

<b>Cultural Information for:</b>	Campanula Champion Pro	Annual
<b>Common Name:</b>	Cup and Saucer	
<b>Botanical Name:</b>	Campanula medium	
<b>Seed Count:</b>	23,000 /ounce	800 /gram
<b>Optimum Germination Temperature:</b>	65-68°F / 18-20°C	
<b>Optimum Growing Temperature:</b>	55-60°F / 13-15°C	
<b>Optimum pH:</b>	5.8 – 6.2	
<b>EC – Plug:</b>	0.4 – 0.8 mmhos/cm (1:2) / 0.9 – 2.0 (SME) / 1.1 - 2.6 (Pour Thru)	
<b>EC – Finishing:</b>	0.9 – 1.3 mmhos/cm (1:2) / 2.1 – 3.5 (SME) / 2.7 - 4.6 (Pour Thru)	

## Plug Culture – 5 weeks (288 / 12 x 24 tray)

**Stage One** (days 1-10) Single sow pelleted seed into a 288-plug tray using a sterile and well-drained media. Cover the seed lightly with vermiculite and maintain high humidity and sufficient moisture to melt the pellet. Optimum germination temperature is 65-68°F/18-20°C. For the highest germination, maintain an even temperature of 68°F/20°C for the first four days after sowing.

**Stage Two** (days 11-21) After the seedlings emerge, place the plug flats in a bright and cool greenhouse with good air circulation. Apply a light feed of 100 ppm Nitrogen using a well-balanced fertilizer. Maintain moderate air temperatures, 68-72°F/20-22°C, to avoid stress and prevent rosetting\*.

**Stage Three** (days 22-34) Seedlings are beginning to fill in the plug tray. Fertilize as needed to maintain strong growth using a well-balanced fertilizer. The use of Calcium Nitrate-based fertilizer is beneficial in helping to build strong and healthy transplants.

**Stage Four** (day 35) Seedlings should now have 2-3 true leaves and are now ready to transplant into cut flower beds. Campanula medium as a species possesses a tap root structure and root bound plants will not produce a healthy and strong plant. In order to maximize stem length do not delay transplanting.

*\*induced dormancy caused by stressing the plugs (uneven moisture, excess fertilizer, chemical damage, delayed transplanting, a day temperature above 82°F/28°C, a night temperature above 77°F/25°C, or insufficient lighting during flower bud initiation. Maintain optimum temperatures and transplant on time.*

## Transplanting to flowering – 13 -15 weeks

Site preparation: Select a bed with good drainage and a soil that is high in organic matter. For best results provide full sun and good ventilation.

### **Plant Spacing:**

Single Stem\*: 4 inches/10 cm. apart

Multi Stem\*\*: 10 inches/25 cm. apart

\*single stem production will crop more quickly and is recommended for greenhouse production.

\*\*multi-stem production is best for outdoors or in a cold frame. Expect 8-10 stems per plant.

**Note:** After transplant do not allow the plants to dry out in order to prevent tip burn.

**Temperature:** Ideal growing temperature is 55–60°F/13–15°C.

**Fertilizer:** Campanula is not a heavy feeder. Use a well-balanced calcium nitrate-based fertilizer for strong growth. A lack of boron will cause distortion and tip abortion. A lack of iron will cause tip burn on the leaves.

**Support:** Campanula Champion Pro series grows 2 to 2 ½ feet /60-90 cm. tall, but support is recommended to avoid damage to plants during windy periods; especially for single stem production.

**Lighting:** Campanula is a long day responsive plant and will require lighting for winter flowering. Light the plants when they have 8 to 10 true leaves, (4 to 5 weeks after transplanting), using “mum lighting” from 10 pm to 2 am for 40-45 days. No supplemental lighting is required for a late spring flowering (transplanting in mid February).

**Note:** *Provide short day conditions (< 12 hours) from sowing until 4-5 weeks following transplant to ensure sufficient vegetative growth.*

**Crop Time:** In general, Campanula Champion Pro flowers in 120-140 days from sowing using the above culture. An early August sowing will yield cut flowers in late December to early January if the night temperature is maintained at a minimum of 50°F/10°C on the growing point and the crop is lighted for 40-45 days starting 4 to 5 weeks after transplanting. For late spring to early summer flowering from a February sowing, no day length manipulation is necessary.

**Indoor/Outdoor Production Under Long Days:** (Sowing late-February to early August)

In mild temperature regions, (Coastal California, Northwest Upper Midwest, and New England) year-round production is possible with either a black out system or starting with short day-treated plugs.

**Using a Black out System:** During long day conditions (sowings from late-February to early-August), maintain short day conditions (less than 12 hours) in the plug stage continuing until 4-5 weeks after transplanting with optimum production temperatures.

**Starting with Short Day Plugs:** Sow seed into a 128 to 162 deep plug tray and produce under short days (>12 hours) for 9-10 weeks. Transplant into cut flower beds.

**Note:** For outdoor production sow seed either 9-10 weeks prior to the average last frost date (spring) or 9-10 weeks prior to the first killing frost (fall).

### **Overwintering**

Transplant mid-sized plugs (128) in mid-September (Zones 5-6) to early October (Zones 7-8) to establish prior to winter with flowering the following spring (May/June). Protect from deer and rabbits with row cover.

**Harvesting:** Cut stems when two or three lower buds are open. Dip stems in 100°F/38°C temperature water to reduce latex flow and then place in tepid water with a bactericide (chlorine tablets). Keep the stems in a cool spot in an upright position to avoid stem bending.

**Post-Harvest Care:** Treat with 1-MCP as campanulas are quite sensitive to ethylene and pulse with 5% sucrose. Sugar is necessary to encourage the buds to open and develop good color.

**Storage:** Cut stems can be stored upright at 36°F/2°C either wet or dry for 1 week; however, longer storage will reduce the vase life.

*“All information given is intended for general guidance only and may have to be adjusted to meet individual needs. Cultural details are based on North American conditions and Sakata cannot be held responsible for any crop damage related to the information given herein. Application of recommended growth regulators and chemicals are subject to local and state regulations. Always follow manufacturer's label instructions. Testing a few plants prior to treating the entire crop is best.”*