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Technologies for Effective Use of Flower Water in the Conditions of Global Climate Change and Water Shortage

Donabaev A. A [1], Ph.D, N. N. Abdurakhimov

[1] senior researcher, Fine Fiber Cotton ITI (ITPITI)

[2] candidate of agricultural sciences, associate professor. Termiz Institute of Agrotechnologies and Innovative Development, (Termiz Institute of Agrotechnology and Innovative Development)

Abstract: In this article, the water flow, water consumption and time spent on irrigation, water flow, water consumption and time spent for irrigation in the irrigation of fine-fiber cotton in the southern region of our republic, and the wetting of the egates in relation to the volume of the soil in the 0-45 cm layer of the soil, depending on the length of the egates in the irrigation methods, were conducted.

Keywords: Water, runoff, temperature, relative humidity, standard, cotton, variety, fine fiber, hydrological regime, flow, variable flow, discrete, method, egate length, well, plowed layer, productivity.

In the countries of Central Asia, rational use of existing water sources, saving water in agricultural irrigation, introduction of technologies that increase the quality of irrigation have become the demand of the time. Proper organization of irrigation in the care of cotton, which is the main crop in the Republic of Uzbekistan, rational use of available water reserves and increase of the useful work coefficient of irrigation, ensuring uniform distribution of water along the field and uniform moistening of the soil, in which the soil-climatic conditions of each region and the biology of the cultivated variety and it is important to know the level of water supply of the area. Water wastage during irrigation and reduction of physical evaporation of moisture from the soil surface requires further improvement of irrigation technologies. In order to prevent water scarcity in the country's agrarian sector and rational use of available water resources, scientific research and implementation of water-saving irrigation technologies for irrigation of agricultural crops in the region on a scientific basis requires conducting a number of scientific research works in this direction. In particular, in the southern region of our republic, during the period of cotton harvest, the climatic conditions change sharply, and it differs from other regions with extremely high daily temperature and dryness, as well as low relative humidity. It is known that the temperature favorable for the growth and development of cotton is 25-37o℃. Higher than this, especially hot, hot, hot sandstorms, soil and atmospheric dryness have a negative effect on the growth and development of seedlings, the formation of crop elements and the collection of crops in the spring, as well as its quality. This condition leads to the shedding of buds, flowers, nodes and small pods. Under the influence of global climate changes in the region, the arrival of warm winter, large-scale sudden changes in the amplitude of the lowest and highest air temperatures in March, April and May, overheating of the air in the summer months and rising temperatures, and such weather continuously for a long time (22 2018 days, 35 days in 2019, 26 days in 2020, 2021 days, 2022 days) causes the relative humidity of the air to be extremely low and the moisture deficit to exceed 90 mbar. Also, the decreasing flow of water in the rivers and the decreasing level of ground water in the regions are changing the previously formed hydrological regimes.

The purpose of the research work. Taking into account the fact that the demand for water is increasing day by day in all sectors, tests and field experiments were conducted on the development of agrotechnics for the maintenance of new thin-fiber cotton varieties under water shortage conditions and the development of quality fiber extraction. In order to alleviate the lack of water for crop irrigation, the methods of improving irrigation technology were compared and studied.

Research method. The experiments were carried out based on UzPITI, Central Asian Irrigation ITI and international (FAO) methodical methods in the conditions of barren grassland soils of the Central Experimental Farm of Fine Fiber Cotton Research Institute. Water consumption was measured on the automatic water meter VSK M 16/404. VNP-1 "Elektronika" moisture meter was used to determine soil moisture. The movement of water on the edge was determined by a stopwatch.

Irrigation technologies in sheep were studied in the irrigation of cotton variety SP-1607 with fine fibers.

All options were watered in rows. The width of the row is 60 cm, the length of the egate is 200 m, the permissible limit of the water flow to the egate is 0.25-1.3 l/s.

Table 1.Optimum water flow, rate of spent water and spent time in irrigation technologies. (1st irrigation)

№ Variant	Irrigation technologies	Water flow, l/s	Irrigation rate, m3/ha	Time spent on watering, hours
1	Control, irrigation in alternating flow	0,1 0,317 0,25	1607	12 13 24
2	Compacting the egat with a tractor wheel, crushing the pieces, watering the prepared egat	0,4 0,25	645	7 6
3	Same as option 2 + discrete watering	1,0	675	2,5 1,0 0,5 0,5

*Research results. Option 1 - variable flow irrigation is an irrigation technology used in almost all farms, in which water is first poured into the irrigation ditches, and the ditches are prepared by spreading water at a small (up to 0.1 l/s) flow. (from 4-5 hours to 12-17 hours depending on the viscosity of the soil)*1-боскич: In barren and barren soils, this process took about 12 hours, and in the experiment, 15 m^3 of water was used for 14 rows.

2nd stage: water was discharged for 13 hours at a flow rate of 0.317 l/s, water consumption: 103.8 m^3 of water was supplied to an area of 1680 m^2.

Stage 3: 24 hours of water flowed at a small flow (0.25 l/s), water consumption is 151.2 m^3 per 1680 m^2 area. The total water supplied was 270 m^3 or 1607 m^3/ha. 550 m^3/ha of water was discharged into the effluent. It was found that 1/3 of the soil was crushed, and 1/3 of the soil was not wetted enough despite the water discharge at the rate of 1607 m^3/ha. In this case, the water is finished. Soil moisture was determined after 3 days. According to it, 33.4 percent of the soil volume in the 0-45 cm layer at a distance of 25 m from the beginning of the slope, 31.6 percent at a distance of 75.0 m, 28.4 percent at 125 m, 25.6 percent at 175 m, 45-70 cm 35.8%, 33.0%, 30.0% and 26.2% moisture was found in the layer.

Option 2. In order to reduce the resistance of the cuttings to the flow of water (in order to quickly complete irrigation, evenly distribute water, not let it run off, and reduce water consumption), the surface of the soil is leveled, compacted, and crushed with a tractor (wheel). in order to get enough moisture from the adok part) in the adok part of the field, a distance of 40-60 m was irrigated from the prepared egates, which were additionally leveled until it reached the "O" slope.

Step 1: Water was discharged at a flow rate of 0.4 l/s until it reached the end of the egate. In 4.5-5 hours, the water reached the end of the egate and the forward flow was reversed from the ditch in the adok to the 50 m "O" sloped area and the equalization irrigation continued for another 2 hours. No discharge. Water consumption: 420 m^3/ha.

Step 2: Water is reduced to 0.25 l/s. 37.8 m^3 or 225 m^3/ha of water was discharged on an area of 1680 m^2. The 50-meter area at the end of the field was also given enough water. A total of 645 m^3/ha was irrigated, and the water was completed in 13.0 hours. There was no discharge. In order to check the distribution of water along the egate, the moisture content of the soil layers was determined 3 days after watering. According to it, 30.2% of the soil volume in the 1st well, 29.1% in the 2nd well, 27.8% in the 3rd well, and 31.4% in the 4th well were recorded in the 0-45 cm layer. In the 45-70 cm layer, 29.3%, 27.4%, 26.2%, and 30.0% were recorded.

It was found that the water received for irrigation was absorbed into the arable layer and moved to the lower layer in the following days.

In option 3: Discrete (tact) irrigation technology was used. The calculated irrigation rate was discharged with several tacts in a large stream.

Table 2. Variation of the yield of the fine fiber new cotton variety SP-1607 across the field, ts/ha

Options	0-50 meters away	50-100 meters away	100-150 meters away	150-200 meters away	average	Irrigation rate, m^3/ha
1	30,5	35,2	34,0	28,4	32,0	6037
2	36,5	33,5	30,0	35,6	33,9	4400
3	37,0	37,4	36,5	34,6	36,4	4535

Stage 1: 1.0 l/s water flow took 2.5 hours to reach the end of the egate and wet. In this case, 375 m^3/ha of water was given. Irrigation was stopped from the distribution network. (discharged to the next block) After a break of 3 hours, it was discharged again at a flow of 1.0 l/s, this time it took 1.0 hours to reach the end of the egate and wet the last ¼, giving 150 m^3/ha. It took 30 minutes for the water to reach the end of the tank in the 3rd and 4th steps. 675 m^3/ha of water was used for irrigation in 4 cycles. Watering is completed. Soil moisture in the 0-45 cm layer is 31.2 in accordance with the above; 30.0; 30.0; 29.0%, and 31.0 in the 45-70 cm layer; 30.0; 29.3; 28.5% humidity was found. It can be seen that equal wetting was achieved from the beginning to the end of the egate.

It was found that the time spent on irrigation can be reduced by 36 hours and the rate of irrigation by 2.5 times in the 2nd option compared to the currently used technology (in the 1st option) due to the full use of the possibilities of the cotton irrigation technology. When discrete irrigation technology was used, the irrigation time was reduced by 10 times, and the irrigation rate was reduced by 2.5 times. The same data as above were obtained in subsequent irrigations.

The highest yield (36.4 t/ha) was obtained when the irrigation technology was irrigated with 4-5 tacts, with the use of discrete technology. In conventional farm technology, 32.0 t/ha was obtained despite high water supply (6037 m^3/ha). The yield was 33.9 t/ha in the alternative of irrigated from the egates prepared by flattening the egates and crushing the pieces.

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