Seed Storage

Seed storage in general

Around 10,000 years ago as humans began to shift over from a hunting and gathering culture to a farming culture, preserving and storing seeds became a very important aspect of, not only survival, but of civilization itself.

There are various reasons to store seeds, starting from simply preserving grain for consumption later in the year or as sowing for the next season. The longer the storage period, the more complex is the actual process of collection and preservation of seeds. Long term storage is used to facilitate a specific outcome such as protecting a species from extinction or to ensure genetic variety in future generations. Long term storage may also be considered in order to have a backup source in case of catastrophic events like natural disasters and outbreaks of diseases. These types of long term storage are usually accomplished in well protected storage buildings called seed banks.

Facts & Figures

- The oldest seed that has grown into a viable plant was a Judean date palm seed that was about 2,000 years old.
- The Millennium Seed Bank Project in the UK is the biggest seed bank in the world. Currently they store 31,880 species and 1,907,136,030 seeds.

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Inside each seed is a living plant embryo that breathes through the exchange of gases and is constantly undergoing metabolic processes known as aging. The natural lifespan of a seed is influenced by several factors including: permeability of the seed coat, dormancy and seed physiology. One of the most important factors in seed lifespan is the storage environment. Temperature and humidity play a key role in effective seed storage environments.

Why the need to measure humidity?

As mentioned above, controlling the environment in seed storage is essential for maintaining the germination capacity or the food quality of certain seeds.

Generally

As a rule of thumb, for every 1% decrease in the moisture content of the storage environment, seed storage life will double. The same applies for every 5°C decrease of the storage temperature. Another rule of thumb is; the sum of the temperature (in degrees F) and the relative humidity (in percentage) should be less than 100 for optimum seed storage conditions.

Storage conditions

Proper storage conditions maintain relative humidity levels between 20% and 40% providing corresponding seed moisture content between 5% – 8%, depending on the type of seed. This range is safe for most seeds. When seed moisture

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Why the need . . .

Storage conditions *(continued)*

content drops too low (<5%), storage life and seed vigor may decline. When seed moisture content raises above 8%, aging or seed deterioration can increase. Deterioration involves cell membrane integrity, along with other biochemical processes, all resulting in loss of vigor and viability. Seeds with a moisture contents above 12% will promote growth of fungi and insects. Most seeds cannot germinate until seed moisture content is above 25%.

Seed preparation for long term storage (Seed bank)

The seeds first get put in to a drying room where temperature and humidity are carefully maintained at 15°C and 15% relative humidity. Under these conditions the seeds gradually dry out. They are then cleaned, counted and put into air-tight containers, before being placed in the seed bank at -20°C. The seeds are tested for viability on a regular basis.

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The Millennium Seed Bank Project buildings at Wakehurst Place, West Sussex, England.

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