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«ҚАЗАҚСТАН РЕСПУБЛИКАСЫ
ҰЛТТЫҚ ҒЫЛЫМ АКАДЕМИЯСЫ» РҚБ
«ХАЛЫҚ» ЖҚ

ХАБАРЛАРЫ

ИЗВЕСТИЯ

РОО «НАЦИОНАЛЬНОЙ
АКАДЕМИИ НАУК РЕСПУБЛИКИ
КАЗАХСТАН»
ЧФ «Халық»

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NAS RK is pleased to announce that News of NAS RK. Series of geology and technical sciences scientific journal has been accepted for indexing in the Emerging Sources Citation Index, a new edition of Web of Science. Content in this index is under consideration by Clarivate Analytics to be accepted in the Science Citation Index Expanded, the Social Sciences Citation Index, and the Arts & Humanities Citation Index. The quality and depth of content Web of Science offers to researchers, authors, publishers, and institutions sets it apart from other research databases. The inclusion of News of NAS RK. Series of geology and technical sciences in the Emerging Sources Citation Index demonstrates our dedication to providing the most relevant and influential content of geology and engineering sciences to our community.

Қазақстан Республикасы Ұлттық ғылым академиясы «ҚР ҰҒА Хабарлары. Геология және техникалық ғылымдар сериясы» ғылыми журналының Web of Science-тің жаңаланған нұсқасы Emerging Sources Citation Index-те индекстелуге қабылданғанын хабарлайды. Бұл индекстелу барысында Clarivate Analytics компаниясы журналды одан әрі the Science Citation Index Expanded, the Social Sciences Citation Index және the Arts & Humanities Citation Index-ке қабылдау мәселесін қарастыруда. Webof Science зерттеушілер, авторлар, баспашылар мен мекемелерге контент тереңдігі мен сапасын ұсынады. ҚР ҰҒА Хабарлары. Геология және техникалық ғылымдар сериясы Emerging Sources Citation Index-ке енуі біздің қоғамдастық үшін ең өзекті және беделді геология және техникалық ғылымдар бойынша контентке адалдығымызды білдіреді.

НАН РК сообщает, что научный журнал «Известия НАН РК. Серия геологии и технических наук» был принят для индексирования в Emerging Sources Citation Index, обновленной версии Web of Science. Содержание в этом индексировании находится в стадии рассмотрения компанией Clarivate Analytics для дальнейшего принятия журнала в the Science Citation Index Expanded, the Social Sciences Citation Index и the Arts & Humanities Citation Index. Web of Science предлагает качество и глубину контента для исследователей, авторов, издателей и учреждений. Включение Известия НАН РК. Серия геологии и технических наук в Emerging Sources Citation Index демонстрирует нашу приверженность к наиболее актуальному и влиятельному контенту по геологии и техническим наукам для нашего сообщества.

ЧФ «ХАЛЫҚ»

В 2016 году для развития и улучшения качества жизни казахстанцев был создан частный Благотворительный фонд «Халык». За годы своей деятельности на реализацию благотворительных проектов в областях образования и науки, социальной защиты, культуры, здравоохранения и спорта, Фонд выделил более 45 миллиардов тенге.

Особое внимание Благотворительный фонд «Халык» уделяет образовательным программам, считая это направление одним из ключевых в своей деятельности. Оказывая поддержку отечественному образованию, Фонд вносит свой посильный вклад в развитие качественного образования в Казахстане. Тем самым способствуя росту числа людей, способных менять жизнь в стране к лучшему – профессионалов в различных сферах, потенциальных лидеров и «великих умов». Одной из значимых инициатив фонда «Халык» в образовательной сфере стал проект Ozgeris powered by Halyk Fund – первый в стране бизнес-инкубатор для учащихся 9-11 классов, который помогает развивать необходимые в современном мире предпринимательские навыки. Так, на содействие малому бизнесу школьников было выделено более 200 грантов. Для поддержки талантливых и мотивированных детей Фонд неоднократно выделял гранты на обучение в Международной школе «Мирас» и в Astana IT University, а также помог казахстанским школьникам принять участие в престижном конкурсе «USTEM Robotics» в США. Авторские работы в рамках проекта «Тәлімгер», которому Фонд оказал поддержку, легли в основу учебной программы, учебников и учебно-методических книг по предмету «Основы предпринимательства и бизнеса», преподаваемого в 10-11 классах казахстанских школ и колледжей.

Помимо помощи школьникам, учащимся колледжей и студентам Фонд считает важным внести свой вклад в повышение квалификации педагогов, совершенствование их знаний и навыков, поскольку именно они являются проводниками знаний будущих поколений казахстанцев. При поддержке Фонда «Халык» в южной столице был организован ежегодный городской конкурс педагогов «Almaty Digital Ustaz.

Важной инициативой стал реализуемый проект по обучению основам финансовой грамотности преподавателей из восьми областей Казахстана, что должно оказать существенное влияние на воспитание финансовой грамотности и предпринимательского мышления у нового поколения граждан страны.

Необходимую помощь Фонд «Халык» оказывает и тем, кто особенно остро в ней нуждается. В рамках социальной защиты населения активно проводится

работа по поддержке детей, оставшихся без родителей, детей и взрослых из социально уязвимых слоев населения, людей с ограниченными возможностями, а также обеспечению нуждающихся социальным жильем, строительству социально важных объектов, таких как детские сады, детские площадки и физкультурно-оздоровительные комплексы.

В копилку добрых дел Фонда «Халык» можно добавить оказание помощи детскому спорту, куда относится поддержка в развитии детского футбола и карате в нашей стране. Жизненно важную помощь Благотворительный фонд «Халык» оказал нашим соотечественникам во время недавней пандемии COVID-19. Тогда, в разгар тяжелой борьбы с коронавирусной инфекцией Фонд выделил свыше 11 миллиардов тенге на приобретение необходимого медицинского оборудования и дорогостоящих медицинских препаратов, автомобилей скорой медицинской помощи и средств защиты, адресную материальную помощь социально уязвимым слоям населения и денежные выплаты медицинским работникам.

В 2023 году наряду с другими проектами, нацеленными на повышение благосостояния казахстанских граждан Фонд решил уделить особое внимание науке, поскольку она является частью общественной культуры, а уровень ее развития определяет уровень развития государства.

Поддержка Фондом выпуска журналов Национальной Академии наук Республики Казахстан, которые входят в международные фонды Scopus и Wos и в которых публикуются статьи отечественных ученых, докторантов и магистрантов, а также научных сотрудников высших учебных заведений и научно-исследовательских институтов нашей страны является не менее значимым вкладом Фонда в развитие казахстанского общества.

С уважением,
Благотворительный Фонд «Халык»!

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USE OF *FABACEAE* PLANTS AS A PHYTOMELIORANT IN SALINATED LANDS AND STUDY OF THE TRANSLOCATION COEFFICIENT

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Abstract. The amount of land used for agricultural and industrial purposes for a long time is increasing every year. In this regard, the return of agrophytocenoses to the agricultural circulation with the help of methods that create conditions for the normal functioning of degraded ecosystems, including the use of biological methods, is one of the important measures. In the article, in the case of the South Kazakhstan region, one of the urgent problems is to improve the structure of the soil by using phytomelioration methods in the lands subjected to degradation, that is, to the process of re-salination. In this regard, the results of research on the ecological conditions of rice fields belonging to the settlements of Nurtas, Zhanakorgan district, Karatobe, Turkestan region, which have been used for agricultural purposes for many years and have fallen out of circulation, justify the importance of carrying out necessary reclamation activities. The possibility of restoring the soil of the areas subjected to the re-salination process with the help of phyto-ameliorants is provided for determining the main salt ions in the soil samples, the level of changes in the structure of degraded lands, assessing the condition of phytoremediation, analyzing the population of plants grown in re-salinated soils, calculating the biological absorption coefficient of soils.

Keywords: phytoremediation, soil absorption capacity, phytomeliorants, translocation coefficient, salt ions, degradation, agrophytocenosis, degree of salinization, re-salinization

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FABACEAE ТҰҚЫМДАСЫ ӨСІМДІКТЕРІН ТҰЗДАНҒАН ЖЕРЛЕРГЕ ФИТОМЕЛИОРАНТ РЕТІНДЕ ҚОЛДАНУ ЖӘНЕ ТРАНСЛОКАЦИЯ КОЭФФИЦИЕНТІН ЗЕРТТЕУ

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Аннотация. Ауылшаруашылық, өндірістік мақсатта ұзақ уақыт пайдаланылған жерлердің көлемі жыл сайын артып отыр. Осыған орай деградацияға ұшыраған экожүйелердің қалыпты функция атқаруына жағдай жасайтын әдістер көмегімен, соның ішінде биологиялық әдістерді пайдалану арқылы агрофитоценоздарды ауылшаруашылық айналымына қайтару маңызды іс-шаралардың қатарына жатады. Мақалада Оңтүстік Қазақстан өңірі жағдайында деградацияға, яғни қайтара тұздану үдерісіне ұшыраған жерлерді фитомелиорациялық әдістерді қолдану арқылы топырақтың құрылымын жақсарту заманның өзекті мәселелерінің бірі болып табылады. Осы орайда ұзақ жылдар бойы ауылшаруашылық мақсатында қолданылып, айналымнан шығып қалған Түркістан облысына қарасты Нұртас, Жаңақорған ауданы Қаратөбе елді-мекендеріне тиесілі күріш егістік алқаптарының экологиялық жағдайларына зерттеу жүргізу, тұздану дәрежесін анықтау жұмыстарының нәтижелері қажетті мелиорациялық іс-шаралар жүргізілуінің маңыздылығын негіздейді. Топырақ үлгілеріндегі негізгі тұз иондарын, деградацияға ұшыраған жерлердің құрылымының өзгеру деңгейін анықтау, фитомелиорациялық жағдайына баға беру, қайтара тұзданған топырақтарда өсірілген өсімдіктер популяциясына талдау жасау, топырақтардың биологиялық сіңіру коэффициентін есептеу бойынша қайтара тұздану үдерісіне ұшыраған аймақтардың топырақ жамылғысын фитомелиоранттардың көмегімен қайта қалпына келу мүмкіндігі қарастырылған.

Түйін сөздер: фитомелиорация, топырақтың сіңіру қабілеті, фитомелиоранттар, транслокация коэффиценті, тұз иондары, деградация, агрофитоценоз, тұздану дәрежесі, қайтара тұздану

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ИСПОЛЬЗОВАНИЕ РАСТЕНИЙ СЕМЕЙСТВА *FABACEAE* КАК ФИТОМЕЛИОРАНТА НА ЗАСОЛЕННЫХ ЗЕМЛЯХ И ИЗУЧЕНИЕ КОЭФФИЦИЕНТА ТРАНСЛОКАЦИИ

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Аннотация. С каждым годом увеличивается объем земель, давно используемых в сельскохозяйственных, промышленных целях. В этой связи одним из важных мероприятий является возвращение агрофитоценозов в сельскохозяйственный оборот с помощью методов, создающих условия для нормального функционирования деградированных экосистем, в том числе с использованием биологических методов. В статье отмечается, что в условиях Южно-Казахстанского региона одной из актуальных проблем современности является улучшение структуры почв путем применения фитомелиоративных методов на участках, подверженных деградации, т. е. повторному засолению. В этой связи результаты работ по изучению экологических условий посевных площадей риса, относящихся к населенным пунктам Нуртас, Туркестанской области, Каратобе, Янykурганского района, применявшихся в сельскохозяйственных целях на протяжении многих лет, определение степени засоления обосновывают важность проведения необходимых мелиоративных мероприятий. По определению основных ионов солей в образцах почв, степени изменения структуры деградированных земель, оценке фитомелиоративного состояния, анализу популяций растений, выращенных на повторно засоленных почвах, расчету коэффициента биологического поглощения почв предусмотрена возможность восстановления почвенного покрова зон, подвергшихся процессу повторнго засоления, с помощью фитомелиорантов.

Ключевые слова: фитомелиорация, поглотительная способность почвы, фитомелиоранты, коэффициент транслокации, ионы солей, деградация, агрофитоценоз, степень солености, вторичное засоление

Introduction

Ecological problems of soil cover of arid territory of Kazakhstan and ways of their solution are defined. The state of the soil cover of the territory of Kazakhstan is affected by modern environmental problems caused by anthropogenic overload and irrational use of natural resources.

In the last decade there has been a significant deterioration of natural resources of agriculture. In particular, the intensive process of desertification and salinization of lands creates extremely unfavorable conditions for agriculture. The use of such soils in agriculture becomes possible after complex and expensive reclamation or when growing phytomeliorant plants in them, when selecting agrophytocenoses with high salt tolerance (Saparov et al., 2018).

The processes of soil formation and development coincide with the accumulation of nitrogen and ash nutrients by plants. And accumulation of plant nutrients in the soil is closely related to their absorption capacity.

The efficiency of application of fertilizers, ameliorants and pesticides during intensive farming is closely related to their absorption capacity. Sandy soil with low mechanical composition may not be able to absorb part of the fertilizers and pesticides applied to it. Thus, they create conditions for environmental and groundwater population.

Physical absorption capacity of soil provides soil absorption of gases, organic compounds, pesticides and contributes to increase of its pure-protective activity. Clay-composite compounds formed during chemical absorption contribute to improving the appearance of the soil structure, thus improving its physical properties (Shorin et al., 2020).

Soil-forming rocks and soils include primary and secondary minerals. Primary minerals, forming igneous rocks, are incorporated into loose rocks and soils as material left over from the destruction of primary igneous rocks. Secondary minerals are re-formed from primary minerals under the influence of bioclimatic conditions. Clayey, humus-rich soils can be fertilized with nutrients (e.g., superphosphate) in the amount necessary for plants, since in their excess they will not harm plants by being absorbed into the soil and will not be washed out by the soil water. But it should be noted that nitrate should not be used in large quantities because it is poorly assimilated even in clay soils. That is why in practice it should be applied to the surface layer of soil in two parts: the first time — when sowing seeds, and the second time — when the plants are really well developed and grown (Tazabekov et al., 2019). Saline soils are characterized by low fertility and low humus content (sometimes solonchaks are formed by salinization of high humus meadow soil, then the amount of humus reaches 5 %), high concentration of soil solution, presence of crust layer. Reaction of saline soil environment can be neutral, alkaline and acidic. Alkaline soils with high density, low water permeability, poor composition of microflora are especially unfavorable for plants (Pestov, 2004).

The process of soil formation and development coincides with the accumulation of nitrogen and ash nutrients by plants. And the accumulation of plant nutrients in soil is closely related to their absorption capacity **(**Motuzova, 2013).

The absorption capacity of soils varies from soil to soil and is often due to the presence of very fine particles. The fine particles that enhance the absorptive capacity of such a soil are called colloidal particles. The size of colloidal particles is less than 0.001 millimeter. Formation of colloidal particles in nature occurs in the following way: the first way is formed by decomposition of rocks, the second way is formed by decomposition of organic substances. Absorption capacity of soil is closely related to the accumulation of nutrients necessary for plants in the soil (Kabysheva, 2013).

Halophytes prevent salts from rising to the surface by evaporation. The effect of green cover is 2.5 tons/ha of salts. As a result, in the area of halophyte planting, salt removal from soil reaches 10–12.5 tons per year. Many scientists have conducted reclamation works on soil desalinization for 4–5 years in moderately saline areas, 6–7 years in highly saline areas (Mamyshov, 2011; Kenzhegulova, 2016).

Soils of the territory of South Kazakhstan are represented by ordinary gray clays and loams. The climate of this region of Kazakhstan is continental-dry, so farming is possible only under irrigation. Humus content in gray soils of such desert territories is 1–2 %. Since absorption capacity of soil varies from soil to soil, absorption capacity of soils of the Southern Territory is worse than that of loamy soils (Table-1).

Table 1 - Absorbing properties of soils (according to K.K. Gedroyts)

Soil	Absorpposition mg – eq/100g soil	Absorbable cations
Shiny Purple	10–30	Ca, H > mg
Wooded Gray Soil	20–40	As Mg H > >
Karatoprak	40–60	As Mg >
Chestnuts	15–30	Ca Mg Na > >
Purple	10–20	Mg, N.C. >
Red toupee	10–18	HMg Ca > >

Soil does not absorb all substances equally well. For example, nitrate, which is very valuable for plants, is poorly absorbed and therefore easily leached from the soil compared to other substances. In addition, not all soils have the same absorption capacity. Soils rich in clay particles and humus absorb various substances well. Nutrients are firmly retained in such soils, so they are not leached out. In such soils, if they are not saline, the strength of water solution is the same, and this is very important for plant nutrition (Zhamalbekov, 2004).

The properties of sandy soils are completely different. There are few clay particles and humus in them, absorption capacity is insignificant, nutrients are easily washed away by water and disappear without a trace for plants.

At the onset of drought and increase in the concentration of soil solution sandy soil can not absorb excess salts. Therefore, if the soil is fertilized with water-soluble substances, plants may die: they will burn. In this regard, the strength of soil solution is particularly high, and in order not to lose nutrients unnecessarily, sandy soils are fertilized little by little, several times.

Along with clay particles and humus, microorganisms living in the soil play an important role in the absorption capacity of the soil. Multiplying in the soil, they take nitrogen, phosphorus, potassium, calcium, etc. from the soil solution to form their bodies. absorbs various nutrients. After death, the bodies of microorganisms rot, and the absorbed substances return to the soil, soil solution and can be used by plants (Otarov et al., 2007).

According to the above data, it is ecologically and economically advantageous to plant plants that do not require large amounts of fertilizers (herbaceous fodder plants and cultivated crops) in soils of South-Kazakhstan region, which are considered to be low-humus soils.

One suggestion to increase agricultural production with the least impact on the natural ecosystem is to utilize saline land for agricultural purposes. There are several options for increasing productivity to a higher level. First, natural salt tolerant species (phytomeliorants) can be used as crops. Second, crop yields can be improved by using traditional breeding techniques to produce high yields in saline areas. Third, techniques such as marker-assisted selection or genetic engineering can be used to develop salt-tolerant crop varieties, with a focus on legumes. Either of these approaches can increase food production without the need to convert large (natural) areas into agricultural fields; instead, areas abandoned due to increased salinity can be reused (Bas Bruning et al., 2015).

Research methods

As an object of scientific research were taken the lands used for many years for agricultural purposes in Nurtas settlement of Turkestan region and degraded lands of rice field located in Karatobe settlement of Zhanakorgan district of Kyzylorda region.

To consider ways to improve soils by biological methods, including the determination of plant activity. In the research: photocolorimetric, argentometric, titration, potentiometric methods of determination of basic salts in soil. KFK-3, laboratory ionometer apparatuses I–160 MI were used. Research work on determination of cations and anions in the composition of plants was carried out in a water extract obtained by the Ginzburg method.

Analysis and results

Before planting the study plants, the water extract of the soil samples taken for the study was analyzed (Table 2).

The analysis was carried out on the following characteristics:

1) concentration of sulfates, hydrocarbons and carbonates, calcium and magnesium chlorides;

2) concentration of nitrogen-containing ions by photocolorimetry;

3) amount of humus in the soil;

4) total degree of salinity;

5) moisture index;

6) pH of the medium.

According to the results of the analysis in the soil of Nurtas settlement increased content of salt elements was detected. The amount of chlorine, nitrate, ammonium

and calcium ions in the soil of Nurtas settlement was slightly higher than in Karatobe settlement. Nitrate in the soil of Nurtas settlement - 169 mg/dm3, ammonium - 6.081 mg/dm3, calcium - 572.6 mg/dm3, magnesium - 300 mg/dm3, magnesium - 123 mg/dm3, ammonium - 5034 mg in the soil of Karatobe settlement, nitrite - 0.248 mg/dm3. The amount of these ions in the soil is higher than normal. According to the results of the analysis carbonate ions in the soil were not found.

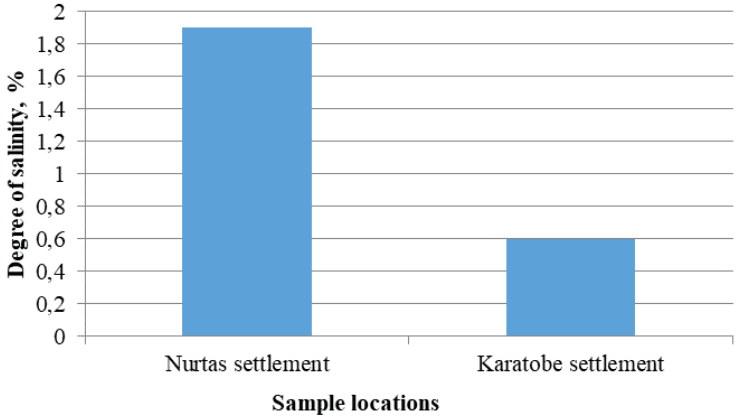
Table 2 - Results of laboratoryanalysis of soil samples on aqueous table

Salt ions, mg/dm^3	Nurtas settlement of Turkestan district	Karatobe settlement of Zhanakorgan district	MPC by volume in water insulator, mg/dm^3
Cl^-	244,71	75,3	350
SO^-_4	0,629	2,602	500
NO^-_2	0,18	0,248	0,1
NO^-_3	169	30,93	45
NH^-_4	6,081	5,034	2,5
CO^-_3	-	-	100
HCO^-_3	305	305	1000
Ca^{2+}	572,6	157	200
Mg^+	300	123	100

High content of cations and anions in saline ordinary gray soils is observed in South Kazakhstan oblast. All micro- and macroelements in soil are necessary for plant growth. If necessary elements in the soil are not enough or they are increased, it will negatively affect plants. There is a significant difference in the composition of soils of Nurtas and Karatobe settlements. When studying Nurtas soils, phytoremediation works were carried out on Karatobe soils, which were compared. Therefore, it is very important to improve the chemical and physical composition of saline soils of Nurtas, which are out of agricultural turnover.

The degree of soil salinity was determined before planting plants on the studied soils (Fig. 1).

Figure 1. Degree of desalination of soil samples of objects under study



Basically, saline soils are understood as the content in soil of 0.25 % and more mineral salts harmful to agricultural plants.

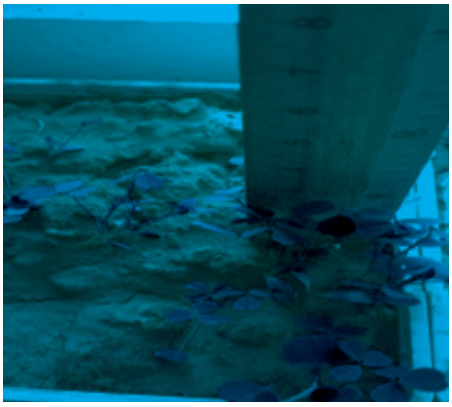
It is established that salt content in the studied objects exceeds 0.25 %. Thus, the degree of salinization of Nurtas settlement is 1.9 %, highly saline soil, and the degree of salinization of Karatobe is referred to 0.6%-moderately saline soil.

Control plants were grown under laboratory and field conditions (Fig. 2,3).

Plants were planted in soils in two proportions. In the variant with the addition of manure to the initial soil in the ratio of 1:1.

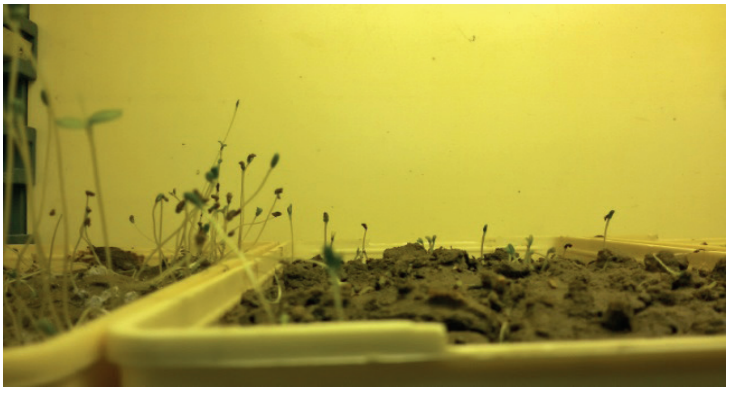
Plants were planted in bottomless wooden boxes of 100x50x100 cm in field conditions, on gray soil of the studied objects in natural conditions. The experiment was repeated 3 times. Analyses were carried out to determine the humus content of the study sites, as a result, the humus content in the soil of Nurtas settlement was 0.6 %, Karatobe - 1.04 %.

Figure-2. Plants grown in the laboratory: a, b - Karatobe; c - plants planted in soil samples taken from Nurtas settlement



a)

b)



c)

Germination energy and yield of plants grown in laboratory conditions were monitored (Table 3).

It is very important to analyze the suitability of seeds of the studied herbaceous plants, i.e. germination energy and productivity. This is the proof of obtaining a quality product.

Figure-3. Plants grown under valley conditions: a - Karatobe; b, c - plants planted on the soil of Nurtas settlement

a)

b)

c)

Table-3. Germination energy and seed yield of observed herbaceous plants

Name of crops	Productivity, %	Germination energy
Melilotus	95,5	4
Trifolium repens	94,85	4
Medicago sativa	96,1	3

The content of cations absorbed by the soil and their ratio can be regulated by fertilizers and ameliorants. For example, gypsum should be used to displace absorbed sodium cations from saline soil composition causing alkaline reaction. Here calcium cations replacing sodium create favorable conditions for plant growth.

Thus, in accordance with the data obtained when considering the absorption complex of soils, the gray soils of the studied regions were analyzed. In this regard, by planting plants on these soils, ways to reduce the amount of salt ions and improve soil structure were considered. Therefore, this study is based on the biological absorption complex.

When considering the soil absorptive complex, it is necessary to consider the translocation coefficient, which is important for plant growth and development.

Living organisms selectively absorb and accumulate some chemical elements.

Therefore, the mineral part of the studied soils and plants and its ash content were studied. Most of the elements in ash differ from the average composition of elements in the earth crust, because plants selectively absorb elements. The intensity of uptake is characterized by the ratio of the amounts of elements in plant ash and soil. Such a proposal was named the biological absorption coefficient with an index by B.B. Polynov and A.I. Perelman. Intensity of biological absorption coefficient is calculated in % in percent:

$$A_x = \frac{lx}{nx} \times 100,$$

Here is the amount of elements in the plant ash, – the $l_x n_x$ content of elements in the litosphere as part of the soil in which the plant was grown.

For the purpose of the study, in determining the proportion of coefficient of ions and elements contained in the soil samples taken for the study, the leaves, roots, saps of the plantswere identified together.

Biological absorption of substances in soil solution is indicated by the absorption of plant roots and soil biotas, The biological absorption process changes the composition and concentration of the solution in the soil and affects many sorb balances formed in the soil.

It is important to switch on nitrogen fertilizers for biological absorpnation and replenishment of necessary substances. This is because many nitrogen compounds are absorbed by peat microorganisms, In the calculation of the biological absorpnation coefficient, the effect of substances containing manure added to the soil as fertilizers was also taken into account (Table 4).

Table 4 - Classification of composition depending on the preservation of manure, % (according to Polynov B.B.)

Substances containing manure	New manure	2 months of stored manure	4 months of stored manure	Manure stored for 5 - 8 months
Water	72,0	75,5	74,0	68,0
Organic synthesis	24,5	19,5	18,0	17,5
Total Nitrogen	0,59	0,60	0,66	0,72
Protein nitrogen	0,33	0,45	0,54	0,68
Ammonia nitrogen	0,15	0,12	0,10	0,05
Phosphorus	0,31	0,38	0,43	0,48
Potassium	0,60	0,64	0,72	0,84

Analysis of the composition of herbal plantswas carried out, the results of which are given in tables 5,6.

Table 5 - Results of the analysis of the chemical composition of plants growing in soils not connected to manure (mg/dm^3 by water compression)

Where a sample was taken	Plant Name	Salt ions, mg/dm^3					
		Mg^{2+}	NH_4^+	Ca^{2+}	NO_3^-	NO_2	SO_4^{2-}
Nurtas Settlement	Samosa	143	0,42	290,5	0,04	0,051	0,189
	Common alfalf	165	3,998	290,5	0,065	0,71	0,299
	White bed	138	2,052	290,5	0,092	0,05	0,18
	Tracking soil template	300	5,034	574,6	169	0,18	0,629

Karatobe Settlement	Samosa	75	2,823	89,5	0,04	0,041	0,52
	Common alfalf	75	2,995	90,2	0,032	0,008	0,621
	White bed	60	1,875	68,6	0,041	0,019	0,782
	Tracking soil template	123	5,034	157	30,93	0,248	2,602

Table 6 - Results of the analysis of the chemical composition of plants grown in the soil with the addition of manure (mg/dm^3 by water compression)

Where a sample was taken	Plant Name	Salt ions, mg/dm^3					
		Mg^{2+}	NH_4^+	Ca^{2+}	NO_3^-	NO_2	SO_4^{2-}
Nurtas Settlement	Samosa	152	1,52	300,2	0,07	0,061	0,269
	Common alfalf	174	4,423	300,2	0,085	0,81	0,333
	White bed	149	2,194	300,2	0,155	0,1	0,21
	Tracking soil template	300	5,034	574,6	169	0,18	0,629
Nurtas Settlement	Samosa	80	3,094	100,2	0,04	0,039	0,43
	Common alfalf	80	3,398	100,2	0,032	0,005	0,523
	White bed	66	2,385	78,6	0,041	0,009	0,662
	Tracking soil template	123	5,034	157	30,93	0,248	2,602

5.6 - Chlorine and bicarbonate ions were not detected in both samples in the results given in the tables. According to the literature, plants do not absorb the ions of chlorine and hydrocarbonate.

After the chemical elements of the plant composition were identified, the absorpunation coefficient of gray soil was calculated. The biological absorpnation rate of the salted gray soils is 7.8 - in tables.

Table 7 - Biological absorption coefficient of saline sierozems of Nurtas village, %

	Salt ions	Herbivorous plants for research		
		Common camel	Common alfalf	White bed
1	Calcium	52,5	52,5	52,5
2	Magnesium	50,6	58	49, 6
3	Ammonia nitrogen	63,1	65,6	35,7
4	Nitrite	33,8	45	55,5
5	Nitrate	0,04	0,05	0,08
6	Sulfate	42,7	52,9	33,3

Table 8 - Biological absorpnation rate of plants grown on the normal gray soil of Karatobe settlement, %

	Salt ions	Herbivorous plants for research		
		Camel alfala	Common alfalf	White bed
1	Calcium	63,8	63,8	38,2
2	Magnesium	65,4	65	59,6
3	Ammonia nitrogen	61,4	64,4	47,3
4	Nitrite	16,5	3,2	7,6
5	Nitrate	0,2	0,1	0,1
6	Sulfate	19,09	23,8	30,05

Different plants assimilate different amounts of trace elements. The studied herbaceous plants assimilated cations better than anions. In Karatobe soil, the coefficient

of biological absorption of calcium, magnesium and ammonium nitrogen in three plants was relatively high.

Conclusion

Thus, among the plant seeds in this study, the highest germination was observed in common alfalfa. Its germination was 96.1% higher than that of common alfalfa and white clover.

The saturation of plants in the soil with organic matter also depends on their life span. The main function of plants in growth and development depends on their rooting in the soil and absorption into the soil structure. Therefore, it is very important to pay attention to the characteristics of plants grown in agro-systems and the technologies of utilization and cultivation. This allows obtaining quality products in the field of agriculture.

When using plants as phytomeliorants, firstly, their importance in the structure of the root system and in all economic systems was taken into account, and secondly, the dynamics of growth on all types of soils. It is well known that the root system of plants with its reticulate branching easily penetrates into all layers of soil structure and affects the soil both directly and indirectly.

The amount of cations and anions in the soils of Nurtas and Karatobe settlements and the degree of salinization were determined. Phytomeliorative properties of the observed plants were determined and the studied plants were planted. The chemical composition of the soil in which the plants were planted was analyzed and a decrease in the degree of salinization of the studied soil was observed. The plants were found to have ameliorative capacity and the possibility of utilization was shown. The amount of ions in control and fertilized soils and salinity reduction was determined. The absorption complex and biological translocation coefficient of soil samples were calculated for the study sites.

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