

To Cut or Not to Cut

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Have you ever wished you could save tulips for an event, or have flowers available weeks after your production ended? If you have dug around online, you may have found decades of literature and grower reports stating tulips could be stored in a cooler for weeks at a time. The catch: there are little to no data presented to support these claims. For that reason, our program sought an ASCFG Research Foundation Grant to provide data on how long tulips could be reliably stored.

We implemented two studies. The first compared flowers stored with or without the bulb still attached, at either 31 or 33°F. The 31°F temperature was used to explore the option of storing flowers colder than generally recommended. Tulips often sprout and flower well before frost-free dates, so we wanted to test their ability to handle storage temperatures below freezing. The second study's objective was to see if commercial preservatives could be used to either maintain or increase vase life when used as a pulse prior to storage.

Experiment 1: Bulb attached vs cut stored at 31 or 33°F.

Tulips 'Golden Oxford' and 'Renown' were harvested by uprooting stems with buds that had reached 50% color. Half of the stems for each cultivar were cut to a set length. The bulb was left attached on the other half. Stems were then wrapped in newspaper and placed in cardboard boxes held at either 31 or 33°F.

Experiment 2: Pulse solutions prior to storage at 31°F.

Tulips 'Golden Oxford', 'Menton', and 'Piste' were cut and pulsed for 8 hours with one of 3 pulse solutions: tap water, Floralife Bulb 100 (2ml/L), or Chrysal CBVB (2ml/L). All stems were held at 31°F.

We removed stems from storage after 3 and 6 weeks. We recut one inch off of the base of the cut stems; stems with the bulb attached were cut to the same length as the cut stems. All flowers were rehydrated in tap water with support to promote straightness before vase life evaluation. Stems were individually placed in mason jars filled with tap water. The following responses were recorded to assess cut flower quality: vase life (days), length gained in vase by termination, percent weight lost after storage. Flowers were terminated when petals and tepals were 50% discolored or petals and tepals abscised.

Tulips stored for multiple weeks will likely be less wilted and have a longer vase life when the bulb is kept attached. Our results show that in most cases, 31°F better preserved vase life than 33°F. Most growers will not be able to achieve this temperature, but as with most cuts, the lower the storage temperature, the better preservation of quality.

Results

Experiment 1. ‘Golden Oxford’ stems stored with the bulb attached had a longer vase life than those stored cut, at both temperatures and every duration of storage (Fig. 1). The 31°F temperature preserved vase life better for both bulb-attached and cut stems. After 6 weeks at 31°F, stems with the bulb attached lost 1.0 day of vase life compared to 3.0 days of vase life at 33°F. Cut stems held at 31°F lost 2.3 days of vase life compared to 3.8 days when held at 33°F. Neither storage method nor storage temperature affected vase life of ‘Renown’. Non-stored stems lasted 5.5 days. After 3 and 6 weeks, vase life was 4.1 and 2.8 days, respectively.

Tulips are known to stretch after being cut. Storage method, with or without the bulb, did not influence the stretching of ‘Golden Oxford’. However, stems stored at 31°F gained 4.7 inches by termination, while stems stored at 33°F gained 3.8 inches. Stems stored for 6 weeks were shorter than those stored for 3 weeks by approximately 0.7 inches. Stem length of ‘Renown’ was not affected.

Stems with the bulb attached were less wilted following storage and took less time to rehydrate. Figure 2 shows the condition of bulb-attached and cut stems following 6 weeks of storage. While cut stems appeared more wilted, both cut and bulb attached stems lost a similar percentage of weight following storage. Stems with the bulb attached likely used water reserves in the bulb to keep stems, leaves, and buds better hydrated during storage than the cut stems. All stems rehydrated regardless of weight loss.

Experiment 2. Pulsing stems of ‘Golden Oxford’ with Bulb 100 and CBVB increased vase life by 0.5 days for non-stored stems, 0.7 to 0.9 days for those stored for 3 weeks, and 1.7 days for those stored for 6 weeks. Stems treated with Bulb 100 and CBVB had a vase life of 5.6 days after 6 weeks of storage, which was only 1.0 day shorter than non-stored stems. Similarly, Bulb 100 and CBVB equally improved vase life of ‘Menton’ and ‘Piste’ (Fig. 3). After storage, ‘Menton’ and ‘Piste’ stems pulsed with a preservative lasted 1.6 or 2.0 days, respectively, longer than water pulsed stems. Bulb 100 and CBVB increased vase life of stored stems to a time similar to that of the non-stored control for both ‘Menton’ and ‘Piste’. On average both cultivars lost one day of vase life for every 3 weeks of storage regardless of treatment.

Stored ‘Golden Oxford’ stems pulsed with water increased in stem length by 3.7 inches. Bulb 100 and CBVB pulsed stems gained approximately 0.5 to 1 inch more in length. ‘Menton’ and ‘Piste’ stems increased in stem length by 4.5 and 3.7 inches, respectively. After 6 weeks of storage, ‘Golden Oxford’, ‘Menton’, and ‘Piste’ had lost 29, 22, and 32% of their weight, respectively. Some stems did fail to rehydrate.

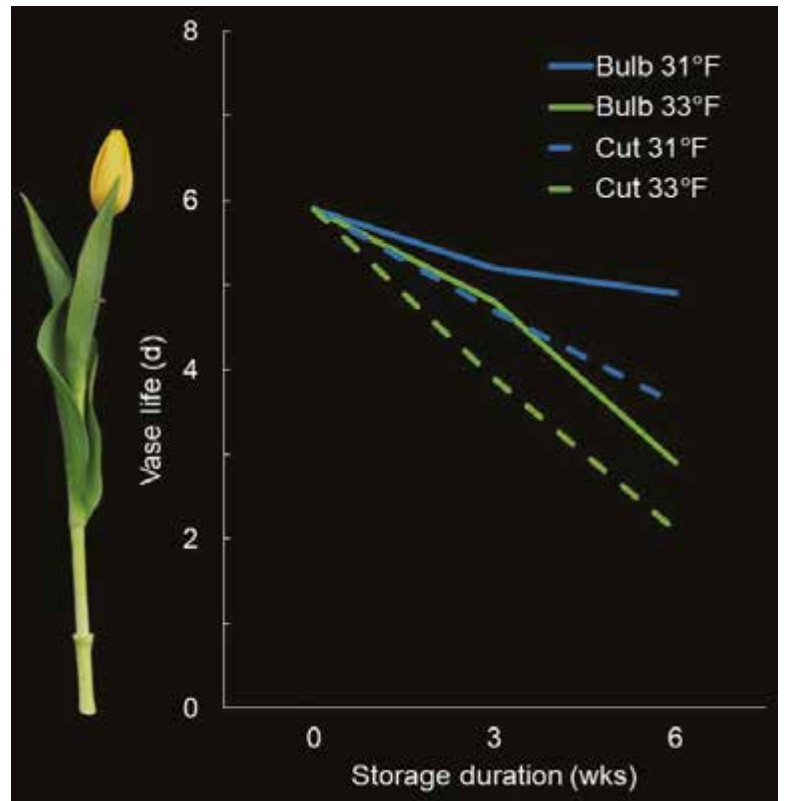


Figure 1. Vase life of ‘Golden Oxford’ stored with or without the bulb attached at two temperatures.



Figure 2. Condition of ‘Renown’ following 6 weeks storage at two temperatures.

Grower Recommendations

Tulips stored for multiple weeks will likely be less wilted and have a longer vase life when the bulb is kept attached. Our results show that in most cases, 31°F better preserved vase life than 33°F. Most growers will not be able to achieve this temperature, but as with most cuts, the lower the storage temperature, the better preservation of quality.

Preservative pulses will likely be beneficial when storing most cut tulips. Pulses of Floralife's Bulb 100 and Chrysal's CBVB increased vase life of both fresh-cut and stored tulips. We did not test preservative pulses following storage, but this may be an alternative option for improving vase life of cut tulips, especially those stored with the bulb attached.

Keep in mind that many factors will influence vase life, such as the time of year, cultivar, and the relative humidity and temperature of your storage facility. With future research, we plan to evaluate additional tulip cultivars and test below-freezing temperatures on other cut flower species.

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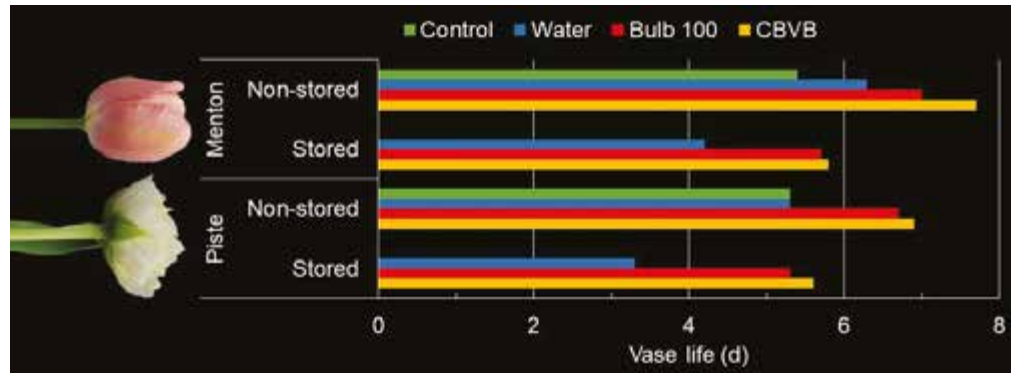


Figure 3. Vase life of 'Menton' and 'Piste' with and without storage after receiving one of three pulse treatments for 8 hours.



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