The Heat is (Off)

By Gay Smith

ASK ANY FLOWER RESEARCHER ABOUT FLOWER quality and it's a sure bet temperature will be an important part of the conversation. Flowers are affected at every step in the chain by temperature conditions: too cold, the blooms suffer chill or freeze damage; too warm, blooms open too fast. Fluctuating temperatures result in high condensation on petals and inside sleeves, providing the perfect environment for Botrytis. The higher the temperature, the faster a flower respires (or uses stored food such as sugars) the quicker the flower dies. Close-to-freezing temperatures slow respiration and flowers go into a state of hibernation.

Post-Harvest Breakdown

Let's take a look at what the industry calls the post harvest "cold chain" — the various links in the process, after the flowers are cut, during which flowers must be kept cold in order to assure good vaselife.

Flowers should be placed in clean, acidic solutions within 30 minutes of being cut. Stems are then graded and bunched, transferred into holding solutions inside coolers at 33°F to 38°F. Ideally, bunches stay overnight in the cooler to ensure cells are filled and all field heat is out. The next day, bunches are separated according to orders and packed.

Blooms should stay cold, so many farms have packing stations inside the cooler. Packing in there prevents condensation from developing on the blooms as they move from a cold to an ambient environment. Because fluctuating temperatures are a form of stress, boxes are pre-cooled: Chilled air is forced through the box contents to ensure inside temperature is 38°F or lower before the shipment is delivered to the airport. Once boxes arrive in Miami, they are pre-cooled again prior to cooler placement to remove heat built up during transit, because the center boxes on a pallet would never cool down just sitting in a cooler or truck.

Some flowers have a high rate of respiration (gypsophila and liatris) and develop heat in transit. Pop open these boxes on arrival and process bunches, or at least split the contents into two boxes to allow air flow and reduce temperature built up inside bunches.

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— G.S.

Inside Your Shop, Act Quickly

At the retail level, don't let flower bundles and boxes sit on the floor until morning deliveries are out. Instead, set up buckets a day ahead filled with a low-sugar flower food or hydration solution. Pre-chill the buckets so they are ready go when delivery arrives — research shows that cold solutions move faster into the stems of most flowers; plus, you avoid problems of condensation developing inside sleeves by putting cold flowers into cold solutions.

Humidity Concerns

Cut flowers lose moisture more readily than many other perishable crops, because of their high surface-to-volume ratio. Both high relative humidity (RH) and low temperature are important in reducing moisture loss from foliage. Proper care and handling requires that you store flowers at 90 percent to 95 percent relative humidity, while maintaining temps of 34°F to 38°F to minimize water evaporation. The maximum difference in temperature between any two points within your cooler (the temperature differential) should be less than 5 degrees to keep sensitive flower tissues from dehydrating.

Work the Numbers

The optimum storage temperature range for cut flowers is 34°F to 38°F (1°C to 3.3°C), except for chill-sensitive crops such as anthuriums, tropical orchids and ginger flowers. Chill damage occurs if tropical flowers are held colder than 50°F (10°C).

Tracking cooler temps daily makes pro-active maintenance easy. Use a thermometer to record temperatures (a typical kitchen thermometer works) rather than relying solely on the wall thermostat. To get an accurate reading, test the temperature of a bucket of solution rather than air temperature. Solution temperature fluctuates less than air temperature. Try to record temps first thing in the morning before cooler traffic starts. Check your service contract and schedule regular tune-ups including vacuuming compressor coils for maximum efficiency.

Beyond the Thermometer

While proper temperature control can help extend vase life and increase flower quality, it's not the only safeguard you should have in place at your shop. Imbalanced plant growth regulators, disease, lack of water, insect infestations and exposure to UV light at high altitudes all affect plants and flowers. Ethylene also has damning effects on flower quality. The good news is that ethylene production and damage is greatly reduced when flowers are held at temperatures below 38°F.

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