The OSCAR PUBLISHING Services
American Journal Of Agriculture And Horticulture Innovations

VOLUME Vol.06 Issue05 2026
PAGE NO. 21-24
DOI 10.37547/ajahi/Volume06Issue05-04

The Importance of Establishing Seed Production Areas for Promising Desert Forage Plant Species

Bobaeva Adiba Saydalievna
(PhD), Scientific Research Institute of Karakul Sheep Breeding and Desert Ecology, Uzbekistan

Received: 18 March 2026; **Accepted:** 24 April 2026; **Published:** 19 May 2026

Abstract: The article presents the results of research on the development of seed production of promising desert forage plants used to improve the condition of natural pastures. Phyto melioration of degraded natural pastures using high-quality seeds of desert forage plant species with high germination rates and productivity indicators contributes to an increase in pasture productivity, improvement in feed quality, and expansion of new species rich in valuable nutritional characteristics within pasture vegetation cover.

Keywords: Desert, foothill, pasture, degradation, semi-shrubs, perennial grasses, fodder, seed production, phytomelioration.

Introduction: At present, as the world's population continues to grow, increasing food production remains one of the most pressing challenges. In particular, under the conditions of rapid population growth in our republic and the limited availability of natural resources such as land and water, meeting the population's demand for food products has become critically important. Milk and meat products play an invaluable role in improving living standards and ensuring food security. Satisfying the population's demand for dairy and meat products requires the sustainable development of livestock farming and the year-by-year increase of gross livestock production. Natural pastures are of great importance in the development of livestock farming and in providing animals with feed and fodder [9].

The natural pastures of our republic cover 20.6 million hectares and serve as the main feed resource base for livestock production. In particular, desert and foothill pastures are used almost year-round in karakul breeding, camel breeding, and goat farming. Although natural pastures are considered inexpensive and convenient areas suitable for year-round use, their feed reserves are extremely low (1.5–3.5 centners) and vary sharply across years and seasons [3].

In recent years, global climate change, the deterioration of the ecological situation, adverse events such as the Aral Sea disaster, as well as the irrational use of natural pastures, have contributed to the intensification of desertification processes. These conditions have led to a sharp decline in plant biodiversity in natural pasture areas, a decrease in pasture productivity, and a deterioration in forage quality. In our country, the main way to develop pasture-based livestock farming is to increase pasture productivity and the nutritional value of forage. Therefore, improving the productivity of natural pastures and enriching their vegetation cover with new species through the use of drought-resistant, high-yielding pasture forage plant species with valuable nutritional properties is currently considered one of the most urgent tasks [5].

High-quality seeds of promising pasture forage plants are essential for improving the condition of natural pastures. Seeds collected from natural pastures are often of low quality, and seed harvesting is complicated by the sparse and scattered distribution of plant species. In addition, plant species possessing the most valuable nutritional characteristics are frequently grazed and trampled by livestock, which limits their ability to produce seeds. These conditions create the need to cultivate seeds of pasture forage plants in specially protected areas. Unlike other agricultural crops, the cultivation and management of pasture forage plants are carried out under extremely arid

conditions (rainfed farming), and the effectiveness of research activities is directly influenced by environmental factors. In other words, opportunities for favorable growth and development conditions for plants are limited. Therefore, specific agrotechnical measures are required in the cultivation and maintenance of pasture forage plants. In particular, agrotechnical practices such as soil tillage, sowing periods, seed placement depth, seeding rates, sowing methods, and plant nutrition area must be implemented in a timely manner and in accordance with established rules and requirements [7]. This article presents the results of research conducted at the seed production field of the “Nurota” experimental station of the Scientific Research Institute of Karakul Breeding and Desert Ecology.

Research materials and methods

The research materials include the light sierozem soils of the Nurota foothills, seeds collected from the gene pool of pasture forage plant species consisting of semi-shrubs and perennial grasses at the “Nurota” experimental station, as well as the biological characteristics, such as survival rate, growth and development, hay yield, and seed productivity, of plant species established in the seed production field.

The planned field experiments were conducted based on phenological observations, biometric measurements, and studies of forage and seed production processes of plants. The research was carried out using generally accepted methods in plant science and plant introduction [1; 2; 8], as well as other methodological guidelines.

Results of the study and their analysis. The research was conducted at the seed production field of the Scientific Research Institute of Karakul Breeding and Desert Ecology. This experimental site is located in Nurota District of Navoi Region. The study area is situated at the foothills of the Nurota mountain range, at an elevation of 660–680 meters above sea level. The climate of the region is sharply continental and highly variable. The long-term average annual temperature is 13.8°C, with significant interannual fluctuations. The absolute maximum temperature reaches 46.7°C (in July), while the absolute minimum drops to -24°C (in January). The long-term average annual precipitation is 215 mm, varying between 132 mm and 308 mm across years, and is mainly observed in winter and spring seasons. The soil type of the experimental field is light sierozem, with a sandy-loam mechanical composition [4].

In the research, seed production processes of promising pasture forage plant species rich in nutritional value, well consumed by livestock, and capable of producing high hay yields over many years were studied. These species include Salsola (izen), Anabasis (qiyrovuq), Krascheninnikovia ceratoides (teresken), Salsola orientalis (chogon), and spherical astragal (Astragalus spp.).

As a result of long-term scientific investigations carried out at the Scientific Research Institute of Karakul Breeding and Desert Ecology, data on the laboratory and field germination rates of these promising pasture forage plants, their growth, development, and yield formation under cultivation conditions, as well as agrotechnical practices for their cultivation, have been developed [10]. However, research on the production of high-quality seeds of these species has not been sufficiently conducted. Therefore, the implementation of a specific system of agrotechnical measures is required to produce high-quality seeds with high germination and productivity indicators. Such agrotechnical measures include determining the plant nutrition area and accordingly establishing optimal seeding rates per hectare.

In arid regions (rainfed conditions), determining the optimal plant nutrition area for cultivated pasture forage plants is considered one of the most important agrotechnical measures. It defines the main criterion for plant growth, development, and the formation of high hay and seed yields.

To determine the plant nutrition area, seeds of Salsola (izen), Anabasis (qiyrovuq), Krascheninnikovia ceratoides (teresken), Salsola orientalis (chogon), and Astragalus spp. were sown in square planting patterns with spacings of 60×60 cm, 75×75 cm, 90×90 cm, 105×105 cm, and 120×120 cm. It was observed that when the nutrition area was small, indicators of plant survival, growth and development, as well as hay and seed productivity were low. When the nutrition area was large, plant survival and growth characteristics were high; however, hay and seed productivity were relatively low. When the plant nutrition area was optimal, plant survival, growth, and development were moderate, while hay and seed productivity were high. It has been shown in previous studies [6] that the highest levels of growth, development, and hay and seed production of pasture forage plants are observed in the third year of vegetation. In subsequent years, these indicators may be lower or higher than expected depending on weather conditions.

According to the table data, the highest seed yield per hectare was recorded at a plant nutrition area of 90 × 90 cm, reaching 116.4 kg in Salsola arbuscula (izen), 81.2 kg in Anabasis salsa (qiyrovuq), and 76.3 kg in Astragalus spp. At a plant nutrition area of 105 × 105 cm, the seed yield amounted to 63.1 kg in

Krascheninnikovia ceratoides (teresken) and 104.6 kg in Salsola orientalis (chogon).

Dependence of Seed Yield of Pasture Forage Plants on Plant Nutrition Area. Fourth (2025) Year of Vegetation

Plant nutrition area (cm)	Seed yield of plants (kg/ha)				
	Salsola arbuscula	Anabasis salsa	Krascheninnikovia ceratoides	Salsola orientalis	Astragalus spp.
60x60	73,9±2,7	65,1±2,2	45,4±1,9	75,9±2,8	66,2±2,1
75x75	95,3±3,4	73,4±2,8	52,7±2,1	86,5±3,3	71,4±3,0
90x90	116,4±4,3	81,2±3,2	59,6±1,8	93,1±3,8	76,3±3,2
105x105	97,2±3,8	72,9±2,7	63,1±2,3	104,6±4,1	67,5±2,9
120x120	76,8±2,9	61,4±2,3	53,5±1,7	91,2±3,9	59,3±2,7

Seed sowing rates per hectare for pasture forage plants are determined based on seed quality, purity, 1000-seed weight, and germination capacity. Seed quality and purity are assessed according to the degree of full ripening and harvesting, as well as the presence of plant leaves, seed wings, and immature floral structures in the seed material.

In addition, sowing rate norms are directly influenced by plant nutrition area. Based on experimental studies, the most optimal sowing rates for establishing seed production fields of pasture forage plants were determined as follows: Salsola arbuscula – 4 kg/ha; Anabasis salsa – 7 kg/ha; Krascheninnikovia ceratoides – 7 kg/ha; Salsola orientalis – 10 kg/ha; and Astragalus spp. – 4 kg/ha.

Costs for establishing seed production fields of promising pasture forage plants, as well as cultivated pastures aimed at improving the condition of natural rangelands, mainly include the purchase of seeds, ploughing of land, and sowing operations, and are incurred only once.

Considering that plants in seed production fields as well as in established cultivated pastures continuously produce hay and seed yields for 25–30 years, farms are provided with a long-term and guaranteed supply of fodder, while the condition of natural pastures is improved.

Conclusion

The establishment of seed production fields of promising pasture forage plants enables the production of high-quality seeds with high germination rates and productivity indicators. The use of these high-quality seeds for the phytomelioration of natural pastures leads to a 3–4-fold increase in pasture productivity, improves forage quality, and enriches the vegetation cover of natural pastures with new forage plant species. As a result, it creates opportunities for increasing livestock numbers and improving the quality of livestock products.

References

1. Белолипов Н.В., Тўхтаев Б.Е.,Қаршибоев Ҳ.Қ. “Ўсимликлар интродукцияси” фанидан илмий-тадқиқот ишларини ўтказишга оид методик кўрсатмалар.-Гулистон, 2011.-24 б.
2. Дала тажрибаларини ўтказиш услублари. Тошкент. ЎзПИТИ, 2014.-175 б.
3. Махмудов М.М. Қоракўлчилик яйловларининг ҳозирги ҳолати ва истиқболли фитомелиорантларни танлашнинг асосий критерийлари// Чўл яйлов чорвачилигини ривожлантириш муаммолари.-Самарқанд, 2005.-187-189 б.
4. Набиева Г.М. Деградацияга учраган яйлов тупроқлари ва улар унумдорлигини ошириш технологияларини такомиллаштириш. -Автореф.дисс.докт.биол.наук. –Тошкент, 2016.-26 б.
5. Отақулов Ў.Х. Яйловларни муҳофаза қилиш, биохилма-хилликни сақлаш экалогик барқарорликни таъминлашнинг муҳим омилидир // Яйловлардан оқилона фойдаланиш ва муҳофаза қилишнинг институтционал масалалари.-Тошкент, 2013.-7-9 б.
6. Раббимов А. Чўл озуқабоп ўсимликларининг генетик ресурслари, улардан фойдаланиш ҳолати ва истиқболлари //Қишлоқ хўжалик экинларининг ресурслари: ҳолати ва фойдаланиш истиқболлари.-Тошкент, 2014.-69-72 б.
7. Раббимов А.Р., Ҳамроева Г.У. Чўл озуқабоп ўсимликлари интродукцияси ва селекцияси бўйича услубий тавсиялар. –Самарқанд, 2016.-42 б.
8. Х.Р Халилов., А.С. Бобоева., Синдаров Ш.Қ. Аҳолини озиқ-овқат маҳсулотлари билан таъминлашда табиий яйловларнинг аҳамияти.//Озиқ-овқат ҳавфсизлиги: миллий ва

глобал омиллар.// Ҳалқаро лмий-амалий конфренция-Самарқанд, 2021.-429-430 б.

9. Шамсутдинов З.Ш. Создание долголетних пастбищ в Средней Азии.-Ташкент, Из-во. «ФАН» Узбекиской ССР, 1975,-176 с.