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Characteristics Of Haloakcumulative Characteristics Of Clover Varieties

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Abstract. This article reports on the eco-biological and salt-accumulating properties of alfalfa (Medicago sativa) local "Tashkent-2009", "Kyzilkesak" and introduced "Scepter" varieties.
As a result of our research, the possibility of haloaccumulation of the researched plants increases as follows: "Sceptra" → "Kyzilkesek" → "Tashkent-2009"; and it was found for the first time that the salt tolerance index decreases in the manner of Tashkent-2009→Kyzilkesek→Sceptra. Among alfalfa varieties studied on the basis of haloaccumulation indicators, "Tashkent-2009" adaptation to saline soils was noted.
The results of the obtained chemical analysis show that it is appropriate to use all varieties and samples of alfalfa in phytoremediation, depending on the haloaccumulation capabilities of plants and the amount of chlorine ions in them. Also, these fodder plants have characteristics of maintaining their salinity tolerance in other soil conditions, which indicates that their salinity tolerance is a stable genetic trait.
Keywords: phytoremediation, growth and development, haloaccumulation, salt tolerance, fodder crops, legumes, Medicago sativa, alfalfa varieties "Tashkent-2009", "Sceptra", variety "Kyzilkesek", mineral salt elements, HCO-3, Cl-, SO-24, Na+, K+, Ca+2, Mg+2 ions.

1 Introduction. Currently, searching for saline soils and the possibilities of their effective use, as well as reducing the level of salinity of land by using salt-resistant plant species, selecting plant varieties suitable for saline soil conditions, with high yield and quality indicators, studying their salt tolerance properties and cultivation technology it is important to create, scientifically justify and introduce technologies for providing livestock with nutritious fodder and feed.

Alfalfa is a protein-rich, agrotechnical and phytomeliorative important plant that can be the basis for solving such problems. Kh.N. Atabaeva said that alfalfa grows well when the pH of the soil is 6.5-7, the root nodules do not develop when the pH is 5, and when the pH is 8 or more, it is necessary to wash the soil. Alfalfa's salt tolerance varies depending on the period of growth and development: it can tolerate more than 0.2% salt during the weeding period, 0.6% during the weeding period, and 0.66% after the first harvest [1][1].

From the results of research conducted by many scientists, it can be concluded that all ways of adaptation of plants to salt is a process that occurs depending on the amount and composition of salts in them[2] [2; 11; 5]. Properties of resistance of plants to saline environment are directly related to their haloaccumulation, which is one of the main factors determining how and to what extent they adapt to saline environment [9]. In this case, the study of the properties of adaptation of plants to salt, first of all, requires the research of their salt accumulation capabilities, and also serves to provide both theoretical and practical conclusions for phytoremediation measures.

2 Materials and methods. Scientific research studies in the conditions of Syrdarya region, studying the eco-biological and salt-accumulating characteristics of the local "Tashkent-2009", new "Kyzilkesak" and introduced "Scepter" varieties of alfalfa (Medicago sativa), determining their chemical composition, and developing agrotechnics for cultivation was conducted in the experimental area of the Gulistan state university.
The soil of the experimental area consists of old irrigated meadow, weakly saline, light sandy loam.
According to the analysis of soil samples taken in early spring, the average amount of salt ions in the 0-60 cm layers of the soil is 0.4-0.6%. Salinity fluctuates in all layers of the soil in chloride-sulfate type. Salinity

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[2] https://www.elibrary.ru/item.asp?id=45364605

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in terms of cations is sodium-calcium type. The abundance of calcium ions in the soil may be due to the rich natural vegetation cover of the experimental area.

The amount of humus in the soil is 0.48-1.05% on average in all cases. The amount of total nitrogen in all layers of the soil horizon is around 0.029-0.98%, and phosphorus is around 0.035-0.120%. Most of the nutrients belong to potassium, its amount is 0.42-1.30%, and this is typical for Central Asian soils.

The purpose of the research is to select salt-resistant, productive and promising alfalfa varieties from the composition of local flora and introductions and to recommend them for the soil-climatic conditions of the Syrdarya region.

In the experiment, the quality of the object was studied by planting representatives of the fabaceae family: control - local "Tashkent-2009", "Kyzilkesek" and "Sceptra" alfalfa varieties.

In the experiment, the number of variants was 3, and it was carried out in 4 repetitions. The number of stitches is 12. The total area of each option is 20 m2, of which the calculated area is 10 m2. The total experimental area is 240 m2.

Study of seasonal development of plants I.N. Beideman [3] and I.V. It was performed according to the recommendations of Borisova [4].

Biomorphological characteristics of plants T.A. Rabotnov [10], and in the study of their root system, M.S. The methods of Shalyt [12] were used.

Taking plant samples for chemical analysis and the amount of bound and free forms of salts in plants was determined using the method of qualitative and quantitative chemical titration of mineral salts in plants based on the methods of "Metody agrokhimicheskih analizov pochv v rastenii" [7] of the Cotton Research Institute of Uzbekistan

3 Results and discussion. In studying the fertility of 3 varieties of alfalfa involved in the experiment in laboratory and field conditions, seeds were scarified in concentrated sulfuric acid before sowing. Fertilization of local "Tashkent-2009" alfalfa seed in laboratory conditions was 92.3%, "Sceptra" variety 91.7 and "Kyzilkesik" variety was the lowest 86.1%.

Fertility is one of the main indicators of seed quality. Field germination of seeds in "Sceptra" variety was 86.3%, local "Tashkent-2009" alfalfa variety was 85.3%, "Kizilkesik" variety was around 80.1%.

At the end of the season, viability of sprouts was 78.4% in alfalfa variety "Tashkent-2009", 72.8% in "Sceptra" variety, and did not exceed 63.4% in "Kyzilkesik" variety.

Also, during the years of research, the resistance of plants to salt was determined, and the obtained results showed that these plants have the ability to accumulate salt in their own way.

When the growth of haloaccumulation potential of plants was compared, it had the following appearance: "Sceptra" → "Kyzilkesek" → "Tashkent-2009" (table).

That is, "Sceptra" variety of alfalfa has the least haloaccumulation potential, and its above-ground part has 6.998% of water-soluble salts, and "Tashkent-2009" alfalfa variety has the most ability to accumulate salts, and its above-ground part has accumulated harmful salts up to 9.118%.

Composition of above-ground part of alfalfa (Medicago sativa) cultivars total amount of mineral salt elements (100g absolute in %/mg.eq relative to dry mass)

Alfalfa varieties	General quantity %	HCO^{-}_{3}	Cl^{-}	SO^{-2}_{4}	Ca^{+2}	Mg^{+2}	$Na^{+}+K^{+}$	$\frac{SO^{-2}}{Cl^{-}}$	$\frac{Na^{+}+K^{+}}{Ca^{+2}}$
Local	9,118	2,162	0,587	3,789	1,984	0,155	0,441	4,8	5,2
		35,44	16,54	78,94	99,00	12,75	19,17		
Kizilkesek	7,242	1,976	0,402	2,885	1,628	0,189	0,162	5,3	11,5
		32,39	11,32	60,10	81,24	15,54	7,04		

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Sceptre	6,998	1,465	0,411	3,147	1,809	0,095	0,071	5,7	29,4
		24,02	11,58	65,56	90,27	7,81	3,07		

If we compare the three varieties of alfalfa according to the characteristics of salt accumulation, its "Kyzilkesik" variety is ahead of the "Sceptra" variety.

When evaluating the tolerance of plants to salt, it is possible to evaluate not only the total amount of salts in them, but also the quantitative distribution of some harmful ions in them. Chlorine ion, which is considered the most harmful of salinizing ions, is among such ions, and its amount in the plant serves to evaluate the plant's resistance to salt[3] [6; 8].

The results of the obtained chemical analysis explain that the chlorine ion in the studied plants is distributed unevenly. In addition, the analysis showed that the amount of chlorine ion in the plants has a correlative unit with their haloaccumulation potential.

According to the distribution of chlorine ion in the studied plants and their decreasing salt tolerance index, they can be placed in the following order: → "Tashkent-2009"→Kyzilkesek→Sceptra.

As can be seen from the row, the plants with high haloaccumulation potential are also in the first place in terms of chlorine ion accumulation. The ratio between SO-24/Cl- ions is high in the variety Skeptra of alfalfa, which is about 5.7. The lowest indicator among harmful ions was observed in "Tashkent-2009" alfalfa variety (4.8).

4 Conclusions. From the results of chemical analysis, it can be concluded that all types of alfalfa can be recommended for phytomelioration works, depending on the haloaccumulation potential of plants and the amount of chlorine ion in them.

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