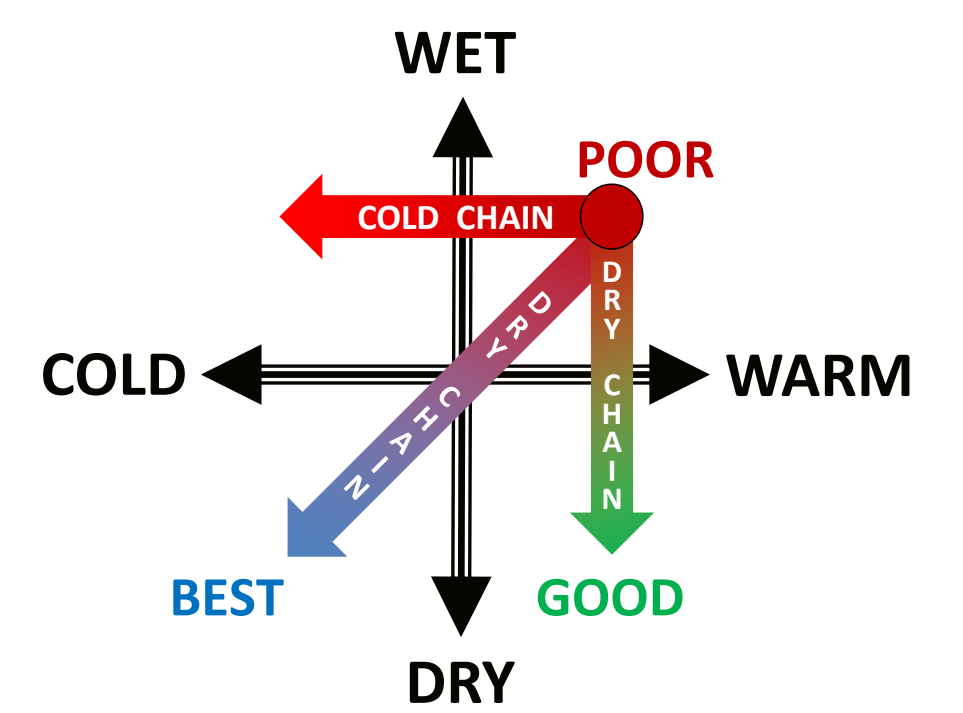


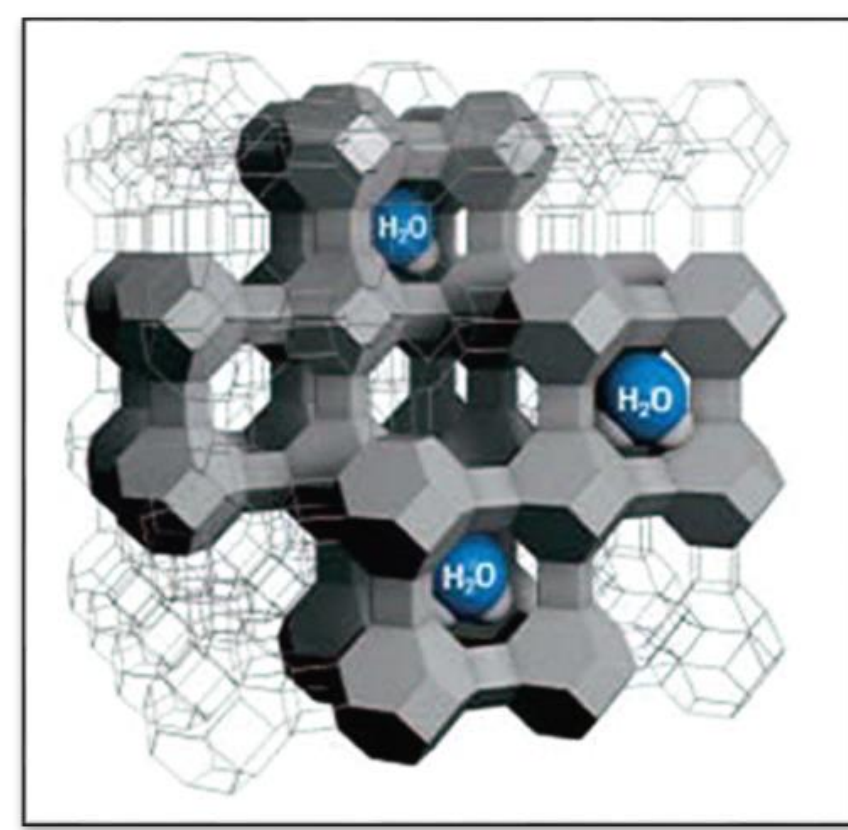


Using Drying Beads to Maintain Seed Quality in Humid Regions



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Drying Beads are a ceramic product that is thermally and mechanically very stable. Beads have a micro-porous structure that can hold water molecules very tightly. The water can be released by heating to allow reuse of the beads indefinitely.



5. Calculate the amount of beads required. Download the Drying Bead Calculator from (www.dryingbeads.org). Follow the steps shown below to determine bead quantity.

Hort CRSP Tutorial on how to use the drying beads calculator UCDAVIS DEPARTMENT OF PLANT SCIENCES College of Agricultural and Environmental Sciences

Click on the numbers for info.

Common name	Corn	1	Temperature (°C)	30	2
Common name	Botanical name	Seed oil content (%)	Bead capacity (%)	17.5	3
Corn	Zea mays	5			
Basis	Initial RH (%)	74.62	Initial MC (%) - Fresh Weight basis	14	5
MC (FW)	4		Desired RH (%)	32.38	
Amount of seeds (g)	2000	6	Beads available (g)	1000	7
			Beads needed (g)	685.71	8

1. Determine current seed moisture content.

Place humidicator strips or relative humidity (RH) meters to equilibrate with seed inside a moisture-proof or air-tight container for 1 to 2 h.

Simple, low-cost methods are available for monitoring seed RH, which is directly related to seed moisture content.



2. Decide desired storage equilibrium relative humidity or seed moisture content.

For long-term storage, seeds should be in equilibrium with 20%-30% RH or lower. Most crop seeds will remain viable for several years at such low MC even at ambient temperatures.

3. Activate beads by heating at 250°C (450°F) for 2-3 h. Beads can be reactivated after each use.

Cool beads inside oven and handle hot beads using sturdy gloves. Transfer beads into hermetic heat-resistant containers. Check bead capacity as in step 4 below.



4. Determine bead water absorption capacity.

- (1) Weigh triplicate 50-100 grams of cooled, reactivated beads.
- (2) Soak the bead samples in excess volume of water for 2-3 min.
- (3) Wipe excess surface water over paper or cloth towel.
- (4) Incubate the wet beads in porous bags over excess reactivated beads or silica gel inside a moisture-proof container for 24 h.
- (5) Weigh the beads again to determine the % change in weight. The value over silica gel closely approximates bead capacity. If incubated over beads, add 20% more to the bead capacity. Use this percentage in the Drying Beads Calculator.
- (6) $\text{Bead capacity (\%)} = \frac{\text{final bead weight} - \text{initial bead weight}}{\text{Initial bead weight}} \times 100$

6. Seeds can be dried in hermetic containers.

Enclose seeds and Drying Beads in a hermetic container or plastic bag to dry seeds to low MC and maintain quality.



Drying conditions should be monitored using humidicator strips or RH meters.



7. Bead-dried seeds should be packaged in hermetic containers to maintain quality.

After drying, beads can be removed for reuse. Seeds should remain in hermetic packaging to prevent rehydration from ambient humidity.



8. Do a feel test before using beads.

Roll reactivated beads over the palm with moist fingers. Properly reactivated beads feel warm, while used beads will not.