

## BEST PRACTICES FOR STORING AND HANDLING SEED

The shelf-life of seed typically decreases once it is harvested. As such, it is considered best practice to use seed as quickly as possible after you receive it. Buying small quantities of seed more often or multiple times a year can be more practical but may be less economical and increases the chance that desired varieties are sold out when needed. However, buying in bulk requires strict handling and storage protocols to preserve quality and performance until seed is sown. The following info will help you store seed more effectively and maximize your investment in both seed and seed storage infrastructure.

### Seed Storage Basics

Always store seed in a cool, dry area, as temperature and relative humidity are the two most important factors affecting seed vigor.

- The headhouse may seem like a good place to store seed from an operational standpoint, but warm temperatures and high humidity will rapidly deteriorate seed quality.
- Have a dedicated, refrigerated storage for seed in an office or other low-traffic area with consistent temperature control.



*Most seed should be stored at 41 °F (~5 °C) and 25–30% relative humidity (RH). Commercial coolers/refrigerators are regularly used for seed storage but often do not provide sufficient humidity control to maximize seed shelf life. Tubs with lids can help to buffer changes in RH if your cooler opens regularly or other items share cooler space with stored seeds.*

Remember these seed storage “rules to live by”:

<i><b>Harrington’s Rule</b></i>	<i><b>James’ Rule of Seed Storage (a.k.a. the Rule of 100)</b></i>
Seed shelf-life decreases by 50% for every: <ul style="list-style-type: none"> <li>• 1% increase in moisture content within the seed.</li> <li>• Every 10 °F (~5 °C) increase in storage temperature.</li> </ul> <p><b>Note:</b> Effects of higher temperature and moisture content by this rule are cumulative, not separate.</p>	Combined storage temperature in Fahrenheit and relative humidity (RH) should be <u>no greater than a total value of 100</u> . <ul style="list-style-type: none"> <li>• Ex. A cooler at 45 °F + 50% RH = 95; this is considered suitable storage conditions.</li> </ul>

### Storing New (Unopened) Seed

New seed containers should be stored at ~41°F (5 °C) in a cooler with low (<60%) relative humidity.

### Storing Seed After Opening/Sowing

Sealed packages help maintain seed moisture content. When a package’s seal is broken and seeds are exposed to ambient temperature and air with higher relative humidity, shelf life reduces per Harrington’s Rule (above). If you intend to partially use a package of seed and store the rest for later sowing, maximize seed quality and shelf life by:

- Removing seed packages from the cooler and allow them to reach room temperature before opening. This will reduce the potential for condensation forming on seeds and drawing in excess water once they are exposed to ambient air/relative humidity.

- Taking out only what is needed and returning extra seed to cold storage as soon as possible when finished. The less time an opened seed package is out of storage, the better. Store opened seed packages at ~41°F (5 °C) and ≤60% relative humidity.
- Keeping seed packages open for ~24 hours before resealing them if your seed storage is humidity controlled (set to ~25–30 % RH). This equilibration period will help to remove excess moisture that may have been absorbed by seeds during sowing operations and increase their shelf life.



### **Summary of Seed Storage & Handling Best-Practices**

It is critical for any greenhouse that grows a large proportion of their own young plants from seed to develop and maintain a well-controlled seed storage and operations area. Look to the following seed storage strategies to establish minimum acceptable practices (starting at “good”) and improve your seed management system and operations over time:

#### **Best-Practices & Infrastructure for Seed Storage**

	<i>Good</i>	+/->	<i>Better</i>	+/->	<i>Best</i>
<b>Temp. Control Capability</b>	Below 55°F/13°C (ex. flower cooler).	→	Below 45°F/7°C; avoid freezing (ex. conventional refrigerator).	→	Precise control at 41°F/5°C (ex. industrial cooler).
<b>%RH Control Capability</b>	Gasketed tubs for seeds packages...	+	with a commercial desiccant inside, <b>OR</b> .....	→	integrated relative humidity control.
<b>Cooler Location</b>	In a temperature-controlled environment...	+	with humidity-control...	+	separated from other areas by airconditioned hallway/room.
<b>Seed Ordering (By Storage Ability)</b>	Buy the smallest economical packages; use as quickly as possible.	→	Buy larger packages; use over weeks/months.	→	Buy seed in bulk; store for use the following year.
<b>Seed Use (By Storage Ability)</b>	Warm seed to room temperature before sowing; return package to storage ASAP.	+	Distribute roughly what is needed in seed cooler room; return extra ASAP.	+	Leave packages with returned seed open for ~24 hrs. to equilibrate seed moisture content.

### **Seed Shelf Life by Variety**

We are often asked to provide shelf-life for specific varieties, when stored using best practices above. However, it is difficult to have a general rule for the wide range of species and varieties we produce, because seed shelf life is a function of many factors including:

- 1) Health/environment of mother plant, 2) Harvest stage and conditions, 3) Seed postharvest handling practices, and 4) Seed storage conditions.**

The first three of these factors vary between seed crops. To account for this variability, we perform cycle testing on all seed in our inventory every 6 months.