IJIAET International Journal of Innovative Analyses and Emerging Technology

| e-ISSN: 2792-4025 | http://openaccessjournals.eu | Volume: 3 Issue: 4

Methods of Determining the Crop Quality of Seeds of Desert Forage Plant Varieties

Rabbimov A

Associate Professor of Agricultural Sciences, Scientific Research Institute of Cattle Breeding and Desert Ecology,

Djamalova U.

PhD student, Scientific Research Institute of Cattle Breeding and Desert Ecology

Abstract: The article presents information on the ecological and biological characteristics of the seeds of desert nutritious plant species, their arable quality, and methods of their assessment.

Keywords: desert, pasture, phytoremediation, seeds, purity, absolute mass, fertility, scarification, stratification, inhibitors.

Introduction. The plant cover of the desert and semi-desert pastures of Uzbekistan is currently in crisis at various levels, the number of nutritious plant species has decreased, the quality of pasture feed and productivity have decreased. This situation calls for the development of pasture management, increase of yield through phytomelioration of low-yielding pastures in crisis, since pasture livestock is one of the important areas that ensure food security of our country. However, ensuring the sustainable development of the sector is directly related to the establishment of solid food reserves. Therefore, the President of the Republic of Uzbekistan Sh.M. In the decision No. PQ-277 adopted by Mirziyoev on June 10, 2022 "On measures to create an effective system of combating land degradation", about 2.5 million people who were in crisis in Uzbekistan during 2022-2025. Forecast indicators for restoration of plant cover and increase in productivity of hectare of pastures have been determined. Ensuring the implementation of this urgent task requires the production of seeds of many desert nutritious plant varieties in our republic. For example, currently available desert grassland phytoremediation technologies require at least 10-12 kg of seeds to re-vegetate 1.0 hectares of grassland. This means that we will need at least 25,000 tons of seeds to achieve the pasture improvement targets. Considering that desert-pasture plant science is a completely new field that is just developing in our republic, the work of seed production has not yet been started. Technological processes are not mechanized. Currently, the necessary seeds are collected only by hand, and there are absolutely no mechanisms for collecting, cleaning, drying, and sorting seeds. In addition, methods for determining the arable qualities of seeds of desert food plant varieties have not been developed. It is for this reason that the existing seed inspectorates are currently unable to certify the quality indicators of the seeds of desert forage plants. However, the law "On Seeding" adopted in the Republic of Uzbekistan prohibits planting seeds without a quality certificate. Research work is being carried out by the laboratory of seed production and seed science of desert plants, and based on the results of the

Published under an exclusive license by open access journals under Volume: 2 Issue: 7 in Jul-2022

research, it will be possible to correctly assess the crop qualities of the seeds, which are not yet familiar to everyone, knowing the specific characteristics of desert plants, based on the research results.

Research sources and methods. Among the plant species that are currently most promising in the phytomelioration of pastures, we can include such plants as black saxovul-Haloxylon aphyllum, chogon-Halothamnus subaphyllus, izen- Kochia prostrata, teresken- Ceratoides ewersmanniana, and kuruvuk- Salsola orientalis. Currently, local varieties of these plants have been created and included in the State Register. The seeds of the varieties "Nortuya" of the black saxophone, "Jaykhun" of the black saxophone, "Otavnyy" of the izen, "Tolkin" of the teresken and "Pervenets Karnaba" of the kuryvuk were taken for the research. , 1974; Metodicheskie ukazaniya po semenovedeniyu introdutsentov, 1988).

Analysis of research results. One of the quality indicators of seeds is seed purity. Because the standards of seed consumption are determined depending on the purity of the seed. Harvesting the seeds of desert edible plants is currently done only by manual labor, that is, when the seeds are ripe, the plants are harvested by hand and transported to the threshing floor. The plant mass is spread and dried for 4-5 days depending on the conditions. The dried plant mass is crushed with the help of branches and the branches are separated. Therefore, in the composition of the seed mass, fractions of small branches, plant leaves and flower buds that have not yet developed into seeds and empty seeds make up significant amounts. Due to the fact that the size of these additional fractions does not differ much from the size of the seeds, the possibility of separating them into separate fractions is limited. Therefore, it is necessary to determine the purity of the grown seeds, and based on this indicator, it will be possible to determine the rate of sowing seeds.

When determining the purity of seeds, average samples of 4-5 g were taken from the seed sample 4 times, depending on the type of plant. Then, the average sample was separated into seed, leaf, and other additional fractions using a laboratory soil sieve set with 5.0 mm to 0.1 mm mesh. Ripe seeds have well-developed wings. The seeds and other additives in the average sample were weighed separately on an electronic scale and their weight was determined. After determining the average sample weight, seed fraction weight, and other inclusion weights, the pure seed fraction weight in the sample was determined by proportion and expressed as a percentage. The purity of seeds prepared for planting in 2022 is presented in Table 1.

Table 1

Purity of seeds of desert nutritious plant varieties, %

Plant type, variety	**Seed purity,%**
Black saxophone "Nortuya"	54,4 ± 2,1
Chogon "Jayhun"	45,7 ± 1,9
Izen "Otavnyy"	40,3 ± 1,4
Терескен «Tulkin»	42,1 ± 2,1
«Pervenets Karnaba»	42,7 ± 1,5

As can be seen from the data in the table, the purity of seeds of desert alzukabop plant varieties is relatively low, that is, in plants with relatively small seeds, this indicator was 40-42%, while in plants with relatively larger seeds, this indicator was 45-54%. The purity of the seeds is also related to the ecological and biological characteristics of the plant and the environmental conditions. Desert plant seeds thrive in extremely dry and hot temperatures. Such extreme climatic conditions certainly do not affect the quality of seeds. It is known from the researches that only 25% of the flower buds formed in the izen plant can develop complete seeds (Rabbimov, 2014). This situation is typical for other species as well, because all the studied plant species

belong to the same family, that is, to the family Chenopodiaceae. Based on the results of many years of observations, it can be said that the purity of the seeds of desert edible plants is around the indicators presented in the table, and these indicators can be considered as normative. Absolute mass of 1000 seeds. The absolute weight of 1000 seeds is one of the main quality indicators, and it has been found that large seeds produce vigorous grasses, their viability is high, and the fertility of large seeds is also high. Determining the mass of 1000 grains of seeds of desert nutritious plants is carried out as follows: 500 seeds are counted twice from a seed sample and their weight is determined on an electronic scale. If the difference between the weight of both counted seeds exceeds 10%, 500 seeds are counted for the 3rd time, their weight is determined, and the average value of the weights of all three counted seeds is multiplied by 2. For example: 1-500 seeds weight-2.0 g; 2-If the weight of 500 seeds is 2.2 g, the difference between them is 10%. In this case, 3-500 seeds are counted and its weight is 2.1 grams. In this case, the absolute mass of 1000 seeds will be: 2.0 g + 2.2 g + 2.1 g = 6.3 g : 3 = 2.1 g x 2 = 4.2 g. Table 2 shows the absolute weight of 1000 seeds of the studied plant species.

Table 2

Absolute mass of 1000 grains of seeds of desert nutritious plant species, g

Plant type, variety	**Mass of 1000 seeds, g**
Black saxophone "Nortuya"	4,2-4,5
Chogon "Jayhun"	16,7-17,5
Izen "Otavnyy"	1,7-2,1
Терескен «Tulkin»	7,1-8,1
«Pervenets Karnaba»	7,5-7,7

The data presented in the table are the mass of seeds produced in different years, and the mass of 1000 seeds, as well as the purity of the seeds, varies depending on the environmental conditions. Therefore, when determining this characteristic of seeds, the amounts given in the table for seeds of each type can be considered as normative indicators.

Fertilization of seeds in laboratory conditions. Fertilization of seeds in laboratory conditions is determined by sowing them in Petri dishes. Usually, absorbent paper is used as a base. Sterilized river sand can also be used as a substrate. Research has shown that the optimum temperature for seed collection of desert food plant species is a variable 10-230 C, and this temperature is achieved by turning the thermostat on during the day and off at night. Seed extraction is carried out in a TSM-80M thermostat. Before collecting the seeds of Chogon, Kuruvuq, and Izen varieties, they are soaked in water for 2 days and cleaned of inhibitors. The seeds are dried, planted in Petri dishes and placed in a thermostat to determine their germination. 50 seeds are planted in each plate. Experiments are repeated 3 times, that is, 150 seeds from 50 seeds are collected from each seed sample. Germination of seeds is counted every 3-4 days, the germinated seeds are removed from the Petri dish. The duration of fertility tests is 15 days. Fertilization of seeds grown in 2022 under laboratory conditions is presented in Table 3.The data presented in the table are the mass of seeds produced in different years, and the mass of 1000

seeds, as well as the purity of the seeds, varies depending on the environmental conditions. Therefore, when determining this characteristic of seeds, the amounts given in the table for seeds of each type can be considered as normative indicators.

Table 3

Fertilization of seeds of varieties of desert nutritious plant species in laboratory conditions, %

Plant type, variety	**Fertilization of seeds, %**
Black saxophone "Nortuya"	62,3±2,1
Chogon "Jayhun"	50,2±1,7
Izen "Otavnyy"	70,2±2,3
Терескен «Tulkin»	62,8±1,9
«Pervenets Karnaba»	52,6±2,5

Experiments on seed fertility in laboratory conditions have shown that the seeds of desert nutritious plant varieties have a dormant period for certain periods, that is, the fertility indicators depend on the storage period of the seeds. The data presented in the table are taken from the fertility studies in February. The dormant period of the seeds is related to the climatic conditions in the year of their formation, and this period can last from 1 to 3 months (Semyonova, Shegay, Fyodorova, 1987). The period of ripening of the seeds of desert edible plants corresponds to October-November. Therefore, the maximum indicators of seed germination are observed in February. The process of germination of seeds of desert food plant varieties is gradual and requires a relatively long time. Depending on the type and variety of the plant, this process takes 15-25 days. In addition, some species require relatively high temperatures for their seeds to germinate, while some species require relatively low temperatures. For example, the optimum temperature for the germination of the seeds of Ferula L. is 0-5ºC, while the optimum germination temperature for the species of the Capparidacea family is 20-30oS. Experiments show that, in addition to creating certain optimal conditions for the germination of the seeds of the studied species and varieties, it is also necessary to stimulate fertility. Such stimulation methods include freezing and washing the seeds in water, drying, scarification, stratification, keeping them at a relatively hot temperature (40 °C) for a certain period of time, storing them at a cold temperature (0-4 °C) and so on. Soaking, washing and drying the seeds in water allows to get rid of the inhibitors that inhibit germination, which are characteristic of the seeds of desert alzucabe plant species, while scarification allows to ensure the access of water and oxygen to the seed coat by dissolving the seed coat. Stratification of seeds in different periods allows seeds with a physiological resting period to fully develop seed pods and release them from the resting period. Table 4 lists the conditions that must be created in laboratory conditions for the germination of the seeds of the studied species and varieties. As can be seen from the table data, a variable temperature of 10-23ºC is optimal for the germination of seeds of most species. It is necessary to wash and dry the seeds of almost all species to rid them of inhibitors. It is necessary to scarify or stratify the seeds of astragalus, Khorasan espartet, and alabuta species.

Table 4

Necessary conditions for studying the germination of seeds of desert food plant varieties under laboratory conditions

Ўсимлик тури, нави	Optimal temperature, t^0C	Stimulation of fertility	Duration of the experi days

IJIAET International Journal of Innovative Analyses and Emerging Technology
| e-ISSN: 2792-4025 | http://openaccessjournals.eu | Volume: 3 Issue: 4

Black saxophone (Haloxylon aphyllum) "Nortuya"	10-23	Freezing in water and drying day	15-20
Circassian (Salsola Paletzkiana))	10-23	Freezing in water and drying day	15-20
Halothamnus subaphyllus "Jayhun"	10-23	Freezing in water and drying day	15-20
Izen (Kochia prostrata) "Otavnyy"	10-23	Freezing in water and drying day	15-20
Kuryvuk (Salsola oriental) "Pervenets Karnaba"	10-23	Freezing in water and drying day	15-20
Teresken (Ceratoides ewersmanniana) "Wave"	10-23	-	15-20
Male grass (Agrophyron desertorum) "Trust	10-23	-	10-15
Perennial of course species (Atriplex sp.)	10-23	Stratification (40 days)	15-25
Astragalus (Astragalus globiceps) "Oktog"	10-23	Stratification (40 days)	15-20
Khorasan asparagus (Onobrychus chorossanica)	10-23	Stratification (40 days)	15-20
Koval (Capparis spinosa)	25-30	Stratification (90 days)	10-15

As can be seen, relatively long periods are required to evaluate the germination of seeds even under laboratory conditions. This creates certain difficulties in quickly determining the fertility of seed batches in seed inspections.

We can offer a method to determine the fragility of seeds in order to provide a short-term assessment of their fertility. Determining the completeness of seeds is an important indicator in evaluating the quality indicators of seed samples. When determining this indicator, seeds are counted in three replicates of 100 seeds, and water is poured into separate containers (1 l jars) and the seeds are cooled in water for 2 days at room temperature. During this period, normal seeds have time to swell, and the swollen seeds are separated from the seed coat, and the number of normally developed seed pods (germs) is determined. The fertility index of normally developed cotyledon seeds corresponds to the index of seed division. For example: it was found that the number of normally developed seeds in inflated seeds was 53 in the first return, 48 in the second, and 42 in the third. In this case, the completeness of the seeds is: 53+48+42= 143 : 3= 47.6%. So, seed germination is 47-48%, and this indicator can be considered as a standard indicator for desert nutritious plant species.

Published under an exclusive license by open access journals under Volume: 2 Issue: 7 in Jul-2022

Stimulation of fertility. It was found that some biologically active substances accumulate in the seed coat and inhibit the germination process. Seeds begin to germinate only after these biologically active substances are oxidized under the influence of the external environment. Such substances are called "inhibitors". According to their nature, inhibitors can be coumarins, essential oils, additives, vitamin R and various acids. It has been suggested that one of the reasons for rapid loss of fertility of seeds of desert plant species is that the amount of vitamin R in their content increases depending on the storage period (Ionesova, 1964). They neutralize the activity of various growth-enhancing auxins (heteroauxin, indolyl fatty acid, etc.) and, as a result, the germination process is inhibited. The case of a sharp increase in the germination of the seeds separated from the seed coat also indicates the presence of inhibitors in the seed coat. In our experiments on extracting mosh seeds from the extracts of chogon, olabuta, kuruvuq, izen, and black saxophone seeds, in chogon extract, the seeds did not germinate at all, and in kuruvug extract, germination was strongly inhibited, the root system was almost not developed in grasses, and in the extracts of olabuta and izen, the development indicators of the lawn and root system were similar to the control variant. two times behind and a significant decrease in overall productivity was observed.

The negative effect of inhibitors on fertility has been studied and scientifically proven by many researchers. For example, sugar beet seed extract has been found to inhibit the germination of barley, pea, and other plant seeds (Froeschel, 1956). Cercocarpus montanus seed extract has been found to inhibit not only the germination of other plant seeds, but also the plant's own seeds. When seeds were washed and dried on agar, and then harvested, their germination was found to be increased (Moore, 1963). Therefore, in order to correctly assess the fertility of the seeds of plant species such as black saxovul, chogon, kuruvuq, olabuta, and izen, it is advisable to first soak the seeds in water for a day, wash them well in running water, dry them, and then plant them in Petri dishes to determine their fertility.

Scarification and stratification. The seeds of most desert nutritive plant species are hardy and can lie in the soil for many years without germinating. Such seeds are called macrobiotic seeds. The reason for this is that the seeds are surrounded by a lignified shell (perennial sedge species, sugarcane) and are strongly protected from the effects of the external environment. Some seeds are covered with a smooth, mature membranous shell that is impermeable to water (egg, astragalus, and spartacete species) and prevents the passage of water and oxygen into the seed coat. The seeds of some species are double protected from the outside by a smooth mature film and a woody shell (covula seeds).

For the germination of such seeds, it is necessary to decompose the seed coats. That is, before planting them, it is necessary to scarify them in different ways or to stratify them for a long time (40-90 days). Germs of seeds that require long-term stratification are physiologically incompletely developed. This condition is also called "physiological smallness". In the process of stratification, physiological processes take place in the seed coat and the seeds become ready for germination. From the experiments, it was found that stratification of the seeds of kandym, kovul, yantak for 90 days, astragalus, espartset, perennial oleander species for 35-40 days gives a good effect. Chemical scarification (soaking in concentrated N2SO4 acid for 90 minutes) of carnation, astragalus, and spartacete seeds before sowing also works well.

But this method is quite inconvenient in production conditions, and long-term stratification of seeds is both convenient and cheap, and environmentally friendly and safe. There are many ways to stimulate seed germination. These include pre-sowing treatments with livestock manure juice, macro and micro elements, glucose and even ionizing rays. There are specific characteristics of studying the fertility of seeds of desert nutritive plant species, and these characteristics must be taken into account when evaluating their fertility under

laboratory conditions. In natural conditions, the seeds lie in the soil for a long time, under the influence of rainwater, the germination inhibiting inhibitors in the seed coats are washed away and soaked into the soil, the seeds are naturally stratified and germinate. Such conditions do not exist in laboratory conditions. Based on many years of experience in the areas of seed production and seed science, Table 4 presents the conditions necessary for studying the fertility of seeds of desert nutritious plant varieties, and it is appropriate to use them in seed control inspections.

Conclusions: The need to increase the productivity of the desert pastures of Uzbekistan through phytomelioration requires the cultivation of a large number of seeds of desert nutritious plant species, and the monitoring of their yield qualities. When evaluating the quality of seeds, it is appropriate to take into account the specific biological and ecological characteristics of the seeds of desert nutritious plant species. Due to the fact that seeds are produced in extreme desert conditions, their quality indicators are significantly lower than the quality of seeds of other types of agricultural crops, and these characteristics, i.e., the indicators described in this article, can be set as standard indicators for seeds of this type of plant seeds in the seed control inspectorates.

References:

1. Resolution of the President of the Republic of Uzbekistan dated June 10, 2022 No. PR-277 "On measures to create an effective system of combating land degradation". Lex. uz.
2. Ионесова А. С. 1964. Исследование витаминов в семенах пустынных растений, быстро теряющих всхожесть при хранения. В сб. «Биологические основы повышения качества семян сельскохозяйственных растений» М., «Наука», стр. 146-148.
3. Кулешов Н.Н. Агрономическое семеноведение. М., Сельхозиздат, 1963. -312 с.
4. Леурда И. Г., Бельских Л.В. Определение качества семян. М., ”Колос”, 1974. -100 с.
5. Методические указания по семеноведению интродуцентов. М.: Наука, 1988.-60с.
6. Раббимов А.Р. Ўзбекистонда изен – Kochia prostrate L. ўсимлиги ва ундан фойдаланиш. Самарқанд, “Zarafshon” нашриёти, 2014.-111 б.
7. Семёнова О.В., Шегай В.Ю.,Фёдорова Л.Ф. Покой семян аридных кормовых растений // Селекция и семеноводство аридных кормовых культур. Ташкент, 1987.-С.99-104.
8. Froeschel P. 1956. Hemmstoffe und Wochsfum.- Acta bot. neerl., 5,№3
9. Moore T. C. 1963. Germination inhibitor in achenes of Gercocarpus motanus.- Ecology, 44, №2 p. 406-409
10. Akramovna, O. N. (2021). Scientific basis for increasing the efficiency of cultivation of crops on the lands of farms and the population. ACADEMICIA: AN INTERNATIONAL MULTIDISCIPLINARY RESEARCH JOURNAL, 11(2), 1297-1304.
11. Ochilova, N. A. ECONOMIC PERFORMANCE OF DEHKAN FARMS IN KASHKADARYA REGION. GWALIOR MANAGEMENT ACADEMY, 117.
12. Akramovna, O. N. (2021). Management of Farming and Horticultureand their Economic Efficiency. Academic Journal of Digital Economics and Stability, 582-586.
13. Mirzakulovna, I. M., & Safarovich, K. Z. (2022). Dependence of Birth Type on Live Weight and Body Dimensions in Black Korakola Lambs. *Periodica Journal of Modern Philosophy, Social Sciences and Humanities*, *11*, 77-80.

14. Bazarova, D., & Klichev, Z. (2022). Maturity Characteristics of Karakul Breed Lambs. *INTERNATIONAL JOURNAL OF BIOLOGICAL ENGINEERING AND AGRICULTURE*, *1*(4), 23-24.
15. Khamdamovna, J. S., & Klichev, Z. (2022). CORRECT ORGANIZATION OF DRIVING IN KARAKUL SUBJECTS. *Galaxy International Interdisciplinary Research Journal*, *10*(5), 6-8.
16. Popova, V. V., & Safarovich, K. Z. (2022). Feeding Level of Ewets in Different Physiological Conditions. *International Journal on Orange Technologies*, *4*(3), 71-74.