JOURNAL OF CRITICAL REVIEWS

ISSN- 2394-5125 VOL 7, ISSUE 16, 2020

CHEMICAL AND AGROCHEMICAL PROPERTIES MOUNTAIN REYD TYPICAL SOILS.

[1]Obid Eshniyozovich Xakberdiev, [2]Ramish Rabbimovich Egamberdiev, [3]Dilnoza Paraxatovna Saparova, [4]Guljakhan Sagidullaevna Tadjibaeva.

[1,2,3,4]Tashkent Institute of Irrigation and Agricultural Mechanization Engineers

Abstract

The article summarizes the data of studies on the eposes of rain fed dark sierozem spread in the foothill zone of the Gissar ridge. On this basis, field experiments were conducted; practical methods of erosion prevention were identified and developed using various anti-erosion agents. The soil-erosion processes of the mountain and foothill territories of the southern part of Uzbekistan have been studied.

Introduction

Rational use and protection of soil, ensuring the reproduction of fertility - occupy a special place in the general problem of the protection and use of natural resources. Soil resources are limited in size and quality. Their current state is alarming, because over the past 30–50 years the soil has been depleted of humus and nutrients, underwent salinization, water and wind erosion, and heavy metal and agrochemical pollution.There is a re-compaction, sometimes alkalization, deterioration of soil properties, its biological activity decreases, and eventually the level of soil fertility decreases. One of the global problems is the problem of soil protection from erosion, increasing their fertility. The problem of soil protection from erosion is relevant for many countries in the arid zone of the world, including Uzbekistan.

Method and materials.

The selection of soil samples of scientific research from hegetic horizons, observations and analyzes were carried out based on “Methods of agrochemical, agrophysical and microbiological studies in the cotton-growing areas” of UzNIIKh, “Guides to soil chemical analysis” E.V. Arinushkina.

Results. Differences in the morphology and physical properties of brown soils also affect the chemical properties of these soils, in particular, the content and distribution of humus, CO2 carbonates, the composition of absorbed bases and other components.The distribution and content of humus in the vertical profile of the considered soils are specific. Brown typical soils are characterized by a moderate content of humus in the upper horizon and a sharp decrease of it below the subdermal horizon. The humus content in the upper turf and turf horizon varies from 9.60 to 4.70%. In the sub-horizon hormone humus content is reduced to -4,7%; its amount downwards decreases more gradually. Mountain brown typical soils are characterized by a wide ratio of carbon to nitrogen: in the upper humus horizon from 8 to 11%. In the following - from 5,1 to 8.9. The enrichment of humus with nitrogen largely depends on its qualitative composition.

The process of soil formation in brown soils occurs under conditions of carbon dioxide weathering. One of the characteristic features of the chemical composition of these soils is the presence of CO_2 carbonates in them. Brown soils are typically leached from carbonates to one depth or another. The depth of leaching, and therefore the location of the carbonate-alluvial horizon, depends on the strength and depth of soil wetting (amount and intensity of precipitation), the degree of carbonate of the soil-forming rocks (chemical composition of the rocks) and the terrain.The relief is a redistributor of precipitation and solar insolation, on which the temperature of the soil, its heating and desiccation, and therefore, the pulling up of soil solutions, including carbonates, or their suppression (washing, pulsation) depend. The tops of the watersheds are less carbonate than their slopes. Usually, carbonate content is less pronounced in the upper part of the watershed than in the lower part.On the slopes of the southern exposure, carbonates are closer to the surface, and if, in addition, the slopes of significant steepness and the upper soil horizons in them are eroded to varying degrees, the carbonates are in the upper horizon. As a rule, in typical brown soils, carbonates are located in the lower part of the humus horizon. at a depth of 70-90 cm: their number increases sharply in the lower part of the profile.

The composition of absorbed bases in the mountain brown typical soils (right bank of the Shukoksai River).

Table-1.

Depth, sm	Humus,%	In a looin e,%.			**C ;N**	CO2 carbonates,%
		N	$P_2 05$	$K_2 0$		
Section 126. Mountain brown typical. North slope.						

ISSN- 2394-5125 VOL 7, ISSUE 16, 2020

0-8	7,15	0,19	0,33	3,41	9,6	0,23
8-28	2,41	0,08	0,12	2,86	8,1	1,11
28-70	1,65	0,07	0,11	2,52	5,4	1,14
70-120	1,01	0,07	0,09	2,34	5,1	7,80
120-150	0,62	0,05	0,07	2,57	5,3	10,34
Section 127. Mountain brown typical. Southern slope. Mediumeroded						
0-6	4,15	0,23	0,15	2,41	8,9	2,01
6-18	1,52	0,13	0,10	2,36	7,2	3,12
18-52	0,75	0,06	0,09	2,41	7,8	3,58
52-100	0,51	0,04	0,07	2,50	7,1	5,76
100-135	0,40	0,02	0,05	2,22	8,0	9,21

In the upper horizons (up to a depth of 70-100 cm), the CO_2 content of carbonates does not exceed 1% by weight of the soil. In the rock, this indicator reaches 8-10% (soils formed on loess loam), with the boundary between the transitional and carbonate horizons being pronounced. In the carbonate horizon, besides pseudo mycelium of carbonates, white-eyed and gall-stones are observed. If we compare the distribution of CO_2 carbonates with brown carbonate soils, they are distinguished by a low carbonate content throughout the profile. And in typical brown soils, the CO_2 content of carbonates does not exceed 1% in the upper meter layer, with the exception of the soil located on the southern slopes, which are subject to erosion, here carbonates vary in profile from 2 to 5-9%. Thus, the obtained materials on the content of humus and nutrients showed that the formation of the humus horizon, its thickness and humus content are largely determined by the exposure of the slope, soil erosion and the stock of plant mass. With an increase in the slope of the slopes of humus and the thickness of the humus horizon, especially located on the southern slopes decreases.

Show that in typical brown soils the sum of absorbed bases along profile horizons varies from 11 to 18-mg. 100 g soil. It is larger in typical brown soils (P.125) and less in eroded brown soils. In typical brown and eroded soils, the sum of absorbed bases in humified horizons is about 13–18 mg.eq. per 100 g of soil, and in the subsoil 11-13 mg. eq. In typical brown eroded soils, the amount of absorbed bases remains more constant along the profile (11-13 mg.eq.).Calcium is clearly predominant in the composition of absorbed bases; its content varies in typical brown from 79 to 85% of the amount, in eroded brown typical soils from 84 to 92%. In all cases, the relative content of absorbed calcium in the humus horizons is less than in the rock. The exceptions are eroded brown soils, somewhat enriched in absorbed calcium, which, in our opinion, is associated with the erosion process, which elevates carbonate horizons to the top.

The content of absorbed Mg ++ in the upper horizons is insignificant and increases in the middle part of the profile, which indicates the accumulation of this element in the colloidal part of the soil during its development. Significantly poor in absorbed Mg ++ on eroded brown typical soils, which characterize the younger phase of development of brown soils. The content of absorbed potassium in the upper humus horizon is 2-4.4% of the amount of absorbed cations and down to 1.1-1.3% are killed. The accumulation of absorbed potassium in the humus horizon of typical and eroded brown soils and over the entire profile of increased humus in the soil is a consequence of the processes of biogenesis. Absorbed sodium in our facilities is either not at all, or it is in small quantities in the subsoil. The actual acidity of brown soils (pH) of aqueous soil suspensions varies from 6.2 to 7.1% throughout the profile, the latter indicator being characteristic of the carbonate horizon on eroded soils. Consequently, the brown soils of the studied object are slightly acidic or closer to neutral and neutral, which is typical of brown soils and other areas. The high value of the absorption capacity is obliged along with organic and mineral colloids, as evidenced by the high values of the capacity in the transitional, significantly depleted humus horizons.

He studies of the gross composition of brown soils on the right bank of the Sukoksai river bank was carried out along two sections characterizing the brown typical soil (section 125) and eroded (sections 127). The data of the gross analyzes are given in table-2.

The uniform distribution of the SiO_2 brown soil profile is noteworthy. The content of aluminum hydroxide is slightly increased in the middle part of the profile of brown typical soils, which is associated with significant oglingn the upper horizons of brown soils, despite their leaching, calcium compounds are present in significant amounts, which is due to the introduction of it with waste. The natural cenotes of brown soils are Cal cephalic. It can be assumed that the accumulation of calcium in the upper horizons of brown soils is partially caused by the process of biological accumulation.

When considering the data of the gross analysis of brown carbonate soils, their enrichment with one-and-a-half oxides is revealed, but somewhat less than in typical brown soils. SiO2 is unevenly distributed across the profile. Its content fluctuates significantly, sharply decreasing in the alluvial-carbonate horizon, which is due to the accumulation of calcium carbonates.The molecular ratio of SiO_2: R_2O_3 in all soil horizons is constant. I.P. Gerasimov (1949) indicates that this ratio of silica and sesquioxides is characteristic of brown soils and other mountainous areas. The relatively low molecular ratio of SiO_2: AL_2O_3 and SiO_2: Fe_2O_3, which does not change within the soil sequence, indicates the absence of migration of Fe and AI hydrates.

An accumulation of small amounts of P_2O_5 and K_2O oxides in the upper horizon is detected, which reflects the accumulation of organic matter in the soil. Along with this, there are accumulations of magnesium. In typical brown soils on the right bank of the Shukoksai river, the batteries are contained in significant quantities. However, the selected soil genera differ somewhat in their content.

The content of gross nitrogen in the turf horizon of the brown soils of the reserve varies from 0.19% in carbonate soils to 0.66 in typical soot, downward it changes according to the change in the content of humus.The content of gross phosphorus and potassium also varies in the soil profile, but to a lesser extent. in the Upper horizons, an accumulation of these elements is observed, which is associated with a biological factor. The content of mobile forms in soils varies. Brown typical soils are characterized by a higher content of mobile forms of phosphorus and potassium than brown leached carbonate, and to a greater depth, which is associated with the accumulation of organic matter.

The reaction of the soil solution is closely related to the carbonate content of the soil profile. In the upper horizons leached from carbonates, it is neutral, and from top to bottom, with an increase in the content of carbonates, rises to alkaline. Thus, brown typical soils are characterized by a dark-collapsed humus horizon, within a turfy-granular, below a lumpy-nut, with a total capacity of 91-136; deeper carbonate horizon with abundant neoplasms and carbonates in the form of pseudo mycelium, white-eyed and carbonated lime nests. On eroded mountain brown differences typical of the southern slopes, these indicators are significantly worsened, the thickness of homicide horizons does not exceed - 50 cm, the new formations are visible with a sub-horizon.

The content of humus and nutrients shows that the soil of the northern slopes in the upper sod horizons 7-9, and the soil of the southern slopes is not more than 4 percent. The distribution of CO_2 carbonates on the soils of the northern slope does not exceed 1% in the upper meter layer and on the soils located southern exposures that are subject to erosion of CO_2 carbonates varies in profile varies from 2 to 5-9%. From the chemical indicators it should be noted that the amount of absorbed bases on the horizons of the profile varies from 13 to 18 mg / eq, per 100 soils.

he composition of absorbed bases in the mountain brown typical soils (right bank of the Sukoksay River).

Depth, sm	Mg / eq per 100 g of soil.				Amount	% fromthesum.				pH	Absorption capacity
	Ca^{++}	Mg^{++}	Na^{++}	K^{++}		Ca^{++}	Mg^{++}	Na^{++}	K^{++}		
	R.125. North slope										
0-12	15,52	2,22	нет	0 ,61	18,35	84,5	12,1	Нет	3,3	6,6	22,7
12-39	14,72	1,97	нет	0,77	17,46	84,3	11,2	Нет	4,4	6,2	20,4
39-62	13,07	2,71	нет	0,41	16,19	80,7	16,7	Нет	2,5	6,0	17,2
62-91	11,57	1,81	нет	0,28	13,66	84,7	13,2	Нет	2,1	6,9	15,0
91-136	10,83	2,22	нет	0,59	13,64	79,4	16,9	Нет	1,3	6,6	15,0
R.127.South slope.											
0-6	11,18	1,48	Нет	0,10	12,76	87,6	11,6	Нет	1,8	6,6	15,8
6-18	11,97	0,57	Нет	0,38	12,92	92,6	4,4	Нет	2,9	7,1	16,7
18-52	10,93	0,52	Нет	0,13	11,88	92,0	6,9	Нет	1,1	6,8	17,0
52-100	9,78	1,15	Нет	0,31	11,24	87,	10,2	Нет	2,6	6,6	-
100-135	11,57	1,81	нет	0,28	13,66	84,7	13,2	Нет	1,3	6,6	-

ISSN- 2394-5125 VOL 7, ISSUE 16, 2020

It is more in typical brown soils located in the northern slopes and less in eroded soils, where the amount absorbed is more constant along the profile (11-13mg / eq). Calcium, the content of which varies in typical brown 79-85% of the amount, in eroded brown typical soils from 84 to 92% clearly dominates in the composition of absorbed bases.

Conclusion.

In all cases, the relative content of absorbed calcium in the humus horizons is less than in the rock the exception is in eroded brown typical soils, which are associated with the erosion process, which raise carbonate horizons to the top.All these indicators show that the content of humus and nutrients and the formation of the humus horizon and its thickness are largely determined by the exposure of the slope to soil erosion and the stock of plant mass. With an increase in the steepness of the slope, the humus content and thickness of the humus horizon decreases especially located on the southern slopes.

References

1. Azimbaev S. Soils of the southern part of Uzbekistan and their ameliorative state. “Fan”, T. 1991
2. Gorbunov B.V., Konobeeva G.M. - Rainy soils of Uzbekistan and their qualitative assessment. - “FAN”, Tashkent. 1975
3. Zaslavsky M.N. Erosion management. M. High School, 1983.
4. Konobeeva L.M. Irrigated and rainfed soils of Uzbekistan and their evolution during the development and cultivation. T.1988
5. Kuznetsov M.S. Anti-erosion resistance of the soil. Moscow State University, I., 1981.
6. Kuznetsov M.S. The concept of erosion resistance of soils and soil classification according to erosion resistance of soil erosion and channel processes. 5. M ed. 1981 Moscow State University Art.54-66.
7. Kuznetsov MS, Glazunov G.P. - Erosion and soil protection, Moscow State University, M. 1996.
8. Makhsudov Kh.M. –Eroded serozem and ways to increase their productivity. FAN Tashkent 1981
9. Makhsudov Kh.M. –The erosion resistance of soils, foothills and lowlands of Uzbekistan. Tez Doc. IV delegate congress GP. Tbilisi Metsniereta 1981
10. Makhsudov Kh.M., Usmanov K.U. - Agrotechnical techniques to combat soil erosion on rainfed crops. Tr. IPA ANRUzvol.26., Tashkent, 1984.
11. Makhsudov Kh.M., - Soil Erosion in the Arid Zone of Uzbekistan. “Fan” T., 1989
12. MakhsudovKh.M., Gafurova L.A., Turapov I.T., Khanazarov A.A. - Mountain and foothill soils of Uzbekistan, their genetic features and protection. III-Congress of soil scientists and agrochemists of Uzbekistan. 2000
13. MakhsudovKh.M., Gafurova L.A., Turapov I.T., Khanazarov A.A. - Mountain and foothill soils of Uzbekistan, their genetic features and protection. III-Congress of soil scientists and agrochemists of Uzbekistan. 2000
14. Rustamov S.S., MakhsudovKh.M., YusupovKh., Mirkhaydarova G.S. - Soil erosion on rainfed dark sierozems in bass. r.Sanzar of Uzbekistan and their protection. “Materials of the international scientific-production conference“ Modern problems of land management and land cadastre ”., Belarus, Gorki, 2000.