



DYNAMICS OF DEVELOPMENT DURING THE INITIAL VEGETATION PERIOD OF SEED PROPAGATION OF SEEDLINGS OF SEEDLINGS OF QUERCUS ROBUR

Khojamurotov N.B.

Khamroev Kh.F.

Baltaniyazov J.S.

TKamalov A.K

Karakalpak Institute of Agriculture and Agrotechnologies

Tashkent State Agrarian University

<https://doi.org/10.5281/zenodo.19315335>

ARTICLE INFO

Received: 23rd March 2026

Accepted: 25th March 2026

Online: 28th March 2026

KEYWORDS

Quercus, seed propagation, stratification, taproot, vegetation, technological parameters, ecosystem, seedling development

ABSTRACT

The article analyzes the biological and agrotechnical features of oak seed propagation. It examines the seed dormancy period, the stratification process, and the priority of root system development. The study provides key technological parameters such as sowing depth, temperature regime, and moisture, alongside seedling growth indicators during the first year of vegetation. It is scientifically proven that during the first two months of oak seedling development, 80% of energy is directed toward the formation of the root system.

Seed propagation of the oak tree is one of the most complex and interesting processes in nature. Unlike most other tree species, oak seeds, that is, the crown, have a high energy reserve, which fully provides the initial stages of seedling development.

The process of seed germination and stratification is associated with the fact that the oak does not sprout immediately after sowing. Inside it, a period of rest occurs, during which, under the influence of low temperature and humidity, the complex starch substances in the seeds begin to break down into simple sugars. This process is called stratification in scientific terms and serves as a biochemical signal necessary for the spring awakening of seedlings.

The dominance of the root system is a characteristic feature of the oak, which produces a strong taproot before forming seedlings on the ground. The first root, emerging from the tip of the seed, runs downwards, searching for moisture in the deep layers of the soil. This is an oak's natural viability strategy aimed at creating a solid foundation until the aboveground part emerges.

The onset of photosynthesis and the appearance of the first leaves occurs after the root system is firmly established in the soil. A small, reddish-green shoot rises to the surface. The first leaves of an oak can differ from those of an adult tree. At this stage, the main function of the seedling is to obtain energy from sunlight and transition to self-sufficiency until the reserve nutrients in the seed pods are depleted.

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For successful germination of oak seeds and healthy seedling development, it is necessary to observe a number of specific technological parameters. In this process, the sowing depth is determined depending on the soil composition. In light sandy soils, seeds are sown to a depth of 5-6 centimeters, while in heavy clay soils, a depth of 2-3 centimeters is sufficient.

The temperature regime also directly affects the growth rate of the seedling. For the rooting process to begin, the minimum temperature should be between plus 5 and plus 8 degrees. The optimal temperature for active growth and development of seedlings is plus 18 and plus 25 degrees. At the same time, maintaining soil moisture at a constant level of 60-70 percent is an important factor in preventing the drying out of the root system.

During its first growing season, the oak seedling spends its main energy not on the aerial part, but on the root system. According to numerical indicators, if in the first year the height of the seedling rises to 10-20 centimeters, its underground roots can reach a depth of 30 to 100 centimeters, depending on the softness of the soil. The number of leaves usually ranges from 3 to 7 in the first year (Fig. 1).

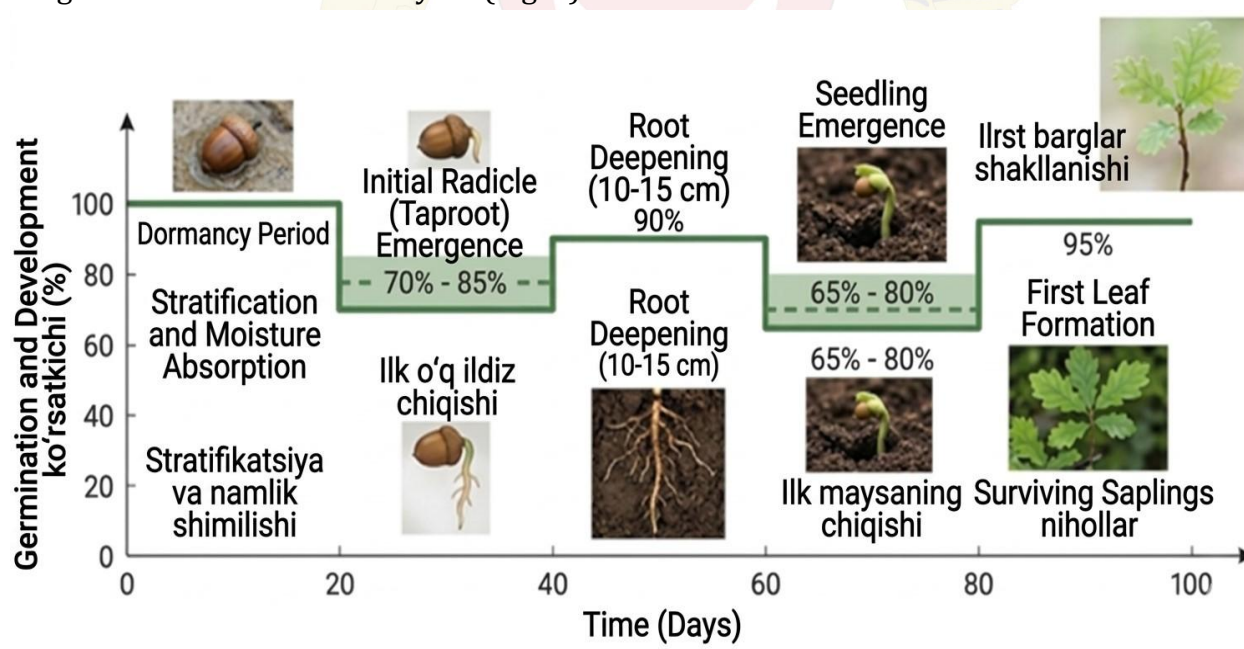


Figure 1: Dynamics of oak seed germination

The main conclusion at this stage is that during the first 2 months, the oak seedling uses 80% of its energy to form the root system, and the remaining 20% for the above-ground part. Such a distribution of energy serves as a natural guarantee for the tree to survive various natural trials for hundreds of years in the future.

Planting oak seeds is a long-term investment in the future ecosystem. A small seed planted with your own hands will turn into a strong tree in a few years, not only purifying the air, but also ensuring the strength of the soil.

References:

1. Baltaniyazov J. S., Kamalova N. B. Environmental and decorative properties linden leaved (*Tilia cordata*) under Karakalpakstan // Современное экологическое состояние природной среды и научно-практические аспекты рационального природопользования. – 2017. – С. 820-821.
2. Baltaniyazov J. S., Kamalova N. B. Growing and cutting of dolls pharmacy // Научно-практические пути повышения экологической устойчивости и социально-экономическое обеспечение сельскохозяйственного производства. – 2017. – С. 607-608.
3. Qayumov A., Boltaniyozov J. S. Dust-Holding Properties Of Wood And Shrub Species In The Conditions Of The Republic Of Karakalpakstan // The American Journal of Applied sciences. – 2020. – Т. 2. – №. 09. – С. 170-174.
4. Sherniyazov K., Atamuratova K., Baltaniyazov J. Types of vegetative propagation of ornamental tree-shrub plants in landscaping // International Bulletin of Applied Science and Technology. – 2023. – Т. 3. – №. 5. – С. 1068-1070.
5. Қайимов А. Қ., Ҳамроев Х. Ф., Балтаниязов Ж. С. Қорақалпоғистон республикаси шароитида кўкаламзорлаштириш учун танланган япроқбаргли дарахт турларининг ўсиш кўрсаткичлари // Science and innovation. – 2022. – №. Special Issue. – С. 208-212.

