Flower School: This month we're kicking off a 5-part series on extending flower life and maintaining flower quality.

WATER, WATER EVERYWHERE

> Like people, flowers are mostly water, with 60 to 70 percent of each cell comprised of water. Water allows flowers to maintain normal metabolism, so they can use stored sugars for flower opening and for energy to move water up the stem. Water absorbed by cut flowers expands the cells in the petals, just as air inflates a balloon. Flower petals will open only partially if they do not have adequate water. The importance of water to flowers is often taken for granted. Just submerging stems in buckets is not sufficient.

If cut flowers lose 10 to 15 percent of their internal water supply, premature death becomes a likely possibility. Flowers lose water during shipping and storage and — when shipped long distances — can lose roughly half this amount (4 to 6 percent). Dry storage for extended periods may cause them to lose even more, **so proper re-hydration, with clean water and the right additives, is critical.** Commercial hydration and flower food solutions have a proven track record when it comes to improving flower quality and longevity. And don't forget storing flowers in coolers with high humidity (80 percent) and using clean tools will also help assure that water moves up the stem and into the leaves and flowers.

The Science Behind Hydration

How does water move from the base of the stem to the leaves and flowers?

Water is pulled up the stem by pressure differences between the leaves and the base of the stem. As the stomata (pores) on the leaves and petals open, water is pulled up the stem in the xylem. Think of the xylem as a series of straws that go from the base of the stem into the leaves and petals. As the water runs up the stem, it moves into the cells of leaves and petals. And when you use flower foods, the cells also get a boost from sugar for extra energy and optimum flower longevity.

Bacterial Blockage

Any blockage of the stem (xylem) restricts water uptake and lowers the amount of water that can reach the flower petals. Most commonly, the xylem is blocked by bacteria —microbes that can build up in holding or vase solutions. Microbes can collect on dirty buckets, knives and clippers or they might already be present on flower stems and leaves themselves. Commercial hydration solutions or flower foods lower the solution pH, which restricts the growth of these microbes. They also contain wetting agents to accelerate water absorption. That is why they are so effective.

To Cut Or Not To Cut?

When flower stems are cut under water (a common practice in many floral operations), stem parts, dirt or other minute materials in the water may also block the stem. To address this problem, researchers have developed new hydration and flower food solution technologies that increase water absorption without the need to cut stems. Wholesale and retail florists have found these new products to be effective.

If you don't use these new products, we recommend cutting 1 to 1.5 inches from the base of the stem with a sharp knife or clippers to remove dried out tissue at the base of the stem. Do not, however, recut stems underwater, since microbes and stem cells in the tank will also get sucked into the stems, thus restricting water uptake.

And please do not even consider the old practice of smashing woody stems with a hammer to expose more water-absorbing tissue! This damages the xylem in the stems and releases many fine plant pieces in the water that cause blockage and reduce water uptake.

Natural science writer Loren Eiseley once said, "if there is magic on this planet, it is contained in water." Take his words to heart. Share the magic with your flowers, and they will thank you.

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