

BASIC SEED TERMINOLOGY

Understanding natural regeneration, planning an artificial one, running seed collection and storage as well as production of seedlings in a nursery require understanding basic seed physiology which can be described by such terms as: viability, dormancy and germination.

The first term, viability, refers to a seed's ability to germinate and produce a plant. Some seeds cannot be stored for a long time because they lose their viability quite quickly whereas others can stay viable for years. Information which tells us to which group the seeds of a certain species belong is of utmost importance to foresters in ensuring tree establishment success.

Another term worth mentioning is dormancy – a case when viable seeds do not germinate. Dormancy can be determined either by morphological factors or physiological ones. The former are usually caused by an immature embryo whereas the latter by too hard or thick seed coat. In a natural habitat dormancy can be overcome by moisture and changing temperatures. Seeds of trees and shrubs which are produced in autumn do not germinate at that time of the year because their seedlings would not stand a chance of surviving winter. Instead, their seeds delay germination until spring. In the meantime, moist soil helps to soften a seed coat and penetrate it by water. This process, known as imbibition, combined with changing temperatures, exposing seeds to low ones in winter, enables not only seed coat softening but removing growth inhibitors as well. These two factors stimulate germination and seedling growth.

Foresters can control germination and, as a result, production of seedlings because they know how to mirror natural conditions. The methods employed to achieve such a goal are called stratification and scarification. The former term refers to subjecting seeds to low temperatures in a moist environment whereas the latter aims to damage or soften the coat. There are three methods applied. The first involves immersing seeds in hot water; the second is based on acid treatment, and the third is mechanical (coats are weakened by sandpaper or nicked with a knife).

Once seed coats no longer hamper water and air penetration into a seed, dormancy is broken and germination begins. It is a complex process influenced by temperature, oxygen, water and, in some cases, light. Oxygen aids metabolic processes while water dissolves nutrients in endosperm making them available to the embryo which starts to grow. Optimal germination temperatures vary depending on individual species requirements.

Finally, the coat is split and the root, called a radicle, emerges, followed by the shoot consisting of the stem and leaves. A new plant can now start an independent life.



Worth remembering

viability, viable, dormancy, dormant, germinate, germination, seed coat, imbibition, stratification, scarification, break dormancy, radicle, endosperm, embryo