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# IRRIGATION RATE AND ELEMENTS OF IRRIGATION TECHNOLOGY

*Annotation. Study of water efficient method of cotton-plants on the base of traditional sort "Yulduz" ("Star") by using solt structure formers such as polymers and polycomplex which aims to increase fertility and to fight against the erosion on the slopes is described in this article. The works of such scientists of plant genetics institute AS of Republic of Uzbekistan as academician A.N.Kostyakova, N.T.Laktayeva are used in this article.*

*Key words: cotton-plants, polycomplex, erosion on the slopes, polymers.*

On typical sierozem soils, the most common soil in the region for studying water-saving irrigation technology in light sierozem soils of medium loamy mechanical composition, we introduced the following: polymer K-9 (Institute of Chemistry of the Academy of Sciences of the Republic of Uzbekistan) and the polycomplex KMC, with the help of which polymer-soil humidifier blocks with a capacity for moisture content and moisture retention in the soil (with an application rate of 40 kg/ha and 75 kg/ha) were created under the soil. The elements of furrow irrigation technology were determined by the SANIIRI method (Irrigation Technology Department). On a slope of 0.06 with the studied irrigation regime of 65-70-70% of the soil HB for the Yulduz variety (soil bulk density - 1.36 g/sm$^3$, specific gravity - 2.69 g/sm$^3$, soil porosity 49.6%) with irrigation streams of 0.11 and 0.10 l/s, elements of the irrigation technique (Table 1) were obtained for a uniformly moistened slope.

It is evident from Table 1 that the usually recorded water leakage of 562 m$^3$/ha in total was retained by us in humidifier blocks in the 0-30 cm soil layer,

which were then used for cotton water consumption. To identify the advantages of water retention and water conservation using the above-mentioned chemical polymers (environmentally tested and approved for use by the Ministry of Health of the Republic), an experiment was conducted using the dependence of the calculated total evaporation with the forecast of the increase in cotton biomass, when the lower limit of the biomass increase was reduced to the limit of the optimal interval for each phase of plant development. For example, according to the example of Table 1, where the irrigation rate was determined according to A.N. Kostyakov as the difference between the moisture reserves before and after irrigation by the increase in dry biomass, total evaporation and irrigation schemes, it was checked according to the humidification diagram according to N.T. Laktaev, i.e. In the experiments, the time of irrigation was determined using the increase in biomass after two years of experimental research on the same site.

Table 1 - Irrigation rate and elements of irrigation technology

| No. watering | Timing of watering | Consumption, l/s | Irrigation rate, $m^3$/ha | | | | Watering time, hour | |
|---|---|---|---|---|---|---|---|---|
| | | | gross | net | leak | dump | total | run |
| 1 | 19.06-20.06 | 0,11 | 1400 | 990 | 137 | 223 | 25,3 | 3,7 |
| 2 | 17.07-18.07 | 0,11 | 1310 | 930 | 170 | 210 | 23,6 | 3,0 |
| 3 | 10.08-11.08 | 0,10 | 1140 | 850 | 132 | 158 | 22,8 | 4,1 |
| 4 | 3.09-4.09 | 0,10 | 850 | 670 | 73 | 104 | 15,5 | 4,0 |
| Total for the year | | | 4760 | 3440 | 562 | 698 | 87,2 | wed.3.7 |

Table 2 - Irrigation rates for the forecast of biomass growth of the cotton variety "Yulduz"

| Received irrigation rate, $m^3$/ha | Watering | Irrigation rate, $m^3$/ha | Start watering, (4.1.5) | Inter-irrigation period, days | Biomass growth, g/day per plant |
|---|---|---|---|---|---|
| 3510 with a scheme of 65-70-70% HB (optimal according to the forecast of plant biomass) | 1 | 720 | 15.06 | 15 | 0,5 |
| | 2 | 550 | 1.07 | 16 | 1028 |
| | 3 | 740 | 17.07 | 14 | 1,31 |
| | 4 | 560 | 1.08 | 14 | 1,30 |
| | 5 | 520 | 15.08 | 16 | 1,12 |
| | 6 | 420 | 31.08 | 16 | 1,10 |

Irrigation rates of 420-740 m3/ha per season, for example 6 times per season, allowed to meet the criteria of the optimal regime of plant biomass growth with minimal water consumption and at the end of the season cotton harvests were obtained (Table 3). Polymers not only allowed to eliminate water leakage deep into the soil, but also to turn it into an increase in soil moisture reserves in the root zone to ensure an optimal water regime for plants between irrigations, naturally with the recommended measures of UzNIIH.

Table 3 - Cotton yield of the Yulduz variety and water consumption per unit of yield

| Options of experience | 1 choir, c/ga | 2 choir, c/ga | 3 choir, c/ga | Total yield, c/ha | Costs per unit of yield, m3/c |
|---|---|---|---|---|---|
| Control: production irrigation | 22,00 | 7,59 | 0,31 | 29,9 | 157,2 |
| Polymer K-9 | 25,35 | 8,29 | 0,25 | 33,9 | 103,5 |
| Polycomplex KMC | 24,07 | 7,62 | 0,11 | 31,8 | 111,0 |

Thus, the combined use of biomass growth and total evaporation allows us to outline a procedure for identifying the optimal moisture reserve at each stage of ontogenesis and, accordingly, to ensure irrigation during the growing season. We have worked out this technique mainly on the Yulduz variety, but we are further interested in the viability of this technique on other new cotton

varieties that are only being introduced by the Institute of Genetics of the Academy of Sciences of the Republic of Uzbekistan (Armugon, Gulbakhor). It is appropriate to note that optimal water consumption and irrigation technologies (Table 1) allow us to calculate water reserves to solve the problem of water conservation in the field when using the irrigation regime.

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