Campanula 'Kent Belle' Production Schedule

<table>
<thead>
<tr>
<th>Duration</th>
<th>Cultural practice</th>
<th>Temperature</th>
<th>Photoperiod</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-15 weeks</td>
<td>Cold Treatment</td>
<td>41°F (5°C)</td>
<td>Natural daylength or short days in cooler</td>
</tr>
<tr>
<td></td>
<td>Begin Forcing</td>
<td></td>
<td>Long days (16 hours or night interruption)</td>
</tr>
<tr>
<td>63°F (17°C)</td>
<td>7 weeks to flower</td>
<td>73°F (23°C)</td>
<td>6 weeks to flower</td>
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<tr>
<td>8 weeks to flower</td>
<td></td>
<td></td>
<td>Visible bud to flower 68°F - 12 to 14 days</td>
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</tbody>
</table>

Figure 1. Campanula punctata ‘Cherry Bells.’ Figure 2. Campanula ‘Kent Belle.’

Campanula punctata

Campanula has been gracing gardens at least since the 16th century. There are about 300 species in the genus, which includes an impressive diversity of forms ranging from tiny alpine species to five-foot tall specimens with large, showy flowers. The blooms of most are violet-blue, lavender, or white but a few pink forms exist. Compact varieties including C. carpatica and campanula ‘Birch Hybrid’ are excellent choices for potted plant production and have been produced by the millions in Europe.

We have recently been working with three cultivars of Campanula punctata, commonly known as spotted bellflower. These vigorous plants spread by runners and can be invasive in the garden, but are showy and reliable. The cultivars ‘Cherry Bells,’ ‘Wedding Bells,’ and the hybrid cultivar ‘Kent Belle’ all have very large, tubular, nodding flowers. ‘Cherry Bells’ produces numerous rosy pink flowers that are spotted inside (Figure 1) and the flowers of ‘Kent Belle’ are glossy, deep violet-blue (Figure 2). The flowers of ‘Wedding Bells’ are white with spots and are double, with a configuration known as “hose-in-hose” type. Campanula punctata is native to eastern Siberia and Northern Japan and these varieties are hardy to USDA zone 5 (-10°F to -20°F, or -23°C to -29°C).

Propagating And Plant Size

These bellflowers are vegetatively propagated. ‘Cherry Bells’ plugs with five or six nodes and ‘Kent Belle’ plugs with three to 10 nodes, all flowered readily in our experiments and were quite uniform. ‘Wedding Bells,’ as plugs with three to six nodes, did not reach 100% flowering in any of our treatments, suggesting that juvenility may be an issue with this variety.

Cold Treatment

Cold was required for flowering of these three bellflowers. Without cooling, no ‘Cherry Bells’ plants flowered and only a few noncooled ‘Kent Belle’ plants flowered. Thus, a cold...
Figure 3. 'Cherry Bells' plants require a cold treatment and long days to flower. These plants received 15 weeks of cold at 41°F and then were forced under one of three photoperiods: nine-hour short days or 16-hour days provided by incandescent lamps or 16-hour days provided by high-pressure sodium lamps (left to right). The high-pressure sodium lamps provided 500 to 600 footcandles of light in addition to ambient light levels, and clearly improved plant quality.

**Photoperiod**

'Kent Belle' is a facultative long-day plant, flowering more than two weeks earlier under 16-hour long days than under nine-hour short days. Photoperiod had little effect on flower bud number or final height. Long days were required for flowering of 'Wedding Bells' and 'Cherry Bells.' Thus, the suggested photoperiod for forcing these bellflowers is 16 hours, or a four-hour night interruption.

**Media, Fertilization, And Irrigation**

Bellflowers generally tolerate a range of growing media, but prefer good drainage. Plants in our experiments performed very well in a standard soilless peat-based medium. We supplied nitrogen levels of 125 ppm N in a constant liquid feed program, and this was sufficient for healthy growth. We maintained pH levels between 5.8 and 6.2.

**Lighting And Spacing**

Bellflowers are generally considered full-sun plants. We found that supplemental high-pressure sodium lighting (500 to 600 footcandles) improved the quality of 'Cherry Bells' and 'Wedding Bells' by increasing the flower number during mid-winter forcing (Figure 3). Supplemental light had little effect on flower bud number or plant height at flower in 'Kent Belle,' but plants were sturdier with supple-

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mental light.

These bellflowers filled out the five-inch pots used in our experiments very quickly and are more appropriate for one gallon or larger pots. Both 'Cherry Bells' and 'Wedding Bells' were very sturdy, with many stiff upright stems that supported the flowers easily. In contrast, the stems of 'Kent Belle' were not as strong and the weight of the flowers caused some to bend. Providing high light levels and using several plugs per pot will improve the appearance of 'Kent Belle.'

**Plant Height Control**

'Kent Belle' is the tallest of these bellflowers, reaching 24 to 28 inches in height when flowering. 'Cherry Bells' is about 15 to 28 inches tall when blooming and 'Wedding Bells' is 12 to 18 inches in height. In our plant growth regulator trial on 'Kent Belle' and 'Cherry Bells,' plants were sprayed six times at weekly intervals using A-Rest at 100 ppm, B-Nine at 5000 ppm, Bonzi at 90 ppm, Cycocel at 1500 ppm, Sumagic at 15 ppm, and Control.

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**Keys To Success**

1. Provide 10 to 15 weeks of cooling at 41°F (5°C).
2. Force under long days (16 hours or four-hour night-interuption).
3. Provide forcing temperatures at or below 73°F for best quality and most flowers.
4. Choose large containers (one gallon or larger) and use height-control strategies.
1500 ppm, or Sumagic at 15 ppm. B-Nine and Sumagic controlled elongation of 'Cherry Bells' and 'Kent Belle' very effectively (Figures 4 and 5). We did observe a flowering delay of three to five days with B-Nine. A-Rest, Bonzi, and Cycocel also reduced elongation, but to a lesser degree. Our objective in this trial was to determine which chemicals were effective, not to determine optimum rates. Growers are encouraged to perform their own trials on these plants to determine the best rates under their growing conditions.

**Temperatures And Crop Scheduling**

Under 16-hour long days, time to first flower was five to six weeks for 'Cherry Bells' and seven to eight weeks for 'Kent Belle' and for 'Wedding Bells' at 68°F (20°C) following cold treatment. We grew 'Kent Belle' plants under long days at temperatures ranging from 63°F to 79°F (17°C to 26°C). Plants flowered approximately two weeks earlier when grown at 73°F compared to 63°F. However, as for most other campanula species we have tested, the number of flower buds per plant and final plant height generally decreased with increasing temperature. Plants were most attractive at temperatures at or below 73°F (Figure 6).

**Disease And Insect Pests**

We observed no insect or disease problems on any of these bellflowers.
PERENNIALS

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They were very vigorous and trouble-free.

Postharvest Concerns

The individual flowers of these bellflowers are sturdy, long lasting, and numerous – more than 120 on some of our ‘Cherry Bells’ plants. The flowers open in succession, so the plants remain attractive for several weeks, but we suggest marketing them when just starting to bloom.

About the authors: Cathy Whitman is a research technician, Art Cameron is a professor, Erik Runkle is an assistant professor and extension specialist, and Royal Heins is a professor, Department of Horticulture, Michigan State University, East Lansing, MI 48823. The authors wish to extend thanks to Dave Joeright, Mike Olrich, and the generous industry supporters who made this work possible.

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