants, because during this period the movement of salt in the soil had not yet begun, and no doubt the effect of salt on the plant was not felt.

The amount of runoff saved in the experimental field on the cotton growing phases, in m³ / ha. (2020).





Options	Phases of cotton development			Total amount of water saved
	Until flowering	Flowering	Opening the cup	
Irrigating with flowing water	-	-	-	-
Irrigating with mixed water	-	900	800	1700
Irrigating with mixed water	-		800	800

In the first variant, the plant height was 29.0 cm in the June 1 measurements, and in the second and third variants, where the cotton was irrigated with mixed water, the plant height was 27.0 and 28.0 cm, respectively. The reason for such a slow growth of cotton during the early development period is due to its biology, the roots in the cotton initially go deep and its growth is not observed in the early period of development. Once the lateral roots have formed from the main root, the processes of growth and development in the upper organs are accelerated.

In the experiment, the effect of irrigating cotton with water in peace in the later stages of growth was felt. In particular, in the first variant, ie in the control, the height of the cotton is 94.0 cm, in the second variant - 77.0 cm. and finally in the third variant it was 86.5 cm.

Observations on measuring plant height growth in the experimental field, cm.
(2020 data)

Experiment options	Height of main stem, cm			
	1-June	1-July	1- August	1-September
Irrigation of cotton with flowing water (control).	29,0	58,0	92,0	94,0
Irrigation of cotton with mixed water	27,0	53,0	75,1	77,0
Irrigation of cotton with mixed water	28,0	56,4	85,3	86,5

Analyzing the effect of irrigation of cotton with ground mineralized water on cotton yield, it was possible to determine the following. In particular, the highest experimental yields were obtained from the experimental variant grown under flowing water. At the same time, in the first variant of the experiment, the yield of cotton was 36.5 ts / ha per hectare. In the second variant, when cotton was irrigated with mixed water, the yield was 29.2 ts / ha per hectare, and in the third variant, the yield was 33.7 ts / ha.

Conclusion

It should be noted that the reduction of water from the two river basins from year to year and its excessive use in agriculture requires the conservation of water resources.





The current water supply in agriculture uses 30-40% more water than the current norm. This is due to the fact that irrigation norms are not sufficiently differentiated depending on the climatic-soil-reclamation conditions of the region and the biological characteristics of crops. Including the following advantages can be achieved due to the alternate irrigation of cotton and other crops during the growing season with runoff and water in peace.

- Water resources and irrigated lands will increase.
- The use of this water does not require the construction of main distribution and wide irrigation networks, as well as many hydraulic structures.
- Due to the fact that the negative part of the irrigation network is not very long, the water wasted on filtration will have a high efficiency and irrigation capacity.
- Water intake from the river to the irrigation network will be reduced. As a result, water consumption for filtration is reduced and the groundwater level is reduced.

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