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STUDYING THE DEGREE OF SOIL SALINIZATION IN EXPERIMENTAL AREAS

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Abstract
To conduct experiments in experimental plots, the degree of salinization of soil fields was studied by the initial amount of salts in them. The results obtained showed that the soils of the first experimental field have a heavy mechanical composition and, due to the presence of mineralized Syzob waters in the surface of the earth, are somewhat more saline than the soils of the second field. According to the results of our long-term studies of cotton in the Karshi steppe, watering the crop ahead of schedule or delaying watering, as well as an excessive decrease or increase in irrigation rates, lead to a decrease in yield and soil salinization.

Keywords: watering, irrigation regime, soil salinization, mineralization, mechanical composition, ground water, dry residue, depth, yield.

Introduction

To describe the degree of soil salinization in experimental fields, the initial amount of salts in them was studied. In experimental plots, cotton, wheat, vegetables, sugar cane, fruit trees, grapes and many other crops considered valuable for the national economy are planted and abundant and high-quality harvests are obtained from them. The Kashkadarya region occupies a leading place in the republic in terms of the weight of products grown in irrigated agriculture. Over the past three years, 426-459 thousand tons of cotton have been grown. This is approximately 10-15 percent of the total crop grown in the republic. The soil of the oasis is fertile, there is enough labor, equipment, mineral fertilizers, and solar heat is above normal [1-2].

LITERATURE AND METHODOLOGY

The results obtained showed that the soils of the first experimental field have a heavy mechanical composition and, due to the presence of mineralized Syzob waters at the surface of the earth, are somewhat more saline than the soils of the second field. The top meter layer of the first experimental field contains 0.590% dry residue and 0.046% chlorine ions. Under a meter-long layer, the salt content is even higher - the dry residue is 0.725%, and the chlorine ion is 0.063%.

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Table 1 **The degree of mineralization of water infiltration in experimental fields**

Years	Deadline for determination	Depth of water infiltration, m	Dry residue, g/l	Chlorine ions, g/l
First experimental site				
1 year	Spring	1,78	6,600	1,420
	Autumn	1,79	6,920	1,040
2 year	Spring	1,80	10,005	1,085
	Autumn	1,82	9,825	0,920
3 year	Spring	1,77	11,280	2,130
	Autumn	1,79	10,910	1,600
Second experimental site				
1 year	Spring	3,88	4,122	0,160
	Autumn	3,63	3,485	0,175
2 year	Spring	4,00	4,002	0,210
	Autumn	3,70	3,502	0,142
3 year	Spring	3,72	4,600	0,192
	Autumn	3,65	3,612	0,137

The soil of the oasis is fertile, there is enough labor, equipment, mineral fertilizers, and solar heat. This makes it possible to further increase the production of cotton and other agricultural products in the oasis [3].

However, this country lacks one factor - the water factor. At the same time, water is always at a minimum. Therefore, the development and implementation of ways and methods for the rational use of available water resources in irrigated agriculture in the country is one of the most pressing tasks.

When using irrigation water in irrigated agriculture, this measure must be carried out taking into account two goals: First, when irrigating cotton, wheat, corn, alfalfa, vegetables, sugar cane and other agricultural crops, it is necessary to develop such optimal timing, methods, norms and techniques of irrigation, which will ensure good growth and development of crops, harvesting an early, abundant and high-quality harvest. Secondly, such a crop irrigation regime should allow stabilizing the runoff regime, reducing its mineralization, clearing old saline lands, preventing secondary salinization, and maintaining a clean ecological environment.

RESULTS

According to the results of our long-term studies of cotton in the Karshi steppe, watering the crop ahead of schedule or delaying watering, as well as an excessive decrease or increase in irrigation rates, lead to a decrease in yield and soil salinization. At the same time, not only does the cotton yield decrease and its quality decreases, but the Syzob water regime is also disrupted, and the lands are subject to secondary salinization. The only way to prevent this is to develop optimal irrigation regimes for cotton and other crops in crop rotation [5]. According to the results of our many years of research, the growth of fine-fiber cotton for the first time in conditions of light gray soils with infiltration depths of 1.5-2.0 m and 3.5-4.0 m, optimal irrigation timing, ensuring the development and early ripening of abundant harvests, as well as the maintenance of reclamation lands in a stable condition,

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their quantities and standards were developed. At the same time, for the conditions of the lower regions of the oasis, irrigation regimes for cotton and other crops in crop rotation were developed and put into practice. Water plays a very important role in the life of plants, including cotton.

The vital activity of plants, the normal course of all physiological processes occurring in them, is manifested in conditions of complete provision of cells and tissues with water. Growing cotton of high technological quality in the soil and climatic conditions of the Karshi steppe is inextricably linked with the salt regime of the soil. Because an increase in the amount of easily soluble salts in soil and agricultural crops, including a decrease in cotton yield. On slightly saline lands, cotton yields decrease by 15-20%, on average by 35-40%, and on strong lands - by 80-85%. This is due not only to the toxic effect of salts, but also to an increase in the concentration of the soil solution and, accordingly, osmotic pressure [6]. As a result, root hairs cannot absorb the water they need, and over time, the plant's seedlings may die. To describe the degree of soil salinization in experimental fields, the initial amount of salts in them was studied (Table 2).

Table 2 **Initial amount of salts in the soils of the first experimental field**

Layer, cm	Dry residue, %	Total alkalinity, %	Chlorine ion, %	H_2SO_4 acid residue, %
0-20	0,654	0,037	0,028	0,378
20-40	0,876	0,032	0,053	0,513
40-60	0,470	0,038	0,046	0,143
60-80	0,473	0,039	0,057	0,237
80-100	0,477	0,038	0,048	0,260
100-120	0,952	0,040	0,045	0,252
120-140	0,830	0,020	0,072	0,490
140-160	0,817	0,030	0,072	0,481
160-180	0,680	0,020	0,060	0,380
180-200	0,617	0,036	0,043	0,344
0-60	0,666	0,035	0,043	0,344
60-100	0,375	0,038	0,052	0,248
0-100	0,590	0,037	0,046	0,306
100-200	0,725	0,025	0,063	0,402
0-200	0,610	0,031	0,054	0,349

Considering the weak salinity of the soils of the first experimental field and the weak salinity of the soils of the second experimental field only in a layer of 100-200 cm, then it becomes clear that these salts rise to the upper layers of the soil after a certain period of time and pose a danger to plants. Of course, the crop irrigation regime has a great influence on the occurrence of this situation. In the field, where filtration waters lie at a depth of 1.5-2.0 m, a significant change in the salt regime of the soil was observed under the influence of the cotton irrigation regime. For example, in the first year, provided that the moisture content of the irrigated soil was equal to 70-70-65% of the maximum field moisture capacity, option 2, if in the spring, that is, before the start of irrigation, the amount of dry residue in the 0-60 cm layer was 1.153%, by autumn it became clear that its amount dropped to 1.121%. However, the accumulation of salts occurred in the soil layer of 100-200 cm

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from spring to autumn. For example, in the spring this layer contained 1.019% dry residue, and by autumn its amount increased to 1.240%.

DISCUSSION

During the experiment, it was found that the amount of chlorine ions increases from spring to autumn in all layers. In the first option (60-70-65%), the amount of salts in the soil increased significantly from spring to autumn. A similar scenario was observed in options 3 and 4. For example, at the beginning of the growing season, the amount of dry residue in the 0-60 cm layer was 1.153%, by autumn this figure increased to 1.270% in the 3rd option and 1.261% in the 4th option. However, it was found that the amount of salts in the 100-200 cm layer is slightly less (1.227-1.262%) than in option 1 (1.328%). The best reclamation conditions were observed in options 2 and 3 - 70-70-65% and 70-75-65% compared to the moisture capacity of an immature field with a wet irrigation regime.

Table 3 **The initial amount of salts in the soils of the second experimental field**

Layer, cm	Dry residue, %	Total alkalinity, %	Chlorine ion, %	H_2SO_4 acid residue, %
0-20	0,120	0,034	0,012	0,056
20-40	0,108	0,037	0,018	0,039
40-60	0,122	0,029	0,033	0,034
60-80	0,140	0,029	0,033	0,042
80-100	0,116	0,032	0,014	0,048
100-120	0,460	0,026	0,021	0,275
120-140	0,656	0,017	0,023	0,427
140-160	0,600	0,018	0,025	0,305
160-180	0,448	0,018	0,033	0,261
180-200	0,338	0,020	0,018	0,207
200-220	0,260	0,025	0,033	0,130
220-240	0,128	0,024	0,014	0,056
240-260	0,124	0,025	0,012	0,063
260-280	0,118	0,024	0,009	0,057
280-300	0,126	0,024	0,011	0,063
0-60	0,140	0,033	0,021	0,043
60-100	0,129	0,030	0,023	0,045
0-100	0,121	0,032	0,025	0,043
100-200	0,500	0,019	0,024	0,295
200-300	0,171	0,023	0,015	0,073
0-200	0,315	0,025	0,024	0,169
0-300	0,264	0,037	0,022	0,255

CONCLUSION

Data on the salt regime of the soil of the second experimental field are presented in Table 3. The research results showed that the amount of dry residue and chlorine ions in a meter layer of soil practically did not change from spring to autumn under different irrigation regimes [7-9]. A significant change in the salt regime was observed in the 100-200 cm layer, which has a higher salinity compared to the upper layer. In all years of research and under all irrigation regimes, it was found that salts were washed out from the 100-200 cm layer and entered the lower layer of 200-300 cm.

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