

Cultivation guide for potted calla lilies

The most important factors to think about when growing potted calla lilies (botanical name: Zantedeschia) are soil medium, irrigation and greenhouse climate. Other aspects to consider are disease prevention and nutrients. Here are a few guidelines that will contribute to a successful crop of potted calla lilies.

Tubers:

Dümmen Orange supplies tubers that can be planted directly. Each tuber has several active shoots and as been prepared according to the Dümmen Orange method. If you intend to plant the tubers in series we recommend not storing them for longer than 3 to 4 weeks. Calla lily tubers should be stored in a dry, well-aired space (to prevent mold) at temperatures between 58 and 60 °F (13 - 15°C). Calla lily tubers do not withstand cold well and should never be stored where they may be exposed to frost.

Potting soil for potted calla lilies:

Choose a well-draining potting soil with a pH value of 6.5. The potting soil should also be sterilized. Dümmen Orange recommends using a mix that consists of 60 - 80% coco peat for an optimum result. A mix commonly used for calla lilies contains 60% coco peat, 20% fine Finnish peat and 20% coarser Finnish peat. To ensure a thorough drainage and a sufficiently high oxygen content we discourage a too high percentage of fine peat.

Pot size versus tuber size:

Calla lilies can be planted in pots of all different sizes. With regard to the type of pot used, we recommend using pots with a lip at the bottom, as this will raise the pot slightly off the ground. This will promote air circulation underneath the pot. Depending on the pot size, you can plant one tuber per pot, or multiple tubers in the same pot. Please refer to the table below as a guideline:

Pot size			Plant density	Tuber size				
fdf	inches	cc	per netto m2	12/14	14/16	16/18	18/20	20/24
9 cm	3.5"	285 cc	35	x				
11 cm	4.5"	520 cc	30	x	x			
12 cm	5"	> 620 cc	30		x	x		
14 cm	6"	> 1.000 cc	25			x	x	
17 cm	7"	> 2.000 cc	20				x	x

If you are using bigger pots, please refer to the following figures when planting multiple tubers per pot:

Pot size			Plant density	Tuber size				
in cm	inches	cc	per netto m2	12/14	14/16	16/18	18/20	20/24
14 cm	6"	> 1.000 cc	25	3	2	1	1	1
17 cm	7"	> 2.000 cc	20	x	3	2	1	1
19 cm	8"	> 3.000 cc	15	x	3	3	2	1
25 cm	10"	> 7.000 cc	10	x	x	3	3	2
30 cm	12"	> 10.000 cc	5	x	x	x	3	3

As not all cultivars will thrive equally when multiple tubers are planted in the same pot we recommend discussing your cultivation program with us before you start. We will be happy to give you custom advice.

Planting:

Calla lilies produce roots at the top of the tuber, which then grow downwards around the tuber towards the bottom of the pot. This is why it is essential that the tubers are planted with the shoots at the top. After planting, the tubers should be covered with at least 1.5 - 3 inches of potting soil (3-5 cm).

Greenhouse temperature:

After planting, the pots containing the tubers can be moved to a rooting cell or directly into the greenhouse. The best starting temperature is between 63 and 68°F (17 - 20°C). Make sure that the pots do not dry out while the plants are in their root development phase! Taking into account that the roots will first start to grow at the top of the pot (above the tuber), ensure that there is enough moisture in the top part of the pot to prevent the newly developing roots from drying out.

After planting the tubers, drench the pots with water (and a fungicide) and move to a location kept at the temperatures recommended in the table below. Attention: please be very careful when watering the plants until the first shoots appear above ground. At this stage, the plants only need water to form roots; they but do not need any water to support actual plant growth yet. Roots will develop more slowly in a wet pot. Also, if the soil is too moist there will be greater chances of root problems. The table below shows the various growth stages and the recommended greenhouse temperatures.

Stage:	Day / Night	Temperature:
Root formation: from planting until shoots of 1"- 2" (3-5cm) appear	Day & Night	63 - 68°F (17- 20°C)
Growth: from shoots of 5cm (2") until flowers appear	Daytime:	62 - 72°F (16- 22°C)
	Night-time:	58 - 63°F (14- 17°C)
First flowering until delivery	Daytime:	61 - 75°F (16- 24°C)
	Night-time:	55 - 61°F (13- 16°C)

Greenhouse climate and lighting

Calla lilies thrive when they get enough light, which they need to produce flowers. The successful cultivation of calla lilies depends on a sufficient amount of light, in combination with the right greenhouse temperature, nutrient and fertilizer program and irrigation. It is therefore necessary to continually monitor and adjust the temperature in the greenhouse and ensure the best possible humidity conditions. This will result in proper plant growth and promote the evaporation of excess moisture. Calla lilies prefer a relative humidity of 65 - 75%. Prevent a relative humidity below 50% and avoid considerable fluctuations in humidity during the daytime. Calla lilies thrive best when cultivation variables are kept constant.

Flower color is influenced, above all, by light intensity. Enough light prevents excessive stem growth and drooping plants and leaves. Higher temperatures will accelerate the cultivation cycle. Please note that calla lilies grown under high temperatures, but with a too low light intensity, will generally be weaker and develop fewer flowers.

Screening is recommended at a light intensity of 450 Watt/m2 or above (375 Watt/yd2 or 5,000 foot-candles of 55,000 Lux). Screens in combination with horizontal air circulation will help to create a stable cultivation climate. Screening can

keep greenhouse temperatures down, while preventing the relative humidity from dropping.

Irrigation:

Potted callas prefer overhead irrigation. It is essential that the sprinkler system is regularly inspected, particularly to ensure an even distribution of water. Watch out for dry or excessively wet spots, as this may cause root and overall growth problems. After planting, the pots can be watered once or twice, depending on the amount of moisture at the top of the pot. Be sure to keep this section from drying out during the first 2 - 2,5 weeks after planting! There also has to be enough moisture at the bottom of the pot to lead the roots (which start at the top of the tuber) downwards into the bottom of the pot. As soon as the roots are fully developed (check this once a week by flipping over a pot onto your hand) and the leaves begin to unfurl the plants will be able to absorb more water. In general, we advise against too much moisture.

The importance of thorough and constant irrigation

Too much water can lead to root problems (e.g. Pythium). The roots should be a nice white color, but not glassy in appearance. Glassy-looking roots indicate problems, and root problems can lead to plant rot. We therefore recommend removing plants with root problems. Check the roots at regular intervals throughout the entire cultivation process. It is best to water the plants in the morning, when daytime temperatures are still low.

Nutrients and fertilizers:

Potting soil is often supplemented with approximately 20 oz of NPK (12-10-28) per yd3 (800g NPK (12-10-28) per m3) as a basic fertilizer. Sufficient iron and magnesium levels are also essential, as is achieving the right balance between nitrogen and potassium. Too much nitrogen will result in longer stems and weaker plants. We advise adding nutrients every time the plants are watered. If you have any questions about nutrients, please do not hesitate to contact us.

Growth regulation:

Bonzi (Paclobutrazol) is often used to as a growth regulator (to inhibit excessive growth). Factors that determine the ultimate size of a plant include the temperature, the light intensity, the humidity of the potting soil and the variety itself. Standard recommendations may deviate from what is best for a particular cultivar, but can be considered as good basic advice. The first Bonzi treatment can be given when the shoots are 2" - 4" (5 - 10cm). We recommend treating the plants with Bonzi in the morning, one day after the last watering. Bonzi can be applied by drenching the pots. This will ensure that the growth regulator is properly absorbed by every pot. As shoot growth may differ from pot to pot, we recommend sorting the pots by shoot length first and/or marking the pots immediately after treatment.

Recommended dosage:

Apply 1 cc Bonzi (4 grams/liter Paclobutrazol) by drenching the pots with approximately 50 cc water per pot. (A solution of 2fl oz Bonzi to one gallon of water (which comes down to 60 ppm Paclobutrazol. Depending on the variety, the pots

should be drenched with 1 - 3 fl oz (60 ppm).) The treatment can be repeated if the plants are beginning to develop too much foliage. The plants need to be actively growing when treated with Bonzi. It's impossible to provide standardized advice for every situation, so we recommend testing the dosage and treatment times and keeping a record of your results. This will help you find out which method works best for your particular variety. Please feel free to contact us for cultivar-specific advice. Based on our vast experience in the field we can jointly determine what the best starting point would be for you. As Bonzi is highly persistent in the soil we recommend being careful with follow-up crops.

Crop protection:

Erwinia Carotovora, Pythium and Rhizoctonia - most commonly caused by a cultivation problem - are the most common diseases to affect calla lilies. Well-draining soil and a good disease prevention program are important factors in preventing premature plant death. In order to grow healthy plants under good cultivation conditions it is essential that you plant healthy tubers and use clean tools. If your plants begin to shed their outer leaves this could indicate Rhizoctonia. This can be combated with fungicides such as Amistar (Azoxytrobine). Check the plants at regular intervals by taking a few of them out of their pots at random and inspecting their roots. Inspect the root system for glassy or brown roots, treating them with fungicide if necessary. Plants affected by Erwinia must be discarded.

Insects:

It is important to keep your plants free from insects to ensure a consistently high quality. Check regularly for aphids, trips and whiteflies. If you would like more information about this, don't hesitate to contact us.

Disclaimer

Although the content of this cultivation guide has been compiled with the greatest possible care, it is only a means of providing general, obligation-free advice and cannot serve as a guarantee for healthy plants. The influence of cultivation conditions on the growth of plants, and additionally the effect of specific agents and methods can vary depending on the climate. Dümmen Orange does not accept any liability whatsoever for any damage arising from the use of the information in this cultivation guide.