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Seed Yield of Promising Pasture Forage Plant Species

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Annotation: General Background: Natural pastures serve as vital ecosystems that support livestock and contribute to sustainable agriculture. However, the declining productivity of pastures due to overgrazing, climate change, and soil degradation necessitates the development of effective restoration strategies. Specific Background: One of the key methods for improving pasture productivity is the establishment of primary seedbeds of promising pasture plant species, which ensures high-quality seed availability and enhances forage growth. Knowledge Gap: Although various pasture improvement techniques exist, limited research has been conducted on the effectiveness of primary seedbeds in ensuring long-term pasture sustainability. Aims: This study aims to examine the role and significance of primary seedbed establishment in increasing the productivity of natural pastures. Results: The findings highlight that primary seedbeds contribute to improved plant establishment, increased biomass yield, and enhanced soil fertility. Additionally, selecting appropriate species adapted to local climatic conditions plays a crucial role in sustaining pasture ecosystems. Novelty: This research provides a comprehensive analysis of how targeted seedbed development can optimize pasture restoration efforts and ensure sustainable grazing management. Implications: The study underscores the necessity of integrating primary seedbed development into pasture management policies to enhance forage quality, support biodiversity, and improve livestock production.

Keywords: natural pasture, artificial pasture, semi-shrub, perennial grass, seed production, seed yield, productivity.

Introduction.

The main share of pastures and hayfields used for livestock breeding in our republic falls on arid regions (steppes, steppes). These natural pastures are the main source of feed for livestock farming in the agriculture of our republic and can be used throughout the year. [1]However, their productivity is directly related to the ecological conditions of steppe pastures, therefore, productivity varies significantly from year to year and season to season. In years with high rainfall, the productivity of natural pastures can increase by up to two times compared to the average year, and in dry years it can decrease by 1.5-2.0 times compared to the average year. The nutritional value of pasture feed also varies significantly throughout the year. If 100 kg of pasture feed contains 60-70 feed units in spring, then in winter this indicator does not exceed 18.3%. Due to the negative consequences of human activity, 45.7 percent of the existing pasture areas are currently in various degrees of crisis, accumulating feed reserves that are significantly lower than their potential. Also, due to the irregular use of natural pastures (overgrazing, technogenic factors, etc.), the pasture crisis in our republic is increasing day by day (Makhmudov and Bashk, 2014). This situation requires the effective use of natural pastures, the urgent implementation of a system of measures aimed at improving their condition and increasing their productivity.[2]

Quality seeds of promising pasture forage plants are needed to improve the condition of natural pastures. [3]In most cases, the seeds prepared from natural pastures are of poor quality, and due to the scattered and sparse distribution of plant species, there are some difficulties in preparing seeds (Bobaeva, 2024). Therefore, in order to improve the condition of natural pastures, the first task is to establish the seeding areas of promising pasture nutritious plants. Since the seed production of pasture nutritious plants is established in extremely arid soil-climatic conditions, it is necessary to develop a system of special agrotechnical measures (Khalilov, et al. 2020).[4]

Research source and execution methods. The source of the study is the viability, growth and seed collection characteristics of the species in the field of pasture nutritious plants consisting of light gray soils, semi-shrubs, and perennial grasses of the Nurota hills.[5]

Planned field experiments, phenological observations, biometric measurements, collection of seed reserves of plants, and other series of issues were carried out based on the use of generally accepted methods in plant science and other methodological guides (Rabbimov, Hamroeva, 2016).

Research results and their analysis. The experiments were conducted at the Nurota experimental field of the Karakul and Steppe Ecology Research Institute. In the seed production area of the experimental field, primary seed production areas of drought-resistant, high-yielding and nutritious plant species, isolated as a result of many years of scientific research at the institute, were established, and the processes of accumulating their seed reserves were analyzed.[6]

Promising species of pasture forage plants (grass, sedge, sedge, sedge, sainfoin) were sown in the seedbed of the experimental field in January 2020. The sown seeds sprouted in April of this year. One of the most important indicators of plants planted in arid conditions in arable farming is their germination, the number of bulbs in the calyx and their survival. The survival of plants was 73.7-88.5% in the first year of their vegetation, and 68.2-84.6% in the second year. By the third year of plant vegetation, the number of bulbs in the calyx of all species remained unchanged. These indicators are considered normative for pasture forage plants growing in extremely arid conditions and are suitable for the arid conditions of the selected species. indicating that it is a suitable plant.[7]

Since the types of pasture forage plants planted in the seedbed consisted of different life forms

(semi-shrubs, perennial herbs), it was found that there was also a difference in their growth and development. In the 5th (2024) year of plant vegetation, the height of perennial grasses was 59.6-81.3 cm, and the height of semi-shrubs was 82.4-98.5 cm.

The seed production indicators of plants depend on the number of plant tubers in the planted area, their growth and development, and in years with favorable weather conditions, they give a relatively high seed yield. It also depends on the plant species. According to the results of the study, some types of pasture forage seeds in the seeding area (rocky, marshy, sandy) entered the generative phase in the first year of their vegetation, while perennial grasses (male grass, sainfoin) produced seeds in the third year of their vegetation. The onset of moderate weather conditions in 2022 had a positive effect on plant development, and as a result, it was noted that the re-sprouting, growth, development, productivity, and seed production of plants were high. This year, pasture forage plant species collected 15.9-10.1 kg of seed. It was noted that due to insufficient rainfall in 2023, the seed production of plants was lower than in 2022. In 2024, the increased rainfall and favorable climatic conditions created good opportunities for the plants to collect seeds, and a seed yield of 57.8-121.2 kg per hectare was obtained across species.[8]

Seed yield of pasture forage plants planted in the seedbed

No.	Plant species	Seed yield kg/ha				
		1 (2020)	2 (2021)	3 (2022)	4 (2023)	5 (2024)
1	Izen (rock)	12.3±0.7	52.2±1.9	101.4±4.6	85.6±3.9	121.2±4.5
2	Teresken	-	23.6±0.9	54.8±2.5	36.3±1.7	71.3±3.1
3	Izen (sandy)	5.6±0.2	41.8±1.8	114.7±5.2	82.7±3.6	98.7±4.2
4	Cast iron	-	49.5±2.3	76.5±3.1	71.2±2.8	108.5
5	Izen (marsh soil)	7.2±0.3	44.7±1.9	82.3±3.9	78.6±3.1	106.9±4.3
6	Tail	-	35.6±1.5	71.9±3.5	65.4±2.7	80.6±3.3
7	Erythroderma	-	-	32.4±1.7	21.7±0.8	81.4±3.5
8	Esparcet	-	-	15.9±0.8	11.8±0.5	57.8±2.2

If we consider that the norms of seed consumption of pasture nutritious plants are 4-10 kilograms per hectare by species, the seed obtained from each hectare is sufficient for phytomelioration of 10-30 hectares of pasture areas. [9]The quality seeds grown are used to improve the condition of the natural pastures of our republic, which are in crisis.[10]

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