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# Prospects For Achieving High Productivity In Degraded Lands

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**Abstract:** This article presents the results of scientific research work on establishing a farming system and increasing crop yield and soil fertility using resource-efficient technologies in the degraded hilly lands of Nurota district, which have been unplanned for many years.

**Keywords.** degradation, productivity, fertility, hilly land, dry farming, resource efficient, bentonite clay powder, shelling, suspension.

Fighting against land degradation in the country and mitigating its negative consequences, preventing desertification and drought in the regions, preserving biodiversity, maintaining and increasing soil fertility, restoring degraded lands, achieving sustainable development of regions based on the wide use of advanced scientific developments and innovations in this direction are today's goals. is one of the urgent tasks [1].

Over the years, a state of degradation occurs as a result of the deterioration of the natural potential of the land, which negatively affects the integrity of the ecosystem, as a result of the decrease of ecological productivity and natural biological diversity, or the loss of tolerance to external influences, and the loss of land productivity.

Since the beginning of the 1990s, the credit score of irrigated lands in Uzbekistan has decreased by an average of 10 points from 55-65. The map of land credit indicators for the country shows that the credit status of most lands is "average" or "below average", and the status of the lands of the Khorezm region and the Republic of Karakalpakstan belongs to the "bad" category.

Land productivity, pollution tolerance, hydrology and participation in chemical cycling are directly related to the available biodiversity. With the decrease of biological species, the ongoing processes and their quality decrease. The result is degraded land.

A healthy ecosystem in constant motion can withstand various natural and anthropogenic influences. It is the processes in the right action within the system, the presence of biodiversity, which leads to the recovery of the ecosystem from negative impacts and regaining its previous functions. Serious disruption of biophysical processes causes the system to lose its ability to recover. As a result, such lands in the country will fall out of use.

The main causes of land degradation are unreasonable practices in agricultural production; are processes such as excessive use of pastures, destruction of forest and other plant cover.

Irrational agriculture can be seen in the use of excess water in irrigated lands, exposure of the upper soil layer to wind and water erosion, densification of the upper soil layer, soil salinization and pollution.

Overuse of pastures leads to over-grazing of livestock in one place, thereby reducing the ability of pastures to regenerate. Basically, the number of pastures around settlements or working water sources is rapidly decreasing.

At the same time, many natural pastures are not being used and are being degraded. If livestock are not fed on the pastures, the seeds of the native plants will not spread, and the biological diversity of the plants will not develop, and as the biological species decrease, the passage of biological processes will deteriorate, resulting in land degradation.The old method of seasonal replacement of pastures is not used now [5].

By now, about 40 percent of global land resources have been degraded. Humanity's influence on the earth is expanding to such an extent that as a result the earth ceases to fulfill its important functions and becomes unusable.

Humanity is using all the advanced technologies of food production. In particular, measures aimed at growing quality products, increasing productivity, and providing the world market with ecologically clean food are becoming more active day by day.Among them, although it is not visible at first glance, there is another very important issue - it is the improvement of soil quality and productivity. Without achieving this, it is difficult to fully ensure the current food security.

Improving the condition of agricultural lands and increasing soil fertility is one of the important issues in our country. In particular, the fact that it is being paid attention to at the level of state policy, in the current conditions of Uzbekistan, which organizes the development of its economy in the agro-industrial direction, creates the need to study the legal problems of soil fertility protection, to find their solution, to develop proposals based on deep scientific and theoretical observation, and to give conclusions.

Consequently, today desertification threatens many countries of the world. Unfortunately, this is largely due to the human factor, and soil and wind erosion due to the ruthless use of nature is accelerating the processes of desertification. According to the evaluation results of the Food and Agriculture Organization of the United Nations (FAO), now one third of all land is subject to soil erosion, i.e. erosion, siltation, hermitization (densification), soil salinization, leaching of organic and nutrient substances from the soil, soil pollution and other is deteriorating under the influence of processes.The main reason for this is the incorrect and inappropriate use of land resources by people.

In general, efficient and rational use of land is a necessity demanded by today and the future. The lack of usable land for agricultural activities in Uzbekistan requires finding new and effective ways of using natural resources and land-water resources [6].

Land is the main means of production in irrigated agriculture. From the beginning of human society to the present day, the earth has been taking care of people in its bosom and providing them with delicacies. The earth is the only witness of different eras and historical events. Because the earth is the mother of mankind.Therefore, our global challenge today is to protect our motherland as the apple of our eye. According to experts, as a result of various natural factors and human activities, 32-35% of our planet is affected by degradation. It threatens the life, health, lifestyle and future of millions of people [4].

Full and effective use of agricultural land in our republic is an extremely urgent problem. Improving the condition of irrigated and dry lands and increasing the efficiency of their use is one of the most urgent issues of today.

Despite the reduction of irrigated arable land in agriculture, there is a tendency to increase the volume of production and productivity. This situation is explained by the growing number of farms in agriculture and the increasing status of them, as well as the formation and development of the sense of ownership of the land.However, the decrease of irrigated arable land in agriculture, the growing share of neglected, uncultivated land, the need to further increase the yield of agricultural products, increase the profitability of economic entities, require the effective use of limited land resources, which is an important economic resource (factor) [2].

In order to anticipate and prevent the degradation of existing pastures in our republic, all pastures require constant scientific monitoring and conduct all activities based on monitoring conclusions.

Three-level monitoring and scientific research should be carried out continuously in pastures, and all industry experts should participate in this event;

Livestock feeding must be carried out on the basis of information on the determined pasture productivity, accurate calculations, as a result of which the height of the pasture fodder crops will grow by 20-25 cm and pasture degradation will be prevented;

As a result of regular systematic monitoring, the composition of pasture plants is enriched with new species based on the results of monitoring, and the renewal of pastures is an important factor in increasing livestock production in our country, preventing the crisis of pastures.

Prevention of pasture degradation requires monitoring of pasture degradation in 3 directions:

**The first direction** is the monitoring of pasture productivity. In this, the relationship between the nutrient unit of pasture crops, their growth indicators and their rainfall amounts is studied.

**The second direction** is to determine indicators of pasture degradation based on "indicator" plants in the pasture. For example, the increase of frankincense in endangered pastures has long been used by pastoralists as an indicator of pasture replacement.

**The third direction** is monitoring the number of plants per hectare of land will provide us with accurate information. In this direction, it is of great importance to establish and observe the standards for the number of livestock per hectare of land.

The task of restoring the condition of pastures mentioned above can be achieved only by conducting research with farmers in the pastures themselves, improving the economic conditions of farmers, and most importantly, by increasing the efficiency of the work being done.

Many studies have been conducted by scientists in Uzbekistan, and they have gained interesting information about the useful aspects of non-traditional agro-minerals. Applying 10-12 tons of bentonite clay under the plow in the irrigated lands of Khorezm region made it possible to get 10.3-32.6% additional yield from cotton [3].

The special feature of bentonite clays is that they have a good effect on the water-physical and physico-chemical properties of the soil, they contain 20-60% or more magnesium montmorillonite mineral, so the amount of volatile, volatile and exchangeable cations and anions is 23-150 mg per 100 g of soil. /eq. The comparison surface is 200-300m$^{2'}$ grams.

In addition, bentonites are a source of nutrients for plants, they contain 0.3-4.7% carbon, 0.4-3.0% potassium, 0.3-1.0% phosphorus.

During 2021-2022, experiments were conducted on the use of natural bentonite clay powder in the cultivation of spring wheat and desert-pasture nutritious plants in the dry land of the Nurota district "Umrbek" farm.

One of the most important measures is to know the level of nutrient supply of the selected fields and to carry out feeding based on this before starting the field experiments.

It is necessary to analyze to what extent the agrochemical processes in the soil change during the maintenance of agricultural crops. In our research, the agrochemical properties of the soils of the experimental field were determined. The amount of total humus, total nitrogen, phosphorus, mobile nitrogen, phosphorus and exchangeable potassium in the soil was studied.

When the soil of the experimental field was analyzed before the experiment, the amount of humus in the 0-30 cm layer of the soil was 0.15%, total nitrogen-0.022%, total phosphorus-0.18%, nitrate nitrogen-12.3 mg/kg, mobile phosphorus-10 .8 mg/kg and the amount of exchangeable potassium was 71.2 mg/kg, while the amount in the 30-50 cm layer of the soil was 0.09%, 0.010%, 0.092%, 9.2 mg/kg, 7.5 mg/kg and 59.6 mg/kg.

In the studied area of Nurota district, the coldest temperature of the year falls on January, when the average temperature is 3.7, the absolute lowest temperature is - - 2°C. The average temperature in July is 29.6°C, the highest temperature reaches 35.1°C. According to the information about the climatic conditions of the researched area, the air temperature, amount of precipitation and relative humidity of the air change dramatically during the main period of wheat production (March-June) in dry conditions.

The increase in air temperature and the abundance of precipitation accelerates the growth processes of wheat in dry conditions. During this period, the average air temperature was +9.6, +27.1°C, the lowest temperature was +3 +8.5°C only on some days, and the highest temperature rose to +25.1 +34.6°C. The amount of precipitation in March was 138 mm.

July is characterized by high air temperature (29.6°C) and low relative humidity (18.9%) in the experimental area, and the absence of precipitation at all.

In order to implement the planned tasks in the research work, the wheat varieties Surkhak-5688 and "Janubgavhari", recommended for cultivation in dry conditions, were used for field and production test experiments. Wheat grain was coated with bentonite clay powder at different rates and planted according to the established experimental structure.

215.2 sprouted lawns of soft wheat variety "Surkhak-5688" seeds planted in experimental fields of "Umrbek" f/x in the early spring period (February 11-14) in 1 m² in the control option; 229.3 in the option where 30 kg/t of bentonite clay powder was used in shelling the seeds; It was 230.7 in the 40 kg/t option and 228.3 in the 50 kg/t option.

In the experimental fields planted with "Zanub gavhari" variety, the number of grasses sprouted per 1 m² of seeds in the control option was 210.5; 224.3 in the option of 30 kg/ha; 227.6 in the 40 kg/ha option; It was 223.3 in the 50 kg/ha option.

In the control plots in our experimental fields, the yield was 6.2 t/ha in "Surkhak-5688" and 4.8 t/ha in "Janub gavhari", while in the fields where 30, 40 and 50 t of bentonite clay powder per 1 ton of seeds were used for seed coating, these indicators were higher with bentonite and urea. when used together with the suspension, the average yield of wheat grains in "Surkhak-5688" and "Janub gavhari" varieties was 14.2, 16.1, 15.3 t/ha and 7.3, 8.1, 7.6 t/ha.

Under these conditions, in the fields where bentonite clay powder was applied, these indicators provided an additional yield of 8.0, 9.9, 9.1 t/ha and 2.5, 3.3, 2.8 t/ha, respectively, compared to control options when applied in combination with bentonite clay powder coating and bentonite and urea suspension.

In the fields where bentonite clay powder was applied, coating with bentonite clay powder and foliar feeding with bentonite and urea suspension, when applied together, had a positive effect on grain yield and ensured higher grain yield.

Experiments on the use of bentonite clay powder in the cultivation of desert-pasture nutritious plants were carried out on izen, Khorasan spartet, male grass (jitnyak), chogon and teresken plants. In the experiments, plant seeds were coated with bentonite clay powder at different rates and planted according to the experimental structure.

After planting the seeds of desert-pasture plants covered with bentonite clay, they began to germinate in late March and early April. The number of plants sprouted from seeds per 1 m² at the beginning of the year in control options was 1.57, 2.21, 1.78, 1.31, 1.32; 1.64, 2.27, 1.83, 1.35, 1.37 in the 50 g/kg option; 1.78, 2.46, 1.96, 1.48, 1.46 in the 100 g/kg option; 200 g/kg was 1.72, 2.39, 1.91, 1.44, 1.41.At the end of the growing season by the end of the year, the number of plants per 1 m² of control according to the options: 1.52, 1.91, 1.55, 1.14, 1.15; 1.44, 1.99, 1.61, 1.19, 1.20 in the 50 g/kg option; 1.60, 2.21, 1.76, 1.33, 1.31 in the 100 g/kg option; in the 200 g/kg option it was 1.51, 2.10, 1.68, 1.26, 1.24.

The branching phase in the desert-pasture fodder crops in the experimental fields was observed from the second half of April after germination in the control cuttings, and according to the amount of bentonite clay powder, it occurred in the middle of April in the options of 50 g/kg, 100 g/kg and 200 g/kg.

17.07 in the first year of desert pasture nutritious crops only in the first year on the control pad; 14.07 in 50 g/kg option; 12.07 in 100 g/kg option; 200 g/kg was observed on 15.07. 28.07 in the control plot after flowering period; 25.07 in 50 g/kg options; 22.07 in 100 g/kg option; 200 g/kg version started to be observed on 23.07.The seed production period is 20.09-05.10.22; seed ripening was 10.10-20.10.22 and the end of the vegetation period was at the end of October.

18.04 branching on espartate in plants other than izen of desert-pasture fodder crops in our experimental fields; 50 g/kg, 100 g/kg, 200 g/kg options in appropriate condition 15.04, 12.04, 16.04; formation of side leaves in “jitnyak” in the control plant 17.04, 50 g/kg, 100 g/kg, 200 g/kg in suitable conditions 15.04, 10.04, 13.04; 28.04 in the branching control plate in the furnace; 50 g/kg, 100 g/kg, 200 g/kg options in suitable condition 25.04, 20.04, 26.04; 28.04 on the control panel in teresken; 50 g/kg, 100 g/kg, 200 g/kg options were determined on 25.04, 23.04, 26.04.Since this was the first year of planting in our desert pasture forage crops, there were almost no tillering, flowering, seeding phases. The end of the vegetation period is 19-24.05.22 in espartets; in “jitnyak” 15-25.07.22; in the furnace 20-27.10.22; Tereskenda fell on 20-30.09.

Covering the seeds of desert-pasture plants with bentonite clay powder at different rates showed a positive effect on their growth and development and the duration of the vegetation period. In this case, the optimal rate of shelling was observed in all plant species in 100g/kg options, that is, germination was accelerated by 2-3 days.

**Conclusion**

In summary, the highest yields were obtained in the experimental fields with bentonite clay powder crusting at a rate of 40 kg/t and bentonite and urea suspension. It was observed that the grain yield was 51.6 t/ha in "Asr" variety planted in autumn, and 16.1 and 8.1 t/ha in "Surkhak-5688" and "Janub gavhari" varieties planted in dry conditions in spring.

For the growth, development and duration of the growing season of desert-pasture nutritious plants, the optimal coating rate of the seeds of bentonite clay powder at different rates was observed in all plant species at 100g/kg, that is, it accelerated germination by 2-3 days.

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