

Zabo Plant



Zantedeschia, a brief cut flower cultivation manual

Tubers or rhizomes?

This cultivation manual is ment to be used for the culture of Zantedeschia from tubers (Calla Lily) and not for Zantedechia aethiopica rhizomes. For the record: Zantedeschia is a tuber which produces colored flowres. The cutflower is harvested when it's ripe and does not ripen further after harvesting. The stems can withstand a few days of dry transport well and the vase life extends up to 3 weeks. Zantedeschia aethiopica is a rhizome, which produce large white or green flowers. The flower is cut unripe and is able to ripen on. It's origin lies in marches and therefore requires much more water than Zantedeschia.

Zantedeschia from Chile

Erwinia, poor quality tubers and virus have been the most limited factors for a succesful crop in the past. However, thanks to our unique climatical conditions and our way of production of the tubers, we have been able to overcome these problems.

All material originates from tissueculture multiplied, disease free, in our own laboratory. Tubers production is done in insect free greenhouses (1st year) and in areas with very low aphid-pressure (2nd year). Furthermore culture is 100% aimed at the production of tubers and not for flowerproduction. This means we only supply 'fresh' tubers which have never been used for cut flower production before.

Planting period

Zantedeschia tubers in Chile are normally harvested during the months April, May and June. It appears that a minimum of six weeks of post-harvest storage is needed before they can be planted again. This means that we are able to supply tubers from half of June onwards, which can be planted immediatly. However tubers can be stored easily for another two months. For that reason they have be placed in well ventilated trays at 12-18°C. For a long-storage (6 or more weeks) lower temperatures are advised (8-10°C).

The exact planting period depends a lot of the local climate and location. Based upon your local conditions we are able to given you an exact advise about your possibilities.

Soil Type

Zantedeschia do well on all types of soil as long the irrigation is in good order. The ideal rooting temperature is about 16°C. Especially in the first two weeks after planting it is advised to stick to this recommendation temperature. At higher temperatures the offshoot develops faster than the roots. The forming of a firm root cluster is of the utmost importance at the beginning of the cultivation. Never let the ground temperature exceed 22°C.

Too many changes in the ground temperature are not good for the development of either roots or plants. Prefably the ground has to be covered with sawdust or straw to obtain a most stabilized possible ground temperature. Covering the ground with sawdust or straw has three advantages:

- Direct radiaton of sunlight (= warmth) is prevented; important at the beginning at the beginning of the cultivation when the cultivation is not fully grown.
- Sawdust or straw has insulating capabilities (temperature control).
- Covering of the soil prevents the topsoil from blocking up due to regular watering.

Soil disinfection

Desinfection the soil by steam is recommended. Clean ground has the best results, because if too much weeding has to take place during the cultivation the clusters can be damaged. This naturally results in adisturbed growth .

Before planting 30 gr. Per 10 m² of Ridomil can be milled into the soil at planting depth. After planting 20 ml per 10 m² of Rizolex can be sprayed on the planted bed.

After this watering may be done by the overhead system.

Planting density

The planting density depends on the choice of assortment that has been made. Some varieties give more crops and have to be planted less dense. The table below gives an indication, which suffices in daily practice.

Size:	10-12	12-16	16 up
Tubers/netto m ² :	32	24	20

Immersion advice/Gibberelic Acid

Before planting the tubers have to be immersed in: Captan 1% and Bavistin 0,4%.

To improve the flower percentage Zantedeschia tubers have to be immersed before planting in a growth-regulator (Gibberelic Acid) for 20 minutes. This can be done together with the fungicide treatment. Gibberelic acid is a growth regulator that gives a yield of 2-3 times as many flowers by transforming the bractlets into flowers. As soon the tubers starts to sprout they can be immersed with the growth regulator.

After the treatment it's advised to dry the tubers at least an hour before planting them. Better even is to do the treatment a couple of days before planting so that tubers can dry back well before planting. Since concentrations of Gibberelic Acid can vary from country to country, we advise you to revise what is available in your country, so that we can give you a proper advice.

In every case it's important to use the immersion solution for a short time only, because light and evaporation of the chemicals will lose its strength. Preferably, do not use the bath longer than 1 to 2 hours. Keeping the solution makes no sense at all.

Come up/watering

The tubers are planted with the eyes facing up and with about 5-7 cm compacted soil on top of the tuber. Roots are formed on top of the tuber. The come up of the crop is rather irregular.

After planting water thoroughly. Then, keep the planting medium on slightly moist until plants reach a height of 15-20 cms. From that moment watering can be increased.

The forcing period in summer is 70 to 90 days. A prolongation period of three weeks is necessary for all flowers to come out of the axial. With tubers that have been stored for a long time and that have a large sprouting capacity it is possible that first flowers appear within the first 5 weeks. These stems are usually shorter than normal.

Light

Zantedeschia likes a lot of light (above 2500 footcandle). A higher light intensity in combination with the difference in day and night temperatures results in a more intensive flower color. Too much light though might give too short flowerstems.

Further too strong sun radiation must be avoided, because a too high temperature will be obtained. Preferably using shades or blinds must controls the temperature.

Temperature

At the beginning of the cultivation the greenhouse temperature must be between 17 to 20°C. During the night the temperature may drop to 16°C.

Nearing the time that the flower basis is made, the night temperature may drop to 11°C to give the orange and red varieties a more intense flower color.

High greenhouse temperature is to be avoided as much as possible. A high temperature in combination with high air humidity increases the chances for Erwinia infestation.

Fertilization

A normal fertilization is advised. N – P - K: 1.5 - 0.2 - 1.5/2.

Too high N levels will give a too luxuriant growth and makes the crop more sensitive for Erwinia.

Harvest

The flowers are forced. The forcing is easy and fast. The harvested flowers also have more length and it prevents the splitting of the stems. Preferably, the flowers are picked in the morning before it becomes warm and stored at 7 to 9°C. If flowers are stored at lower temperatures, it will affect the keeping qualities. Zantedeschia has grown increasingly in demand and popularity, especially due to the exceptional long vase life of about 3 weeks. Further since flowers are harvested ripe it's not necessary to harvest every day. It's even possible to harvest according to your orders.

Erwinia

Erwinia caratovera is a feared bacterial attack that can lead to high percentages of loss. The bacteria can attack the plant in every growth stage. When the circumstances are favorable the Erwinia bacterial infestation spreads rapidly leading to great losses of plant material. Symptoms above the ground are firstly leaves turning yellow, following by the dying of a few leaves and finally the whole plant. The tuber can rot away wholly or partially. Erwinia also called soft rot, comes along with an unpleasant smell, up to now there is no measure known to fight this infestation. However Erwinia in most of the cases comes secondary, therefore it's very important to prevent those situations that work infestations in hand. A plant growing in less than optimal conditions gets into stressed situation which makes the plant more sensitive to Erwinia attacks. Check the culture daily to ensure that the conditions (air temperature, ground temperature, irrigation and fertilization) stay within the suggested limits, Make use of thermometers, leaf and soil samples and try to know as much as possible about the conditions on hand. Measuring = knowing.

Erwinia is often present in greenhouse because the bacteria having preference for conditions of high humidity and high temperatures. A ground temperature of 24°C and higher accelerates the infestation enormously.

If due to precautions Erwinia is contracted, often in certain areas, lower the temperature of the greenhouse. Erwinia will then have a smaller chance to spread itself. Don't remove the contracted plants from the greenhouse, but just let them to dry. The moment that the infested plants are lifted the Erwinia will be spread.

During the harvesting of the tubers especially take into consideration the infested areas, keep the tubers from these infested areas separate from the others and dry them at a faster rate. In storage an infected tuber can infect the other tubers as well.

Viruses

Four types of virus are known for crop Zantedeschia. Virus can affect the leaves or the lower. Aphids or thrips spread the viruses known in Zantedeschia. It is recommended to removed virus-infested plants in any case. To prevent further infestation, the crop has to be selected and checked constantly. The most (up till now) occurring virus is the Poty-virus. The Poty-virus is a collective name of a group of viruses. This group is difficult to identify in both laboratories as in daily practise. Often poty-virus can be identified by for instance a "bubbled" leaf and/or a lank or weedy leaf-form. The strange thing about the poty-group is that sometimes the virus is present in the plant, but can not be proven visually. Due to stress factors (i.e. Drought), the virus can suddenly become visible in the crop.

Pests

Fighting against aphids and thrips is very important. These insects can transfer virus in the Zantedeschia crop.

Growth after flowering

After all flowers have been harvested, it is recommended to let the crop grow out well. By using the Gibberlic acid treatment at the start of the culture, the crop is somewhat disturbed. After flowering the plants usually readjust. Extra formation of leaves after the flowering period ensures that the tuber can readjust and can grow in size. Sufficient growth is essential for a good progress of the following cultivation.

Zantedeschia goes into dormancy at low temperature or drought. It is therefore, recommended that with a greenhouse cultivation no irrigation takes place 4-6 weeks before raising the tubers to give the crop a chance to wither and die. In this manner the crop goes into rest in a natural way.

Raising of the tubers

The period of raising depends of the planting period. The most enlargement growth of the tubers takes place in the summer. When raising the old noses may not be broken and therefore it is best to cut off the crop in case the plants have not been died completely. Prevent any form of damage during raising and dry tuber quickly after raising to prevent Erwinia attacks and premature growing. To dry the tubers place them in gauze crates and make use of a ventilator. Store them in a well ventilated storage room, an area that can carry off the moisture.

Huijelas, July 10, 2000