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Sanitation: A Critical Aspect of Flower Care and Handling

Background

Flowers require water to live—even after harvest. Water allows stem, leaf and flower cells to function normally, so that stored sugars and starches convert to energy needed for flowers to open. Water and sugars are also required to achieve maximum flower life. Stems must remain clear from obstruction so water can be absorbed and move freely up the stem.

Stem blockage is one of the main factors limiting vase life. Air and cellular components resulting from stem cuts and bacteria can block stems. Bacterial contamination also leads to air blockages further up the stem. Research consistently confirms that bacteria in hydration solutions and vase solutions lead to premature flower death.

Bacteria are generally present in water, and their levels vary by source. Growers that use water from ponds may be exposing flowers to very high levels of bacteria without realizing it. Unfiltered pond water contains high levels of algae, dirt and other particles. These can cause mechanical blockage at the base of the stem.

Use of bacteria-contaminated water is a serious problem for the floral industry at all points of handling and distribution. A 1995 Dutch study found that nearly 70 percent of retail florists and supermarkets in Europe and the U.S. used water with levels of bacteria high enough to reduce flower vase life and kill flowers.

What are the sources of bacteria?

Bacteria collects on stems, leaves and flowers from airborne sources and/or from irrigation water. Sustainable water practices may involve using recycled water, or water from available ponds or streams. Water from these sources should be purified and filtered prior to use to avoid premature flower death (see photos below). Growers, wholesalers and retailers should also place special emphasis on regularly cleaning buckets, work surfaces and tools such as, clippers, knives and other cutters.



Gerbera in freshly made flower food solution (left) and Gerbera in bacteria contaminated flower food solution (right)



Rose in freshly made flower food solution (left) and Rose in bacteria contaminated flower food solution (right)

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Where do bacteria accumulate?

Generally, bacteria collect in the lower four inches of the stem. The cut surface contains food for bacteria growth. Bacteria multiply inside the stem and in the vase water. They are then absorbed into the stem with the water. When bacterial concentrations increase enough to block water flow, air bubbles form in the stem and flowers die prematurely. Blockage results not only from living bacteria, but also from polysaccharides they produce. As they degrade, these bacteria form other chemical by-products that also cause blockage.

What about using citric acid?

Some growers use citric acid to lower the pH of hydration and holding solutions. Citric acid can reduce the number of air blockages in the stem. However, it is not effective in controlling bacteria.

Some bacteria produce ethylene!

Some view contaminated vase water in terms of its effect on water uptake. However, some bacteria produce ethylene. Flowers placed into vase solutions containing ethylene-producing bacteria showed a rise in ethylene levels within two days. Ethylene levels continued to rise for seven days. In addition to preventing the absorption of water, some bacteria may produce ethylene that could damage flowers.

Seven Rules of Cleanliness

The way to prevent bacterial blockage is to embrace preventive sanitation measures. Strict adherence to the following steps will provide clean conditions and long-lasting flowers.

1. Use only sanitized water for flower hydration, holding solutions and vase solutions.
2. Clean buckets with sanitized water and professional bucket cleaner.
3. Use ONLY commercial hydration and flower food solutions containing anti-bacterial compounds. Adjusting the pH with citric acid or other buffers does not prevent bacterial accumulation.
4. Mix fresh solutions daily. Start with clean, freshly-made hydration and holding solutions at grower, wholesale and distribution centers and properly-mixed commercial flower foods at retail stores.
5. Clean all clippers and cutters with disinfectant solutions several times a day
6. Sanitize cooler walls monthly, as these can be a source of bacteria and fungi.
7. Become a Sanitation Fanatic!

Customers will applaud the long-lasting flowers that result from clean, properly-managed conditions. Learn and live by the 7 rules of Cleanliness!