



**H2O Life:**  
This is the first in a two-part series on water quality.

## WATER QUALITY AND CUT FLOWER LIFE

> Cut flower processing done from farm to consumer always involves water as a medium to deliver necessary ingredients. The quality of water that you place your cut flowers in has a profound effect on how your flowers are going to perform. Understanding water quality will help you improve the look and performance of your flowers. It's essential knowledge to get the best return on investment from the postharvest care products you use.

Several aspects determine the quality of water: physical properties (mostly water temperature and any particles suspended in water), chemical properties (what other chemicals are dissolved in water) and biological properties (microbes or any other living matter). This article will focus on the chemical properties.

### Water pH

The pH scale is a measurement of acidity or alkalinity of water. The pH scale ranges from 0 to 14, with a pH of 7 being neutral, a pH below 7 considered acidic and a pH above 7 considered basic or alkaline. The pH scale is such that a change in 1 pH unit equals a tenfold change in the acidity or basicity. The natural pH of water used for cut flowers could vary from 5.0 to 9.5, depending on the source of water and any other processing it has undergone. The pH of water dictates many chemical reactions, but for cut flowers, the most important implications are the speed of water uptake and the performance of flower food you add to the water. Numerous research studies have shown that cut flowers take up water fastest if the water pH is between 3 and 5. This is acidic water. Almost all cut flower food products contain "acidifiers"

to ensure the water pH is brought down to that pH range for best performance.

### Water Alkalinity

The initial pH of your water offers only a limited snapshot of water quality. You also want to know alkalinity, which is also described as the buffering capacity of water. Caused by salts dissolved in water, it is a measurement of resistance of water when an "acidifier," such as flower food, is added to lower the water's pH. Alkalinity is typically measured in parts per million (ppm). The higher the alkalinity, the more resistant the water to a pH change. Typically, water with alkalinity in the range of 60 to 180 ppm works well with flower food.

If the water you use has extremely high alkalinity, you have two choices. Some flower food companies sell specific versions of flower food compatible with extreme alkalinity. Or you can purify water to remove alkalinity (deionization or reverse osmosis system) before processing cut flowers.

### Water Hardness

The level of hardness refers to the amount of calcium and magnesium ions in your water (measured in ppm). If your water has high alkalinity, chances are that the water has high hardness too. As with any other living thing, flowers don't do well with very high levels of these chemicals. The most common method of getting rid of hardness in water is to use a water softener. A typical water softening process replaces calcium and magnesium ions with sodium ions. Unfortunately, too much sodium also is not good for cut flowers; therefore, "soft-

ened water" is not recommended for use with cut flowers. There are water softening units that use potassium rather than sodium, which would be better for cut flowers as high potassium levels are less harmful than sodium.

### Total Dissolved Solids

The total dissolved solids (TDS) is a measurement of all the dissolved solids in the water (typically measured in ppm). It is essentially the level of salts in the water. Similar to any other living thing, cut flowers cannot handle too much salt. Research has shown having some salt in water is good for cut flower quality, so a healthy balance of salts is the best way to go. There are other specific chemicals, such as iron and fluoride, that can be harmful for specific types of cut flowers at low concentrations, so we need to keep an eye on those too.

### How to Measure Water Quality

There are simple test kits available to measure these water quality parameters. Search online or check with a retailer that supplies tools for pool maintenance. If you want a comprehensive analysis, you could send a sample to a lab. Also, some flower food companies will evaluate your water for free and make flower food recommendations. 🌸

**Anil P. Ranwala, Ph.D.,** is the manager of postharvest research and development for Floralife, a division of Smithers-Oasis Company. He has more than 25 years of research experience in the field of cut flower postharvest. [aranwala@smithersoasis.com](mailto:aranwala@smithersoasis.com)