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Plant Cover of Kyzylkum Desert and the Aral Region and Cultivation of Salt Resistant Plants of Cultural Plants in this Region and Recommendations

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Summary

The article discusses the plant and soil cover of the Kyzylkum Desert and the Aral Sea, the characteristics of the plants growing in these areas, regionalized cultural crops, and obtaining high-quality, environmentally friendly products from them. Today, in order to satisfy the growing population's demand for food products in many countries of the world, in order to ensure food security in the countries of the world, the use of crops growing wild and cultivated by humans is of great practical importance. Establishment of saksovul plantations in Kyzylkum Desert, dry bottom of the Aral Sea, as a result of which, in order to prevent 100 million tons of dust-salt mixture from the bottom of the dry Aral Sea, which is carried by wind and storms and deposited on the agricultural fields, to carry out phytoremelioration works in this area, to establish saksovul plantations is of great scientific and practical importance. Because each bush of saksovoul tree holds more than ten tons of sand with its roots, it grows very well in saline lands, uses mineralized groundwater, and keeps the critical depth of groundwater in the norm. As a result, we have naturally prevented processes such as secondary salinization of soils and soil erosion.

Key words: Kyzylkum Desert, Aral Sea, phytoremelioration, agricultural fields, saksovul plantations, groundwater, Amu Darya, soils cover and soil erosion.

Key findings: This article discusses the plant and soil cover in the lower reaches of the Amudarya, as well as the scientific research conducted in these areas.

Introduction

The Aral Sea is the largest closed salt lake in Central Asia. Administratively, more than half of the Aral Sea is located in the southwestern part of Karakalpakstan of Uzbekistan, and the northeastern part of Kazakhstan. Until the 60s of the last century, the area of the Aral Sea with its islands was on average 68,000 km². It is the fourth largest in the world after the Caspian Sea, Lake Superior in America and Lake Victoria in Africa, and second after the Caspian on the Eurasian continent. The sea stretches from north-south to south-west, its length is 428 km, the widest part is 235 km - 45° north latitude. The area of the basin is 690 thousand km², the volume of water is 1000 km³, the average depth varies around 16,5 m. It is called the sea because of the size of its basin. The Aral Sea was formed in the Upper Pliocene in a depression where the Earth's crust was rifted. The relief of the bottom is flat, except for the western part. There were many peninsulas and gulfs in the Aral Sea. The Aral Sea and the Aral bay region are administratively located on the territory of Uzbekistan and Kazakhstan, and include the lower part of the Amudarya and Syrdarya rivers and the areas around the sea, as well as the Aral desert, which was formed in its northeastern and southern parts as a result of the lowering of the sea level.

In the recent past, its area, including the islands, was almost 68,000 square meters. km. of water volume is 1000 cubic km. established The average depth is 50,5 m. was around. 38,6 cubic km

from Amudarya to the Aral Sea until the 60s of the 20th century. 14,5 cubic km from Syrdarya. water comes, 5,5 cubic km. underground water was also added. In the sea with large ports such as Aralsk and Moynok, the shipping season lasted 7 months.

The Aral Sea, which ranks fourth among the world's lakes in terms of size, is saturated with the waters of the two largest rivers of Central Asia - Amudarya and Syrdarya. This water basin also performed the task of controlling the climate in Central Asia and mitigating sudden changes in the weather. Wind masses entering the region warmed up in winter and cooled down in summer under the influence of the Aral Sea.

In order to preserve the unique fauna of our region, it was also proposed to establish protected transboundary natural areas in the Orol zone. It is extremely important to work together to save endangered animals, including leopards, cobras, saigas and other rare animals. It is necessary to sharply increase the level of regional cooperation in the issues of water conservation, management of transboundary water resources and their rational use.

Materials And Methods

Genetic-geographical, profile-geochemical, stationary-field and chemical-analytical methods were used in the research. Chemical, physico-chemical, agrochemical analyzes of soils "Guide to Chemical Analysis of Soils", "Methods of agrochemical, agrophysical and microbiological research in irrigated cotton areas"as well as field and camera works "Management of land monitoring in the Republic of Uzbekistan" and "For maintaining the State Land Cadastre" performed on the basis of the instruction on conducting soil surveys and drawing up soil maps. Mathematical-statistical analysis of the data was calculated by the method of dispersion (B.A. Dospekhov) using the Microsoft Excel program.

Object Of Research

Flora and fauna of the Kyzyl Kum desert and the Aral region - today there are many ecological zones on the Kyzyl Kum plateau, where flora and fauna are carefully protected. The availability of water, which is the lifeblood of the Kyzylkum region, ensures the development of unique flora and fauna of different colors. Over 130 plant species and over 300 insect and bird species can be found in the desert. In Kyzyl Kum, stunted shrubs and grasses grow well, even in extreme conditions. These are saksovul, willow, camel thorn, reed, selin, yuzgun, chingil, wild kavul, kokbosh, balykkoz, self-growing tulips and many types of tulips, acacia and willow. The fauna of the Kyzyl Kum desert is extremely rich. This endless desert is home to camels, jackals, mountain rams, gazelles, saigas, deer, wild donkeys, Przewalski's horses, mice, foxes, lizards, hedgehogs, rabbits, underground mammals, turtles, lizard and a rattlesnake, eagle, falcon, mallard, wild duck, blackbird, fisherman, sparrow, golden vulture, dove and other creatures.

Branched horsetail - *Equnisetum ramosissimum* - this plant belongs to the horsetail family - *Equisetaceae*, branched horsetail is a perennial spore herb of the horsetail family, the rhizome is long, thin, creeping, blackish, articulated, with spherical tuberous substances, nutritious, nutritious. Horsetail stems are spore-bearing and vegetative. In early spring, the plant forms spore-bearing unbranched, succulent, reddish shoots up to 25 cm high. Spores ripen in april-may, after which the stems die off. Instead, stems 10–50 cm high, erect, branched, segmented, green, appear from the rhizome at the beginning of summer. The branches are arranged in whorls of 8-16 along the entire stem, directed obliquely upward. The leaves are underdeveloped, grow together on the stem into cylindrical tubular sheaths. It grows in meadows, tugai among bushes, along river banks, like a weed in fields and gardens. Distribution: grows almost everywhere in the European part of Russia, Siberia, the Caucasus, Central Asia and Kazakhstan, in the conditions of Karakalpakstan - the lower reaches of

the Amu Darya. The main resource values of the horsetail are medicinal, poisonous, tanning properties.

Aktavsky feather grass - *Stipa aktabensis*, this family belongs to the bluegrass family - *Poaceae.* A perennial dense bushy turfy herb, the height of this wild medicinal plant reaches 25–30 cm, the leaves are narrow, the upper ones are widened, embracing the inflorescence. The inflorescence is 6–10 cm long, narrow, with spikelets. The axis of the caryopsis is about 13,5 cm long, geniculate-bent, feathery along the entire length, feather hairs 4–5 mm long. It blooms and bears fruit in April-June, propagates by seeds. The main habitats are dry gravelly slopes, cracks in the rocks of the remnant low mountains. The reason for the change in the number and range is improper grazing. In many countries of the world, livestock grazing is carried out in a rotary way. This plant is listed in the Red Book of Uzbekistan, the status of the Aktavsky feather grass is a very rare narrow endemic of the Central Kyzyl Kum. The distribution of this plant in the remnant low mountains of the Central Kyzyl Kum - in the Republic of Karakalpakstan and Bukhara regions, in the region of Karakalpakstan - occurs in the vicinity of Sultanuizdag.

Poplar Aryan - *Populus ariana*. Belong to the Willow family – *Salicaeae*. A tall tree up to 10,0 m in height, a trunk diameter of 30–40 cm. Turanga is a dioecious plant, that is, on some trees there are only male (staminate) flowers, on others - only female (pistillate) flowers. Leaves on branches crowns from rhomboid to ovoid, with a different number of teeth. The presence of different leaves is due to age variability. Turanga leaves are leathery, rough, dense, green or green-gray. In nature, the tree blooms before the leaves bloom, in late March-April, sometimes in early May. Flowers are collected in cylindrical earrings. Anthers and stigmas are claret-red with a purple tint, but green-flowered forms are also found. The fruit is a capsule, the seeds are small, pinkish-white in color, ripen in late June - early July. It grows along the banks of the Amu Darya, its channels and large canals, in tugai along the old beds of ancient rivers. It spreads in Central Asia, Kazakhstan, China and Iran, in the conditions of Karakalpakstan - the lower reaches of the Amu Darya. The resource value of the Aryan poplar is fodder.

Leafless Juzgun - *Calligonum aphyllum* - this plant belongs to the Buckwheat family - Polygonaceae. The Latin name of the genus comes from the Greek words “callos” - beautiful and “gonos” - knee and reflects the peculiar appearance of the plant's branches, which are genicuously connected to each other. Shrub from 0.5 to 4 m tall, very branched. The stems and old branches are curved. Young shoots are long, sinuous-curved, segmented, as if leafless. Leaves are inconspicuous, linear or acicular, 3–7 mm long. Flowers are axillary, solitary, bisexual, regular, with a simple 5-membered perianth. The leaves of the latter are white, pink, pinkish-purple, greenish. The fruit is a nutlet with long feathery processes, which are several times longer than the nut and give the fruit a generally spherical shape. It grows in the desert in various habitats: on sandy and clay soils. Distribution mainly in the Eastern Ciscaucasia and Transcaucasia, the south of the Lower Volga region, Kazakhstan, Central Asia; under the conditions of Karakalpakstan, it is found in the Kyzyl Kum, in the Ustyurt plateau and in the remnant low mountains. The main resource value is fodder, tanning and good phytomeliorant.

Salsola chiwensis - this plant belongs to the family *Marevye* - *Chenopodiaceae*. It was first described in 1914 by the botanist M.G. Popov on his collection of plants from Sultanuizdag. Semi-shrub 30-60 cm high, glabrous, leaves are alternate, fleshy, semi-lumpy, spike-shaped inflorescence, with fruits translucent kidney-shaped or broadly obovate wings develop on the leaves. Blossoms in July, bears fruit in September, propagates by seeds. It occurs both singly and in thickets, grows on gray-brown gypsum and marly soils. The main reason for the change in the number and range is the anthropogenic factor, improper grazing, cattle driving and transport loads. Solyanka Khiva is listed in the Red Book of Uzbekistan with status. Relic and endemic species of Northern Uzbekistan. It spreads

in the republics of Uzbekistan and Turkmenistan, in Karakalpakstan it is found on the chink of Ustyurt, Sultanuizdag and in Kyzylkum.

Cherkez Richter - *Salsola richteri* - this plant belongs to the family *Marevye* - *Chenopodiaceous*. Tall shrub or small tree, typical psammophyte, up to 2,5 m high, with a trunk up to 15,0 cm thick, with light bark, annual branches are thin, flexible, almost white, glossy varnished, leaves are alternate, linear. The flowers are arranged one at a time, forming a spike-shaped inflorescence in the aggregate. The flowers are 1–2 cm apart from each other, and do not develop simultaneously. In autumn, at the base of the inflorescence, fully mature fruits are developed, in the middle - flowers, and at the top - buds. Under the weight of the fruit, the inflorescences hang down, giving the plant a weeping shape, the flowers are five-membered, small. Fruits are dry, single-seeded, blooms from late May to September; fruits ripen from July to late autumn. Richter's solyanka is an endem of the sandy deserts of Central Asia. The range of this plant is mainly confined to the sandy deserts of the Karakum and Kyzylkum desert. It is distributed in Turkmenistan and Uzbekistan, in the Karakalpak region it is found in Kyzyl Kum. The main resource value is medicinal, fodder and good phytomeliorant. Multi-branched Tamarix - Tamarix ramosissima - this plant belongs to the Tamarix family - Thamaricaceae. This large shrub grows up to 2.0–2.5 m. In Karakalpakstan, it is very widespread, but does not withstand soil salinity and does not grow on sands. Well developed in the floodplain of the Amu Darya, in tugai along the banks of channels and canals, on fallow lands. Often forms clean, dense thickets. Leaves are small sessile green or gray scale-like, secrete salt on their surface. The flowers are small, with a calyx and a pink corolla of four to five petals. Flowers are collected in long clusters. The fruit is a drop-down capsule the seeds are small, with hairs or a tuft. It blooms in May-August, sometimes bred in parks and gardens as ornamental plants. In the lower reaches of the Amu Darya, it is a permanent component of tugai arboreal and shrub communities; it is widespread in Southwestern Siberia, the Caucasus, and Central Asia. in the conditions of Karakalpakstan - in the lower reaches of the Amu Darya. The main resource value is decorative, dyeing and tanning. The lands of the Lower Amu Darya and the Aral Sea are covered with modern and ancient deltas of the lower reaches of the Amu Darya, as well as Kyzylkum, the Ustyurt plateau and the Aral Sea. The ancient and modern surface part of the delta was not previously exposed to periodic floods and went through certain stages of its development - construction and desertification - before it was involved in irrigation.

Results Of Research

In the delta part of the Amu Darya, tugai, halophytic or desert groups of plants can be distinguished. Wetlands, especially in areas with high humidity, are divided into 4 main lithological and geomorphological regions, taking into account the structure, cattail, Phragmites australis - reed, Ceattophyllum - the formation of hornworts occurs in plants. Due to the rapid reduction in the area of wetlands, the diversity of vegetation species, but also the scale of the ranges. The most common vegetation on the lakes and periodically flooded areas of the island is reed formations.

In 1960-70 s, the total area of reeds on the lakes and swamps of the Amu Darya delta and the Aral Sea was 500,000 hectares. According to the analysis of modern satellite imagery data, the area of reed is 70 thousand/ha. In the next 20-30 years, the area of reed in the irrigated area has sharply decreased, which led to the opening of the upper soil layer, intensification of the desertification process.

Turangil-Ropulus arainal, *Lox-Elcacagnus tureosnica* are permanent and main woody plants of tugai forests. The species Jungar-*Solis songaria* and *Solis Wilhelmsiana-Vilgelma a*re very rare to this day. Currently, the plants of the *Turangil Formation* - Badai-Tukai and Nurimtubek are in good condition. The *Turangil* Formation is widespread on both banks of the Amu Darya and around the

moving stream of the Kazakh River, along the banks of the Moshyankol and around the Moinak Canal. In other parts of the delta, this formation has declined sharply.

In the period from 1960 to 1968, the area of tugai forests in the delta region, which created a unique microclimate and performed functions of combating erosion, deflation, disruption of the relief and other processes, amounted to 300,000 hectares. However, as a result of the development of large areas in the delta area, their area has sharply decreased. In addition to cultivated plants on the irrigated lands of the Republic of Karakalpakstan, the flora consists of the following ecological groups:

1. The youngest group of aquatic freshwater formations - this group consists of a group of reeds and sedges that grow in areas where the water table is close to the surface.

2. In the groups of saline soils, mainly in low-mineralized groundwater, there is a group of arboreal-shrub and saline comb plants, turangil, dzhiyida, Karelenia, reed grass, pig, sometimes hemp tugai, which provide valuable fiber. Under such a vegetation cover, relatively high subdivisions of meadow-tugai soils are formed.

3. A group of succulent halophytes - salty fatty grass - plants that grow well on highly saline soils, mainly in highly mineralized groundwater, and have the ability to accumulate a large amount of water-soluble salts in their assimilation organs. The "ash content" of this group of plants is observed in an amount of up to 46% of the dry weight, and the content of chlorine ions is much higher. This group includes fatty hodgepodge, shaggy hodgepodge, and grate hodgepodge of Caspian plants.

4. Group of meadow or rootstock grasses - this group includes plant formations that are common in silty meadow soils and form a continuous grass cover, the main representative of which is saline grasses. Groundwater is very close, and in the wetlands, salineros, sarsan, potash, sveda and other plants are leading.

5. Group of non-succulent halophytes - this group of plants consists of a group of plants that retain less salt in their mass than oily grass, hodgepodge, which develops in a slightly humid environment in conditions of slightly mineralized groundwater.

6. A group of weeds - slightly moist, slightly saline and moderately saline or well developed in wormwood, wastelands and abandoned soils, developed sedges, sedges, sedges.

7. A group of sparse vegetation and low vegetation - blue-green algae, diatoms and green grasses are common on dry bare and bare soils.

It is important to restore the formation of plants lost due to desertification in order to increase biodiversity.

To ensure the food security of our country, the demand of the population of our people for soybean plant increases day by day. History and distribution - the plant also grows in the tropical and subtropical zones of Africa, southern Asia, Australia; it is cultivated on the islands of the Pacific and Indian oceans.

The most popular type of plant is cultivated soybean (Glycine max). The seeds of this particular species are called soybeans. They are of great nutritional and technical importance for humanity. In China, images of soybeans were found on the surfaces of various objects found during excavations, which made it possible to assert that the soybean plant has been familiar to mankind since the third millennium BC. The description of the process of cultivation of soybeans was found in the works of early Chinese literature. China is also addicted to soybeans in neighboring countries: first Korea, then Japan. In the 19th century, the interest of Europeans in the East bore fruit: many were carried away by the culture of China, its national products, including soybeans. The United States began researching the properties of soybeans in the mid-19th century. Americans quickly felt how profitable soybeans were for industrial purposes: within fifty years of their acquaintance with the plant, enterprising Americans occupied about a million hectares of soybeans.

Soya came to Russia much earlier - after the 17 th century expeditions to explore the Middle East. At the World Exhibition in Vienna, Russian breeders amazed the Europeans with bred soybeans.

Plant it is successfully cultivated in Russia to this day: in the Krasnodar, Stavropol Territories and in the Rostov Region. Soy is not eaten raw, but various products are prepared from it by fermentation. Soybeans hold the record for protein content. This fact makes it possible to produce many products from soy, including vegetable substitutes for food of animal origin, meat and milk. All the main methods of cooking not only dishes, but also soy products originated in East Asian cuisine.

To prepare, for example, miso soup, a paste of the same name is required, which is made from the seeds of the plant. They are also essential for making soy flour. Soybean oil, which is pressed from soybean seeds, can be used in frying, just like any vegetable oil. Soya milk is white and is part of the tofu cheese dish. Skimmed soy milk is a component of soy meat that resembles meat in appearance. The skimmed soy milk film is called yuba. It is used frozen or dry, dipped in soy sauce, as an excellent "soy asparagus" snack.

Tempeh pressed soy curd bars are used as an addition to soups or as an independent dish. Eastern technologies for processing and preparing various products from soy are similar to the production of dairy products. Soybeans are a waste-free product.

Soya is a legume that has been successfully cultivated since ancient times. The fruits of this plant contain more than 35% pure protein. It is excellently used as a healthy alternative to meat products. Plant characteristics. The homeland of soybeans is China. At the moment, it is grown in the fields of America, Europe, Argentina, Asia and Australia. The main characteristics of this annual plant that have made it popular are the following: high yield; it is possible to make a large number of different products out of it; the product contains a lot of protein; contributes to the prevention of cardiovascular diseases, osteoporosis, heart attack; contains important vitamins of the group. The polyunsaturated fatty acids, calcium and potassium. Nutritional value of soybeans The main advantage of soybeans is protein. Its in the product in question is more than a third of the total mass. Various sugars make up 10% of the total nutritional value, and fats make up 40%. Soya contains almost all irreplaceable trace elements: nickel, manganese, aluminum, iodine, cobalt, molybdenum. Most of the macronutrients are magnesium, potassium, calcium, silicon, phosphorus and sulfur. In addition to the above substances, there are others: starch; folic acid; retinol; tocopherol; pectins; riboflavin; enzymes; phospholipids; choline and lecithin.

The beneficial properties of the dish made from soy help the functioning of all body systems. Among its useful properties are the following: contains natural antioxidants. Accelerates the metabolic process, lowers the level of "bad cholesterol", restores cells of the nervous system.

1-picture. Plant Soya. Cleans the body, removes heavy metal salts. Improves the functioning of the pancreas, helps to produce insulin. Useful for use in diabetes mellitus. The phytic acid found in soy helps to break down and absorb protein.

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Sorghum belongs to the *Paceae* family of cereals. Due to the wide variety of species and forms of sorghum, it was decided to develop their classification, but for a long time it was not possible to come to a single classification. This was due to the multitude of varieties and their intermediate forms. The specific name *Sorghum bicolor L*., which means two-colored sorghum, is often used to designate a composite species that includes several forms. To avoid misuse of names, read only the designation of the different types of sorghum in general here. According to the principle of economic use of sorghum, four types are distinguished: sugar sorghum, broom sorghum, grass sorghum and grain sorghum.

Other genera and species of millet also belong to the millet subfamily: for example, Pennisetum pearl barley millet and Panicum common millet. Other subfamilies such as *Chloridoideae* are important for agriculture and are the crabgrass millet. There are also weeds, which are also referred to as barnyard millet. This clearly shows that sorghum is only a part of the species called millet. For grain sorghum Sorghum sp. belong to different kinds. Sorghum bicolor is often considered common sorghum because it is very important for agriculture. The production of molasses syrup from sugar sorghum was of great importance before the use of sugar beets and sugar cane in the 19th century. The United States is currently the largest producer of sugar sorghum syrup.

Besides being used as a food product, sorghum is also a very popular forage crop. For this, grassy sorghum is primarily suitable, which is used as green forage, silage or straw. It has a similar nutritional value to corn and yields, but it needs at least twice as much water as corn. In addition, broom sorghum is traditionally used for the production of brooms, as a building material, for papermaking, or as a combustible material.

In industrial areas, the popularity of sorghum as an energy and plant raw material is growing. In the United States, sugar sorghum is used to make bioethanol. The sugar required for this is obtained from the stems of the plant. Also in Germany, such attempts are being made: to obtain a biogas substrate, they are trying to achieve a methane yield similar to that of corn fermentation. By-products of starch production are protein feed, oil and wax.

There are attempts to develop new varieties of sorghum in order to increase their nutritional value. At the same time, a concentration is made to increase the content of vitamin A, zinc, iron and some amino acids.

Sugar beet is a root crop used worldwide for the production of beet sugar. Compared to ordinary purple beets, sugar beets are white in color and contain more pulp and sucrose. Processed production residues of beets - pulp and molasses, are used as food additives in animal husbandry. Today, most of the production capacity for the cultivation of white beets is located in France, Russia and the United States.

The most favorable environment for the cultivation of sugar beet in Kazakhstan is the southern, southeastern regions of the country. In the Almaty region alone, more than 440 thousand tons of crops are sold annually. However, at the moment, the harvest from all over the country does not cover even half of the total demand. This factor puts buyers in front of the need to purchase raw

materials from abroad, and as a result, this puts us on the first lines in the world list of the largest importers of sugar beet.

Sugar beet is a biennial plant and its full growth spans two growing phases. In the first phase, the active formation of the root system and rosette leaf arrangement occurs, in the second, the plant begins to form a root crop and start flowering shoots. The duration of the first growing phase depends on the variety or type of hybrids, weather conditions, usually 135-155 days on average.

Despite the fact that the culture is resistant to saline soil, it positively manifests itself in slightly alkaline, drained, aerated chernozem with a large mass of nutrients. Sugar beets are intolerant of prolonged drought, therefore the relative humidity (about 60-70% HB) in the soil is a necessary condition.

According to the recommendations, in conditions of compliance with crop rotation, after winter wheat, it is necessary to carry out a procedure for cleansing the soil from stem residues of a grain crop, namely, to carry out peeling or disking. Then, under autumn plowing, apply organic fertilizer 20-30 t / ha and most of the planned mineral fertilization is about 250-300 kg / ha). The depth of winter plowing varies between 22-25 cm. In case of excessive soil density, pre-plowing irrigation can be carried out. Before the onset of winter, it is necessary to carry out deep plowing of the plow. In early spring, the soil is harrowed, herbicides are applied, then pre-sowing cultivation and sowing are carried out with an inter-row spacing of 60 cm, in some cases 45-50 cm. After sowing the seeds, the most crucial moment in the development of the culture begins. At this stage, it is necessary to be vigilant and carefully look after the crops, namely, carry out the following procedures: rolling, harrowing before and after germination, treating with herbicides and pesticides plant protection products, cultivation, periodic watering at least 5 times per growing season.

When cultivating sugar beets, great attention should be paid to the crop rotation process. Violation of the alternation of agricultural crops will inevitably lead to soil degradation and infection with fungal diseases, which will entail a loss of weight and sugar content of the fruit, that is, the entire crop. Returning to its original place when growing beets is permissible only after 3-4 years, after winter crops. Therefore, the introduction of fertilizers, pesticides and herbicides are irreplaceable measures for the culture.

We recommend the following nutrition program for our clients:

Alas, regular feeding of sugar beets with fertilizers is not a guarantee of a high-quality harvest. Without pesticide treatment, the culture's immunity is unable to cope on its own, and the infection of the culture with a fungal disease is the most terrible ailment that it can face. Unfortunately, this is not an uncommon problem for Kazakhstani farmers. Some areas of the fields of the South-East, cultivated for sugar beet, are massively affected by fungal diseases. Reversing this process is practically impracticable, the reason for this is the developed immunity of pests to pesticides. To suspend the infection is possible only by the introduction of large amounts of chemicals and pesticides, which not every farmer can afford. The government intends not to slow down the already gained momentum, therefore, it sees the most optimal solution for the country to develop new areas.

Sugarcane or belongs to several species and hybrids of tall perennial grasses from the genus Saccharum, tribe Andropogoneae, which are used for sugar production. Plants are two to six meters six to twenty feet tall with strong, articulated, fibrous stems rich in sucrose that accumulates in the internodes of the stem. Sugarcane belongs to the Poaceae grass family, an economically important flowering plant family that includes corn, wheat, rice and sorghum, as well as many crop forages. It grows from the warm temperate and tropical regions of India, Southeast Asia and New Guinea.

Sugarcane is the world's largest crop by volume, with 1,8 billion tonnes produced in 2017, with Brazil accounting for 40% of global production. In 2012, the Food and Agriculture Organization

estimated that it was cultivated on an area of about 26 million hectares and 64 million acres in more than 90 countries.

About 70% of the sugar produced in the world comes from a variety of sugarcane called Saccharum officinarum and its hybrids. All types of sugarcane can be crossed, and the main commercial varieties are complex hybrids.

Sugarcane accounts for 79% of the sugar produced; most of the rest of the production is made from sugar beets. While sugar cane grows predominantly in tropical and subtropical regions, sugar beets tend to grow in colder temperate regions.

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