Impact Factor: 9.2 ISSN-L: 2544-980X

The Effectiveness of Phytomeliorative Measures on Strongly Saline Soils

Atamurodov B N [1], Sobirov K S [2], Najmiddinov M M [3]

Abstract: The article presents the results of experiments on the cultivation of phytomeliorant plants in 2009-2011 in order to rationally use water resources in the Bukhara oasis with increasing water shortages, the introduction of water-saving technologies in irrigation and saline washing.

Key words: water-saving technologies, salt regime, irrigation standards, phytomeliorant plants, white sorghum, dry residue.

The problem of global climate change is on the agenda of mankind, which includes not only the average annual temperature rise on the planet, but also changes in the entire geosystem, rising global oceans, melting ice and permanent glaciers, increasing uneven rainfall, changing river flow patterns and climate instability. other changes.

Observations of the temperature dynamics regime in Uzbekistan over the past 50 years have shown that the maximum temperature growth rate was 0.22 degrees per year, and the minimum -0.36 degrees. On this basis, after 20 years, the average annual temperature in the northern part of the Republic will increase by 2-3 degrees, and in the southern part - by 1 degree. Climate change will result in 10-15% evaporation of water from water surfaces, 10-20% more water consumption due to increased plant transpiration and irrigation standards, and an average 18% increase in non-renewable water consumption. This will undoubtedly complicate the further growth of agricultural production.

This dissertation is dedicated to the rational use of water resources in the context of growing water shortages, the introduction of water-saving technologies in irrigation and saline leaching, optimization of soil water, salt, nutrients and other regimes through phytomeliorative measures to improve the reclamation of saline lands. “Strategy of actions on five priority directions of development of the Republic of Uzbekistan for 2017-2021” approved by the Decree of the President of the Republic of Uzbekistan No. PF-4947 dated February 7, 2017 and approved by the Decree No. PF-6024 of July 10, 2020. Development Concept for 2020-2030 ” to a certain extent.

In 2009-2011, the effect of white corn and moss cultivation as a phytomeliorant on soil water and salt regimes was studied in the experimental fields. In order to study the dynamics of the movement of salts in 2009-2011, the soil 0-10, 10-20, 20-30, 30-40, 40-50, 50-60, 60-70, 70-80, 80-90, 90-100 cm samples were taken and the amounts of salts (CL1, SO_4, HCO_3, dry residue) that adversely affect plant growth and development were analyzed under laboratory conditions.

After the autumn wheat harvest in 2009, field crops were harvested and irrigated to moisten the soil (1100-1150 m3 / ha). As soon as the soil matured, the field was prepared for planting and phytomeliorant plants were planted. After planting the phytomeliorative crops, general soil samples were taken from the field, and the amount of salts in the soil was determined before and after each irrigation, and at the end of the growing season, after the phytomeliorants had been harvested. When we analyzed the change in the amount of salts in the soil, at the beginning of the growing season, the chlorine content in the 0-30 cm layer was 0.015%, and in the 0-100 cm layer it was 0.012%. Increased to 0.045%, while in the 0-100 cm layer it was 0.040%. In variant 2, where white oats were grown, at the end of the growing season, the amount of chloride ions in the soil was 0.033% in the 0-30 cm layer and 0.029% in the 0-100 cm layer, 0.011-0.012% less than in the control variant. Also, in variant 3, where the mosh crop was planted, the amount of chloride ions in the soil increased by 0.020-0.21% compared to the original amount and amounted to 0.036 and 0.032%. This indicates that the harvested area was 0.008-0.009% less than the control-uncultivated field.

When analyzing changes in the amount of hydrocarbon HCO3 in the soil in scientific studies, it was observed that in the fields planted with phytomeliorant plants, its content increased by up to 50% per vegetation. In experiments conducted in 2009-2011, the amount of HCO_3 in the drive (0-30 cm) layer of soil before planting of phytomeliorant plants was 0.044%, while in the 0-100 cm layer it was 0.037%. Towards the end of the growing season, i.e. after harvesting the phytomeliorant plants, the HCO_3 content in the control variant was 0.103% in the driving (0-30 cm) layer and 0.085% in the 0-100 cm layer. Also, in variant 2, where white oats were grown, the HCO_3 content in the 0-30 cm and 0-100 cm layers was 0.077

[1] Bukhara Institute of Natural Resources Management of the National Research University of TIIAME - 32, Gazli shokh ave., Bukhara, 105009, Uzbekistan
[2] Bukhara Institute of Natural Resources Management of the National Research University of TIIAME - 32, Gazli shokh ave., Bukhara, 105009, Uzbekistan
[3] Bukhara Institute of Natural Resources Management of the National Research University of TIIAME - 32, Gazli shokh ave., Bukhara, 105009, Uzbekistan

and 0.058%, respectively, which was 0.026-0.027% lower than in the control variant. In variant 3, the amount of hydrocarbons in the soil increased by 0.034-0.029% compared to the initial result and amounted to 0.082-0.070%.

In order to determine the effect of phytomeliorant plants on the amount of dry residue in the soil during the study, the results of the study were first analyzed.

$N = 10000 * lg * [S_i / S_{adm}]^{\alpha}$ **(м^3/ha).**

In this formula, a is the free salt transfer coefficient, Si, Sadm is the salinity of the soil before saline leaching and the allowable amount, in% of weight.

In the field where scientific research was conducted in 2009-2011, saline washing was carried out in autumn and winter. During the experimental field, the highest saline leaching standards in the experimental field were observed in plowed and uncultivated control, ie in Option 1, in this variant the seasonal saline leaching rate averaged 5383 m^3/ha in 3 years and 3 saline leaching operations were carried out during the season. .

In Experiment 2, where white corn (sorghum) was planted as a phytomeliorant, the saline leaching rate was 2380 m^3/ha and 3003 m^3/ha less water was used than in the control option. In this variant, saline washing was performed 1 time. In the 3rd variant, the seasonal saline leaching rate was 3403 m^3/ha, which was 1980 m^3/ha less than in the control variant, while in the 2nd variant, white oats were used 1023 m^3/ha more. In the field, which was grown as a phytomeliorant, saline washing was carried out twice during the season.

During the study, saline washing activities lasted from the third decade of December to the last decade of January, with an interval between irrigations of 14–18 days.

On the basis of research conducted in Bukhara region on the application of phytomeliorative measures to ensure an optimal land reclamation regime, reduce water consumption in soil salinization, increase the productivity of irrigated lands, the following conclusions can be made:

According to the analysis of the effect of water-saving phytomeliorant plants on the salt regime of the soil, the chlorine ion content in the soil was initially 0.015% in the driving layer, 0.012% in the 0-100 cm layer, but by the end of the growing season, formed. These values were 0.033 and 0.029% when white corn was planted as a phytomeliorant crop, 0.036 and 0.032% when moss was planted, and 0.008-0.012% less chlorine ion was collected than the control field. The coefficient of seasonal salt accumulation was 2.3 in the field planted with white corn, 2.6 in the field planted with moss and 3.3 in the field not plowed.

According to the results of the experiment, the following can be concluded: The maximum saline leaching rate in the experimental field in the plowed control variant was 5383 m^3/ha. In the 2nd variant planted with white oats as a phytomeliorant, the seasonal saline leaching rate was 2380 m^3/ha, and in the 3rd variant planted with moss, the saline leaching rate was 3403 m^3/ha, which is 37-56% or 1980-3003 m^3/ha compared to the control variant. less water was used.

REFERENCES

1. Atamurodov, B. N., Sobirov, K. S., & Najmiddinov, M. M. (2022). BASICS OF FARMING ON SALINE AND SALINE-PRONE SOILS. *Oriental renaissance: Innovative, educational, natural and social sciences*, *2*(6), 725-730.

2. Xamidova, S. M., Juraev, U. A., & Atamurodov, B. N. (2022). EVALUATION OF THE EFFECTIVENES OF PHYTOMELIORATIVE MEASURES IN THE TREATMENT OF RECLAMATION OF SALINE SOILS. *Web of Scientist: International Scientific Research Journal*, *3*(6), 835-841.

3. Jurayev, A. K., Jurayev, U. A., Atamurodov, B. N., Sobirov, K. S., & Najmiddinov, M. M. (2022). IRRIGATION OF COTTON BY WATER-SAVING METHOD. *Oriental renaissance: Innovative, educational, natural and social sciences*, *2*(6), 718-724.

4. Atamurodov, B. N., Sobirov, K. S., & Najmiddinov, M. M. (2022). USE OF RESOURCE-EFFICIENT IRRIGATION TECHNOLOGY IN THE REPUBLIC OF UZBEKISTAN. *Science and innovation*, *1*(D2), 96-100.

5. Jurayev, A. K., Jurayev, U. A., Atamurodov, B. N., Najmiddinov, M. M., & Sobirov, K. S. (2022). EFFECTIVE USE OF WATER IN IRRIGATED AREAS. *Oriental renaissance: Innovative, educational, natural and social sciences*, *2*(6), 810-815.

6. Jurayev, A. K., Jurayev, U. A., Atamurodov, B. N., Sobirov, K. S., & Najmiddinov, M. M. (2022). GROWING TOMATOES HYDROPONICALLY IN GREENHOUSES. *Science and innovation*, *1*(D2), 87-90.

7. Atamurodov, B. N., Murodov, O. U., Najmiddinov, M. M., & Sobirov, K. S. (2022). IN IRRIGATION OF AGRICULTURAL CROPS, IRRIGATION WITH DIFFERENT QUALITY WATER. *Science and innovation*, *1*(D2), 91-95.

8. Jurayev, A. K., Jurayev, U. A., Atamurodov, B. N., Sobirov, K. S., & Najmiddinov, M. M. (2022). SOYBEANS ARE TRANSPLANTED INTO SALINE AND SALINE SOILS TO JUSTIFY THE EFFECTIVENESS OF DRIP IRRIGATION.

9. Jurayev, A. K., Jurayev, U. A., Atamurodov, B. N., Sobirov, K. S., & Najmiddinov, M. M. (2022). IRRIGATION OF GOOSE BY WATER-SAVING METHOD.
10. Jurayev, A. K., Jurayev, U. A., Atamurodov, B. N., Sobirov, K. S., & Najmiddinov, M. M. (2022). SCIENTIFIC AND PRACTICAL IMPORTANCE OF EFFICIENT USE OF WATER IN IRRIGATED LAND.
11. Jurayev, A. Q., Jurayev, U. A., Atamurodov, B. N., & Najmiddinov, M. M. (2021). Cultivation of Corn as a Repeated Crop. *European Journal of Life Safety and Stability (2660-9630)*, *10*, 49-51. Jurayev, A. Q.,
12. Jurayev, U. A., Atamurodov, B. N., & Najmiddinov, M. M. (2021). Scientific Benefits and Efficiency of Drip Irrigation. *Journal of Ethics and Diversity in International Communication*, *1*(6), 62-64.
13. Jurayev, A. Q., Jurayev, U. A., Atamurodov, B. N., & Najmiddinov, M. M. (2021). Aphorisms of Farming in the Method of Kidroponics. *International Journal of Discoveries and Innovations in Applied Sciences*, *1*(6), 133-135.
14. Jo'rayev, U. A., Jo'rayev, A. Q., & Atamurodov, B. N. (2021). Application of Provided Irrigation Technologies in Irrigated Agriculture. *International Journal of Development and Public Policy*, *1*(6), 164-166.
15. Atamurodov, B. N., Ibodov, I. N., Najmiddinov, M. M., & Najimov, D. Q. The Effectiveness of Farming in the Method of Hydroponics. *International Journal of Human Computing Studies*, *3*(4), 33-36.
16. Jurayev, A. Q., Jurayev, U. A., Atamurodov, B. N., & Najmiddinov, M. M. (2021). The Main Purpose of Drip Irrigation in Irrigation Farming and Its Propagation. *European Journal of Life Safety and Stability (2660-9630)*, *10*, 46-48.
17. Fazliev, J., Khaitova, I., Atamurodov, B., Rustamova, K., Ravshanov, U., & Sharipova, M. (2019). EFFICIENCY OF APPLYING THE WATER-SAVING IRRIGATION TECHNOLOGIES IN IRRIGATED FARMING. *Интернаука*, *21* (103 часть 3), 35.
18. Xamidova, S. M., Juraev, U. A., & Murodov, O. U. (2022). EFFECTS OF PHYTOMELIORANT PLANTS ON LAND RECLAMATION CONDITION AND SALT WASHING NORMS. *Oriental renaissance: Innovative, educational, natural and social sciences*, *2*(6), 803-809.
19. Ulugbekovich, M. O., Komiljonovna, S. M., Sobirovich, K. B., & Murodovich, M. M. (2021, March). DETERMINATION OF EFFICIENCY OF GROUNDWATER USE IN IRRIGATION OF MILLET PLANTING. In *Euro-Asia Conferences* (Vol. 3, No. 1, pp. 131-134).
20. Murodov, O. U., Teshayev, U. O., Amrulloev, O. I., & Islomov, S. U. (2021). DETERMINING THE EFFICIENCY OF THE USE OF UNDERGROUND WATER IN IRRIGATION OF TARIK. *Экономика и социум*, (3-1), 187-191.
21. Ulugbekovich, M. O., Sobirovich, K. B., & Komiljonovna, S. M. son of the Islamic Charter of Prayer.(2020). Smart irrigation of agricultural crops. Middle European Scientific Bulletin, 3, 1-3.
22. Ulugbekovich, M. O., Sobirovich, K. B., Komiljonovna, S. M., & Nizomiy ogli, I. I. (2020). Smart irrigation of agricultural crops. *Middle European Scientific Bulletin*, *3*, 1-3.
23. Khamidov, M. K., Balla, D., Hamidov, A. M., & Juraev, U. A. Using collector-drainage water in saline and arid irrigation areas for adaptation to climate change. 2020. In *IOP Conference Series: Earth and Environmental Science* (Vol. 422, No. 1, p. 012121).
24. Dagma, B., Hamidov, A., Muhammadkhon, K., & Jurayev, U. Improvement of drainage water quality through biological methods: a case study in the Bukhara region of Uzbekistan. *European Science Review.–Ausrtia Vienna.–2016.–№ September-october.(05.00. 00. № 3)*.
25. Ro'Ziyeva, M. A., & Najmiddinov, M. M. (2022). Sho'rlik darajasi turlicha bo'lgan suvning jamadon tipidagi ko'chma quyosh suv chuchiktgich qurilmasining unumdorligiga ko'rsatadigan ta'siri. *Science and Education*, *3*(4), 218-221.
26. Ruziyeva, M. A., Najmiddinov, M. M., & Sobirov, K. S. (2022). COMPARATIVE ANALYSIS OF METHODS FOR MEASURING BURNUP OF SPENT FUEL ASSEMBLIES BETI. *Oriental renaissance: Innovative, educational, natural and social sciences*, *2*(5), 385-389.
27. Саксонов, У. С. (2022). АКТУАЛЬНОСТЬ ВОДОСБЕРЕГАЮЩИХ ТЕХНОЛОГИЙ ПОЛИВА. *Scientific progress*, *3*(2), 1004-1009.
28. Жураев, А. К., & Саксонов, У. С. (2019). BUG 'DOY O 'SIMLIGINING BIOLOGIYASI HAMDA AGROTEXNIKASI. *ЖУРНАЛ АГРО ПРОЦЕССИНГ*, (6).
29. Жураев, А. К., & Саксонов, У. С. (2019). BUXORO VOHASIDA KUZGI BUG 'DOYNI SUG 'ORISH MUDDATLARI VA ME 'YORLARINI ILMIY ASOSLASH. *ЖУРНАЛ АГРО ПРОЦЕССИНГ*, (6).
30. Фазлиев, Ж. Ш., Хаитова, И. И., Атамуродов, Б. Н., Рустамова, К. Б., & Шарипова, М. С. (2019). ТОМЧИЛАТИБ СУҒОРИШ ТЕХНОЛОГИЯСИНИ БОҒЛАРДА ЖОРИЙ ҚИЛИШНИНГ САМАРАДОРЛИГИ. *Интернаука*, (21-3), 78-79.

31. Атамуродов, Б. Н., Фазлиев, Ж. Ш., & Рустамова, К. Б. (2020). ИССИҚХОНАЛАРДА ПОЛИЗ ЭКИНЛАРИ УЧУН ГИДРОПОНИКА УСУЛИ САМАРАДОРЛИГИ ВА ФОЙДАЛИ ЖИХАТЛАРИ. *ЖУРНАЛ АГРО ПРОЦЕССИНГ*, *2*(3).

32. N., Atamurodov B., et al. "The Effectiveness of Farming in the Method of Hydroponics." *International Journal of Human Computing Studies*, vol. 3, no. 4, 2021, pp. 33-36, doi:10.31149/ijhcs.v3i4.2026.

33. Rustamova, K. B., Sobirov, K. S., & Najmiddinov, M. M. (2022). BASICS OF FARMING ON STRONGLY SALINE SOILS. *Web of Scientist: International Scientific Research Journal*, *3*(6), 1902-1907.

34. Rustamova, K. B., Sobirov, K. S., & Najmiddinov, M. M. (2022). AGRICULTURE FEED CHAPTER THE BASICS OF CROP IRRIGATION. *Academicia Globe: Inderscience Research*, *3*(06), 381-386.

35. Rustamova, K. B., Sobirov, K. S., & Najmiddinov, M. M. (2022). ECONOMICAL USE OF WATER RESOURCES IN IRRIGATION IN THE REPUBLIC OF UZBEKISTAN. *Web of Scientist: International Scientific Research Journal*, *3*(6), 1860-1865.

36. Jurayev, A. K., Rustamova, K. B., Sobirov, K. S., & Najmiddinov, M. M. (2022). WATERING THE COTTON BY DRIP IRRIGATION METHOD. *Spectrum Journal of Innovation, Reforms and Development*, *4*, 605-610.

37. Jurayev, A. K., Sobirov, K. S., & Najmiddinov, M. M. (2022). HIGH AND HIGH QUALITY HARVEST FROM PET FOOD CROPS BY LASER LEVELING ON DESERT SLOPES. *Academicia Globe: Inderscience Research*, *3*(06), 387-391.

38. Jurayev, A. K., Jurayev, U. A., Atamurodov, B. N., Sobirov, K. S., & Najmiddinov, M. M. (2022). THE EFFECTIVENESS OF INTENSIVE CULTIVATION OF POTATOES IN CONDITIONS OF SALINE SOILS. *Web of Scientist: International Scientific Research Journal*, *3*(6), 1853-1859.

39. Atamurodov, B. N., & Najmiddinov, M. M. (2022). The Effectiveness of Farming in Greenhouses Drip Irrigation Method. *Journal of Intellectual Property and Human Rights*, *1*(1), 14-18.

40. Jurayev, A. K., Jurayev, U. A., Atamurodov, B. N., Sobirov, K. S., & Najmiddinov, M. M. (2022). WATERING THEIR CROPS WITH WATER OF DIFFERENT QUALITY. *Oriental renaissance: Innovative, educational, natural and social sciences*, *2*(6), 1251-1257.