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IMPROVEMENT OF IRRIGATION REGIME OF COTTON VARIETIES DEPENDING ON SOIL AND CLIMATE CONDITIONS OF THE REPUBLIC OF KARAKALPAKSTAN

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ABSTRACT

In the conditions of the southern zone of the Aral Sea region, a water-saving and optimal irrigation regime has been developed for medium-fibrous cotton varieties "S-4727", "Sulton" and "Chimboy-5018". Comparative analysis showed that a high yield of cotton variety "Sulton" was achieved with soil before irrigation at a moisture level of 80-80-60% of LCMF and an irrigation rate of 650-800 m^3 / ha and an irrigation rate of 3500 m^3 / ha. At the same time, the yield of cotton was 31.2-32.6 c / ha.

KEYWORDS: *Cotton, Fibers, Irrigation Scheme, S-4727, Chimboy-5018, Sulton, LCMF, Raw Yield, Meadow–Alluvial, Moisture, Soil;*

INTRODUCTION

There has been a water shortage in Karakalpakstan for the last 5-6 years. In years of water scarcity, the water supply of agricultural crops is 30-40% and in many areas leads to a decrease in crop yield and quality. Therefore, the area of saline lands in irrigated lands is expanding as a result of anthropogenic impacts.

In the current context of global and local climate change, one of the urgent tasks is to improve the demand for water in agriculture, to conduct research to take into account natural and climatic conditions in determining the impact of external factors on soil properties

In the irrigated lands of the republic, comprehensive measures are being taken to ensure the efficient use of water resources and increase the yield of cotton. Therefore, the Decree PF 5748 of June 17, 2019 "On measures for the efficient use of land and water resources in agriculture" and other regulations related to this activity to some extent serve the implementation of the tasks.

Research methods: All observations, measurements, calculations and analyzes were carried out on the basis of the techniques [1-3]. In all variants, in order to determine the minimum moisture capacity of the field before irrigation, in early spring, a trial plot measuring 1.5x1.5 was laid on the plots. The duration and rate of irrigation was determined by taking soil samples at each site (0-50 cm before flowering, 0-70 cm during flowering and 0-50 cm during cotton opening) from each 10 cm layer to determine moisture content by drying in a thermostat within 6 hours and subsequent weighing on the scales. The amount of water used for irrigation was determined using 50 cm wide Chippoletti water meters.

Experimental results: Field experiments In 2018-2020, in the meadow-alluvial soils of the northern and southern regions with a groundwater level of 2-3 m, the irrigation regime of medium-fiber cotton varieties "S-4727", "Chimboy-5018" and "Sultan" was studied and the effect on yield was determined.

According to scientific research, in the northern region of the Republic of Karakalpakstan, the yield of cotton varieties "S-4727", "Chimboy-5018" and "Sultan" with an average soil moisture of 70-70-60% of ChDNS in 2018 averaged 25.3 ts / ha of S-4727. In 2019 and 2020 it was 27.1 and 26.9 ts / ha, respectively.

TABLE 1 IMPACT OF IRRIGATION SYSTEM ON COTTON YIELD (2018-2020)

Opt. s/n	Pre-irrigation soil moisture relative to ChDNS, %	Cotton varieties	Northern region				Southern region			
			Irrigation system	Seasonal irrigation rate, m3 / ha	The average yield in three years is ts / ha	Additional yield, ts / ha	Irrigation system	Seasonal irrigation rate, m3 / ha	The average yield in three years is ts / ha	Additional yield, ts / ha
1	70-70-60	C-4727	0-2-0	2129	26,4	± 0,0	1-2-0	2856	27,2	± 0,0
2	80-80-60	-//-	1-3-0	2952	27,4	+ 1,0	1-4-0	3559	28,9	+ 1,7
3	70-70-60	Chimboy-5018	0-2-0	2221	28,7	+ 2,3	1-2-0	2918	29,3	+ 2,1
4	80-80-60	-//-	1-3-0	2826	30,0	+ 3,6	1-4-0	3891	30,9	+ 3,7
5	70-70-60	Sultan	0-2-0	2145	30,3	+ 3,9	1-2-0	2864	31,5	+ 4,3
6	80-80-60	-//-	1-3-0	2928	31,2	+ 4,8	1-4-0	3430	32,6	+ 5,4

With the transition of soil moisture to 80-80-60% relative to ChDNS, an increase in cotton yield was observed and 26.8 per cent, respectively; 27.6; The yield was 27.9 ts / ha.

It should be noted that in all cotton varieties studied, the highest yield of cotton was observed when the soil moisture before irrigation was 80-80-60% of ChDNS, while relatively good results were obtained in the variety "Sultan"

In the Chimboy-5018 variety, when the soil moisture was 70-70-60% relative to the ChDNS, an average yield of 28.7 t / ha per hectare was obtained in 3 years, or 2.3 t / ha more than in the S-4727 variety. It was found that with an increase in soil moisture from 70-70-60% to 80-80-60%, the cotton yield increased by 3.6 ts / ha.

Cotton yield of “Sultan” variety when soil moisture is 70-70-60% from ChDNS 2018-31,2; 2019 y-30.4 and 2020 y-29.3 ts / ha, or an average of 30.3 ts / ha in 3 years, which is 1.6 ts / ha higher than the navigation "Chimboy-5018".

However, with an increase in soil moisture relative to ChDNS by 80-80-60%, the yield per hectare in 2018, 2019 and 2020 was 33.1, respectively; 29.4 and 31.0 ts / ha, ie an average of 31.2 ts / ha in 3 years, and an additional cotton yield of 4.8 ts / ha compared to the standard navigation. Compared to the Chimboy-5018 navigation, the additional cotton yield was 1.2 ts / gani. According to the level of yield of cotton varieties can be placed in the following order: "Sultan" (29.4-33.1 ts / ha), "Chimboy-5018" (29.7-30.3 ts / ha) and "S-4727" (26.8-27.9 ts / ha)

Irrigation regimes of these varieties at optimal times, depending on the biological characteristics of cotton varieties, climatic conditions, allowed to obtain high yields.

Medium-fiber varieties of cotton "S-4727", "Chimboy-5018" and "Sultan" in 2018-2020, the grassland-alluvial soils of the southern region, the groundwater level is 2-3 m. Irrigation system was studied and its effect on productivity was determined.

Yields of cotton varieties studied in the southern region are irrigated in 1-2-0 systems per year when irrigation is carried out in the order of 70-70-60% relative to soil moisture, with irrigation norms of 910-1075 m3 / ha and seasonal irrigation norms of 2800-3015 m3 / ha. Yield on cotton variety “S-4727” averaged 26.1-27.8 t / ha, on variety “Chimboy-5018” 28.4-30.0 t / ha and on variety “Sultan” 31.0-31 , Was 9 ts / ha.

Irrigation rate was 640-890 m3 / ha and seasonal irrigation rate was 3350-3930 m3 / ha when pre-irrigation soil moisture was carried out at 80-80-60% humidity relative to ChDNS and required 5 times irrigation, irrigated in 1-4-0 system. . In the above irrigation regime, the average yield of S-4727 cotton was 28.9 ts / ha in three years, Chimboy-5018 - 30.9 ts / ha and Sultan - 32.6 ts / ha

This means that cotton varieties require a 1-4-0 system of irrigation in the southern region of Karakalpakstan, and require an additional one or two times irrigation compared to cotton varieties grown in the northern region.

CONCLUSIONS

In all the cotton varieties studied in the northern and southern regions of the Republic of Karakalpakstan, the highest cotton yield was observed when the soil moisture before irrigation was 80-80-60% relative to ChDNS, while relatively good results were obtained in the Sultan

variety with high yields. In the southern region, the periodic irrigation rate is 600-700 m3 / ha, the total irrigation rate is 2800-3500 m3 / ha and requires irrigation in the 1-4-0 system, i.e. the irrigation regime of cotton varieties is recommended to be irrigated one or two times more than in the northern region.

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