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Research Article

WATER PROPERTIES OF SOILS OF KHORAZM REGION

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ABSTRACT

The irrigated soils scattered in the Khorezm oasis on the lower shore of Amudarya have great potential in the agriculture of our republic. Therefore, the creation of a system of measures aimed at preserving and protecting them, increasing production capacity and productivity, and improving land reclamation is one of the most important current issues of today.

KEYWORDS

Water properties, irrigated soils and khorazm region.

INTRODUCTION

It is important to deeply analyze the current agrophysical condition of the main soils distributed in the territory of the Khorezm oasis, to determine the change in the level of soil fertility as a result of irrigation, and to develop the scientific basis for its improvement. In order to solve this goal, it is necessary to study the properties of water in the soil layers, taking into account the geomorphological, lithological

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and hydrogeological conditions of the soil. In different periods, the ameliorative state of the Amudarya lower reaches, including the Khorezm oasis, soil cover, distribution, chemical, physical-chemical and including water-physical properties were studied by various factors [1-4].

However, since these scientific works were carried out in the past, the current state of the Khorezm oasis soils does not fully describe the period. Therefore, it is necessary to carry out scientific research in order to reflect the current situation.

Research object and methods. The irrigated soils of Khorezm region serve as a research object. The water properties of these soils are generally accepted, the methods are soil moisture drying method at 1050 C, water capacities in laboratory conditions by cylinder method and water permeability in field conditions by S.I. It was determined by the Dolgov method.

Analysis of the obtained results. Knowledge of water-physical properties of soil under irrigated agriculture is important in increasing its productivity. Water-physical properties determine soil moisture consumption and mobility, as well as nutrient uptake.

Water properties of the irrigated meadow soils of Khorezm region are different levels of moisture obtained during the cutting period, where the influence of irrigation and erosion seepage can be observed. The effect of the Eros storm water is clearly visible in the grassy soils scattered in I. Kholmetov Water Consumption Association (WCA) of Gurlan district, "Khorazm" WCA of Shavat district and Al-Khorazmi WCA. Their amount fluctuates from 24 to 32% in the layers close to the seepage water. At all the obtained points, it is possible to observe a sharp decrease in moisture in the driving layer. At the same time, a lack of natural moisture was observed in some deep layers with a light mechanical composition.

According to the results of the research, the field moisture capacity (FMC) in the upper meter layer of weakly saline sandy loam, light sandy and grassy soils is 22% on average, and this indicator is 22-23% in relation to the soil mass in light medium sandy types with moderate salinity. (Table 1)

Thus, it was determined that the water properties of the soils, their mechanical composition, layer density, mineralogical and salinity levels are not homogeneous due to the haze. According to the obtained data, total and capillary moisture capacity is slightly higher in grassland soils. For example: KNS - 30-32%, and TNS - 35-37%, respectively, of the driving layer obtained from the entire section. In the driving layer, this value is slightly reduced.

Table 1

Water capacity of irrigated soils of Khorezm region

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Location №	Layer depth, см	FMC	KNS	TNS	Location №	Layer depth, см	FMC	KNS	TNS
"Bogolon" WCA, Yangibozor district					Khanka District Al-Khorazmi WCA				
88	0-35	22,20	30,55	35,41	589	0-30	21,52	31,25	36,11
	35-55	22,30	31,21	36,40		30-37	21,00	31,15	36,23
	55-100	21,50	31,18	36,90		37-50	22,72	31,16	36,56
	100-150	21,80	31,91	36,10		50-70	22,36	31,57	36,18
	150-200	21,90	31,01	36,80		70-100	21,52	31,25	36,11
Gurlan district I. Kholmetov WCA					Bogot district "Tashkent" WCA				
136	0-30	22,56	31,09	36,58	643	0-35	22,43	31,41	36,53
	30-50	21,90	30,70	36,36		35-50	21,42	31,81	36,36
	50-86	22,07	31,10	36,36		50-80	21,62	32,43	37,10
	86-130	21,90	31,50	36,30		80-100	21,42	31,81	36,36
"Khorazm" WCA of Shavat district					Khozorasp district Yu. Sherjonov WCA				
265	0-32	22,60	30,82	36,30	788	0-30	21,62	31,76	36,48
	32-48	21,10	31,69	36,61		30-50	21,52	31,20	36,11
	48-75	21,16	31,38	36,49		50-75	21,73	31,52	36,41
	75-105	21,51	31,39	36,62		75-110	21,32	31,61	36,02
	105-140	22,80	31,37	36,60					

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At the same time, the heavy mechanical composition of old irrigated grassland soils has a slightly higher water capacity (27.3-28.5%) than their medium and light soils. Due to the fact that the mechanical composition of individual layers is not the same, the water capacity is also different.

Old and newly irrigated meadow soils are close to seepage water and have a relatively high water capacity, which is 27% of soil weight in one-meter layers.

In some layers, the water capacity fluctuates from 22% to 29% due to changes in mechanical composition and salinity.

Due to differences in mechanical, mineralogical composition, density and salinity of irrigated meadow soils of Khorezm region, their water properties are not the same.

Water permeability of soils and soils is considered the most important water-physical properties. Water permeability is of great importance in the agronomic and reclamation classification of soils, and it comprehensively determines the water regime, irrigation techniques, salt washing, the occurrence of erosion and other activities.

In order to efficiently use irrigation water in irrigated agriculture of Khorezm region, it is important to study and manage soil permeability. The soils of the districts where we have conducted research are distinguished by their own characteristics and diversity, that is, they have different mechanical composition, many layers, different levels of salinity and compaction, and their water permeability is also different. Among them, weak-medium salinity, sandy-light sandy loam mechanical composition meadow and gray-meadow soils, which are irrigated from new water, have good water permeability properties (Table 2).

The lightness of the mechanical composition of soils, the abundance of water-resistant aggregates in the upper layers and the lack of compaction cause high water permeability. The irrigated soils of the Khorezm region are irrigated soils of medium loam, strong salinity, with low water permeability. The reason for low water permeability of these soils is the aggravation of the mechanical composition, the presence of highly dense (HO 1.50-1.64; total porosity 38-43) layers. It can be explained as follows that the rate of absorption in saline soils is high at the beginning (3.47-5.94 mm/min) and by the end of the 6th hour (0.04-0.08 mm/min). A large amount of water-soluble salts dissolves under the influence of water and passes into the soil solution and is washed into deep layers. As a result of the release of salt in these layers, the aggregates are dispersed (spread) and the soil becomes a whole mass with a high density (1.64 g/cm3).

The high water permeability of the irrigated soils of Khorezm region in the fall is the reason for the low density of the soil and the deep location of the seepage waters with the same composition and high porosity in the soil section. At the same time, absorption is slow in somewhat compacted, saline and saline, plastered soils.

Weak-medium salinity, medium-heavy mechanical composition soils that are irrigated with satisfactory water permeability are characterized by their poor structure, compaction and close location of seepage water. Violation of the granular structural state of irrigated soils worsens water permeability. In such places, it becomes difficult for water to penetrate into the lower layer. Also, it was found that water permeability is poor in old irrigated soils with heavy mechanical composition, presence of a dense subsoil

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layer, and saline soils with a lot of sodium cation in the absorption complex.

Depending on soil moisture, plowing time and the quality of agrotechnical measures used in farming, the state of water permeability in layers also changes. According to the cultural condition of the soil, it was found that the water permeability is also different, despite being of the same type.

Table 2

Water permeability of irrigated soils of Khorezm region

Location №	Time interval								Total liters	Coefficient of creep.	
	10 mins	30 mins	60 mins	2 hours	3 hours	4 hours	5 hours	6 hours		mm/ day	m^3/ha
"Bogolon" WCA, Yangibozor district											
88	3,73	0,52	0,79	0,55	0,74	0,62	0,49	0,19	21675	0,70	291
Gurlan district I. Kholmetov WCA											
136	2,22	0,19	0,12	0,048	0,028	0,019	0,014	0,010	2095	0,020	8
"Khorazm" WCA of Shavat district											
265	5,28	0,29	0,12	0,049	0,035	0,024	0,017	0,014	8160	0,034	14
Khanka district "Galaba" WCA											

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396	1,70	0,23	0,082	0,035	0,021	0,014	0,011	0,008	1735	0,030	12
Khanka District Al-Khorazmi WCA											
589	7,77	0,36	0,32	0,35	0,21	0,15	0,10	0,083	9675	0,21	87
Bogot district "Tashkent" WCA											
643	4,76	0,72	0,33	0,27	0,16	0,11	0,090	0,074	8136	0,15	65
Khozorasp district Yu. Sherjonov WCA											
788	5,21	0,69	0,33	0,16	0,099	0,071	0,054	0,043	6492	0,102	42

CONCLUSION

Summing up, it should be noted that the basis of the water-physical properties of the soil of Khorezm region depends on its mechanical composition, general physical and description of the soil-forming mother rock, its effect is manifested in volume mass, field moisture capacity, water permeability, changing it to a positive aspect is definitely agrotechnical. the water properties of irrigated soils are improved under the influence of measures:

a) macro- and micro-aggregates increase in the plowed layer, forming an acceptable density, and overall porosity and water permeability increase.

b) field moisture capacity and productive active moisture content increase at the limit of root propagation of plants.

Condensed and heavy mechanical composition soils consisting of different layers are characterized by low water permeability and 8-68 m3 per hectare of water is absorbed at a rate of 0.020-0.15 m3 per day, and in porous, non-consolidated soils, water per hectare is 104-291 m3 It can be absorbed at a rate of 0.25-0.70 m/day, which in turn determines the proper distribution of irrigation water.

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