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EVOLUTION OF OROSCHAEVYE SOILS UNDER THE INFLUENCE OF ANTHROPOGENIC FACTORS

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ABSTRACT

The article highlights the evolutionary development of the change in morphological features of the eroded meadow soils of the Ferghana Valley under the influence of anthropogenic factors.

KEYWORDS

Anthropogenic factor, morphology, evolutionary development, arzik, shokh, gypsum, carbonate, easily soluble salts.

INTRODUCTION

It is known that under the influence of extensive irrigated farming activities of the anthropogenic factor, soils have undergone extensive changes, and their morphogenetic structure, as well as other properties, has acquired a different appearance compared to the appearance formed during the stagnant period. Also, this process takes place in different activity depending on the intensity of the impact level.

In the researches on the genesis and gradual development of soils formed in the region of Fergana Valley during the past time, it was noted that these soils are formed and developed under the influence of specific factors [2,83-110 p, 4, 77 p.]. Now, an approach

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with sufficient emphasis on the leading influence of the anthropogenic factor in the changes in the cross-section of soils may allow to further illuminate the process of their gradual development.

It is known that the study of the process of gradual development of soils is an important problem in the development of a system of collective measures to determine the direction of changes occurring in their cross-section and to solve many issues such as preserving and increasing their productivity in the future, improving land reclamation and rational use.

Research object and methods. The research object is the meadow saz soils formed in the Fergana valley. The method of placing the soil sections along the geochemical-geographic section was used in the field research. "Methodological recommendations" of the Institute of Soil Science named after V.V. Dokuchaev [3] were also used.

Research results. The maturity stage of soil formation and development for a specific area is characterized by its genetic layers within a certain soil type and its specific properties and characteristics, as well as the formation of a stable level of fertility.

The change in ecological conditions changes the geochemical properties of the soil through it to the stage of gradual development [5, 34-37 p] and as a result the genetic layers in the soil section, its natural properties and characteristics begin to change and lead to an increase in the level of natural fertility. Accordingly, the properties of the soil can be divided into three groups, that is, "residual" properties inherited from the parent rocks in the process of soil formation, properties that appeared during the development of the soil during the stagnant period of the ecological environment, and finally, the properties that appeared during the evolutionary development of the soil.

Thus, the gradual development of soils is understood as the change of already developed full-profile soils in connection with the evolution of the entire natural environment. In this case, one genetic type or type of soil can pass to another genetic type or type. In the soil profile, the features characteristic of the previous stage of soil formation gradually fade or transform, and new features are formed corresponding to the new stage of soil formation.

V.V. Dokuchaev showed that during periods of stagnation (climax) when the soil-forming factors are in balance, changes in soil genetic horizons are weakly expressed, and there are no systematic large changes in the soil cover.

It is known that soil-forming factors are not equally strong in some directions according to the degree of influence, for example, they are divided into two groups according to the geographical extent of their influence.

The first group includes factors that affect large areas of land on a wide geographical scale - climate, organisms, and the age of the land. The regularity of the geographical location of the groups of soil types, which are sharply different from each other, depends on the ratio of these factors. Soil-forming rocks, topography, microclimate and human activity are the second group of factors. These factors have varying degrees of influence on smaller taxonomic units within a soil type, the emergence of subtypes, soil differences.

The balance between these factors was disturbed under the influence of natural factors until the higher

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stages of the development of social formations of human society.

Ecological factors that have been in balance for centuries have been disturbed by mechanical, irrigation and similar extensive effects of man, and the soil covers lying in a state of preservation have undergone extensive changes. The influence of the anthropogenic factor, especially in the meadow soils formed in Central Fergana, is well visible in the following directions:

1. Planning of uneven lands in nature reserve;

2. Irrigation of land, irrigation water supply, i.e. laying of suspended muddy rocks;

3. Changing the water regime through the construction of the collector-water system complex;

4. Integrated measures such as tillage systems, replacement of natural vegetation by crops in crop rotation systems, fertilization systems;

5. Brine leaching and similar hydromelioration and agromelioration conditions.

6. Secondary salinization, increase in the density of the driving layer;

7. Acceleration of the degumification process at the initial stage on newly developed lands, etc;

The irrigated meadow soils of Central Fergana were mainly developed after the 30s-50s of the last century, among which the rich meadow saz soils separated by type occupy a large area. This section of soils differs from the section of grassy saz soils in the region by the formation of specific layers, gypsum, clay, chalky, gypsum-rich, clay-rich layers.

The cross-sectional structure and morphology of the fertile soils differ sharply from other soils of the region. In the cross-section of their soil and subsoil rocks, a clear stratification of geochemical substances is observed, which corresponds to the law of their migration and accumulation. Nutrient soils contain calcium and magnesium carbonates in the lower part of the soil-soil section, gypsum and carbonates in the middle part, and gypsum and water-soluble salts in the upper part. Accumulation of these compounds in large quantities has formed their own suitable layers - rich, arzic, gypsum and saline layers, and in this regard, the soil section of arzic soils has a three-layer or three-tiered structure [1,42-83 p.].

At the end of the 70s of the last century, protected arable soils were located in the north-western parts of the Isfayram-Shahimardonsoy contiguous spreading cones and in small areas within the irrigated lands of the lake-proluvial plain and in salt marsh complexes of sandy valleys (2, 83-110 p.). At present, almost all areas with fertile soils have been brought under irrigated agriculture. The eco-ameliorative status and structure of the soil cross-section of the reclaimed rich soil lands in the study area varied widely, depending on the length of the irrigation period, the complex of applied meliorative measures, the intensity of farming, etc. Irrigation and other anthropogenic activities have varied effects on the morphology and other properties of fertile soils.

Within the comprehensive influence of the anthropogenic factor, depending on the length of the development period, as well as the applied system of activities, the soil cross-section underwent extensive changes.

According to M.A. Pankov [2, 84-85 p.], the above-described soils undergo rapid changes as a result of irrigation and a number of other activities from the first

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stages of exploitation, and agro-irrigation humus layers are formed in them under the influence of sediments and processing of the surface (30 cm) layers. started By the 70s of the last century, the cross-sectional structure of these soils became the appearance of cultivated oasis soils. By this time, the changes in the structure of the soil cross-section mainly moved towards the overcoming of the disturbed balance factors under the influence of the anthropogenic factor.

The rate of change has now slowed down, and is now undergoing irrigation-induced changes that are more rapid than those in conservation soils, but slower than those in the early stages of development. The scale of changes over the next 30-40 years is reflected in the changes in the forms of some components in the cross-sectional structure, their quantitative changes along the cross-sectional layers, and again in the chemical composition of the soil.

In particular, as a result of the research, strong complexity appeared in the soils, depending on the thickness of the soil layer and the depth of the gypsum layer. It was mentioned above that the reason for this is land leveling. The effect of irrigation on plaster forms is clearly expressed. Gypsum layer consisting of fine and small crystals of gypsum and their derivatives (gypsum can also be amorphous), usually located near the earth's surface. The size of the crystals increases in the deep layers of the cross-section, they enter rhombic, rhombohedral and coin-shaped forms. In gypsum layers, the phenomenon of suffosis, which indicates the washing of gypsum, is clearly expressed. This phenomenon may increase over time.

A fine crystalline gypsum layer naturally contains a lot of gypsum and is white in color. Irrigation water moving from top to bottom in the process of irrigation drains the soil mass with small particles from the plowed layer into the gypsum layer and deposits them in the spaces between the gypsum crystals. From the gypsum layer, it partially melts the gypsum crystals and washes the small crystals down. The longer the duration of irrigation, the more clearly the result of this process will appear. As a result of these processes, the white gypsum layer has turned into a mixed layer of fine rock-gypsum clay-soil with a cloudy gray color.

The arable layer of soils has become homogeneous under the influence of irrigation, cultivation and other activities. Gypsum and arzic wounds were partially washed away, the remaining crystals became smaller in size, mixed with the soil and became indistinguishable. The amount of organic residue has also increased. As a result, the roots penetrated the subsoil layer. They are more abundant in the upper part of the layer and sharply decrease towards the bottom. There are small roots in the cracks between the pieces of the structure. In this layer, the phenomenon of leaching of salts is more strongly expressed. Cavities, waterways and funnels are found in the area, formed by the washing of plaster. They are filled with loose soil mass. Plant roots are well developed in them. In the lower layers of the sections, the results of the suffusion processes can also be observed, but they are weakly expressed and not everywhere.

Changes are also clearly visible in other geomorphological districts, in particular, in the eastern part of the valley, in the Shahrikhonsay influence zone.

Unlike the soils of Central Ferghana, here the soil profile does not have separate complex structural layers (rich or rich). But the scale of changes is expressed by the increase in the level of soil cultivation, the thickening of the humus layer, the lack of salinity (absence of saline layers) or deepening of the soil. The soils that were brought into the irrigated agriculture circle were mainly due to the drained and leveled soils

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as a result of the removal of waste from the places that were located in the depressions in the past. This situation is reflected in the preservation of humus layers buried in more soils.

CONCLUSION

According to the above, in the course of the changes in the soil of the research object, the anthropogenic factor activates the stagnant period in the gradual development of the soil, and actively changes other factors (mother rock, relief, flora and fauna) without being able to show the effect on some factors of soil formation and development (climate, age of the country). it acquires its uniqueness by appearing as a controlling factor. Now, the movement of this factor in the right directions can serve as a solution to all issues related to soil in the region.

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