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## IMPROVING THE SOWING QUALITIES OF GRAIN SEEDS

Bekbanov Bisenbay Arepovich

Candidate of Agricultural Sciences, Senior Researcher,  
at the Karakalpak Research Institute of Agriculture

<https://ORCID.Org/0000-0003-0881-3009>

[biysenbaybekbanov@gmail.com](mailto:biysenbaybekbanov@gmail.com)

Kutlimuratova Zukhra Alisher daughter

Doctoral Student Karakalpak Agricultural Research Institute

[zuxrakutlimuratova9298@gmail.com](mailto:zuxrakutlimuratova9298@gmail.com)

Djuldasova Gulbanu Maratovna-magistrate

Karakalpakstan Institute of Agriculture and Agrotechnologies

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### Abstract

Agricultural production imposes certain requirements on the quality of seed material. The higher the varietal purity of the seeds, the more fully their productive properties manifest themselves. Another important role is played by the purity of the seed material – the absence of foreign impurities in it. Germination of seeds is the main indicator of their sowing qualities. These requirements are due to the fact that when sowing seeds with reduced purity and germination, it is necessary to increase the seeding rates. In addition to high sowing qualities and high purity, seeds must also have high yield properties.

Harvested seeds do not always have good germination. For many seeds, additional time is needed to complete the post-harvest maturation processes. Many seeds do not need to be ripened, but their economic and sowing qualities deteriorate during storage. The longevity of seeds varies within the same variety. It has been established that stored seeds of large and small fractions retain their germination in different ways.



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The sowing qualities and yield properties of seeds are greatly influenced by environmental and meteorological conditions. Among the environmental conditions affecting seed quality, an important role belongs to temperature, precipitation, type and mechanical composition of soils.

Field germination significantly affects the formation of such crop elements as the density of seedlings and plants preserved for harvesting. With an increase in field germination, their number increases. In this and there is a great agronomic importance of increasing the field germination of seeds [1].

Field germination is influenced by numerous factors, such as the soil and climatic conditions of the zone, soil properties, meteorological conditions of individual years, biological characteristics of plants, diseases and pests, seed quality and the level of agricultural technology.

Soil fertility, its mechanical, chemical composition, and physical properties affect germinating seeds both directly by resisting growing seedlings, and indirectly by changing water, heat, air, and light conditions [2].

The role of individual nutrition elements in the formation of seed quality is of undoubted interest [3]. Therefore, the effects of various elements of nutrition on the sowing qualities and yield properties of seeds are of great interest.

Long-term experiments have shown that the unilateral use of nitrogen in seed crops, although it increased productivity, had a negative effect on seed quality [4]. Against the background of one-sided nitrogen nutrition, there was deterioration in the sowing qualities of seeds and the yield properties of seeds decreased. Nitrogen delays the intake of potassium, calcium and magnesium, and phosphorus promotes their accumulation, which improves seed quality and yield properties.

Potassium promotes the formation and storage of starch in seeds and is a nitrogen antagonist in this regard [5].

The depth of fertilizer embedding has one effect or another on the seeds. The application of phosphorous and potash fertilizers together with seeds reduces germination. When fertilizers were embedded 1.0-4.0 cm below the seed, the number of seedlings approached the control level. The yield level depends on how fertilizers are applied during seed germination [6].



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The formation of seeds with increased germination in a short day is due to the photoperiodic reaction of plants. Seeds formed and ripened on a 12-hour day can germinate well at high temperatures. The length of the day determines the formation of seeds with certain duration of the rest period of post-harvest ripening. This condition must be taken into account when harvesting seeds that ripen in dramatically different conditions of day length [7].

The processes of swelling and pecking of seeds during germination are extremely important stages in the individual development of plants. During this period of life, the young plant is especially plastic and adapts relatively easily to unfavorable living conditions. The influence of changed environmental conditions leads to the determination of a number of signs and properties that manifest themselves throughout the plant's ontogenesis [8].

Environmental conditions have both a direct effect on seeds and an indirect effect on morphological and physiological changes in plant ontogenesis. The length of the seed dormancy period largely depends on the geographical location of the plants. The influence of weather conditions during the flowering period on the sowing properties of seeds is indicated by the fact that premature frosts in late summer reduce the germination of ripening wheat seeds by up to 85% [9].

The effect of temperature on the viability of seeds largely depends on their moisture content. As you know, seeds either give off or absorb moisture. It depends on its content in the seeds, as well as on the humidity of the air. If the moisture content of the seeds is in balance with the humidity of the air, then the seeds do not give off or absorb moisture [10].

Phosphorous fertilizers have a very good effect on the formation and maturation of seeds. Phosphorous compounds are the most mobile substances in an easily digestible form. Therefore, an increased phosphorus reserve in seeds is a favorable factor contributing to the intensification of the germination process.

The field germination of seeds is greatly influenced by the weather conditions that develop during the sowing – germination period. Therefore, it is very important to know the optimal temperatures, humidity and aeration of the sown soil layer in



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order to create favorable conditions for seed germination and thereby increase their field germination.

The most favorable time for obtaining timely friendly seedlings is the early sowing period; the soil temperature at the seed depth is 9-11<sup>0</sup>C. With a further increase in temperature, the field germination of seeds decreases. Consequently, with late sowing of spring crops, field germination of seeds is noticeably reduced, even with optimal soil moisture.

The temperature and humidity of the soil have approximately the same effect on the germination rate and field germination of seeds. Winter crops are characterized by lower field germination than spring crops. The reason is that winter crops are sown, as a rule, with freshly harvested seeds, and during their germination, soil moisture is lower than when germinating seeds of spring crops.

The higher the level of agricultural technology, the higher the field germination. Thus, with a low level of agricultural technology and a yield of 12.0 c/ha of spring wheat, field germination was 62.0%, with 20.0 c/ha – 70%, with 30.0 c/ha - 73%, and with a high level of agricultural technology and a yield of 38.0 c/ha, it reached 82%.

Therefore, to increase the field germination of seeds, it is necessary to increase the overall level of agricultural technology.

The purity of the seed material plays an important role – the absence of foreign impurities in it. The higher the varietal purity of the seeds, the more fully their productive properties manifest themselves. In addition to high sowing qualities and high purity, seeds must also have high yield properties. Germination of seeds is the main indicator of their sowing qualities. These requirements are due to the fact that when sowing seeds with reduced purity and germination, it is necessary to increase the seeding rates.

Seeds grown on different backgrounds of mineral fertilizers have different field germination. Ammonium nitrate had the greatest delaying effect on the germination of winter wheat seeds, followed by superphosphate and less potassium salt. Nitrogen and potash fertilizers should not be mixed with seeds, but they should be sown away from the row combined seeders. The application of mineral tuks for



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basic plowing, especially in combination with organic fertilizers, even increases the field germination of seeds.

The conditions of seed growth have a significant impact on their yield qualities. It is necessary to grow the starting material on an agrotechnical background that promotes the formation of high-quality seeds.

The technology of seed sowing should be aimed at obtaining varietal seeds with high sowing and yielding properties. Such seeds can be obtained only by applying a set of scientifically based agricultural practices.

Thus, the life span of seeds depends on both the environment and their physiological state. The conditions under which they are stored also have a great influence on the longevity of seeds. For seeds of some crops, negative temperatures are more favorable than positive ones. High-quality seeds can be obtained, as a rule, from highly productive plants,

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