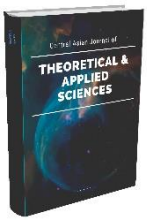

CENTRAL ASIAN JOURNAL OF THEORETICAL AND APPLIED SCIENCES

Volume: 03 Issue: 12 | Dec 2022 ISSN: 2660-5317
https://cajotas.centralasianstudies.org

Effects of Irrigation with Mineralized Waters on Plants and Soils

Mamatqulov Orifjon Odiljon o‘g‘li, Xoliqov Muxridin Baxromjon o‘g‘li
Fergana State University, Joint faculty of viticulture, fruit growing and vegetable growing
orifjonmamatqulov435@gmail.com

G`oziyev Mahamadali Anorbayevich
Dotsent, Fergana State University, Joint faculty of viticulture, fruit growing and vegetable growing

Qobulov Soxib Sherovich
Senior Teacher, Fergana State University, Joint faculty of viticulture, fruit growing and vegetable growing

Received 4th Oct 2022, Accepted 6th Nov 2022, Online 9th Dec 2022

Abstract: *At present, the country is working to improve the reclamation of soils, including the annual design and extension of drainage networks, which, as a result of such processes, increase the fertility of soils in all respects, but deeper study of them halogeochemical changes occur in soils as a result of erosion.*

Keywords: *Hungry steppe zone, Sherabad steppes, old irrigated tracts, collector-drainage, capital washing, water extract, soil alkalinity, sulfate-chloride-hydrocarbonate, mineralization, hydrogalite, halogen formation, migration coefficient, migration intensity, province.*

INTRODUCTION.

At the moment, a large, long-term program is being implemented in our country to improve soil reclamation and irrigate lands, including cotton and other agricultural lands. In addition to the implementation of these works, no matter how hard people and science fight, the soils, to be more precise, the irrigated and newly irrigated soils are constantly exposed to salinity. zone, Sherabad, and Buhoro oasis are widespread. In recent years, new types of collector-drainage systems have been further developed in these areas, including vertical drainage systems, closed and open ditch networks on the old irrigated soil cover.

Taking into account the climatic conditions of the regions in the implementation of reclamation works, the implementation of reclamation measures is considered one of the important issues of today. Currently, regardless of the implementation of any reclamation measures, there is no absolute possibility to avoid one negative feature, and that is the process of seasonal salt accumulation in the soil. But the existence of this process cannot be the reason for coming to the final conclusion that there is absolutely no possibility of increasing soil fertility. Because it is possible to achieve positive results in such areas, i.e., in the soil cover with a sharply continental climate, by carrying out comprehensive reclamation measures.

LITERATURE REVIEW.

Among the scientists working in this direction, we can cite the works of the following. UzPITI and Yuldashev G., Kruger T.P. and others determined that in the conditions of the Fergana Valley, the use of collector-drainage water in the short term is not dangerous from the point of view of the risk of the development of the salinity process, and it can be used for cotton irrigation [1-5].

As you can see, it is not about irrigation of agricultural crops, it is economically justified to use drainage and collector water as an additional source of irrigation canal water.

In addition, irrigation with mineralized water, which has been proven to cause large crop losses without additional irrigation, creates a flushing regime and annual preventive flushing.

RESEARCH RESULTS AND DISCUSSION:

Almost all salts involved in the process of soil formation are present in the soil extract. Such salts include NaCl, Na_2SO_4, $MgCl_2$, $MgSO_4$, $NaHCO_3$, Na_2CO_3, $MgCO_3$ and non-toxic $Ca(HCO_3)_2$, $CaSO_4$. Now we bring to your attention the following idea: plants contain almost all types of the above ions in their natural state. we can say that it is made on the basis of arbitrary classification as harmful or not harmful. Most of the toxic salts are considered to have high solubility and mobility in water, it is this property that determines the negative properties of salts for plants and soils. In our conditions, the main toxic (poisonous salts) salts are chloride and sulfate salts of sodium and magnesium [6-10]. Therefore, their chemistry, as well as the ratio of anions and cations, is taken into account when evaluating salinity. At this point, it should be said that the type of salinity for the soil cover of our republic is determined by N.N.Bazilevich and E.I.Pankovalar (1972).

Chloride type of salinity $Sl:SO_4$ ≥25; Sulfate-chloride $Sl:SO_4$=2.5-1.0 Sulfate $Cl:SO_4$≤0.3; Sulfate-chloride-hydrocarbonate $NSO_3:Sl>1$; $HCO_3:SO_4>1$; According to the composition of cations, the following types of salinity are distinguished: Sodium Na:Mg=2-1; Magnesium-sodium Na: Mg=2-1; Sodium-magnesium Na: Mg=1-0.5; Magnesium Na: Mg<0.5.

Currently, soil salinity is determined for a meter layer. The classification system developed by N.N. Bazilevich and E.I. Pankova is based on this model. The process of salinization in soils occurs in the non-irrigated and irrigated conditions. These depend primarily on the proximity of the groundwater level to the surface, as well as the level and quality of mineralization, movement of groundwater, etc. In connection with the above, the depth of underground water is conditionally distinguished. As a result of irrigation water in the soil, the first factor in the formation of halogeochemical properties is considered to be the upward movement of seepage water through capillary tubes. At this point, it is important to note that the maximum rise of groundwater through capillaries is characteristic of heavy and medium sandy soils. Depending on the level of mineralization of irrigation water, we can divide it into the following groups.

Fresh with mineralization up to 1 g/l; slightly mineralized with salt content - from 1 to 3 g/l; average mineralization -3-10 g/l; highly mineralized - 10-50 g / l; saline waters >50 g/l.

As a result of the strong mineralization of underground waters in the conditions of Fergana region, and the compression of water from the bottom to the top in soils with heavy mechanical composition, seepage waters lie at different depths in different periods [11-16]. For example, 1.2 m at the beginning of the growing season, IV-IX during the growing season. 1.5 m (1.3-1.6 m), 1.7 m (1.7-1.2 m) in the non-vegetation period for X-II. This was proven by experts of the UzPITI experimental station.

Of course, long-term use of such irrigation water can cause salinization of the soil. The economic efficiency of using such waters is very effective in regions with a shortage of irrigation water.

The ability to mobilize, settle, and migrate water-soluble salts in soils is called pedolithogenesis. Halogenetic processes are composed of elements with a large radius and low valency. Ions, cations, sodium, calcium, magnesium, potassium, and anions participating in halogenetic processes include chlorine, [17-20] These are mainly caused by processes such as rock erosion and technogenesis.

From the above, the most important part for us is that the development of irrigation in the deposits of the Quaternary period greatly affects the migration ability of these salts, which, in turn, changes the salt content in the deposits accordingly.

In such areas, the best way to regulate salt migration is considered to be the use of collector and drainage ditches. If such works are not put into practice, the process of secondary salinization of the soil will develop rapidly. The process of salinization in soils depends not only on the collector networks, but also on the migration coefficient of salts.

As you and I know, gypsum is a compound with low solubility in water, but its solubility increases slightly due to the influence of some migrating salts, for example, NaCl. We will be able to see it through the following reaction

$$2NaCl+CaSO_4 \rightarrow Na_2SO_4+CaCl_2$$

Vice versa, Na_2SO_4 va $MgSO_4$ if there are many sulfate salts, the solubility of gypsum decreases. We can see it in the example of the following reaction.

$$MgSO_4+SaCO_3SaSO_4 \rightarrow MgCO_3+CaSO_4$$

The amount and quality of salts play a key role in the occurrence of halogenation of salts in soils distributed in arid regions. In such areas, salts, chlorides and sulfates accumulate in underground water. Geochemical zonal provinces are formed as a result of evaporation in soils [21-25]. According to the calcification of such provinces, accumulation of gypsum, sodium chloride, magnesium, salt occurs, where nitrates and nitrites can accumulate at the last stage. The solubility and value of soil salts is constant, depending on a number of soil and water factors, this characteristic can change due to the influence of salt concentration in solution and dissolved gases, partial pressure of CO_2, etc. If we consider temperature as the main factor, we can see the change of solubility as below. That is, we can arrange the solubility of salts at 20^0 C as follows in descending order.

1. $Mg(NO_3)_2$, $NaNO_2$, $CaCl_2$, $MgCl_2$, NaCl, $MgSO_4$; 2. Na_2CO_3, Na_2SO_4, $NaHCO_3$; 3. $Mg(HCO_3)_2$, $Ca(HCO_3)_2$, $CaSO_4$.

The salts of the first group show the highest solubility (at 20^0 C), while the salts of the second group have a lower solubility than those of the first group and are more sensitive to temperature increase [26-30].

CONCLUSION.

1. It has not been fully proven that all the salts present in the soil are harmful to plants, so it is necessary to divide the salts into harmful and non-harmful groups for plants and create a classification for each agricultural crop. and it is necessary to improve the creation of new methods in their scientific justification.

2. Taking into account the climatic conditions of the region when developing irrigation norms and periods, in addition, increasing and developing the irrigation process on soils formed from Quaternary deposits will disrupt the migration coefficient of normal salts in them and cause secondary re-salination.

LIST OF REFERENCES

1. Кузиев Р.К., Сектименко В.Е. Почвы Узбекистана. Т. “EXTREMUM PRESS”. 2009.

2. Кузиев Р.К., Абдурахмонов Н.Ю. Суғориладиган тупроқларнинг эволюцияси ва унумдорлиги. Т. 2015.
3. Darmonov D.Y., “Minerallangan suvlar bilan sug‘orilgan saz tuproqlarda bug‘doy xususiyatlarining o‘zgarishi” doktorlik disertatsiyasi Farg`ona 2020.
4. Mamatkulov O. O., Numanov J. O. Recycling of the Curve Planning in Gat Technology (Auto Cad) Program //Middle European Scientific Bulletin. – 2021. – Т. 18. – С. 418-423.
5. Mamatqulov O., Qobilov S., Yokubov S. FARG ‘ONA VILOYATINING TUPROQ QOPLAMIDA DORIVOR ZAFARON O ‘SIMLIGINI YETISHTRISH //Science and innovation. – 2022. – Т. 1. – №. D7. – С. 240-244.
6. Mamatqulov O., Qobilov S., Abdullaaxatov A. FARG ‘ONA VILOYATI SHAROITIDA TOK KASALLIKLARIGA QARSHI KURASHISH //Science and innovation. – 2022. – Т. 1. – №. D6. – С. 307-311.
7. Xayitmurotovich K. I., Qizi M. G. M., Odiljon O'g'li M. O. Root System Development And Its Activity //The American Journal of Engineering and Technology. – 2021. – Т. 3. – №. 03. – С. 65-69.
8. Sodiqova Z. T. et al. DANAKLI MEVA KASALLIKLARIGA QARSHI KURASHISH YO‘LLARI //INTERNATIONAL CONFERENCES ON LEARNING AND TEACHING. – 2022. – Т. 1. – №. 8. – С. 240-244.
9. Idrisov X. A. et al. Nurmatov UO Mamatkulov OO Rasulov A.. Asqarov H. Results of analytical study of growth, development and grain yield of mung bean (Phaseo1is aireis Piper) varieties //INTERNATIONAL JOURNAL OF SPECIAL EDUCATION, SCOPUS. – Т. 37. – №. 3. – С. 2022.8880-8886.
10. N. Sotvoldiev, O. Mamatqulov, Z. Sodiqova ИПАК ҚУРТИ БОҚИШДА ИНФЕКЦИОН КАСАЛЛИКЛАРНИ ОЛДИНИ ОЛИШ ТАДБИРЛАРИ // SAI. 2022. №D8. URL: https://cyberleninka.ru/article/n/ipak-urti-bo-ishda-infektsion-kasalliklarni-oldini-olish-tadbirlari (дата обращения: 07.12.2022).
11. Газиев М. А. и др. Роль органических и минеральных удобрений в развитии физиологических групп микроорганизмов в системе севооборота //Современные фундаментальные и прикладные исследования. – 2019. – №. 2. – С. 9-12.
12. Газиев М. А., Турдалиев А. Т., Тухтасинов М. Р. Пути восстановлении биоценоза типичных сильно-зараженных вилтом сероземов //Современные научные исследования и разработки. – 2018. – №. 6. – С. 168-171.
13. Закирова С., Газиев М. ВЛИЯНИЕ ПРИМЕНЕНИЯ ОРГАНИЧЕСКИХ И МИНЕРАЛЬНЫХ УДОБРЕНИЙ НА АГРОХИМИЧЕСКИЕ СВОЙСТВА СПЛАНИРОВАННЫХ БУГРИСТО-БАРХАНИСТЫХ ПЕСКОВ //Известия ВУЗов (Кыргызстан). – 2010. – №. 6. – С. 175-176.
14. Sobirov A., Gaziev M., Gulomova G. THE USE OF THE MEDICINAL PLANT OF THE LEONURUS L. AND ITS AGROTECHNOLOGY OF GROWING //Конференции. – 2021.
15. Газиев М. А. и др. ЭКОЛОГИЧЕСКИЕ СРЕДСТВА ЗАЩИТЫ ХЛОПЧАТНИКА ОТ ЗАБОЛЕВАНИЯ ВИЛТОМ //Известия. – 2008. – №. 1. – С. 84.
16. Mamatqulov, Orifjon Odiljon O‘g‘li, Muqimov, Sardor Abdusattor O‘g‘li BATAT O‘SIMLIGI BIOLOGIYASI VA AGROTEXNIKASI // ORIENSS. 2022. №10. URL:

https://cyberleninka.ru/article/n/batat-o-simligi-biologiyasi-va-agrotexnikasi (дата обращения: 07.12.2022).

17. Davronov Q. A., Xoliqov M. B. O. G. L. KUZGI BUG‘DOY NAVLARINI SAQLASH DAVRIDA URUG ‘LIK NAMLIGINI UNUVCHANLIGIGA TA’SIRINI O‘RGANISH //Oriental renaissance: Innovative, educational, natural and social sciences. – 2022. – Т. 2. – №. 10. – С. 1318-1325.
18. Idrisov X., Matholiqov R., Xoliqov M. KUZGI BUG‘DOYDAN KEYIN EKILGAN MOSH NAVLARINING SIMBIOTIK FAOLIYATINI O’RGANISH //O'rta Osiyo ta'lim va innovatsiyalar jurnali. – 2022. – Т. 1. – №. 2. – С. 51-56.
19. Маматожиев, Ш. И., Тожимаматов, Д. Д. У., Камолов, З. В. У., & Холиқов, М. Б. У. (2020). ФАКТОРЫ, ВЛИЯЮЩИЕ НА ПРОЦЕССЫ ХРАНЕНИЯ ЗЕРНА И НА ПОКАЗАТЕЛИ КАЧЕСТВА. *Universum: технические науки*, (12-4 (81)), 75-78.
20. Turdimatova Z., Mirzayeva M. A. THE EFFECT OF GRAIN STORAGE METHOD ON THE PRODUCTION OF QUALITY PRODUCTS //Academicia Globe: Inderscience Research. – 2022. – Т. 3. – №. 04. – С. 311-314.
21. Маматожиев Шарип Икромович, Тожимаматов Дилёр Дилмурод Угли, Камолов Зиёдулло Валижон Угли, Холиқов Мухридин Бахромжон Угли ПРЕИМУЩЕСТВА НОВОЙ СИСТЕМЫ ПРИ ПРИЕМКЕ ЗЕРНА // Universum: технические науки. 2020. №12-2 (81). URL: https://cyberleninka.ru/article/n/preimuschestva-novoy-sistemy-pri-priemke-zerna (дата обращения: 03.12.2022).
22. https://www.indianjournals.com/ijor.aspx?target=ijor:aca&volume=11&issue=5&article=069
23. Arabboevna A. M., Shavkat o‘g‘li Y. S. The Use of Geoinformation Systems in the Study of the Land Fund of Household and Dekhkan Farms //Texas Journal of Multidisciplinary Studies. – 2022. – Т. 8. – С. 163-164.
24. Alakhanov Z. M. et al. THE STATE CADASTRE FOR THE REGULATION OF INFORMATION RESOURCES FOR THE FORMATION AND IMPROVEMENT //Educational Research in Universal Sciences. – 2022. – Т. 1. – №. 1. – С. 47-53.
25. Mavlyankulova S. Z. et al. THE ESSENCE OF CARTOGRAPHIC MAPS IS THAT THEY ARE USED FOR CARTOGRAPHIC DESCRIPTION OF THE TERRAIN. GENERALIZING WORKS IN THE PREPARATION OF MAPS //RESEARCH AND EDUCATION. – 2022. – Т. 1. – №. 4. – С. 27-33.
26. qizi Olimova D. S. et al. THEORETICAL BASIS FOR THE USE OF MODERN GIS TECHNOLOGIES IN THE CREATION OF NATURAL CARDS //RESEARCH AND EDUCATION. – 2022. – Т. 1. – №. 4. – С. 4-10.
27. Mukhriddinkhonovich A. Z. Actual Issues of Design of Small Towns in Uzbekistan //Central Asian Journal of Theoretical and Applied Science. – 2022. – Т. 3. – №. 6. – С. 576-580.
28. Мадумаров Б. Б., Манопов Х. В. НАЧАЛО РАБОТЫ С ARCGIS. ARCMAP //Central Asian Journal of Theoretical and Applied Science. – 2022. – Т. 3. – №. 6. – С. 325-333.
29. Valievich M. H. Measurement Of Sediments Of Industrial And Civil Buildings And Structures By High-Precision And Accurate Levelling Of Short Rays //The American Journal of Engineering and Technology. – 2021. – Т. 3. – №. 05. – С. 65-71.