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METHODS TO INCREASE THE PRODUCTIVITY OF IRRIGATED GRAZING SOILS

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ABSTRACT

This article discusses the methods of increasing the productivity of irrigated lands and their role in agriculture, and also the positive impact of these recommendations on the future development of agriculture in our country. The main task of reclamation measures of the new technology system is creating and maintaining optimal water, food and air regimes to ensure high and low yields of crops grown with efficient use of irrigation water and other sources. The period when the groundwater level raises the most corresponds to the periods of saline washing and vegetation irrigation. The level of mineralization of groundwater in this period is at its lowest.

KEYWORDS: *Agrochemical Properties, Land Resources, Agro Physical, Different Climate, Soil-Climate, Land And Water Resources, State Cadastres, Pests, Digitization.*

INTRODUCTION

Scientific researchers are being conducted in a number of priority areas such as further development of agriculture in the world, maintaining soil fertility, restoration, increase and efficient use of land resources, optimization of ecological condition, assessment of water-physical, technological, agrochemical properties and reclamation of lands in the current conditions. In this regard, special attention is paid to the development of agro-technical, agro-physical measures in accordance with soil and climatic conditions, improvement, restoration and increase of soil fertility, extensive use of scientific and practical achievements.

In the irrigated soil-climatic conditions of our republic, mainly cotton – plant, grain, field, vegetables and fruit crops are grown. Irrigated soils of Uzbekistan are distributed in different climatic conditions; their area is only 4280000 hectares, which does not fully satisfy the needs of the growing population. In order to satisfy the needs of the population, it is necessary to increase

the fertility of irrigated soils and the productivity of agricultural crops. This can only be done by creating and using new technologies.

Decree of the President of the Republic of Uzbekistan dated June 17, 2019 No PF-5742 "On measures for the efficient use of land and water resources in agriculture", decree PF-5853 of October 23, 2019 "On approval of the Strategy of agricultural development of the Republic of Uzbekistan for 2020-2030", decree PF-6061 of September 7, 2020 "On measures to radically improve the system of land accounting and state cadastre" and also Resolution of the Cabinet of Ministers of the Republic of Uzbekistan dated June 18, 2019 No 510 "On measures to improve the system of agrochemical analysis of soil in agriculture, increase soil fertility in arable land" to further strengthen food security in the country, increase the export potential of the agricultural sector, creation of new varieties of agricultural crops with high productivity, resistant to diseases and pests, adapted to local soil-climatic and ecological conditions, improving the system of agrochemical analysis of soil in agriculture, increase and maintain soil fertility in arable lands and its introduction into production, digitization of agriculture, the organization of research work on the application of new technologies in the field.

Targeted soil temperature control is one of the most important issues in soil science. One of the effective measures used to improve soil temperature is mulch, i.e. covering the soil with rotten manure, peat, paper, straw, polyethylene film, hay and coal dust, plant leaves, ash, sand, cement, wood chips, etc., this method raises the soil temperature and slows down the radiation cooling of the soil at night. Mulch is not only optimizes soil heat regime but also reduces physical evaporation from the soil surface and consequently increases soil moisture. Mulch prevents thickening that occurs after heavy rains in areas planted in early spring. In addition, mulch helps to the soil improves its agro physical, agrochemical, biological properties.

Nowadays, as a result of strong influence of anthropogenic factors on soils, their properties change dramatically. As a result, crop yields are much lower than planned in some districts. To date, the productivity of irrigated lands does not fully satisfy their needs. Therefore, increasing the level of soil fertility, creating a scientific basis for the efficient use of land and water resources, mineral and organic fertilizers determines the urgency of the problem.

The main task of reclamation measures of the new technology system is creating and maintaining optimal water, food and air regimes to ensure high and low yields of crops grown with efficient use of irrigation water and other sources. At the same time, the new technology should be aimed at increasing soil fertility in the reclamation system and eliminating the negative impact on the environment. In a special farming system for saline soils, this technology has not developed methods to prevent salinity and restore soil fertility. In this direction, it is necessary to develop a system of technologies that restore the natural state of the soil by alternating the cultivation of agricultural crops with the cultivation of tillage and the accumulation of organic matter on the surface of the pile.

Thus, due to the formation of optimal water-physical, nutrient regimes in the mulched soil, the environmental conditions are improved due to the negative impact of tillage machines and the reduction of emissions of smoke and dust into the environment. It provides high-tech and high-quality harvest, intensive growth, development and maturation of agricultural crops.

As explained above, the development of new technologies that restore the natural condition and increase the fertility of the soils of irrigated areas requires development. In this direction, a new soil mulching technology system will be developed, which will restore the natural state of irrigated soils and increase soil fertility through the rotation of agricultural crops. In this farming system, tillage is done by alternating planting and mulching of agricultural crops. In this regard, a major problem for agricultural science needs to be solved. In this technology the soil is well supplied with moisture and nutrients. Through the pores of the aggregates, worm traces, rotten root cavities, etc., water, nutrients, air, and heat reach the layers where the roots of the plants are scattered. By leaving the vegetative parts of the cultivated crops on the soil surface every year, the maximum accumulation of organic matter leads to moisture retention, creating conditions for the proliferation of soil-dwelling animals and microorganisms. As a result of achieving a sharp reduction in tillage and tillage with the help of mechanization, the natural state of the soil is gradually restored, the ecological environment is stabilized

Hydrogeology and geomorphology of increasing soil fertility.

One of the factors in the process of modern soil formation is hydrogeological conditions. The main sources of groundwater in the Mirzachul region are surface, groundwater and atmospheric precipitation. The all groundwater in the Syrdarya region moves slowly from south-east to north-west under a very small slope (0.0060). Secondary salinity of soils occurs as a result of upward water exchange or evaporation as a result of very slow natural movement of groundwater in the region. The strata of Mirzachul groundwater are crushed (quaternary) deposits with a thickness of up to 300 m, consisting of sandstones, mud, sandstones, sandstones and sometimes gravel [2.46; 266 page]. This was also due to the poor performance of the drainage system. There are many different saline soils in the region. Therefore, in the land resources used for agricultural purposes can be achieved only through the constant application of modern reclamation measures, mainly by cleaning the system of saline drainage ditches.

The groundwater level in the area varies according to water permeability and geomorphologic conditions, depending on the water supply at the current agricultural stage. In the eastern parts or on the terraces of the II-I ridges of the Syrdarya, they are located at a level of 1-2.5 m in the central part, 2-3 m above the sediments and depressions. The groundwater table is mainly located close to the surface, mainly in other parts of the Syrdarya and in the northern districts of the region.

The main source of groundwater is surface water, which is absorbed downstream from irrigation systems, and irrigation water from fields. The period when the groundwater level raises the most corresponds to the periods of saline washing and vegetation irrigation. The level of mineralization of groundwater in this period is at its lowest. At present, the river waters extend to I – terrace and terraces, as well as to the areas of grasslands in the north-eastern part of the region. Thus, the order and mineralization of groundwater in the area will be under the predominant influence of irrigation and human factors.

Studies have shown that due to insufficient management of surface and groundwater, they intensify the process of secondary salinity as a result of infiltration into the upper layers of the soil.

The process of hydromorphic (moist) soil formation is underway in the region at the current stage of agricultural farming. This is also due to the rising groundwater in many parts of the region.

The territory of the Syrdarya region occupies a large foothill plain, forming the main part of Mirzachul, which has a slope to the north, northwest, bordered by the Turkestan mountain range to the south and the Syrdarya River to the north, and the Kyzylkum Desert to the west.

The main part of the Syrdarya region is located in Mirzachul and the first information about its hydrogeology is found in the works of N.A.Dimo [2.46; 266p]. N.A.Dimo describes the genesis, salinity, mineralization, and depth of soils. He connects the origin of the lands in the eastern part of the region with the Syrdarya, and the lands of the western part with the proluvial origins of the Turkestan ridge. The wide plain of the region starts from the south-eastern corner and extends to the Kyzylkum desert, the lands of the central region are divided into a number of self-sufficient sediments and depressions.

Influence of anthropogenic factors on changes in soil properties.

According to UNESCO, in the last quarter of the twentieth century, more than 9 million 2 km of land was degraded by human activities, which now accounts for 43% of the total land area. At the present time, 6/1 of the world's population suffers from desertification.

The active influence of man on the nature of the region can be attributed to the development of light industry-increasing demand for agricultural crops. In this regard, the construction of canals, irrigation and collector-drainage networks led to the technical re-formation of the area, to some extent disrupted the connection with natural landscape components and caused the problem of protection of soil layers and flora.

In order to keep irrigated lands in a favorable reclamation condition, several tens of thousands of kilometers of farms have built internal and inter-farm collector-drainage networks. However, the imperfection of hydraulic structures, often the low level of their use and the lack of the necessary science-based irrigation and saline washing systems have led to changes in natural conditions in irrigated areas, rising groundwater.

As a result of regular irrigation, the acceleration of the development of new types of hydromorphic soils, the regular application of organic and mineral fertilizers to the soil led to the formation of new soils that differ in their properties from the previous natural soils. As a result, salinity processes took place, its evolution accelerated, leading to changes in soil structure.

Irrigation has a significant impact on soil processes, increasing soil moisture and bringing with it various substances dissolved in water. Prolonged and irregular irrigation of lands has led to a radical change in water and salt regimes in the soil. In addition to allowing plants to grow well due to increased humidity, gypsum, carbonates accumulate in the soil and are enriched with easily and difficult-to-dissolve ($CaCO_3$, $MgCO_3$) salts as a result of redistribution of water-soluble salts. In addition, the impact of irrigation water affects the compaction of irrigated soils, as well as the air in the soil surface layer.

Expansion of engineering and geological prospecting works in the region, the emergence of new irrigation networks, aimless earthworks of various sizes, plants that hold the soil firmly, cutting of shrubs and semi-shrubs, grazing of cattle wherever they want, etc. cause the topsoil cover of

soils with light mechanical content to fly away and as a result erosion processes occur, expanding the deflation zone.

Increasing salinity and defoliation processes are causing irreparable damage to agriculture in the region, which in turn requires scientists and specialists to reconsider the issue of proper use of land resources.

Experimental systems and methods

Field experiments were conducted on the basis of field experiments in the conditions of irrigated gray-grass soils. Field experiments were conducted in the conditions of irrigated gray meadow soils on the basis of methodological manuals of the Uzbek Institute of Cotton, Soil Science and Agro chemistry. Field experiments were conducted according to the following scheme:

1. The land was plowed + flattened chisel, storms and showers + garden – bed was taken + seeds were planted, amount of mineral fertilizers - N-250, R-175, K-125 (control).
2. Do not plow, loosen the surface of the pre-obtained garden – bed+ seeds were planted on the garden – bed+ mulched with crushed straw- N-250, R-175, K-125.
3. Do not plow, loosen the surface of the pre-obtained garden – bed + seeds were planted + mulched with lignin + the amount of mineral fertilizers - N-250, R-175, K-125.
4. The surface of the uncultivated garden – bed is softened seeds were planted + mulched with rotten manure-N-250, R-175, K-125.

Field experiments were carried out on the basis of fertilizer standards and agro-techniques adopted on the farm in accordance with our purpose.

The area planted with cotton – plant							
I – returning				II – returning			
1. control	2. cut straw	3. lignin	4. manure	1. control	2. cut straw	3. lignin	4. manure
III- returning				IV- returning			
2. cut straw	1. control	4. manure	3. lignin	2. cut straw	1. control	4. manure	3. lignin

In summary:

1. In the conditions of irrigated gray-grass soils, plowing was the most difficult measure, and leveling the plow required a lot of work and money. In early spring, the soil had a good structure, and preparing it for planting according to the new agro technology made it easier to mulch the seedlings in the areas where the seeds were planted. Correction of sprouts in accordance with agro requirements can be of plow less quality in the studied areas. Mulching and partial plowing during the growing season allowed agricultural crops to maintain the optimum soil density at the optimum level of 1.38-1.39 g / cm3.
2. Nutrients (nitrogen, phosphorus, potassium) were well absorbed by the plant when mulched with organic residues in the soil in which cotton – plant was grown, and the amount of humus

in the soil increased (by 0.6-0.9%). The use of soil nutrients by the plant in the cultivation of cotton mulch depends closely on the norms and types of organic fertilizers applied as mulch. When soils are mulched with various organic substances, the plant absorbs a lot of nutrients.

3. As a result of poor cultivation of mulched cotton, the ecological environment has improved due to the formation of optimal water-physical, nutrient regime in the soil, reduction of dust formation of soil tillage machines and toxic gases emitted from them. Intensive growth, development and increase in productivity of agricultural crops - 2.6-3.5-4.1 ts / ga, compared to the control in the mulched variants in cotton - yielded additional yields.

RECOMMENDATIONS FOR MANUFACTURING

In order to obtain cheap, high-quality, stable and high yields of agricultural crops from irrigated lands, it is necessary to introduce a system of crop rotation and intermediate crop rotation by mulching the soil in the complex agro-technical measures. One of the most promising methods in the future is the cultivation of agricultural crops by mulching and mulching the soil surface with cultivated plant residues.

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