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AGROCHEMICAL PROPERTIES OF ERODED MOUNTAIN BROWN SOILS.

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Abstract: The degree of knowledge of the problem. Researches in the field of the amount of soil humus, its fractional-group composition, distribution patterns in the republic were carried out by F.Yu. Geltserem, P.N. Kostichev, N.P. Besedin with students, M.A.Belousov, S.N. Ryzhov with students (Rizhov, Tashkuziev, Ryzhov, Ziyamuhammedov), D.A. Makhmudova, as well as studies in the field of organic matter and the properties of erosion-prone various soils of mountain and foothill regions were carried out by H.M. Makhsudov, I. Turopov, R.K. Kuzievim , D.S. Tairbaeva, .Adilov, M.F. Fakhrutdinova, N.Yu. Abdurakhmonov, G.S. Mi Khaydarova G.M.Nabievoy, N.Shadievoy and other scientists.

Keywords: soil, mountain, eroded, carbonate soils, erosion processes, mountain brown soils

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A detailed study of the basic soil properties by zonal types, humus state and humus composition, and the mechanism of humus formation in eroded virgin and rainfed soils is of scientific and practical importance. However, studies on the humus state of mountain and foothill soils, the mechanism of humus formation, the physicochemical properties of humic substances, and the issue of their fertility have not been adequately carried out.

Object and research methodology.

Among the zonal soils of the Western Tien Shan, the most common in the mountains are brown mountain-forest and brown, on the plain gray earths are dark, typical, light virgin, rainfed and irrigated.

- Northern slope.Karzhan-Tau. (Bostanlyk district).
- Southeastern slope of the Ugam range. Right tributary of the Nekem river.
- The southern slope of the Karzhan Tau ridge (Bostanlyksky.r-on).
- Northern slope.hr. Karzhan-Tau (Bostanlyksky, reg.) Watershed, upland area, Tselina. (Deposit)
- South slope Karzhan-Tau, (Bostanlyk district),
- The southern slope, reclaimed, ridge. Karzhan-Tau (Bostanlyk district)
- Northern Western slope. (Akhangaran forestry), Watershed.□slope. (Akhangaran forestry) virgin land, (Akhangaran forestry)

- North slope. (Ahangaran). virgin land, Watershed. (Akhangaran), virgin land - Watershed, (Akhangaran), rainfed arable land
- Southeast slope, eroded soil. (Ahangaran),
- Rainfed arable land on a train.washed, (Ahangaran),
- Rainfed arable land North slope. Rainfed arable land.
- South slope, rainfed arable land. Watershed, virgin
- Southeast slope. Whole land, Watershed, rainfed arable land,
- Typical North Slope. rainfed arable land serozem.
- Typical slope serozem Upper part of the southwestern slope eroded, rainfed arable land, (Gallakuduk ")
- Light gray earth. (Syrdarya region)

Research Methods. Studies were conducted according to generally accepted methods. The studies used genetic-geographical, lithological-geomorphological, specific chemical-analytical and profile methods. Based on the guidelines "Agrochemical Methods of Soil Research", UzPITI (1975), chemical analysis of the soil of E.V. Arinushkina [II.15; p.487]: humus composition and its fraction.Method I.V. Tyurin, V.V. Ponomareva, T.V. Plotnikov modification.

The study of agrochemical properties is an important indicator for clarifying the types and differences of soils, when assessing the comparative potential soil fertility. Studies have shown that in the process of flushing the upper, most fertile horizons, significant changes in its chemical and agrochemical properties occur.

It is known that mountain-brown soils are characterized by a high content of organic substances, therefore, they have an increased level of fertility. The results show that the humus content of the upper horizon of mountain-brown carbonate soils is 2.49-3.49%, decreases to 1.30-1 towards the bottom. thirty%. Gross forms of nitrogen, phosphorus and potassium inthe upper horizons are larger than the lower ones; a decrease is observed towards the bottom. The carbonate content in brown-carbonate soils along the profile varies in the range of 8.39-10.9% in non-washed soils, 10.8-11.2% in weakly washed soils and 10.4-11.8% in medium-washed soils. CO2 carbonates in mountain brown carbonate soils are 8.39-11.8%, in typical brown soils 3.69-11.61% and on leached brown soils 3.06-9.20%, and high amounts of carbonates reclaimed in the lower horizons of soils. In the arable horizon of these soils, the humus content on carbonate non-eroded mountain-brown soils was 3.49%, on weakly eroded soils - 2.90%, average eroded soils - 2.49%; on non-eroded typical brown soils - 3.79%, on weakly eroded soils - 3.57%, on average eroded soils - 2.96%, on washed soils - 4.36%; 4.50% on leached brown non-eroded soils, 3.75% on weakly eroded soils, –2.51% on medium-eroded soils. The content of gross nitrogen on carbonate non-eroded mountain-brown soils amounted to 0.260%, on weakly eroded soils - 0.165%, average eroded soils - 0.154%; 0.238% on non-eroded typical brown soils, 0.311% on weakly eroded soils,

0.268% on average eroded soils, 0.227% on washed soils; 0.235% on leached brown non-eroded soils, 0.182% on weakly eroded soils, and 0.175% on mid-eroded soils. The composition of leached mountain-brown soils showed a low content of carbonates, the pH of carbonate mountain-brown soils and typical soils is slightly acidic (pH in the range of 6.4-6.8). The C: N ratio in soils ranges from 9.3–12.9, in typical brown soils –– 7.5–13.1, in leached brown soils –– 9.3–14.0.The C: N ratio in mountain brown carbonate soils varies with the degree of susceptibility to erosion. So, the C: N ratio, that is, the enrichment of humus with nitrogen according to the level of the attribute, uncleaned ones belong to a high degree 1, and weakly and blurred differences of a middle I and II degree. The results of determining the pH of the soil show that the reaction of the soil medium in all differences is slightly alkaline (pH about -7.3).

An analysis of the agrochemical properties of mountain brown typical soils suggests that there is a more powerful humus horizon in these soils than in mountain brown carbonate soils.

The humus content in the upper layer of unwashed and slightly washed soils is 3.79% -3.57%, and decreases to the bottom. And in medium-washed soils in the upper layer, humus is 2.96% and decreases down to 0.85%. In the upper horizon of unwashed soils, gross nitrogen is 0.23%, in weakly and medium-washed soils 0.311% -0.268%, and gradually decreases down the profile. The phosphorus content in the upper horizons ranges from., 183 to 0.135%, as the degree of erosion increases, their content decreases. In the studied soils, the content of gross potassium also varies depending on the degree of leaching. Studies have shown that erosion processes also affect the distribution of carbonates along the profile. The carbonate content in the studied soils along the profile is from 3.5 to 11.6%. Mountain brown typical soils differ from mountain brown carbonate in a lowercarbonate content. The C: N ratio in these soils, according to the level of their characteristics, refers to unwashed and slightly washed to a medium degree, and medium washed to a high degree, the pH of the soil is slightly alkaline. According to the analysis of mountain-brown leached soils, it can be seen: that in these soils the humus content is higher than mountain-brown carbonate and mountain-brown soils, 4.50-3.75% humus is contained in the upper horizon of unwashed and slightly washed soils, down the profile decreases to 1.60-1.72%. In medium-washed soils inthe upper horizon, the humus content is 2.5% and down the profile decreases to 0.85%. In the upper horizon of unwashed soils, gross nitrogen is 0.235% in weakly and moderately washed soils 0.182% and 0.175% down and the profile decreases. The phosphorus content in the upper horizons ranges from 0.290 to 0.184% and decreases in degree of washing from 0.195% to 0.054%. The most important genetic properties of serozems, as pointed out by A.N. Rozanov, is the carbonate content. The nature of the distribution of carbonates reflects not only the current situation,

but also the history of soil development and depends both on hydrothermal conditions, especially the water regime, and on the biological factor of soil formation A.M. Mamytov.

It is known that the process of soil formation in brown mountain soils occurs under conditions of carbonic weathering. According to this, one of the characteristic features of the chemical composition of these soils is the presence of lime carbon dioxide (CO2 carbonates) in them.

Mountain brown weakly leaching, and therefore the location of the carbonate-illuvial horizon, depends on the strength and depth of soil wetting, the degree of carbonation of the soil-forming rocks and the terrain. The relief is a redistributor of precipitation and solar insolation. The temperature of the soil, its heating and drying, and, consequently, the pulling up of soil solutions, including carbonates, or their lowering, depend on this. In the leveled areas of the study area, soil washing is deeper and carbonates are lowered to a considerable depth. On the slopes of the southern exposures, they are closer to the surface, and if, moreover, the slopes of considerable mire and erosion of the upper horizons of the soil are eroded to different degrees, carbonates are in the upper horizon. In rainfed eroded carbonate-brown soils, the content, in addition to humus and nitrogen, of some other nutrients, in particular gross forms of phosphorus and potassium, decreases. The data show that the differences in the content of gross phosphorus and potassium in the arable horizons of poorly washed and unwashed soils are not very large, but a slight decrease in their total amount is observed on average washed-out differences. This is explained by the approach to the surface of the lower soil horizons, poor in phosphorus and potassium. The effect of water erosion on the content of phosphorus and potassium in the soil is most pronounced on medium-washed brown-carbonate soils and, therefore, a decrease in gross and mobile phosphorus due to an increase in the content of calcium carbonates in washed soils that form hardly solublephosphorus compounds. This is explained by the fact that, as erosion increases, lower layers containing more carbonates come to the surface. So, if in the upper horizon of poorly washed brown - carbonate and typical soils, the content of CO2 carbonates is 5 - 2, then the average washed out 9-7%. As can be seen from the table, the increase in carbonate content in the upper horizons of washed brown-carbonate soils manifests itself more sharply than on weakly washed brown-typical soils since carbonates are washed deeper on typical brown soils.

The influence of water (storm) erosion on the position of gypsum neoplasms of virgin rainfed brown carbonate and typical brown soils of the studied object is not clearly manifested in all cases.

Thus, erosion processes significantly changed the chemical, agrochemical properties of mountain brown soils. With an increase in the degree of erosion, the

content and reserves of humus and nutrients decreased; accordingly, this physical parameter worsened some physical properties, in particular the soil structure, and reduced the amount of moisture in the soil.

CONCLUSION

1. The morphogenetic characteristics of the soil cover of the Western Tien Shan region are formed in direct connection with the relief features of the area, soil-forming rocks, vegetation cover, climatic conditions, erosion processes. The high erosion susceptibility of the western Tien Shan mountain brown soils is due to the slope of these mountain slopes, the sparse vegetation cover, and the absence of forest vegetation in much of the area, although the erosion resistance of these soils is higher than in the gray soil zone. As a result, the thickness of the soil decreases, the highest fertile top layers are destroyed and their fertility is replaced by the lowest soil layer, as a result, the soil cover formed over centuries loses its various ecological functions and most important productive power in a short time.

2. From light-colored, typical gray soils to dark-brown and mountain-brown soils, the activity of the studied oxidation-reduction enzymes increases with increasing total microbiological activity, the amount of humus and nutrients. The greatest activity of enzymes is manifested in the upper layer of the soil and their sharp decrease in the lower layers, which is especially observed in eroded soils, and in non-eroded and eroded soils, the stability of enzymes is significantly lower than the profile of microorganisms. changes in carbonates, aggravation of mechanical composition, soil density, genetic layers of soils. A close link has been established between humus substances in soils and respiration and enzymatic activity.

3. Western Tien-Shan brown carbonate, brown typical brown alkaline soils regional specificity of humus state, ie regressive-accumulative type of humus profile, increased hydrolyzability and average moisture content of organic matter, humicity level of organic matter (from high to weak), mainly fulvate in humus and humate-fulvate types and fractional properties of humic acids.

4. In describing the diagnostic indicators of mountain soils from new materials of scientific and practical importance in terms of humus formation, humus status, elemental composition, physicochemical properties and fertility of humus substances of the Western Tien Shan mountain and foothill soils, maintaining and restoring soil fertility and is recommended for use in the development of enhancement measures, as well as in lectures in the fields of soil science, erosion, soil conservation, soil chemistry.

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