

Agrochemical properties of the southern gray-oasis soils

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Abstract: This article presents the degree of supply of humus and nutrients in the genetic layers of grassland-gray soils distributed in the gray-oasis areas. Quantitative indicators of humus reserves in irrigated meadow-gray soils of Shurchi district in the 0-50 cm layer fluctuate at short intervals, in the upper 0-30 cm layer 60,90 tons per hectare, nitrogen 5,29 tons, phosphorus 31,20 tons, potassium 84,00 tons and the amount of total salts and ions with different levels of salinity, depending on soil-climatic and human-economic conditions.

Basic terms: meadow-grass, meadow-grass, meadow soils, nitrogen, mobile phosphorus and potassium, mineral, organic and biological fertilizers.

Object of research. Weak, moderate, strongly saline and non-saline meadow-grass, grassland, meadow soils, the amount of mineral, organic, biological fertilizers, nutrients.

Introduction. Ensuring normal growth and development of plants and obtaining high quality crops depends in many respects on the agrochemical properties of the soil, including the amount of humus and nutrients. Humus is not only the main source of nutrients for plants, but also a high-molecular organic substance that determines the level of soil fertility, regulating their agrophysical, physicochemical and biological properties. In the context of the intensive farming system in recent years, attention has been paid to the increase of arable lands, the increase in the area of cultivated soils, crop rotation, improved water supply, and the use of organic fertilizers.

The purpose of the study. To determine the level of humus and nutrient supply of meadow-soil soils in the southern gray-oasis areas.

Object of research. Meadow-gray, gray meadow, meadow soils of gray-oasis soils were selected.

Research methods. When performing field and in-house studies using genetic-geographical and chemical-analytical methods. Polevye pochvennye i kameralno-analiticheskie raboty vypolneny na osnove razrabotannyx i obshchepriinyatyx v institutax NIIPA i UzNIIX metodax, v chastnosti, na osnov «Instruktsii provedeniya pochvennyx issledovaniy i sostavleniya kadovenniya pochvennyok kartya dogo». Mathematical and statistical analysis of the received data is performed at the level of B.A. Dospexova.

Research results. The amount of humus in the topsoil and subsoil of irrigated meadow-gray soils of Shurchi district fluctuates widely, the highest values are 1,01-1,45%, total nitrogen 0,087-0,126%, phosphorus-0,625-0,743%, potassium 1,25-. 2,0%. The amount of mobile phosphorus is 7,33-18,93 mg / kg, potassium is 184-262 mg / kg, and these studied desert-grass soils are very low (0-15) and low (16-30 mg) with mobile nitrogen and phosphorus. / kg), a group of soils supplied with very low (0-100), low (100-200) and moderate (201-300 mg / kg) with exchangeable potassium. The content of carbonates (SO₂) in the cross-sectional layers is 3,34-7,35%. The ratio of carbon content in humus to the total nitrogen content is observed in the upper layers (0-55 cm) in the range of 7,8-8,42 in the lower layers in the range of 5,8-6,2 (table -1)

Table -1

The main agrochemical indicators of irrigated grasslands of Shurchi district of Surkhandarya region

Depth, cm	Humus,%	Gross, %			Movable, mg/kg		CO ₂ carbonate, %	SO ₄ gypsum, %	pH
		N	P	K	P ₂ O ₅	K ₂ O			
17- cut. Irrigated meadow gray-soil									
0-30	1,45	0,126	0,743	2,00	18,93	262	7,35	0,403	7,69
30-50	1,01	0,087	0,625	1,25	7,33	184	3,34	0,337	7,64
50-75	0,87	0,073	0,593	1,20	5,33	75	7,04	0,387	7,67
75-100	0,66	0,067	0,593	0,75	5,33	62	6,96	0,420	7,64
100-150	0,59	0,056	0,643	1,10	5,33	66	7,32	0,329	7,67

Gypsum is formed from a solution of groundwater in the soil and from the accumulation of salts on the surface of the irrigation water evaporates. During this process, fine crystals accumulate in the soil solution as a result of the accumulation of Na₂SO₄, MgCO₃, CaCO₃, and exchangeable Sa, including gypsum. The amount of gypsum is 20% and above. Gypsum soils have unique water-physical properties, with very high moisture content and other properties that have long attracted the attention of soil reclamation specialists.

According to the analysis of soil samples taken from the cross-sections of the base farms, the amount of gypsum in the irrigated meadow-gray soils of farms of Shurchi district is 0,337-0,403% in the tillage layer (30 -cm) and (50 -cm). The soils of these base farms are not plastered according to the current classification (<10%) form a group of soils (table -1).

table 2

Composition of humus, nitrogen, phosphorus and potassium reserves of irrigated meadow-gray soils of farms of Shurchi district of Surkhandarya region

The name of the soil	Depth, cm	Humus, t / ga	Gross, t / ga		
			N	P	K
1	2	3	4	5	6
Meadow-gray	0-30	60,90	5,29	31,20	84,00
	30-50	28,28	2,43	17,50	35,00
	50-75	30,45	2,55	20,75	42,00
	75-100	23,10	2,34	20,75	26,25
	100-150	44,25	4,20	48,22	82,50

Currently, in the use of saline lands for agricultural purposes, in assessing their soil and reclamation status, in determining the reserves of salts in the soil profile, special attention is paid to three different categories of saline soils: Category 1 - salts accumulated in the upper 0-1 meter layer; Category 2 - soils where salts are mainly accumulated in a layer of 1-2 meters; Category 3 is soils where salts accumulate in soil-forming or lower rocks.

Water-soluble salts are referred to as saline soils, in which the content of water-soluble salts in the amount of more than 0,3%, which is toxic to agricultural plants, or in the usual sense. Water-soluble salts have a direct negative effect on plants as a result of increased osmotic pressure of the soil solution. The main sources of soil salinity are mineralized groundwater, which rises close to the surface, and irrigation water, which contains a certain amount of salt.

The studied meadow, meadow-gray soils are saline to varying degrees depending on the lithological-geomorphological, hydrogeological, soil-climatic and human-economic conditions of the area. , massive soils are mainly composed of strongly saline soils, and the amount of salts in the soil profile is 1,535-2,200% of the dry residue. Salinity is sulfated in all cases (cuts) (table -3)

Table -3
**The total amount of salts and ions in irrigated grassland-gray soils
 (in% of dry soils at air temperature)**

Depth, cm	Dry, %	Generally HCO ₃ ⁻	Cl ⁻	SO ₄ ²⁻	Ca ²⁺	Mg ²⁺	Na ⁺	The amount of toxic salts %	Salt reserves, t / ga	Type of salinity	
										Tip	Deg ree
17- cut. Irrigated meadow-gray soil											
0-30	2,12 5	0,024	0,08 7	1,134	0,285	0,030	0,049	1,259	62,22		strong
0-50	2,20	0,021	0,12 2	1,078	0,280	0,046	0,027	1,391	47,58		strong
0-75	6,40	0,021	0,11 4	0,907	0,285	0,037	0,053	1,307	46,25		strong
5- 100	5,35	0,018	0,08 0	0,905	0,300	0,021	0,050	1,295	65,85		strong
0- 150	6,40	0,018	0,56	0,964	0,305	0,024	0,029	1,338	118,9		strong

The total amount and reserves of salts in irrigated soils, irrigated meadows and meadows studied in selected farms in Shurchi district - salt reserves in gray soils. The location of horizons in the soil profile has different reserves in the soil profile (in the calculated layers), depending on the location and quantitative indicators. Determination of the total amount (%) and reserves (t / ha) of water-soluble salts in the upper root layer (0-1 m) of irrigated soils is extremely important in terms of soil reclamation, agro-technical, hydrotechnical and reclamation measures to clean this layer from toxic salts development of a complex, on the basis of which the correct setting of norms and terms of saline washing, will save irrigation water.

Data on the average quantity (%) and reserve (t / ha) of salts based on the results of aqueous absorption analysis, calculated for different layers of soil, the total amount and reserves of salts in the irrigated soils of farms of Shurchi district are given in table -3.

According to the analysis of the table, the quantitative indicators of water-soluble salts in irrigated soils of farms of Shurchi district fluctuated at short intervals and amounted to 65,85 tons per hectare in the upper 0-1 meter layer, including 62,22 tons per hectare in the topsoil.

In summary, grassland-gray soils in terms of nutrient content of mobile nitrogen and phosphorus are very low, low, and in terms of exchangeable potassium are very low and low-supply soils. 60,90 tons per hectare, nitrogen 5,29 tons, phosphorus 31,20 tons, potassium 84,00 tons.

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