



Preliminary Results of Trial of Desert Forage Plant Species to Establish Pastures In the Drying Tub of the Island Sea

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Abstract: The article provides information on the testing of desert forage plants in the conditions of the drained bottom of the Aral Sea. A conclusion is made about the prospects for cultivation in order to create highly productive pastures of such species as *Salsola paletziana*, *Haloxylon aphyllum*, *Halothamnus subaphyllum*.

Key words: *black saxaul, finger Circassian, chogon, growth, development, survival rate, root system, salinity, agrochemical features of the soil.*

Introduction:

The drying up of the Aral Sea has led to the disruption of the natural balance and the emergence of huge environmental problems not only in the Republic of Uzbekistan, but also in all Central Asian countries. The region, which occupies an area of 3.5 million hectares and is now known as "Arolqum", is almost not covered with vegetation, it is the source of salted sand and dust due to the drying of the surface layer of the soil, the spread of salt over hundreds of kilometers, the deterioration of the ecological environment, the agricultural system and causing significant damage to the health of the population. One of the important measures to mitigate the enormous damage of the problem and the ecological crisis is to cover the bottom of the depleted Aral Sea with vegetation. Therefore, the President and the Government of the Republic of Uzbekistan are working on the implementation of huge and urgent tasks to alleviate the environmental problem. In particular, all forestry enterprises of Uzbekistan are planting saplings of bush plant species resistant to the stress factors of the desert, such as saksobul and yulgun, on millions of hectares of land. These works will definitely bear fruit in the coming years. However, the problem of using such lands in agriculture in the future is also of great social and economic importance for the Republic of Uzbekistan. In this case, the development of pasture livestock in the region can serve as an important economically based sector. Therefore, it is very important to cover the dry bottom lands of Orol with vegetation, to use desert nutritious plant species and to create high-yielding pastures. In this regard, the allocation of a special fund and the announcement of the selection of grants by the Government of the Republic for the purpose of supporting and financing the scientific-research works aimed at solving this problem led to the development of research works in this direction. The practical project of the scientific-research institute of pastoralism and desert ecology on the topic "Testing desert nutritious plant varieties in the conditions of the dry bottom of the Aral Sea and organizing the primary seed production of promising species and varieties" was recognized as the winner of the

competition and was included in the financing starting from 2022. This article presents the scientific results achieved by the project in the first year.

Address, source and methods of research. Researches are being conducted in the area in the north direction, 14 km from the dry bottom of the Aral Sea. The sources of the research are the seeds of the black saxophone "Nortuya", "Jaikhun" of the chert, "Baraka" of the Paletsky Circassian, "Tolqin" of the teresken, "Otavnyy" of the izen, "Malika" of the mackasupurgi, "Odil" of the Nitens larch and "Yona" of the perennial larch and seedlings of the Kyzylkum population of the salt fennel were served. In conducting research A. Rabbimov and G. From Khamraeva's (2016) "Methodological recommendations on the introduction and selection of desert nutritious plants", the methods of B.A. Dospekhov (1979) were used for biostatistical processing of the obtained data. The agrochemical characteristics of the soils of the experimental field were studied in the soil analysis laboratory of the limited liability company "SAG AGRO".

Analysis of research results. A brief economic description of the tested species and varieties.

Paletsky Cherkezi - *Salsola paletzkiana* Litv. is a nutritious plant for livestock. Paletsky cherkzeka is one of the common bushy plants in sandy deserts. Its nutritional properties are described as follows: hay contains 19.83-20.35% protein, 2.82-2.96% fat, 14.25-17.24% ash, 42.21-47.13% nitrogen-free extractives. and contains 15.62-17.43% fiber. Depending on the seasons, 100 kg of Circassian hay contains 33-45 nutritional units (Shamsutdinov, 1975).

Boyalich - *Salsola arbuscula* Pall - a halophilous shrub of the Chenopodiaceae family, 50-80-120 cm tall, producing small, round, pointed succulent leaves. Height growth - 75-78 cm, dry phytomass yield - 20-22 tons/ha, seed yield 250-300 kg/ha. Protein content is 8-10%. It blooms and bears fruit in June-September. Grows in sand, in various compacted soil environments. Sample K-5238 collected from Amudaryo district of Paletsky Cherkessk, sample K-5242 from Haydarkol were found to be promising in gypsum desert conditions, it was found that this species can grow and collect high yield not only in sandy desert, but also in gypsum desert and hill conditions (Bobaeva A. , Rabbimov A, 2018).



Picture 1. *Salsola paletzkiana* Litv.

Black saxophone - *Haloxylon aphyllum* is a tree-like perennial shrub up to 3-4 meters tall, sometimes forming a landscape, well adapted to growing in extreme desert conditions. The assimilative branches of the saxovull are readily eaten by camels throughout the year. Sheep and goats eat well the annual branches and seeds of the saxophone in autumn and winter. The roots of saxovul reach the underground water and provide its extreme resistance to drought. Saxovul feed is one of the nutritious

feeds in desert conditions. Its feed contains 10-12% protein, 2.2-2.7% fat, 28.9-38.6% ash, 39.3% nitrogen-free extractives. 100 kg of saxovol feed stores 46 food units in autumn and 37 food units in winter. A specific microclimate occurs in saxovuly pastures, which has a positive effect on the good growth of other types of semi-shrubs and herbaceous plants.



Picture 2. Haloxylon aphyllum

Izen- *Kochia prostrata* L. Schrad. Perennial semi-shrub plant belonging to the family of sorghums. A fattening feed for livestock is a plant. Many breeders call it "desert alfalfa". The vegetation period is 250-270 days. Life expectancy is 12-15 years. The root penetrates to a depth of 5-7 meters. In the Adir pastures, the productivity of tillers is 20-25 quintals, the seed yield is 2-3 tons/ha (Rabbimov, 2014). Izen feed contains 10-12% protein. 100 kg of hay contains 45.9-40.5 nutritional units depending on the seasons. Feeding livestock in Izenzors, especially in the fall, that is, when the seeds are ripe (October), causes them to gain weight quickly. Herders: "A sheep that eats izen in the fall does not get tired in the winter!" it is not for nothing that he says. In Uzbekistan, varieties of izen such as "Pustynnyy", "Karnabchulsky", "Malguzarsky-83", "Otavnyy", "Sakhro", "Nurota" were created.



Picture 3. Kochia prostrata

Chogon- *Halothamnus subaphyllus* (C.A. May) Botsch. It is a perennial branchy bushy plant belonging to the family of sorghums. Unlike other types of desert plants, sorghum grows well in almost all types of soil and collects high yields. The root develops strongly, penetrates to a depth of 7-8 meters. The vegetation period is 230-240 days. Productivity reaches 12-27 centners per hectare (Bekchanov, 1992). The seeds ripen in October. Chogon is one of the most valuable plants for creating autumn-winter pastures. Due to the abundance of sorghum, ephemeral plant remains remain in the pasture until late autumn. Chogon can live 20-30 years in the pasture.



Picture-4. "Jaykhun" variety of chert (*Halothamnus subaphyllus*).

The fodder contains up to 24.7% protein, 2.7% fat, and 16.3% fiber. 100 kg of hay contains 59 nutritional units.

Teresken-Ceratoides ewersmanniana (Stchegl. et Losinsk.) Botsch.-A perennial bushy plant belonging to the shurados family.



Picture-5. "Wave" variety of Teresken (*Ceratooides ewersmanniana*).

Table 1

Moisture dynamics of experimental field soils, %.

Soil layer, cm	Determination periods		
	18. 02	23.04	3.06
0-20	2,8±0,36	4,1±0,17	1,9±0,4
20-40	5,6±0,36	3,8±0,05	2,6±0,2
40-60	5,5±0,18	4,2±0,6	4,2±0,4
60-80	12,5±0,38	6,7±0,7	10,4±0,75
80-100	15,4±1,6	6,3±0,04	17,0±0,86
100-120	15,1±1,8	5,7±0,4	18,4±0,5

So, in the 2022 vegetation year, the amount of moisture in the surface layer of the soil is much lower, and during the intensive development of plants, at the beginning of the summer season, the amount of moisture in the soil in the surface layer (0-20 cm) is 1.9%, in the layer 20-40 cm deep, 2.6%. It was found that it was 4.2% in the layer 40-60 cm deep, 10.4% in the layer 60-80 cm deep, and 17-18.4% in the 80-120 cm deep.

there was a water shortage, and although it was possible to obtain satisfactory lawns from some of the planted species, the lawns of Izen, Teresken, and Alabuta plant species dried up during the grass season (Table 1).

Indicators of plant development and viability. On February 18, 2022, 9 out of 10 planted varieties of desert alzukabop plants were found to have germinated in the

second ten days of April. Germination of seeds was observed in the third ten days of April in saxophone "Nortuya", "Baraka" of Circassian, and "Jaikhun" of chert.



Picture 6 Chughon and alabuta

The seeds of Olabuta "Odil" and Maize broom "Malika" varieties germinated mostly in May. The seeds of Izennig "Otavniy", teresken "Tolqin", olabuta "Yogana" varieties did not germinate satisfactorily.

In the first ten days of June 2022, the number of plant stems, the viability of lawns and their growth were studied in the plots of existing plant species and varieties in the experimental field. Observations showed that the indicators of the development of lawns are quite slow, and the number of lawns was reduced to a certain extent in some species, and more in others.

By August, i.e. during the transition of the dry season, it was found that the height growth of the lawns of the Circassian "Baraka" variety is about 13 cm, and the viability of the plant is 77% (table-2). The seeds of Olabuta "Odil" and Maize broom "Malika" varieties germinated mostly in May. The seeds of Izennig "Otavniy", teresken "Tolqin", olabuta "Yogana" varieties did not germinate satisfactorily. In the "Nortuya" variety of the black saxophone, the height of the lawns was on average 10 cm, and the viability of the plants was very high, i.e. 100%.



Picture 10. Circassian and black saxophone meadows

Table 2

Results obtained during the first year of testing desert nutritious plant varieties in the conditions of the dry bottom of the Aral Sea

Plant varieties	Plant fragrance, cm	Viability of plants, %
Circassian "Baraka" variety	13±0,3	77
"Nortuya" variety of black saxophone	10±0,2	100
"Jaikhun" variety of Choghon	5±0,06	85

"Odil" variety of Olabuta	10±0,1	78
The only variety of Olabuta	-	-
"Princess" variety of Makkaspurgi	4±0,07	51
"Otavniy" variety of Izen	-	-

It was found that the growth of grasses in the "Jaikhun" variety of Choghon was 5 cm on average, and the viability index was 85%. It was found that the height growth of Olabuta variety "Odil" was 10 cm on average, and the viability was 78%. It was observed that the lawns of plants such as Izen, kuyrovuk, and teresken could not withstand the dry and hot climate of summer and dried up.

The formation of the root system is of great importance in the growth, development, and viability of plants. The formation of the root system of the plants in our experiment had the following indicators. In the initial phase of growth and development of the roots of sorghum in the first year of vegetation, it was found that when the height of the plant was 1.6 cm, its roots were 16.0 cm. During the budding period, the length of the roots reached 25.4 cm.

It was found that Chogon roots have a strongly developed root system of the universal type, with a root system that spreads vertically and quickly to the sides.

In the initial phase of growth and development of black saxophone roots in the first year of vegetation, it was observed that the root was 25.3 cm, which showed that it grew 8 times more than the above-ground part. On July 15, when the height of the plant was 22.3 cm, its roots reached a depth of 58 cm. On September 25, when the height of the saxophone reached 36.9 cm, its roots reached a depth of 72.0 cm.

The roots of the Cherkes plant reached a depth of 33.3 cm in the first year of its vegetation, which showed that it grew 8 times more than the surface part of the earth.

On July 15, when the height of the plant was 22.3 cm, its roots reached a depth of 58 cm. On September 25, when the height of the saxophone reached 36.9 cm, its roots reached a depth of 72.0 cm.

The roots of the Cherkes plant reached a depth of 33.3 cm in the first year of its vegetation, which showed that it grew 8 times more than the surface part of the earth.

Conclusions. Thus, it can be concluded based on the initial data on plant growth and lawn viability indicators, indicators of root system formation, that despite the dry year, black saxophone, Paletsky cherkezi, chogon and Nitens olabuta are resistant to the stress factors of the dry bottom soil of the island, and this plant by planting species in the region, it is possible to combat wind erosion and establish high-yield pastures.

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