ҚОЛДАНЫЛҒАН ӘДЕБИЕТТЕР ТІЗІМІ

1. Алабушев, А. В. Уникальные возможности сорго / А. В. 1. Алабушев //Земледелие. – 2000. – № 3. – С. 19.
2. Невежин С. Сорго не боится засухи. // Приусадебное хозяйство, 2011. №3.
3. Жанзақов М.М. «Егіншілік» Оқулық. Қызылорда . «Тұмар», 2010 230 б
4. Глухих М.А., Батраева О.С.: Земледелие: учебное пособие, 2019г. https://e.lanbook.com/reader/book/122157/#1

РЕЗЮМЕ

Сорго – исключительно засухоустойчивая культура, выдерживает жару, суховеи, растет на соленых почвах. Многие фермеры Казахстана в последние пару лет интересуются этой культурой, выгодной для зон рискованного земледелия, ее особенностями, рассматривают возможность ее выращивания.

Высокоурожайная кормовая и продовольственная культура сорго относится к роду Sorghum, из многочисленных видов его в Казахстане культивируются в основном два: сорго обыкновенное и травянистое – суданская трава, возделываемая как кормовое растение. По характеру использования сорго делят на три группы: зерновое, сахарное (кормовое) и веничное.

По строению метелки различают формы сорго: развесистое (метельчатое), сжатое и комовое. Для возделывания на продовольственное зерно используют вид с комовой формой метелки. Для выращивания в качестве сахарного (или кормового) сорго (зеленый корм, сено, силос, для получения патоки и на зерно) применяют сорта преимущественно с развесистой формой метелки. Веничное сорго не имеет кормовой ценности, представлено главным образом сортами со сжатой формой метелки, не имеющей главной оси. Из последнего изготавливают веники, щетки. По всем формам сорго в нашей стране в настоящее время имеются селекционные сорта и гибриды.

Установить в условиях Актюбинской области оптимальную технологию обработки посева сорги на зеленый корм. В статье изучались закономерности роста и развития сорги в зависимости от нормы высева семян.

RESUME

Sorghum is an exceptionally drought-resistant crop that can withstand heat, dry winds, and grows on salty soils. In the last couple of years, many farmers in Kazakhstan have been interested in this crop, which is beneficial for risky farming zones, its features, and are considering the possibility of growing it.

The high-yielding fodder and food crop of sorghum belongs to the genus Sorghum, of its many species in Kazakhstan, mainly two are cultivated: ordinary sorghum and herb - Sudanese grass cultivated as a fodder plant. By the nature of its use, sorghum is divided into three groups: grain, sugar (fodder) and broom.

According to the structure of the panicle, sorghum forms are distinguished: spreading (panicle), compressed and lumpy. For cultivation for food grain, a species with a lumpy panicle is used. For cultivation as sugar (or fodder) sorghum (green fodder, hay, silage, for molasses and for grain), varieties are used mainly with a spreading panicle. Broom sorghum has no forage value, it is represented mainly by varieties with a compressed panicle shape that does not have a main axis. Brooms and brushes are made from the latter. There are breeding varieties and hybrids for all forms of sorghum in our country.

To establish in the conditions of the Aktobe region the optimal technology for processing sorghum sowing for green forage. The regularities of the growth and development of sorghum depending on the seeding rate were studied in the article.

UDC 68.05.29
Nasiyev B.N., doctor of agricultural Sciences, Professor, corresponding member OF NAS RK
NPJSC «Zhangir khan West Kazakhstan Agrarian-Technical University », Uralsk, Kazakhstan

AGROECOLOGICAL MONITORING OF FORAGE LANDS

Abstact

The main economic consequences of desertification and land degradation are a decrease in crop yields and pasture productivity, a decrease in the number of animals and their productivity, and a reduction in the export potential of agriculture. Combating desertification is a prerequisite for ensuring the long-term productivity of drylands. Currently, in the semi-desert zone of the West Kazakhstan region, there is a

General degradation of natural forage lands and land desertification. In these areas, natural forage lands are the main sources of feed for farm animals. In this regard, identifying the processes and factors of degradation and desertification of forage lands in the semi-desert West Kazakhstan region is an urgent task. The purpose of the research is to identify forage lands that are subject to degradation and desertification and to study the extent and factors that contribute to their degradation and desertification. In the reporting year, in accordance with the tasks, geobotanical surveys of the vegetation cover of forage lands were carried out to determine the degree of degradation.The article discusses the results of research on the degradation of vegetation cover of forage lands in the semidesert zone. As shown by geobotanical research data, a clear predominance of vegetation degradation over other processes of desertification is characteristic of forage lands in the Bokeyurdinsky and Zhangalinsky districts of the West Kazakhstan region. The analysis of materials obtained in the course of scientific research on the territories of forage lands in the semi-desert zone of Western Kazakhstan allowed us to distinguish 3 classes of desertification by degradation of vegetation cover. In zhangali district, vegetation and soil cover of pastures of Zhanakazan rural district are most degraded; in the rest of The territory, degradation has 1 and 2 degrees.

Keywords: *degradation, vegetation, productivity, pastures, desertification*

The progressive desertification of the semi-desert zone of Western Kazakhstan is caused by the development of two main processes related to human economic activity: degradation of vegetation cover and degradation of soil cover. On the territory of the southern regions of the region, on a much smaller scale, there are processes of man-made desertification caused by technical means (machines, mechanisms) during the construction of mines, wells, industrial facilities, roads or when using vehicles in off-road conditions, which often leads to the complete destruction of very fragile arid ecosystems. A distinctive feature of vegetation and soil cover of desolate steppes is complexity. It is caused by a large lack of moisture and huge evaporation in which vegetation and soils react to the slightest changes in the water regime of surface horizons. In addition to aridity, its formation is facilitated by the youth of the territory, the strong salinity of soil-forming rocks and the equalization of the terrain [1, 2, 3, 4].

When studying the vegetation cover of forage lands, we used satellite multispectral images of average (15-30 m/pixel) resolution obtained from the Landsat TM spacecraft.

In the course of studying the vegetation cover of the grassland Bagautdinova district, we obtained the following results.

State of vegetation cover of transect No. 1, which is located on the territories of Temir Masinsky rural district, the state of vegetation cover reflects long-term derived communities. The projective cover of native vegetation is 17.76 %. The height of the herbage is 30.61 cm. Ruderal plants and tropics of livestock were not found on the site. The pasture feed yield was 3.63 C/ha, with a modern productivity of 80.32 %. At this site, the decrease in feed stocks was 3.59 %. In General, according to the assessment criteria, this site corresponds to 1 weak degree of vegetation degradation.

According to research data, on the territory of Bokeyurda district, forage lands with 1 weak degree of vegetation degradation are identified in Urda (pastures, transect No. 9), Muratsay (pastures, transect No. 8) rural districts. Long-term derived plant communities are common in these forage areas. Projected coverage of native vegetation at the level of 18.68-1942%. On these sites, the number of livestock paths and ruderal plants were not found. The decrease in feed stocks with the current productivity of forage lands of 82.22-83.14% is 3.31-3.69%. The yield of pasture stands is 3.99-4.15 C/ha. Plant height at the level of 31.38-32.05 cm.

Transect No. 2 is located on the territory of pastures of Temir Masinsky rural district. On this transect, the projective cover of pastures of indigenous vegetation is 14.37%, and ruderal vegetation is 2%, the number of livestock paths is 5 PCs per 20 sq.m. The decrease in feed reserves with the current pasture productivity of 78.32% is 5.11 %. The yield of pasture grass was 3.13 C/ha. The presence of plants-indicators of desertification were not noted. The height of the herbage is 29.17 cm. According to the assessment criteria, the vegetation cover of the pasture has 2 moderate degrees of degradation.

In the Bokeiurda district, forage lands with a moderate degree of vegetation degradation are also established in the territories of pastures of Muratsay (transect No. 7), Urda (transect No. 10), Bisensky (transect No. 11), Temir Masinsky (transect No. 12) and Uyala rural districts (transect No. 14). On pastures, the yield of grass stands at a plant height of 23.89-28.79 cm was at the level of 2.58-2.87 C/ha. Projected coverage of pastures with native vegetation at the level of 13.46-14.31 %. Current productivity is 60.12-77.91 % of the potential. On pastures, a decrease in feed stocks was found from 5.93 to 6.88 %.

Transect No. 3 (pastures of Binsen rural district) according to research has a very strong degree of degradation of vegetation cover. Short-term derived plant communities are common here. On the specified pasture, the projective cover of indigenous vegetation is 7.86%, the number of livestock paths is 11 PCs per 20 sq.m. The decrease in feed reserves with the current pasture productivity of 35.22% is 12.48 %. The yield of pasture grass is 1.48 C/ha, with a plant height of 21.15 cm. Alhagi pseudalhagi, Euphórbia, Anabasis aphylla, Xanthium strumarium, and Datura are found among the degradation indicator plants.

In the Bokeyurda district, pastures with a very high degree of vegetation degradation are also established in the territories of Urda (transect No. 4), Saikha (transects No. 5 and 6), Uyala (transect No.13) and Saralzhinsky rural districts (transect No. 15).

In the Bokeyurda district, there are 270 230.3 hectares of forage land. On the territory of the district, the following forage lands are distributed:

1) Feather grass forage lands with a predominance of feather grass;
2) Ciaco-tyrsikova feeding grounds;
3) Green field feeding Grounds;
4) Forage lands with a predominance of volosnets, veynik, MII, beskilnitsy, soft-stemmed grasses of stalk-less stalk, Wheatgrass, creeping Wheatgrass, foxtail;
5) Solyanka feeding grounds with a predominance of Kokpek;
6) Ephemeral feeding grounds with a predominance of bonfires;
7) Solyanka forage lands with a predominance of sarsazan, Sveda, warty Swan, annual solyanok, ebelek, Tatar Swan;
8) Modification vegetation (itsigek, leafless ezhovnik, saline ezhovnik, milkweed, licorice);
9) Forage lands with a predominance of granary, yerkek and tyrsik;
10) Krasnopolye the grassland dominated sagebrush Verhovskoy, Austrian, odnopestichnyj;
11) Cernopolni grasslands with a predominance of black sagebrush and odnopestichnyj;
12) Grasslands with a predominance of rushuna;
13) Tipchak Feeding grounds with a predominance of tipchak, Becker's fescue and tonkop;
14) Forage areas with a predominance of Tamarix.

Of the total area in the district, forage lands with 3 degrees of degradation are distributed on an area of 107,860. 7 ha (39.91%). 97,424. 1 ha or 36.05 % of forage lands are degraded to 2 moderate degrees. On 48,744. 2 ha, forage lands with signs of 1 weak degree of degradation are distributed. The share of hayfields and pastures with indicators of 1 degree is 18.04 % of the total land area. 16 201.3 ha or 6.00% of forage land has no signs of degradation. The data obtained in the course of geobotanical studies of the vegetation cover of forage lands indicate a significant depth of degradation processes, since in the territory of the district, forage lands with signs of 3 severe degrees of degradation make up 107,860. 7 ha or 39.91 % of the total area. However, by organizing techniques to improve the condition of degraded forage lands, it is possible to restore their bio – productivity, which is favourably promoted by climatic conditions-temperature, precipitation, SCC and radiation.

According to the results of research conducted in 2020, it was found that within the Zhangalinsky district, forage lands located in the Northern part are degraded to a lesser extent compared to the lands of the southern part. Pastures Czlapinski (transect No. 4), Kopzhasarova (of transect No. 7) and Lastexitcode rural districts (transects No. 9) is not degraded. In these pastures, the yield of grass stands at a plant height of 42.64-49.88 cm was 5.38-6.30 C/ha. Projected coverage of pastures with native vegetation at the level of 29.48-32.11 %. Current pasture productivity from potential at the level of 89.81-92.25 % with a decrease in the feed stock of 1.98-2.09%.

In the course of our research on the territory of Brliksogo, Pyatimarsky, Mendeshevsky, Mashteksaysky and Kopzhasarsky rural districts, we identified pastures with 1 weak degree of vegetation degradation (transects 1, 2, 5, 6 and 8). Projected coverage of native pasture vegetation in the range of 16.87-19.92 %. The height of the grass stands is 33.74-39.12 cm. The yield of grasslands in the absence of livestock paths is 3.57-4.48 c/ha. The current pasture productivity is 80.74-85.42 %, with a decrease in feed reserves of 2.00-2.52 %.

Research data shows that on transects 3 (pastures, Pyatimarsky rural district), 10 (haymaking Mashteksaysky rural district) and 14, 15 (pastures Zhanakazansky rural district), the projected coverage of forage lands with indigenous vegetation at the level of 13.15-14.95 %, and ruderal vegetation 1-2 %. The number of livestock paths is 5-7 PCs per 20 sq.m. the decrease in feed stocks with the current productivity of forage lands of 54.24-62.15% is 6.51-7.93 %. The yield of grass stands at a height of 24.89-32.15 cm was 2.86-3.48 c/ha. According to the assessment criteria, the vegetation cover of these forage lands has 2 moderate degrees of vegetation degradation.

In the Zhangali district, forage lands with 3 degrees of degradation are established on the territory of Zhanazhol and Zhanakazan rural districts of transects No. 11, 12 and 13. Projected coverage of land with indigenous vegetation 5.84-7.75 %, ruderal vegetation 3%. The yield of grass stands is 1.14-2.05 c/ha. Tracks of cattle up to 9-12 PCs/20 POG.m indicates a greater load and a high degree of trampling of land by sheep. Reduced current productivity from potential (38.12-43.75 %), feed stocks are reduced to 11.57 - 14.74%. The ecosystem of these transects is represented by short-term-derived communities. The height of herbage plants was 17.44-20.44 cm

In the Zhangali district, there are 357,268. 0 ha of forage land. On the territory of the district, the following forage lands are distributed:

1) Kiyako-tyrsikovye forage lands;

2) Green-Field forage lands with a predominance of poorly eaten sagebrush, Shagyr and Burgun;

3) Forage areas with a predominance of volosnets, veynik, MII, beskilnitsy;

4) Forage areas with a predominance of soft-stemmed grasses of boneless stalk, cornless Wheatgrass, beskilnitsy, foxtail;

5) Solyanka feeding grounds with a predominance of Kokpek;

6) Ephemeral feeding grounds with a predominance of bonfires;

7) Solyanka forage lands with a predominance of sarsazan, Sveda, warty Swan, annual solyanok, ebelek, Tatar Swan;

8) Modification of vegetation;

9) Forage lands with a predominance of granary;

10) Krasnopolye the grassland dominated sagebrush Verhovskoy, Austrian, odnopestichnyj;

11) Cernopolni grasslands with a predominance of black sagebrush and odnopestichnyj;

12) Fescue grasslands.

Of the total area in the district, 19,583. 0 ha (5.48%) is forage land with a high 3 degree of degradation. 42,852. 1 ha or 12.00% of forage land is degraded to a moderate 2 degree. On 140,448. 1 ha, forage lands with signs of 1 weak degree of degradation are distributed. The share of hayfields and pastures with indicators of 1 degree is 39.31% of the total land area. 154,384. 8 ha or 43.21% of forage land has no signs of degradation.

The data obtained in the course of geobotanical studies of the vegetation cover of forage lands indicate a weak depth of degradation processes, since in the territories of the district, forage lands with signs of 3 strong degrees of degradation make up 19,583. 0 ha or 5.48 % of the total area.

By organizing techniques to improve the condition of degraded forage lands, it is possible to restore their bio-productivity.

Climate conditions such as temperature, precipitation, SCC, and radiation favorably contribute to the restoration of the bioresource potential of forage lands in the Zhangalinsky district.

According to research data, a clear predominance of vegetation degradation over other processes of desertification is characteristic of the forage lands of the Bokeyurda and Zhangali districts of the West Kazakhstan region.

The analysis of materials obtained in the course of scientific research on the territories of forage lands of the semi-desert zone allowed us to distinguish the following classes of desertification by degradation of vegetation cover:

Weak desertification. The state of ecosystems is close to the background level. The main dominant composition of plants is preserved in the vegetation cover. The vitality of the plants is good. These include mainly stable natural ecosystems (with a low internal risk of desertification) of medium-loamy soil surfaces.

Moderate desertification. The dominant composition of plant communities in the main part of the territory is preserved, but the vitality of well-eaten and dominant species is somewhat weakened by the alienation of shoots. There are clearly visible traces of sheep grazing on the pasture. The number of plant species and the projective cover are reduced by 1.5 times in comparison with the class of weak desertification. The participation of ruderal plants increases. This class includes relatively stable ecosystems with a moderate internal risk of desertification.

Severe desertification. The dominant composition of plant communities in some areas is strongly disturbed. The plant species that are eaten are eaten to the limit, their vitality is significantly weakened, and they are undersized. The grass cover is often sparse or absent. The projective coverage of dominants and sodominants is reduced to 5 %, and the participation of ruderal vegetation is increased to 3 %. Annual production is reduced by 3-4 times. This class is formed mainly by unstable ecosystems characterized by a strong internal risk of desertification.

According to geobotanical studies, 60 species were identified in the floristic composition of the studied forage lands in the semidesert zone of the West Kazakhstan region.

Ecological analysis of the flora in the studied forage lands of the semi-desert zone of the West Kazakhstan region showed that part of the flora consists of mesophilic species - 21 species or 35.00% of the total flora. The xerophilic group includes 16 species (26.66 %) of the total number of flora. Plants xeromesophyte group consist of 4 types (6.66 per cent), and gidrofilnye hydrophilic groups, respectively, 3 of a kind or 5.00 %.Therophytes represent 3 species or 5.00 %. Halophytes are represented by 10 species and make up 16.68% of the species composition of forage lands (Figure 1).

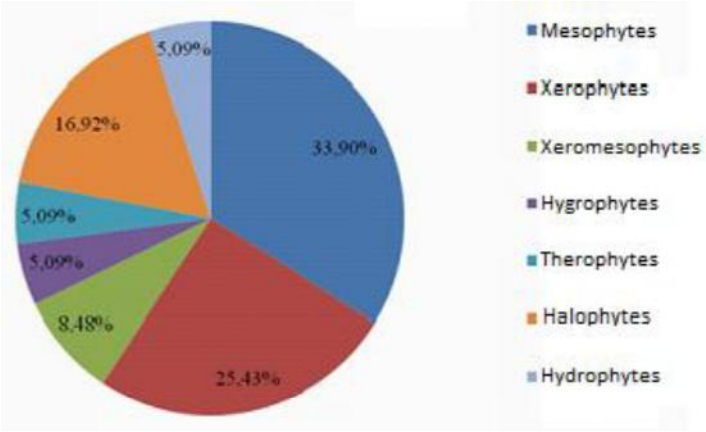

Figure 1 – Ecological groups of flora and vegetation of forage lands in the semidesert zone of the West Kazakhstan region, 2020

Desolate areas are characterized by binomial, three-and four-member communities, called spotted or "Chub" steppes. The predominant components of such steppes are grasses (*Stipa capillata, S. sareptana, Festuca valesiaca*) and semi-shrubs (*Artemisia lerchiana, A. pauciflora, Camphorosma monspeliaca, Atriplex Sapa*). Forage areas are also represented by communities dominated by *Stipa lessingiana, S. capillata, S. pennata, Festuca valesiaca, Artemisia austriaca*. Xerophytes are found in various *grasses: Astra galus testiculatus, Crinitaria tatarica, C. villosa, Falcaria vulgaris, Phlomis pungens.* Ephemeroids are quite diverse (*Poa bulbosa, Tulipa biebersteiniana, T. gesneriana, Ornithogalum fischerianum, Gagea bulbifera, Iris pumila*). The herbage is dominated by xerophilic semi-shrubs: *Artemisia austriaca, A. lerchiana, A. pauciflora, Kochia prostrata, Thymus marschallianus, Tanacetum achilleifolium*.

REFERENCES

1. Nasiyev B., Tulegenova D., Zhanatalapov N., Bekkaliev A., Shamsutdinov Z. Studying the Impact of Grazing on The Current State of Grassland in The Semi-desert Zone // Biosciences biotechnology research Asia. - 2015. - No.12.2. - P.1735-1742.

2. Scollan N.D., Enser M., Richardson R.I., Wood J.D. Effect of forage legumes on the fatty acid composition of bee // The Proceedings of the Nutrition Society. - 2002. - No.61(3A). - P.99-100.

3. Weber K.T., Horst S. Desertification and livestock grazing: The roles of sedentarization, mobility and rest // Pastoralism: Research, Policy and Practice. - 2011. - No.1. - P.19-20.

4. Toma H. Regional assessment of desertification of the ECWA region. – Baghdad, 2004. – 251 p.

5. Greene S. Hart T. Afonin A. Using geographic information to acquire wild crop germplasm: I. Map development and field use // Crop Science. - 1999. - No.3, vol.39. – 235 p.

6. Le Houerou H.H. Ecological management of arid grazing land ecosystem. - IUCN, 2005. – P. 45-49.

7. Rachkovskaya E. I. Safronova I. N. Khramtsov V. N. on the zoning of the vegetation Cover of the deserts of Kazakhstan and Central Asia // Botanic journal. - 2010. - Vol. 75, No. 1. - P.15-17.

8. Dzhanpeisov R. soil degradation of mountain and desert pastures of Kazakhstan // Problems of desert development. - 2010. - No. 4. - P.11-19.

9. Rodin L. E. Pastures and geobotanical zoning of the Syrian Arab Republic // In: Vegetation of the USSR and foreign countries. – L.: Nauka, 1964. - P.10-15.

ТҮЙІН

Табиғи мал азықтық алқаптардың болуы, етті мал шаруашылығының аз шығынды жайылымдық технологиясы Қазақстанның әлемдік нарықта маңызды және бәсекеге қабілетті ойыншы ретінде қалыптасуы үшін әлеует жасайды. Осыған байланысты, табиғи жайылымдардың өнімділігін арттыру басымды міндет болып табылады. Мақалада жартылай шөлейт аймақтың мал азықтық алқаптарының өсімдік жамылғысының күйзелуін зерттеу нәтижелері қарастырылады. Геоботаникалық зерттеулер көрсеткендей, шөлейттенудің басқа процестерінен өсімдік жамылғысының күйзелуінің айқын басым болуы Батыс Қазақстан облысының Бөкей ордасы және Жаңақала аудандарының азықтық алқаптарына тән. Батыс Қазақстанның жартылай шөлейтті аймағының мал азықтық алқаптарының аумақтарында жүргізілген ғылыми зерттеулер барысында алынған материалдарды талдау өсімдік жамылғысының күйзелуі бойынша шөлейттенудің 3-сыныбын бөлуге мүмкіндік берді. Жаңақала ауданында Жаңақазан ауылдық округінің жайылымдарының өсімдіктер жамылғысы неғұрлым күйзелген, қалған аумақтарда күйзелу 1 және 2-дәрежеге ие.

РЕЗЮМЕ

Наличие естественных кормовых угодий, малозатратная пастбищная технология мясного скотоводства создает потенциал для становления Казахстана как значимого и конкурентоспособного игрока на мировом рынке. В связи с этим, повышение продуктивности природных пастбищ является задачей приоритетной. В статье рассматриваются результаты исследований по изучению деградации растительного покрова кормовых угодий полупустынной зоны. Как показывают данные геоботанических исследований, явное преобладание деградации растительного покрова над другими процессами опустынивания, характерно для кормовых угодий Бокейурдинского и Жангалинского районов Западно-Казахстанской области. Анализ материалов, полученных в ходе проведенных научных исследований на территорий кормовых угодий полупустынной зоны Западного Казахстана, позволил выделить 3 классы опустынивания по деградации растительного покрова. В Жангалинском районе наиболее деградированы растительность и почвенный покров пастбищ Жанаказанского сельского округа, на остальной территории деградация имеет 1 и 2 степени.

UDC 68.35.00; 68.35.31

Nasiyev B.N., doctor of agricultural Sciences, Professor, corresponding member OF NAS RK
NPJSC «Zhangir khan West Kazakhstan Agrarian-Technical University », Uralsk, Kazakhstan

ELEMENTS OF THE TECHNOLOGY OF CULTIVATION OF SUDANESE GRASS IN THE DRY STEPPE ZONE

Abstact

One of the requirements of modern animal husbandry is the uninterrupted supply of agricultural animals with an increasing number of full-fledged feed. An important factor in increasing the efficiency of crop diversification in Western Kazakhstan and reducing the dependence of crop productivity on weather conditions is the expansion of crops that are most adapted to unstable moisture. In recent years, in Western Kazakhstan, due to the diversification of agricultural production, commodity producers have widely begun to cultivate drought-resistant Sudanese grass. High ecological plasticity and otavnost, the ability to form a good mass during the summer depression of perennial grasses, the ability to sow in several terms and excellent eating of green mass by all herbivores, put it in a number of indispensable components of the green conveyor. The value of Sudan grass is also invaluable as a universal crop that is equally suitable for making hay, haylage, grass flour and silage, as well as for using green mass for feeding and grazing. The article presents research data on the development of adaptive technologies for cultivation of Sudanese grass in the dry steppe zone of Western Kazakhstan. Sudan grass – as a drought-resistant and plastic crop has a great appeal among farmers. One of the important points of its technology is the height of the cut of the mowing mass. According to research data, in Western Kazakhstan, to increase productivity and quality, it is advisable to mow the green mass of Sudanese grass at the level of 5 cm. In studies under this regime, the average yield of green mass of Sudanese grass for 3 years was 118.83 c/ha. With the productivity of feed units of 23.15 c/ha, protein collection was at the level of 2.16 c/ha. The cut height of 5 cm is optimal for growing Sudanese grass after harvesting. In General, the implementation of the obtained scientific data will allow