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Effects of Water Quality on Cut Flower Hydration and Flower Food Solutions

Introduction

Most cut flower postharvest end use solution treatments are liquids delivered in a pulse or uptake manner. These products are typically in the form of a liquid concentrate, granular powder, or tablet which are mixed with water to make the final use solution. The quality of water which is used to mix with the cut flower postharvest product can have significant impact on the performance of the treatment as it relates to flower freshness.

One of the main functions of hydration and flower food products is to lower the pH of water to a range where it is taken up by the flowers most efficiently and effectively. Research data shows cut flowers take up water, or liquid flower food solution, most effectively in a pH range of 3.0 to 5.0. It is important to test and have a good understanding of the water used in your facility as it relates to quality and getting the most out of your postharvest cut flower treatments.

Water Quality Parameters

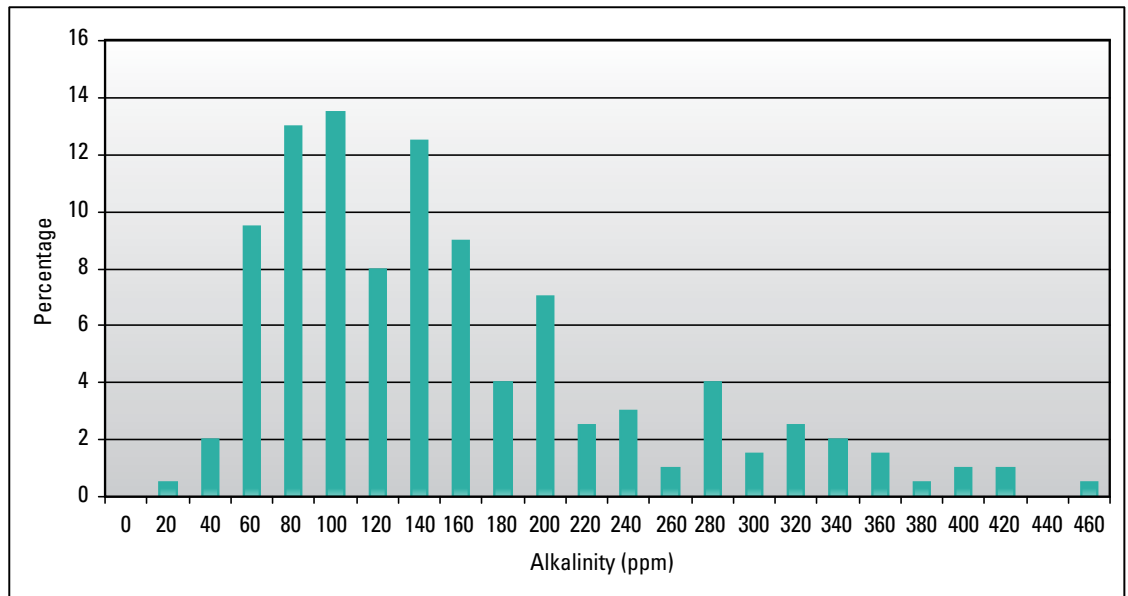
There are several important quality parameters that you should know about your water. The quality of water varies depending on the source, geographic location and any treatments by the local municipalities or in-house water purifiers.

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|-------------------------------|---|
| pH | The pH is a measure of how acidic or basic your water is on a scale of 0 to 14. A pH of less than 7 is acidic; 7 is neutral; and greater than 7 is basic. Typically, water alone has a pH range of 5 to 9. The pH value alone doesn't reveal much about water quality as it relates to flower life, especially the ability of water to resist pH changes (buffering capacity) without the known alkalinity value which is reviewed below. |
| Hardness | The level of hardness refers to the amount of calcium and magnesium ions in the water (measured in ppm, or parts per million). While this gives an indication of the mineral content of the water, it is not a good indicator of the buffering capacity of water. |
| Alkalinity | Alkalinity is the capability of water to neutralize acid. This is an expression of buffering capacity. High alkalinity water absorbs excess acid and protects water from the fluctuations in pH. The alkalinity of water determines the final pH when flower food is mixed with water. Alkalinity is measured in ppms, or parts per million (also known as milligrams per liter), often used to measure and denote the concentration of chemical in a very low quantity. For flower food use, water with alkalinity less than 60 ppm is considered pure; from 60 to 180 ppm it is considered medium; and greater than 180 ppm it is considered high alkalinity. |
| Total Dissolved Solids | Total dissolved solids (TDS) is a measure of the total salt content in your water. The TDS is typically expressed as ppm. While moderate amounts of salts are good for cut flowers, too much salt can adversely affect flower life. If the TDS level of your water is above 500 ppm, you should be concerned and evaluate steps to adjust your water. |

Research Data

The Global Floralife laboratories conduct free water quality testing for customers to assist with making sure they are getting the most out of their pretreatment solutions. The following graph shows the wide range of 200 different water samples of alkalinity received by our lab for testing, representing 40

different states throughout the U.S. The alkalinity of the samples ranged from 20 to 460 ppm. Out of the 200 samples, 2.5% resulted in pure water, 69.5% medium water, and 28% high alkalinity water. Based upon these results, most water sources in the U.S. are acceptable for good flower stem uptake, when properly mixed with a hydration product or flower food.



Does your water have extreme alkalinity?

If you have water with extremely high alkalinity, that being above 400 ppm, you may need to purify it before its use. Two common methods of purifying water are called reverse osmosis (RO) and deionization (DI). These techniques remove the salts in the water. Stay away from using softened water, unless it is potassium salt based, as sodium ions added to the water during the softening process may be harmful to flowers.

Summary

To make sure you are getting the most out of your postharvest flower food treatments, send a water sample for testing to our Global Floralive laboratory facilities. Please send a filled quart (liter) bottle of water, tightly sealed and wrapped to:

Floralife, Inc.
 Attn.: Laboratory
 751 Thunderbolt Drive
 Walterboro, SC 29488

In the EU, send to:
 Holland Research Laboratory
 Nobelstraat 16 BU 6
 2693BC 's Gravenzande
 The Netherlands

In Africa, send to:
 Floralife Africa LTD
 Sasnpac building (next to Nation printing press) / Mombasa Road
 Nairobi, Kenya

Make sure you include all necessary contact information such as your name, company name, address information, telephone, fax, and e-mail in that we can provide you with the analysis results.

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