

BEST MANAGEMENT PRACTICES: URC HYDRATION

Why rehydrate unrooted cuttings (URCs)? Hydrated cuttings can improve sticking rates and rooting uniformity, which helps improve profitability and reduce shrink.

Cuttings can dehydrate at any point in the supply chain—from harvest to stick. On average, research shows URCs could be dehydrated by 20% upon arrival. Farms are improving postharvest handling processes; however, some factors are uncontrollable.

This document details how to identify times or locations where cuttings are dehydrating, strategies to improve hydration or rehydrate URCs and examples of rehydration processes.

IDENTIFYING DEHYDRATED CUTTINGS: Look for these signs of dehydration when shipments arrive.



Cutting fails to stay parallel when picked up.



Cutting bends when stuck into media.



Necrotic tips are visible (especially on high-essential-oil crops).

POTENTIAL DEHYDRATION LOCATIONS:

Coolers: The cooling process naturally removes moisture from the air. Install a dry fog or fog system that visibly adds small droplets into the air but minimizes free moisture on surfaces.

Sticking line: From stick to the greenhouse bench is prime time to lose water. Install fog systems directly over sticking tables or holding areas so cuttings are protected. (Consider how systems will impact employee comfort when adding humidity systems to their workplace.)

Greenhouse bench: Decrease light intensity and radiant heat. Ideally use a fog system to maintain a high relative humidity or low vapor pressure deficit for 5 to 7 days. Mist systems are helpful but can often add too much water weight to substrates, reducing soil temperatures leading to slow rooting, as well as adding free moisture to leaf surfaces increasing the risk of disease development.

PRE-STICKING REHYDRATION METHODS

There are many ways to rehydrate cuttings. Your best option will depend on how best to fit rehydration into your flow of operations. Consider these factors: Are cuttings sorted before sticking? Are cuttings hand stuck or with automation? Is there a holding location for stuck trays? How long do trays wait to be placed under mist?

Here are some options (and one example) for rehydrating cuttings. They are organized into GOOD, BETTER and BEST approaches, based on research and observation.

GOOD: STANDARD MIST

If implemented properly, under ideal greenhouse conditions, misting URCs post-stick can rehydrate cuttings. However, improper misting can lead to slow rooting, diseases, URC losses, fungus gnats and other issues. Mist systems have a larger droplet size, which falls quickly, coating leaf surfaces and rehydrating URCs. *However, this is dependent on the environment and the mist settings.* If set incorrectly, mist systems could leave URCs too dry—either *not* rehydrating them or allowing them to dehydrate. Excess mist provides a conducive environment for pathogens and adds water weight to substrates, inhibiting or slowing rooting.

- **Location:** Post-stick; on the bench
- **Duration for rehydration:** 24 to 48 hours, dependent on environment and system
- **Pros:** No additional changes needed
- **Cons:** High risk for poor or no rehydration; frequent misting leads to poor rooting and pathogen risk

BETTER: DIPPING URCs OR BAGS OF URCs

Dipping cuttings in water can provide an increase in rooting uniformity and improved stickability. If fog systems are not an option, dipping is, but comes with risks and operational challenges. Ensure that dipping containers have been cleaned and sanitized between each use/crop is imperative. A good practice is to group species that are relatively clean and those that can handle some storage time so that more commonly “dirty” species can be stuck first or dipped separately. URCs can be dipped while in a bag or as a loose mass depending on your situation. **NOTE: Bags may limit water infiltration, hold water after dipping and if unopened and not inspected, may harbor pests and diseases.** Storage in a cooler will provide time for water to be absorbed, but without protection, bags or closed containers in coolers will evaporate water within 12 hours. If implemented without storage, dipping can provide a water film on the cuttings which will limit dehydration during sticking.

- **Location:** Prior to stick
- **Duration for rehydration:** 5 seconds unbagged/10-15 seconds bagged; store protected for 12-24 hours/unprotected for fewer than 12 hours
- **Pros:** Easy to implement; quick for low numbers of cuttings; water film protection
- **Cons:** Unprotected cuttings in coolers will dehydrate; pest & disease spread is a risk during dipping; labor intensive

PRE-STICKING REHYDRATION METHODS (CONTINUED)

BEST: HIGH-PRESSURE FOG OR DRY FOG

High-pressure fog or dry fog systems used prior to sticking can be the most efficient method with the least risk of pathogens. This method also ensures rehydration and limits dehydration if implemented correctly. Fog systems add small, micro-sized water particles to the air and moisture is more likely stay in the air, without collecting on surfaces. The fog should stay in the air close to constant *but no less than 15 seconds*. If the mist dissipates in less than 15 seconds, increase duration or decrease air movement.

- **Location:** During staging when cuttings are being unboxed, sorted and organized; on the sticking line with direct fog over the tray; on a rack post-sticking and before moving into the greenhouse; racks can remain under fog or in a cooler with fog overnight
- **Duration for rehydration:** 24 to 48 hours unbagged/48 hours in an open bag
- **Pros:** Minimized pest & disease risk; high surface area contact; minimal hand labor
- **Cons:** Requires purchase and installation of fog system; requires removal of cuttings from bags and boxes for maximum effectiveness

IDEAL PROCESS FLOW FOR REHYDRATION

- ✓ URCs arrive
- ✓ Unpack boxes in a 50°F (10°C) cooler with a high-pressure fog system
- ✓ Organize URC bags based on sticking priority
- ✓ Open URC bags and allow them to rehydrate overnight
- ✓ Stick URCs
- ✓ As trays are filled, move them to a rack or cart that is held under fog until it is moved to the greenhouse or move full racks to a fog area and rehydrate them overnight prior to moving into the greenhouse



DEHYDRATED



REHYDRATED

CHECK OUT THESE ADDITIONAL RESOURCES:

[GrowerTalks: Rehydrating Unrooted Cuttings](#)

[GrowerTalks: Stick & Die—How to Avoid It](#)

[Video Series: BMPs to Enhance Rooting Uniformity](#)