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Agrochemical Properties of Dry Soils of the Northern Part of Turkestan Ridge

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Abstract: The article analyzes the agrochemical properties of developed and undeveloped typical gray soils in the northern part of the Turkestan Range. The article analyzes the agrochemical properties of developed and undeveloped dry gray soils in the northern part of the Turkestan Range. In the undeveloped rainfed typical serozems of the Zaamin district of the Jizzakh region, the content of humus in the upper layer was 1.01-1.44%, gross nitrogen in the upper layers 0.072-0.124%, gross phosphorus 0.136-0.235%, mobile form 64.5-72.0 mg□kg, total amount of potassium 1.10-1.24%, amount of exchangeable potassium 458-495 mg□kg, and with developed typical gray soils, the content of humus in the upper layers is 0.62-0.97%, and gross nitrogen is 0.042-0.090%, the total amount of phosphorus is 0.104-0.128%, the mobile form is 25.6-36.0 mg□kg, the total amount potassium 0.90-0.96%, the amount of exchangeable potassium 241-361 mg□kg, a decrease was observed towards the lower layers.

Key words: mountain and foothill, typical gray soil, section, agrochemical properties, humus, nitrogen, phosphorus, gypsum, carbonate.

Relevance of the topic. Today, comprehensive measures are being implemented in our Republic to study the properties of the soils of the mountain and sub-mountain areas, to use them effectively and increase their productivity, and to develop agriculture. As a result, optimization of soil properties, increase of productivity and increase of yield from agricultural crops are achieved in various regions.

It is important to study the comparative description of the morphogenetic, agrophysical, agrochemical properties of the mountain and sub-mountain soils of our republic, to use modern agro-technologies in their effective use and increase their productivity.

Data on the study of mountain and sub-mountain soils began after the second half of the 19th century. S.S. Neustruev in 1912-1913 was the first to describe the complete and accurate landscapes of the region, from the low hills to the top of the mountain. That is, he fully described the change of soils as they rise above sea level, the differences between the soils of the southern slope and the northern slope, their external appearance, internal structure, and other processes taking place in it, which are not similar to plain soils [1;2;3;4;5;6;7;8].

Kh.M. Maksudov, L.A. Gafurova, I.T. Turopov, R.K. Koziev, V. Research by E. Sektimenko, M. M. Tashko'ziev, N. I. Shadieva, A. Adilov, A. J. Ismanov, G. Mirkhaidarova, N. Yu. Abdurakhmonov, Kh. Yusupov, R. Siddikov, S. Rustamov and others reached [3.43; p. 16].

Continuous planting of grain crops in dry areas of mountain and sub-mountain regions, failure to introduce crop rotation, improper use of organic and mineral fertilizers and pesticides, livestock grazing, and heavy driving tractors lead to changes in the soil cover spread in these areas.

Research object and methods. Dry, typical gray soils of Zomin district of Jizzakh region were selected. Field and laboratory experiments were conducted on the basis of guidelines generally accepted in the republic.

Research results and discussion. Lalmicor soils are distributed in Zomin, Zarbdar, Bakhmal, Jizzakh, Yangiabad and Gallaorol districts of Jizzakh region. Lalmi typical gray soils are common on the northern slopes of Turkestan and Molguzar highlands and low mountains.

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According to the literature, drier is the removal of gypsum and water-soluble salts from the gray soils at a great depth. The amount of dry residue does not exceed 0.1-0.2% at a depth of 1-1.5 meters, but at a depth of 2 meters, water-soluble salts reach 1-1.5%, gypsum reaches 2-4% SO4. The increase in dry residue is mainly due to sulfate salts. Another feature of typical gray soils is that they are washed away from carbonates in their upper layers and meet deep in the layer where carbonates are accumulated. The amount of carbonates is 7-8% in unwashed soils and 9-10% in washed ones. The amount of humus is higher in pale gray soils and varies depending on the level of leaching, it is 1-1.5% in the driving layer, 0.6-0.8% in eroded soils, but can increase to 1% in leached deposits. Total nitrogen content is 0.3-0.7% [1;2;3;4;5;6;7;8].

During our experiment, we analyzed the agrochemical properties of dry soils (Table 1).

The humus content of the uncultivated typical gray soil we studied was 1.01-1.44% in the upper layer of the 1-22 sections, and 0.20-0.62% in the lower layers. Total nitrogen content was 0.072-0.124% in the upper layer, 0.010-0.041% in the lower layers. The gross amount of phosphorus was 0.136-0.235% in the upper layer, 0.040-0.155% in the lower layers, the mobile amount was 64.5-72.0 mg/kg in the upper layer, 10.06-22.4 mg/kg in the lower layers did The total amount of potassium in the upper layer was 1.10-1.24%, while in the lower layers it was 0.85-1.36%, the exchangeable potassium content was 458-495 mg□kg in the upper layer, 154-330 mg in the lower layers /kg (Table 1).

The amount of gypsum was 0.102-0.154% in the upper layer of the 1-22 cross-section, and it was 0.180-1.287% in the lower layers. The amount of carbonates was 5.46-5.68% in the upper layer and 5.92-7.40% in the lower layers (Table 1).

Table 1.

Agrochemical properties of dry soils of the northern part of the mountain range of Turkestan

Deep of the layer	Humus, %	Total Nitrogen, %	Phosphorus		Калий		Gypsum, ($CaSO_4$ x $2H_2O$), %	CO_2 Carbonates, %
			gross, %	mobile, mg/kg	gross, %	exchanger, mg/kg		
Section 1-22. Zomin district is a typical uncultivated gray soil								
0-11	1,44	0,124	0,235	72,0	1,10	495	0,102	5,46
11-32	1,01	0,072	0,136	64,5	1,24	458	0,154	5,68
32-61	0,62	0,041	0,155	22,4	1,36	330	0,180	5,92
61-109	0,40	0,032	0,120	16,2	1,10	252	0,256	6,10
109-152	0,32	0,024	0,082	12,0	0,96	210	0,968	6,35
152-200	0,20	0,010	0,040	10,6	0,85	154	1,287	7,40
Section 2-22. Zomin district is a typical dry gray soil, an area devoid of wheat								
0-21	0,97	0,090	0,128	36,0	0,96	361	0,032	6,54
21-46	0,62	0,042	0,104	25,6	0,90	241	0,046	7,10
46-94	0,54	0,030	0,075	20,8	0,82	195	0,060	7,22
94-145	0,45	0,026	0,048	12,4	0,75	182	0,080	7,50
145-172	0,36	0,014	0,027	9,6	0,58	176	0,089	8,50
172-200	0,25	0,008	0,014	5,2	0,46	160	0,099	9,30

The amount of humus in the typical gray soil of Zomin district 2-22 was 0.62-0.97% in the upper layer and 0.25-0.54% in the lower layers. Total nitrogen content was 0.042-0.090% in the upper layer and 0.008-0.030% in the lower layers. The gross amount of phosphorus was 0.104-0.128% in the upper layer, 0.014-0.075% in the lower layers, the mobile amount was 25.6-36.0 mg/kg in the upper layer, 5.2-20.8 mg/kg in the lower layers did The total amount of potassium in the upper layer was 0.90-0.96%, while in the lower layers it was 0.46-0.82%, the exchangeable potassium content was 241-361 mg/kg in the upper layer, 160-195 mg in the lower layers mg/kg (Table 1).

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The amount of gypsum was 0.032-0.046% in the upper layer of the 2-22 cross-section, and it was 0.060-0.099% in the lower layers. The amount of carbonates was 6.54-7.10% in the upper layer and 7.22-9.30% in the lower layers (Table 1).

In conclusion, our studies have shown that dryland soils, when plowed and cultivated, lose organic matter and become less resistant to erosion. To protect dry soils from wind and water erosion, it is necessary to apply measures that restore and increase their productivity.

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