Intent Research Scientific Journal-(IRSJ)
ISSN (E): 2980-4612
Volume 2, Issue 5, May -2023
Website: intentresearch.org/index.php/irsj/index

THE METHOD OF DETERMINING THE MOISTURE OF GERMOPLASM INTENDED FOR DRYING AND STORAGE AND ITS SIGNIFICANCE

Рустамов Назар Сарвар ўғли
Ўсимликлар генетик ресурслариилмий тадқиқот
Институи Тошкент, Ўзбекистон
perfectfuture@bk.ru

Abstract
Before storing the seeds, the moisture content should be reduced to the optimum level. There are several methods of drying seeds, the most common of which are the use of drying chambers and the use of absorbent equipment. The methods used in drying are selected based on the climatic conditions of the region, the composition and size of the stored plant species, the available material and technical base, and also the financial conditions. However, it should be noted that no matter what method of drying is used in the gene bank, the eternal preservation of the seed is not guaranteed. Drying (weakening) seeds to a critical (limiting) level makes it possible to store this seed up to the maximum allowed period. If the critical moisture level is not followed during the seed drying stage, then the storage capacity of the seed will decrease. In light of the above, all operating genebanks are mandated to dry seeds to the critical moisture point before placing them in refrigerated or frozen storage. By applying different combinations of temperature and moisture concentration during the drying process, seed drying can be accelerated or slowed down. It should also be taken into account that if the seeds are dried at low temperatures, then the physiological aging process of the mature plasma slows down, but the seeds dried at high temperatures require relatively less time.

Keywords: Germoplasm, seed, moisture level, germplasm, medium-term storage, heat, temperature, light.

There are specific aspects of long-term storage of seeds, and these aspects are directly related to the interaction of various biological factors in the seed material, consistency of storage temperature and moisture content of the seed.

Intent Research Scientific Journal
IRSJ

Intent Research Scientific Journal-(IRSJ)
ISSN (E): 2980-4612
Volume 2, Issue 5, May -2023
Website: intentresearch.org/index.php/irsj/index

Long-term storage of seeds also depends on the type of plant. Long-term research shows that the ability to maintain the high quality of seeds for a long time is represented by the cold temperature of the refrigerator and the low level of humidity. It should also be said that the quality characteristics of seeds that have been dried for too long in the drying chamber and passed the critical drying limit may decrease sharply. This is one of the factors that negatively affects fertility and other planting qualities. The proposed storage standards are aimed at maintaining the moisture level of the seed samples at an optimal concentration. As has been said many times , the decrease in the temperature in the refrigerator is ultimately about the risk of moisture in the stored seeds. A decrease in moisture content in over-dried seeds can also have harmful consequences.

When drying seeds to the critical moisture point, the isotherm can be controlled by determining the ratio of moisture in the seeds to the weight of the seed (usually expressed as a percentage) using the isotherm water absorption method. The ratio between seed weight and seed moisture of different varieties and wild forms may vary. Information on the isothermic ratio of seeds can be obtained by relying on information from official sources based on the level of moisture content of seeds.

In this method, the moisture content of agricultural crops is determined, and the standard is based on the method of thermal (air-heat method) exposure. During the application of the thermal processing method, the moisture content of the seeds is analyzed.

Necessary equipment and reagents. A drying rack during the analysis; the shelf is specially equipped and must work in the working temperature range from 100 °C to 150 °C (±2 °C level deviation is allowed) and at the same time have a regular ventilation system; moisture measuring equipment (vlagometer) for displaying absolute humidity in "%" as follows: for determining humidity in the range up to 18% (±1.5%) and for determining humidity in the range higher than 18% (±2.0) equipment; a special scale used in the laboratory: a scale measuring up to 500 grams with an accuracy of not less than 3rd class; a special seed grinder with a rotation speed of not less than 8000 per minute, (laboratornaya melnitsa); stopwatch; special clock (signalnye chasy); glass cups (with a special rough lid); special net bags and net covers used for drying seeds; aluminum bags used for

Intent Research Scientific Journal
IRSJ

Intent Research Scientific Journal-(IRSJ)
ISSN (E): 2980-4612
Volume 2, Issue 5, May -2023
Website: intentresearch.org/index.php/irsj/index

drying seeds (including aluminum lids); crucible clamps; seed rapid cooling equipment (cooler); 300x400x10 mm special stainless steel table (for cooling dishes); Special desiccator according to GOST 25336; Hokandoz; spoon; technical vaseline; calcium chloride.

Preparation for analysis. After the arrival of seed samples to the laboratory, moisture must be determined within 2 days. During the winter period, the dried seed material should be analyzed after no less than 2 hours at room temperature. The drying rack is heated to the required temperature by connecting it to the mains. Dehydrated calcium chloride is placed at the bottom of the desiccator. Calcium chloride should be replaced at least once a month or heated (the rough side of the desiccator is smeared with petroleum jelly). It is necessary to digitize glass bottles and bags. Aluminum boxes and their covers are measured to the nearest 0.01 grams.

Analysis procedure. Seed material whose moisture level needs to be determined is thoroughly mixed, 45-50 grams of seeds are taken for large-seeded crops, 23-25 grams for small-seeded crops (as an exception, up to 50 grams are determined for some small-seeded crops).

The average sample taken from the seed material mixed with water is roughly divided into 2 sets. If the seeds from the first set are used for analysis, the seeds from the second set are stored in glass cups with rough lids until the end of the analysis (if necessary, this reserve is used for re-analysis of seeds).

The seeds in the first batch should be passed through the seed grinder within the time frame indicated in the following table (Table 1).

1 - table

Plant name	Urugarni maydalash vakhti, with
1. Marzhumak, tariq, sorghum	20
2. Bugdoy, spelt, javdar, triticale, guruch, vetch, lupin, sainfoin, dolichos, mosh, yasmik, kanaksesame, tozalangan eryongok	40
3. Makkazhukhori, arpa, suli, nukhat, beans, chickpeas, chin, dukkak, lupine single leaf, soy	60
4. Marigold officinalis, tangu rhubarb	10
5. Marshmallow officinalis, astragalus, cassia, harrow	20

Transfer the crushed seed mass to a glass beaker and mix for 3-5 seconds. After that, the ground seeds are put into 2 aluminum bags of 5.00 grams each. In crop

Intent Research Scientific Journal
IRSJ

Intent Research Scientific Journal-(IRSJ)
ISSN (E): 2980-4612
Volume 2, Issue 5, May -2023
Website: intentresearch.org/index.php/irsj/index

types, where it is necessary to obtain up to 50 grams of seeds, directly unground seeds are analyzed (in some crop types, analysis is performed with unground seeds). The bags filled with seed material are put on their covers and placed in a row on the drying rack (after the temperature of the drying rack has been brought to an appropriate level!). The drying process is carried out according to the modes in the table (Table 2).

Table 2

Plant type	Drying temperature, °C	Drying time, min
1. Wheat, barley, rye, oats , triticale, parsley, chickpeas, vetch	150	20
2. Leguminous and leguminous crops (except for the crops listed in the first row) lupine, asparagus, sunflower, safflower, sesame, soybean	130	40
3. Vegetable crops (besides legumes, beans and chickpeas), legumes, roots and fodder crops, honey crops, flax, hemp, mustard, kenaf	130	60
4. Tobacco and tobacco	130	20
5. Oily crops (except for crops in paragraphs 2 and 3), ether - oil crops and technical crops (except for crops in paragraphs 3 and 4)	105	300
6. Medicinal plants	130	20
a) hemp danish, red foxglove, common thyme	130	40
b) Marshmallow officinalis, large ammi, astragalus woolly-flowered, valerian officinalis, common dope, St. peeled chamomile (pharmacy), blue cyanosis, field harrow, tripartite succession	130	60
d) carrot-shaped wisna (ammy zubnaya), sand immortelle, bitter gorse, high sedum, Indian drug, marena crasil, woolly foxglove, medicinal sage	130	80

The drying time is determined after the seeds are placed on the drying rack and the required temperature is reached.

After the seeds have been dried for an appropriate period of time, the pods are removed from the drying rack using crucible tongs and put on a special iron table to cool for 8-10 minutes (or put in a desiccator for 15-20 minutes). After cooling, the bags (including the lid) are weighed to the nearest 0.01 gram (in this case, the bags must be weighed no more than 30 minutes after cooling).

Intent Research Scientific Journal
IRSJ

Intent Research Scientific Journal-(IRSJ)
ISSN (E): 2980-4612
Volume 2, Issue 5, May -2023
Website: intentresearch.org/index.php/irsj/index

Determining the moisture content of primary dried seeds. In some types of crops, including one-year lupin, sesame, and refined safflower seeds (regardless of the moisture content), grain with more than 18% and soybean seeds with more than 16%, drying is carried out in two stages (primary and main drying). The necessity of the primary seed drying process will become clear after performing an electronic moisture measurement (using a vlagometer).

A 20-gram sample of the seeds obtained according to point **4** is measured and placed in a net bag and closed with a net lid **.** After that, primary drying is performed according to the table below.

Table 3

Plant type	Primary drying temperature, ⁰C	Drying time, minutes
Wheat, barley, rye, oats , triticale, sorghum, peas, vetch	120	15
Donli va don-dukkaklilar: bir yillik lupine, soybean, kanaksesame, donlari azhratilgan eryongoq	105	thirty

Primary dried seeds are cooled in a special cooler for 5 minutes or on a special iron table for 10-15 minutes. After that, the seeds in the bag are tipped onto the scale and the net weight is measured to the nearest 0.01 gram. The measured seeds are ground according to the method used above and placed in aluminum buckets with 2 samples of 5.00 grams (the ground seeds in the buckets are dried and weighed according to the above procedure).

A method for determining the moisture content of raw peanut seeds. In this case, the average seed (unrefined, i.e. shelled peanut) is selected in accordance with the guidelines specified in the relevant GOST. 10-12 grams of peanuts are separated from the selected average seed and peeled. After that, the peanut core is divided into 10-12 pieces, and the shell is finely ground. The core mixture divided by the crushed shell is placed in 2 aluminum bags of 5.00 grams and the process is continued according to the procedure indicated above.

Determining the moisture content of sorghum kernels. When necessary, a sample of 20-25 grams of crushed corn kernels can be taken and its moisture can be determined according to the above method.

In various technological processes, such as seed extraction, seed treatment or seed storage, it is allowed to use electronic moisture measuring equipment with appropriate instructions to determine the estimated moisture content.

Intent Research Scientific Journal
IRSJ

Intent Research Scientific Journal-(IRSJ)
ISSN (E): 2980-4612
Volume 2, Issue 5, May -2023
Website: intentresearch.org/index.php/irsj/index

Analysis of the obtained results. Measured seed material before drying and after drying should be reflected in % moisture loss.

the one-stage drying process is carried out, moisture is determined according to the following formula **(W $_1$)** :

$$W_1 = \frac{m_1 - m_2}{m_1} \times 100,$$

where: m $_1$ – seed sample of 5.00 grams before drying;

m $_2$ – the weight of a 5-gram seed sample after drying, g.

To analyze the results obtained from **the two-stage drying process, the following formula is used (W $_2$)** :

$$w_2 = 100x\left(1 - \frac{m_1 \, x \, m_2}{m_3 \, x \, m_4}\right),$$

where: m $_1$ – sample weight of 20 grams after drying, g;

m $_2$ – the weight of a 5-gram seed sample after drying, g;

m $_3$ – 20 gram seed sample before drying;

m $_2$ – 5.00 gram seed sample before drying, g.

An example. The resulting 20 gram seed sample is 18.36 grams after the first drying. As a result of repeated drying, a 5-gram seed sample was found to be 4.28 grams. If we calculate the obtained results based on the formula:

$$w_2 = 100x\left(1 - \frac{18{,}36x4{,}28}{20x5}\right) = 21{,}42\%$$

The 2nd sample is analyzed in the same order. Results recorded for 2 samples should be expressed as 0.1.

2 seed samples of the same plant species analyzed in parallel must not exceed the following limits: for seeds that are crushed before drying, it should not exceed 0.2%; 0.4% for whole or cut seeds. If the difference between the two samples is greater than the indicated %, the analysis is repeated.

After determining the moisture content of the 2 analyzed samples in the appropriate order, the average arithmetic size of both samples is taken and all the obtained results are filled in the following table.

Summary

Once the moisture level of the seeds has been reached at a sufficient concentration, these seeds should be packed and stored immediately. After

Intent Research Scientific Journal
IRSJ

ISSN (E): 2980-4612
Volume 2, Issue 5, May -2023
Website: intentresearch.org/index.php/irsj/index

drying, the moisture level is optimally maintained if the seed is stored in waterproof (hermetic) containers as much as possible. Glass, plastic, iron containers and aluminum foil are among the most useful tools. Each type of container has its own characteristics. Glass containers with a high thickness or laminated packaging with an aluminum foil cover, regardless of the quality of hermeticity and regardless of the level of humidity of the environment, make it possible to store seeds with high quality for up to 40 years.

Foidalanilgan adabiyotlar

1. Ўz DST 1.0.1998 “ State standardization system of Uzbekistan. Basic provisions.
2. Ўz DST 1.6:2003 “State standardization system of Uzbekistan. Regulations. General requirements for construction, presentation, design and designation.
3. Ўz DST 1110:2006 “Genetics, selection, seed production, seed science and production of cotton seed materials. Terms and Definitions.
4. The rule for conducting comparative analyzes of seeds of agricultural plants in disputable cases, M., 1999
5. Methodological recommendations for the production of elite seeds of cereals, legumes and cereals. - M., VASNHIL, 1990.
6. GOST 52171-2003 Seeds of vegetables, melons, fodder root crops and fodder cabbage. Varietal and sowing quality. General specifications.
7. GOST R 52325-2005 Seeds of agricultural plants. Varietal and sowing qualities. General specifications.
8. Recommendations for the storage of seeds in collective farms and state farms in the conditions of industrial seed production. - M., Kolos, 1984
9. International rules for seed analysis. – Translation from English. - M., 1995.

Intent Research Scientific Journal
IRSJ