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Ecological Analysis Indicators Of Irrigated Gray Pasture Soils

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Abstract

The article briefly describes the physical and geographical location of the experiment area. Analyzes of geomorphological, geological and climatic conditions of gray meadow soil formation are given. In the field experiments, standard methods were used for the determination of organic and mineral substances in the soil, and all data were analyzed statistically. The amount of nitrogen in the upper 0-25 cm layer of the soil under the winter grain was 32.51 mg/kg, and in the lower horizon it was 28.47 mg/kg. The amount of nitrogen under cotton is 30.75-26.42 mg/kg, which is probably related to the plant's nitrogen-fixing physiology. The diagnostic indicators of irrigated gray meadow soils and the conditions of ecological reclamation at the same time were analyzed. Recommendations for further use are given.

Keywords: *Ecological Reclamation, Soils, Agricultural, Monitoring, Cotton, Mechanical, Agrochemical, Nitrogen*

1. Introduction

In the O. Hotamov massif of Sh.Rashidov district of Jizzakh region, crop rotation, neglect of irrigation rules, use of high doses of mineral fertilizers and pesticides in growing cotton from existing irrigated gray-meadow soils for decades lead to weakening of the soil, its degradation, decrease in productivity, rise in the level of underground water. and led to the observation of cases of secondary salinity in some. Groundwater contamination was also observed.

According to ecological studies, it will take hundreds of thousands of years for the area to clean itself. In the future, the cultivation of grain and other grain crops and high yields in agriculture can be achieved only through the cultivation of agricultural crops on the basis of high agrotechnics, together with the rapid development of agriculture and animal husbandry.

Periodic study and monitoring of the agro- and ecomeliorative condition of soils is undoubtedly of great scientific importance in preserving and improving soil fertility as the main means of farming and as an element of the biosphere. Only having a genetic understanding of the soil provides a good understanding of the reclamation status of the area, which is especially important in predicting possible soil changes.(1)

Professor O.K. Komilov has made a great contribution to the study of land reclamation conditions of the region and its improvement. Since the 1960s, under the leadership of O.K. Komilov, a number of studies have been conducted on the salinization and genesis of Mirzachol soils and the improvement of land reclamation of old irrigated lands. The activities developed by them are still used in production today without losing their importance.

M. Umarov believes that physical-mechanical properties of soils have a great influence on the formation of regional soils, their water-physical properties, mechanical composition and soil-forming rocks.

In order to comprehensively study and objectively assess the current state of irrigated soils, a group of TAITDI scientists J. Sattorov, R. Ko'ziev, Kh. Risqieva, M. Toshko'ziev, R. Kurvontoev, A. Akhmedov, A. Ismanov, S. Abdullaev and others In the years 2000-2005, in a number of districts of Syrdarya and Jizzakh regions, comprehensive research was carried out, and all indicators reflecting the agrochemical, agrophysical, physicochemical, reclamation and ecological condition of the soils, the amount and reserves of salts, the level and types of salinity, the hydromelioration system of the studied areas received new evidence and created maps showing the soil and its scores, developed measures to improve them.

2. Materials And Methods

Field experiments were carried out in 2020-2022 in the irrigated gray meadow soils of Sh. Rashidov district, Jizzakh region.

Agrochemical indicators of soils were determined in laboratory conditions based on generally accepted methods. Including: humus according to the Tyurin method, gross nitrogen, phosphorus and potassium in one soil sample according to the Meshcheryakov method.

3. Results and Discussion

Based on the obtained results, it can be concluded that the annual rainfall from the atmosphere has different indicators, and on average 230-300 mm of rain falls on the territory of Jizzakh desert. Based on this, the relative humidity of the air in these areas is also variable. It averages 65-81% in the winter months and the smallest indicator (26-36%) in the summer months (Table 2.3).

As can be seen from the given table 2.3, the highest maximum indicator of air humidity amplitude in summer is 29-36% in irrigated areas, while this indicator is 25-29% in non-irrigated farming conditions. For example: air humidity reaches 34-75% due to irrigation in Jizzakh district weather station.

Table 2.3 Average monthly and annual relative humidity, %

Station	Height above sea level, m	Months												Yearly
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	
Chordara	240	74	77	70	70	55	33	29	31	37	49	69	78	56
Cotton grower	266	67	65	53	44	34	30	28	30	30	31	50	65	44
Mirzachol	275	77	75	76	66	57	47	46	50	53	60	71	80	53
Jizzakh	392	75	75	72	64	50	36	34	35	39	51	65	75	56

In the arable layer of the tested soils, depending on their cultivation level, the amount of humus is 0.6-1.1%, and its reserve in the 0-50 cm layer is in the range of 36-66 t/ha. According to the amount of humus, the amount of nitrogen fluctuates in the range of 0.07-0.12%. The S:N ratio, which represents how rich the soil humus is in nitrogen, is in the range of 5.1-6.3, indicating that the soil humus is poor in nitrogen.

Agrochemical properties of gray-meadow soils planted with repeated mosh crops Table 1

Variant №	**Layer thickness, sm**	**Active, mg/kg**		**N-NO_3, mg/kg**	**General, %**		**N, %**	**Hummus %**
		P_2O_5	**K_2O**		**P_2O_5**	**K_2O**		
I Control N70P60K40	0-30	14,0	228,8	30,9	0,155	1,17	0,061	0,828
	30-50	13,0	240,8	26,9	0,120	0,66	0,058	0,724
II biofertilizer 2 t/ga N70 P60 K40	0-30	23,0	361,2	69,7	0,155	1,10	0,07	0,998
	30-50	24,0	240,8	48,3	0,116	0,57	0,052	0,786
III Rhizome 1 N70P60 K40	0-30	18,0	337,1	139,4	0,170	1,13	0,063	0,890
	30-50	15,0	264,9	18,2	0,155	0,06	0,05	0,724
IV biofertilizer 2 t/ga+ Rhizome -1 N70 P60 K40	0-30	18,0	276,9	149,6	0,145	1,10	0,061	0,992
	30-50	14,0	216,7	15,9	0,120	0,69	0,050	0,807

The amount of nitrogen in the researched gray-meadow soils corresponds to the amount of humus. The total amount of nitrogen in the soils of the examined area is very low, and a lack of organic fertilizers is felt in the cotton-wheat rotation system. Wheat-grown irrigated gray-meadow soils are characterized by a relatively high total nitrogen content. The ratio of carbon to nitrogen in all soils is 5-9.

It is important to study the dynamics of the amount of phosphorus in the nutrients in the gray-meadow soils and its uptake. Changes in the amount of phosphorus in soils mainly depend on the applied agrotechnical measures, environmental conditions, the standards of organic and mineral fertilizers, the introduction of the rotation system and the quality of irrigation water. In general, this indicator shows that there is a strong relationship not only with respect to phosphorus, but also with the accumulation of humus and other nutrients in the soil and their absorption by plants.

In Sh.Rashidov district, where the research was conducted, the amount of humus in the upper arable layer of soils is 0.7-1.2%, and this indicator is 0.6% in weak and moderately saline lands. From the obtained data, it can be concluded that humus decreases with increasing salt content in the soil.

It was found that the amount of humus in the arable and sub-arable layers of irrigated gray-meadow soils is 0.29-0.82%, and the reserve of humus is around 32-65 t/ha.

Thickening of the humus layer is a long process in the soil. This process is connected with farming culture.

Based on the researches of the above-mentioned scientists, we have confirmed their opinion that the amount of humus has increased in the layer of 0-50 cm. In the following years, even if it is a small amount (5-7 tons), manure is applied to the ground, and cotton-wheat rotation is done at the expense of the mineral and organic residues left by them. can be observed to increase.

The amount of nitrogen in the researched gray-meadow soils corresponds to the amount of humus. the total amount of nitrogen in the soils of the examined area is very low, and a lack of organic fertilizers is felt in the cotton-wheat rotation system. irrigated gray-meadow soils planted with wheat are characterized by a relatively high total nitrogen content.

It is important to study the dynamics of the amount of phosphorus in nutrients in the researched gray-meadow soils and its absorption. The change of the amount of phosphorus in the soil is mainly due to the applied agrotechnical measures, environmental conditions, the norms of organic and mineral fertilizers, the introduction of the rotation system and occurs depending on the quality of irrigation water. in general, this indicator shows that there is a strong relationship not only for phosphorus, but also for the accumulation of humus and other nutrients in the soil and their absorption by plants.

4. Conclusion

As a result of the research, it is necessary to conclude that to improve the ecological condition of irrigated gray meadow soils, it is necessary to use irrigation, rotation and wide use of organomineral fertilizers.

1. The amount of humus was 0.828% in the control option, -0.890% in the II biofertilizer option 20 t/ha, 0.869% in the III Rizokom-1 option, 0.998% in the IV biofertilizer 20t/ha + Rizokom-1 option**.**

2. In all options, the correlation between physical clay and humus ranges from r2=0.9232 to 0.9658, and the correlation between nitrogen and humus ranges from r2=0.8832 to r2=1 a close relationship was found.

3. II Microbiological activity of the soil in the control variant was ammonifiers 53-72*105, nitrogen fixers 3-17*104, actinomycetes 9-28*104, microscopic fungi 3-10*104. The most optimal variant IV biofertilizer 20t/ha + Rhizokom was considered, and Rhizobium microscopic bacteria had a strong effect on the activity of ammonifying bacteria.

4. In the control variant, catalase enzyme activity is 6.5; 6.8 in biofertilizer option II; 6.9 in variant III Rizokom-1; IV biofertilizer was 8.1 in 2 t/ha+Rhizocom-1 variant. The correlation between catalase and humus was r2=0.8563.

5. Biopreparation Rizokom-1 has a high biological activity, constantly decomposes a large amount of organic and mineral substances in the soil and synthesizes their new forms. During these processes, the main biogenic elements are cycled, biologically active substances are released. Microorganisms increase the fertility of the soil, with their participation, processes of accumulation of mineral elements necessary for plants take place in the soil. Processing with the use of biofertilizer and Rhizocom-1 is recommended for increasing soil fertility and obtaining abundant harvests from agricultural crops.

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