UDC 631.84:633

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OPTIMAL ELEMENTS OF IRRIGATION TECHNOLOGY

Abstract. Study of biological properties of cotton-plant and their adaption to the natural conditions, especially in the south of Uzbekistan, where optimally selected norms of irrigation increase the efficiency of irrigating techniques, shows the ways of raising fertility of cotton-plant in the fields and recommends optimal elements of irrigation techniques which are considered as the basis of plant cultirating technology, supplying entire, field uniformly with water, neither too much nor too little, since salinization is not restored.

Keywords: cotton-plant, norms of irrigation, cultirating technology, supplying entire, salinization.

Since the biological characteristics of cotton varieties are associated with soil conditions, we were able to study the properties of soils in our experiments. The soil description by mechanical composition and the results of the agrochemical composition of the soil of the experimental plot are given in Table 1, which characterizes the hydromorphic type of soils together with the data of the chemical analysis of the soil, which affect the roots of plants, especially under the influence of weakly mineralized groundwater at a depth of 1.2-1.5 m (with a weak effect of the mineralization of these waters on the meliorative state of the lands). The experimental plot is located on the border of piedmont plains and adyr elevations in the inter-adyr depression, where weakly mineralized groundwater wedges out, there are springs with a flow rate of up to 10-20 l / s, which are collected in drains, 2 m deep and are taken out to the lower irrigation sites by collectors and are used with irrigation water for irrigation of rice, grain crops. The development of the upper tier of hilly lands of about 20 thousand

hectares for grain crops, cotton, and garden crops causes an additional inflow of groundwater to the site from the Khisor farm.

In addition, the area is affected by the upstream Naiman and Kamashi reservoirs. Soils affected by groundwater change over the course of a year: either to a meadow soil formation process or to a sierozem-meadow state due to the poor performance of the collector-drainage network. Therefore, research on the normal maintenance of the meliorative state of soils with optimal irrigation regimes is especially important, since the rise in groundwater levels transfers soils from the category of medium-provided with nutrients to low-provided ones with the leaching of NPK, and the water, air and thermal regimes of soils deteriorate.

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An analysis of the recommendations on the size of the irrigation technique elements according to the recommendations of N.T.Laktaev (1978) shows that all the recommendations are given mainly for automorphic soils, and even then there is scant information on the origin of the absorption parameters: (K_{mouth}), b, α. Therefore, we were forced to study them on experimental plots.

Table 1. Elements of furrow irrigation technique in experimental plots.

consumption, l/s	Field slope	Irrigation norm, m^3/he				Watering time, hour		
		rude	net	reset	leakage	runaway	topping up	general
Karshi district farm "Nasaf"								
0,095	0,01	615 673	400 400	94 189	121 87	5,4 10,0	2,6 3,0	8,0 13
		1207 929	860 800	144 108	63 21	14 17	2,7 3,8	16,7 20,2
		1546 1455	1200 1200	294 218	52 37	20,5 31	1,5 1,2	22 32,2
Yakkabag district, Amir Temur farm								
0,14	0,007	719 555	400 400	245 101	104 54	1,7 2	2,8 34	4 6
		1116 1264	800 800	235 342	84 62	2 2	7,7 18,4	9,7 14,4
		1649 1264	1200 1200	281 209	68 53	3 4	12,3 15,8	15,3 19,8
Yakkabag district, Amir Temur farm (meadow soils)								
0,70 0,61	0,003	626 701	400 400	-	-	2,3 1,2	0,7 2,8	3,0 4,0
		900 1010	700 700	-	-	2,3 1,2	2,9 4,8	5,2 6,0
Yakkabag district, Amir Temur farm (gray soils-meadow soils))								
0,23	0,009	550 510	400 400	30 93	120 17	1,5 1,2	4,9 7,8	6,5 9,0
0,16		1040 1085	700 700	20 68	320 317	3,8 3,0	12,0 19,6	15,8 22,6

Table 2

The content of salts in the soil in the Amir Temur farm of the Yakkabag district

Soil layer	Dry residue, g/l	Total alkalinity		*Cl*	SO_4		*Mg*	*Na+K* by difference	Carbonates CO_2	Gypsum
		HCO_3	CO_3							

0-34	0,156	0,024	0,02	0,018	0,642	0,015	0,006	0,013	10,01	0,505
34-47	0,306	0,028	0,01	0,014	0,272	0,098	0,012	0,013	10,14	0,347
47-60	0,122	0,017	-	0,011	0,046	0,020	0,005	0,007	9,75	0,304
60-110	0,114	0,016	-	0,013	0,032	0,016	0,102	0,013	9,62	0,368
110-150	0,092	0,012	-	0,015	0,037	0,015	0,005	0,009	11,54	0,231
150-180	0,054	0,010	-	0,014	0,030	0,014	0,007	0,003	10,41	0,305

According to N.T.Laktaev's theory, water absorption into the soil has a pattern .

$$K_t = K_{\text{уст}}(1 + \frac{b}{t^{\alpha}}) \quad (1)$$

The role of groundwater influence on irrigation was indicated by V.A. Dukhovny (1974), since the groundwater level is more or less at a stable depth of 1.2-1.5 m during the growing season, it will not be difficult to determine the irrigation regime for cotton and link it with total evaporation. For these conditions, we have studied the irrigation technique, the elements of which are given in Table 1. and which were selected using the graphical analytical method of their determination, for the purposes of implementing the assigned irrigation regime schemes with the maximum efficiency of the irrigation technique for irrigation with a furrow length of 140 m. The irrigation theory for water absorption into the soil is specified according to the hydromorphic properties of soils, since with the stability of the groundwater level at a depth of 1.2-1.5 m, the absorption parameters turned out to be more or less stable, with a deviation variation of about 0.90-0.92, which is considered quite acceptable for the practical application of the irrigation technique elements (Table 1)

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