BRIEF DESCRIPTION OF THE NATURAL CONDITIONS OF THE ARID ZONE OF UZBEKISTAN

[1]Ortikova Lola Soatova, [2]Abrorova Kumush Muxammad Kizi
[1]Jizzakh State Pedagogical University- Associate Professor
[2]Jizzakh State Pedagogical University -Intern Researcher

https://doi.org/10.5281/zenodo.8361971

Abstract. *The economic efficiency of halophytes and the economic usefulness of their phytomelioration have been studied and analyzed.*

Keywords*: pasture, farmer, productivity, plant, economic, profitability, halophyte, phytoremelioration.*

Аннотация. *Изучена и проанализирована хозяйственная эффективность галофитов и хозяйственная полезность их фитомелиорации.*

Ключевые слова*: пастбище, фермер, продуктивность, растение, хозяйственный, рентабельность, галофит, фиторемелиорация.*

Аннотация. *Яйловлар ҳосилдорлигини оширишда ўтказилган тажрибаларда ўрганилган галофитларнинг иқтисодий самарадорлиги ва уларни фитомелиорациялаш иқтисодий жиҳатдан фойдалилиги ўрганилиб таҳлил қилинган.*

Калит сўзлар*: яйлов, фермер, самарадорлик, ўсимлик, иқтисодий, рентабеллик, галофит, фитомелиорация.*

The arid zone of Uzbekistan is characterized by a sharp continentality of the climate, a small amount (100-250 mm) of precipitation, a large amount of evaporation, significant daily, seasonal and annual fluctuations in air temperature, salinity and hypsation of soils to varying degrees, sparse vegetation cover.

The soil and climatic conditions of the arid zone are heterogeneous. In it, according to the typology of K.Z.Zakirov (1955), the belt is distinguished: chul (desert) and adyr (foothill desert). In turn, due to the vastness and heterogeneity of the complex of environmental conditions, the chul itself is divided into: sandy, gypsum, clay and salt marsh.

Ecological types, diversity of soil and climatic conditions significantly affect the formation of vegetation cover.

The variety of soil-forming rocks, ecological regimes, the sharp continentality of the climate, the vastness of the territory caused a significant diversity, complexity of the soil cover.

The most common type of soils for the arid zone of the republic are gray-brown soils and gray soils. All the diversity of the flora of the republic used as pastures mainly belongs to 4 groups of pasture types (ephemeral, shrub–herbaceous, semi– shrub–herbaceous, solyanka) and is distributed on various ecological types of deserts - sandy, gypsum, clay, salt marsh and on the Adyras.

The sandy desert is the largest and most significant; its area is about 12 million hectares.

The soil and geomorphological conditions of this desert are a complex complex consisting of mobile, fixed sands, sandy and sandy loam lands. Its distinctive features from other types of deserts are caused by the properties of sand, which is characterized by high water permeability, flowability, better condensation ability, weak salinity. Due to these properties, they are distinguished by a more favorable water regime of the soil and conditions for vegetation cover. At the same time, a number of negative undesirable properties for economic activity are inherent in

the sandy type of pastures: mobility of the substrate, susceptibility to breakage during grazing, strong overheating of the surface layer of sand in summer, dissection of the relief, etc.

The climate of the sandy desert is characterized by sharp temperature fluctuations during the seasons and days: summers are hot and dry; winters are relatively cold.

The average annual air temperature is 14.6-16 °C, in July–28-32 ° C with a maximum of 46-48 ° C.

The average annual amount of precipitation is about 100-130 mm, timed to the winter-early spring period. The average annual relative humidity is 40-45%.

The main type of pastures is shrubby-grassy. All plant life forms participate in the formation of their herbage.

The most frequently encountered species from among shrubs are various species of the genus Haloxylon persicum, H.aphyllum, Salsola paletzciana, S.richteri; from semi-shrubs: Astragalus sp., Artemisia, Mausoleae, etc.; ephemera are represented by species Anisanta, Eremopyrum, Malcolmia, etc.

The feed stock consumed in shrubby-grassy pastures is significantly higher than in other types of deserts. Gypsum desert is inferior in area and importance to sandy desert, in terms of soil and hydrological conditions is characterized by the greatest diversity, diversity and complexity. The largest gypsum desert in Uzbekistan by area is the Ustyurt plateau.

The main type of gypsum desert soils is gray–brown, gypsum-bearing. The thickness and depth of gypsum is different: gypsum layers lie at a depth of 60-70 cm and below.

The annual precipitation in the gypsum desert is 100-110 mm. The main group of pasture types is semi–shrubby-grassy.

The predominant species of forage plants are Artemisia subgenus, Seriphidium, Salsola orientalis, S.gemascens, Anabasis salsa, Halotamnus subaphylla, annual pickles. In lightly salted areas of pastures and in years favorable for precipitation, there is a good development of ephemera and ephemeroids.

The negative property of gypsum desert pastures is the low yield of feed mass, instability of feed stocks by year and season, acute shortage of summer feed. The sub-mountain sagebrush-ephemeral desert, although characterized by extreme environmental conditions, is still relatively favorable in pasture forage terms.

The dominant type of soil here is gray-brown and transitioning to gray soils. They are characterized by a low humus content (about 1%) and poverty in basic nutrients with a high content of carbonates, gypsum.

The granulometric composition varies from heavy loams to sandy loams. The average annual air temperature is 15-16^{o}C.

The hottest month is July, and the coldest is January. The average annual precipitation is 160 mm with fluctuations over the years from 82 to 297 mm. Precipitation distribution is winter-early spring.

The dry period covers June-November. The vegetation cover is represented by a semi-shrub-ephemeral association.

The dominant species in the vegetation cover are Artemisia diffusa, Garex pachystylis, Poa bulbosa, from among the annual salt pans Halimiconemis villosa, Gamanthus gamocarpus, Climocoptera lanata, from annual grasses Anisantha tectorum, Eremopyrum orientale, Malcolmia spp., etc.

The yield of pastures is 1.5-3.6 kg/ha of dry weight. The foothill desert or Adyrs border the belt of mountainous territories of Central Asia and are located from 350 to 1200 (1600) meters above sea level.

The soils are represented by light, typical and dark gray soils depending on the height of the terrain. The mechanical composition is mainly loam and sandy loam. The average annual temperature is 15 °C; the hottest month (July) is 25 °C, the coldest (January) is 0.5-1.5 °C.

The average annual amount of precipitation is about 250 mm with fluctuations over the years from 108 to 400 mm. The distribution of precipitation is autumn-winter-early-spring. The humidified period falls on November-April months, and the dry period - on May-October.

The vegetation cover consists of a sedge-bluegrass formation. Cousinia, Alhagii, Pseralea drupacea, Iris songarica and other large herbaceous plants are also common in the composition of ephemeral vegetation.

The yield of the Adyr pastures, depending on meteorological conditions, is 3-7 kg/ha of air-dry mass.

They are highly nutritious pastures for sheep in the spring and summer period. By the autumn-winter period, their yields are sharply reduced, and these pastures need to increase their productivity to organize year-round grazing of sheep on these lands. Consequently, arid pastures are characterized by low yields, and their feed productivity can double, and unfavorable years are reduced by 3-5 times in relation to the average year. Within 10 years, one year can be very productive, 2 - yielding, 4 - medium-yielding, 2 - poor-yielding and 1 - very poor-yielding (Gayevskaya, 1971).

According to the seasons of the year, not only the yield value changes, but also the nutritional value of pasture feed. In particular, the content of crude protein from spring to winter decreases from 20 to 5% (Morozov, 1950). 100 kg of air-dry pasture feed contains 80-105 feed units, and by winter it decreases to 18-25.

The current state of arid pastures in Uzbekistan is also aggravated by irrational economic use (unregulated pasture load, deforestation of shrubs and semi-shrubs, exploration, exploitation of ore, energy resources, etc.).

As a result of increasing anthropogenic impacts on the natural vegetation and soil cover of the desert, the species composition, vegetation structure has undergone major undesirable changes, the productivity of pastures has decreased, worsened species diversity and quality of foot food; there is a tendency to increase soil erosion, sand deflation, etc. It is appropriate to note that the destroyed equilibrium of the ecosystem in arid conditions is self-healing extremely slowly, and for quite a long time.

The solution of issues of restoration and maintenance of biological diversity, prevention of desertification processes is possible through the implementation of a complex of various interrelated organizational, economic, social, land reclamation and other measures. Among them, the most reliable and proven methods are considered to be the introduction of pasture rotations, phytomelioration of pastures, the use of artesian waters for oasis forage production, selection of high-yielding varieties from wild flora, etc.

The diversity of soil-forming rocks, ecological regimes, vegetation, the continentality of the climate, the vastness of the territory caused a significant diversity and complexity of the soil cover of the arid zone of the republic (Genusov, Gorbunov, Kimberg, 1960). Since karakul-growing pastures in Uzbekistan are concentrated on gray brown, desert-sandy soils, gray soils and

takyrs, their main characteristics are given below. Gray-brown soils are occupied by the Ustyurt plateau, the remnant lowlands, the plains of Kyzylkum, the foothill plains of Karnabchul, Malikchul, the pebble adyrs of Fergana, the lowlands of Surkhandarya region. Desert-sandy soils are common in the Kyzylkum desert, on the ancient week plain of the Amu Darya and the low mountains of the Surkhandarya basin. Takyr type soils are developed in the ancient deltas of Amu Darya, Zarafshan, Kashkadarya, Surkhandarya, Jizzakh and in the central plain of Fergana.

The general properties of the soils of the desert zone are extreme low humus (1-1.5%), carbonate content of the entire profile, salinity, and an exceptionally strong degree of desiccation of the profile during the xerothermal period. Gray-brown soils are the most common type of soil in the desert zone of Uzbekistan. A characteristic morphological feature of gray-brown soil is that it has a pronounced two-membered structure: the upper part is less dense and lighter colored and the lower part is more dense, layered and intensely colored in brown or orange–brown.

The lower horizons of this soil have bright carbonate formations, below which the gypsum horizon lies. More often, carbonate formations and gypsum can be combined in one layer.

The most characteristic feature of gray-brown soil is the presence of a gypsum horizon in the form of veins, spots, crystals. The thickness and depth of the gypsum horizon can be different and reach from a few centimeters to 1 meter or more. The gray-brown soil is extremely poor in humus and mineral nutrients.

The humus content of the upper horizons is about 0.4 *-0.6%, and at a depth of up to half a meter 0.2-0.3%. In gray-brown soils, the content of vulfoacids is 4 times higher than humic. Another morphological feature of gray-brown desert soils is the presence on the surface of a porous crust of small thickness (2-4 cm), a thin layered pale–gray subcortical horizon often lies below the crust; below it is a compacted lumpy, bare and slightly ironed with a light shade. In gray-brown soil, the largest amount of carbonates is in the upper part of the profile.

This most common zonal type of desert soils is characterized by a significant variety of subtypes, genera and species characterized by various water-physical and agrochemical properties. Desert-sandy soils have a weakly pronounced soil profile and are characterized by a wide variety. Their upper layers are mostly loose or sandy, less often sandy loam.

The tops of ridges and mounds, as a rule, are composed of lightly compacted, easily mobile sands. The desert-sandy soils of the karakul breeding zone are mainly wind– blown ancient alluvial deposits or wind-blown indigenous sands.

The soil forming rocks for these soils are deluvium deposits, Aeolian sediments and eluvium of bedrock of various mechanical composition. The groundwater here is at a great depth and does not affect the soil formation process.

The soil profile is weakly differentiated by non-genetic horizons, with or without an inconspicuous crust on the surface. Carbonates are distributed almost uniformly along the profile or predominate in the upper layers to a depth of 30 cm, the gypsum horizon lies below. In desert-sandy soils, as well as on gray-brown soils, there is little humus (about 0.5%).

The humus horizon is more often formed at a depth of (5-6 cm). salinization of the upper soil horizons is almost absent or weak. Salinization of desert-sandy soils at a depth of 60 cm and below can reach 0.5- 2%.

The number of colloids and the absorption capacity is small, they have low moisture capacity, but precipitation is able to penetrate to a considerable depth. Consequently, desert-sandy soils have a relatively favorable water regime in terms of phytomelioration of pastures.

Their physical evaporation is also somewhat lower compared to other types of soils. With the same amount of precipitation, the same soil, depending on the mechanical composition and water-salt regime, can accumulate a different moisture reserve.

REFERENCES

1. Adaptation of fodder plants to the conditions of the arid zone of Uzbekistan (group of authors). Tashkent, "Fan", 1983, 304s.
2. Akzhigitova N.I. Halophilic vegetation of Central Asia and its incarnation properties. Tashkent, "Fan", 1982, 192 0s.
3. Alimdzhanov A.G. Ecological and biological characteristics of the most important fodder plants in culture. // Theoretical foundations and methods of phytomelioration of desert pastures of Southwestern Kyzylkum, Tashkent, "Fan", 1973, p. 60-74
4. Asliddinov S.D. Biological features and productivity of fodder species of Artemisia subgenus Seriphidium during introduction in arid regions of Uzbekistan. Abstract of the dissertation for the degree of Cand. biol. Sciences. Dushanbe, 1988, 23 p.
5. Blagoveshchensky E.N. Water regime of soils in the deserts of Central Asia. Dushanbe, Publishing House of the Academy of Sciences of the TajSSR, 1958
6. Burygin V.A., Zakirov K.Z., Zaprometova N.S., Pauzner L.E. Botanical bases of reconstruction of pastures of Southern Kyzylkum. // Ed. Academy of Sciences of the Uzbek SSR, Tashkent, 1956, 232 p.
7. Makhmudov M.M. Biological and ecological bases of introducing Salsola orientalis S.G.Gmel into the culture in South-Western Kyzylkum. //Plant resources. v.6, issue 1, 1972a, p. 81-87
8. Makhmudov M.M. Keyreuk is a valuable fodder plant in the desert zone of Uzbekistan. Samarkand, 1991, 63 p.
9. Makhmudov M.M. Agrobiological bases and technology for improving pastures in Kyzylkum. Abstract of doctoral diss., Tashkent, 1998, 52 p. Makhmudov M.M. Achievements and immediate tasks of arid fodder production. //Problems of biology and medicine, 2 (15), 2000, p.34-37