

CULTURAL DIRECTIONS

# ALSTROEMERIA



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## **1. HILVERDAKOOIJ ALSTROEMERIA**

In 1997 HilverdaKooij started sales and propagation of Alstroemeria. Their assortment consist of Dutch and Italian varieties.

In Alstroemeria there are still a lot of possibilities improve the assortment due to new breeding techniques which make it possible to cross different botanical Alstroemeria varieties. This means the grower will get a larger assortment in the coming years.

Please find hereafter more information about the cultivation of Alstroemeria.

## **2. PLANT CHARACTERISTICS**

New Alstroemeria shoots grow from the rootstock. Those shoots can be vegetative and generative, this is very much affected by the soil temperature. The shoots can grow up to 2 meter high depending on the variety. The vase life is good and can be up to 2-3 weeks. Typical is that the leaves are all turned up side down.

## **3. CLIMATE**

### ***Soil temperature.***

Climate is very important for Alstroemeria. Important is a soil temperature between 11 and 16 °C for a good development of new generative shoots from the rootstock. A high average temperature will affect the soil temperature and a high soil temperature will result in many vegetative shoots. To obtain a low soil temperature at least cool nights are necessary. In tropical areas one can find Alstroemeria on a higher altitude. A higher light intensity normally allows a higher soil temperature, in general one says that 50% more light allows a soil temperature of 1 °C higher.

Only just after planting the soil temperature may be higher, 15-17 °C is acceptable.

### ***Light.***

Sufficient light is important to prevent bud abortion and will result in a strong and heavy quality stem. Note that a high light intensity will also increase the soil temperature.

### ***Day length.***

The effect of day length differs per variety. Long day will speed up the development of the flower, but shoot induction will be decreased and the crop will stay a little shorter.

The effect of day length in combination with soil temperature can be summarised as follows:

	long day high light intensity	long day low light intensity	short day high light intensity	short day low light intensity
<b>shootproduction</b>				
- high temperature	++	+	+	--
- low temperature	+-	--	+	-
<b>flower induction</b>				
- high temperature	-	--	-+	--
- low temperature	-	--	-+	--

#### **4. SOIL**

Alstroemeria can be grown on many different types of soil. Important characteristics for the soil are:

- good rooting and structure (to improve the structure sometimes 2-5 m<sup>3</sup> of organic material is mixed in the soil per 100 m<sup>2</sup>);
- good drainage and constant water level (the humidity of the soil also has a big influence on the soil temperature);
- low salt concentration. Alstroemeria is sensitive for high salt levels, this means it is better to give many small gifts of fertilizers in stead of few big gifts;
- right nutrient levels;
- free of pests and diseases. It is necessary to steam (1 hour at 70 °C) or disinfect the soil. After steaming one has to check the soil for an access of Manganese.

#### **5. FERTILISATION**

Before planting any crop it is necessary to have the soil examined on the content of the nutrients, EC and pH. Besides those standard items it is advisable for a proper fertilisation to determine also the pH-KCl, Calciumcarbonate level and the P-Al cipher.

##### ***Organic material.***

Organic material is used as a fertiliser, but also improves the structure of the soil. Unfortunately one never knows exactly the nutrient Ca(CO<sub>3</sub>)<sub>2</sub> contents of this material.

##### ***Calciumcarbonate (Ca(CO<sub>3</sub>)<sub>2</sub>) and pH.***

The pH affects the availability of micro nutrients in the soil. A too high pH will result in a deficiency of for example Manganese (Mg) or iron (Fe). A low pH will result in a deficiency of Molybdenum (or surplus of Manganese).

The level of nutrients before cultivation is the same as during cultivation. The target ciphers, recorded in mmol/l in 1:2 volume extract, are as follows:

	NH <sub>4</sub> <sup>+</sup>	K <sup>+</sup>	Na <sup>+</sup>	Ca <sup>++</sup>	Mg <sup>++</sup>	NO <sub>3</sub> <sup>-</sup>	Cl <sup>-</sup>	SO <sub>4</sub> <sup>-</sup>	P	EC
Normal	<0.5	1.5	<2	2	1.2	4	<2	1.5	0.15	1.0
Range	<0.5	1.2-2	<2	1.6-2.4	0.8-1.6	3.5-5	<2	1-2	<0.15	1.6

Due to the long period of cultivation, it is not possible to give all the nutrients before cultivation, besides, Alstroemeria is very sensitive for high salt levels. Thus it is important to fertilise on a regularly base, in small amounts.

### ***Micronutrients.***

The need for micronutrients is small and normally you give enough together with a gift of organic material. A deficiency is normally not a problem of not enough nutrients in the soil, but a root problem or too high/low pH.

Most common problems with micronutrients are the following:

- Iron deficiency: youngest leaves turn yellow, but all veins remain green (even the smallest lateral veins), can occur after a flush (solve by giving 4-8 gram Fe-EDDHA per m<sup>2</sup>);
- Manganese deficiency: youngest leaves turn yellow, but only the main veins remain green (solve by spraying the leaves with manganese sulphate, spray during overcast, 1-2 gram per litre);
- Magnesium deficiency: at bottom and in middle of the plant, leaves turn yellow, the leaves show yellow lines between the veins (solve by spraying the leaves with magnesium sulphate (2 gram per litre).

### ***Irrigation water.***

For irrigation water, maximum levels of Na and Cl-levels are as mentioned below. For drip irrigation the Na/Cl levels can be a little bit higher because irrigation is more constant:

	EC	Na (mmol/l)	Cl (mmol/l)
drip irrigation	1.5	<4.5	<4.5
overhead irrig.	1.5	<3.0	<3.0

## **6. METHODS OF CULTIVATION**

### ***Planting time & Flowering***

In Holland the growers mainly plant from December till June. Basically one can plant year-round, but planting time can differ because of the required flowering time and seasonal problems like rain and too high temperatures. Depending on light intensity and temperatures, it takes 3-5 months after planting for the first flowers to bloom. An Alstroemeria plant normally can grow for 3-5 years depending on the variety and the climate.

### ***Planting, bed layout & plant density.***

- planting: keep the top of pot at the same level as the soil, or slightly lower.
- path: paths should be minimum 50-60 cm wide
- bed: beds should be 1 meter wide, per bed there are 2 rows of plants.
- density of plants: the distance between 2 plant rows is 35-50 cm. (if the rootstock of a variety is growing easily wide, it is advisable to keep 35 cm. between the rows). The distance between plants is 30-60 cm. depending on the variety. As a result, normally the density is 3.2 plants per gross m<sup>2</sup>.
- support material:
- per bed there is 1 irrigation pipe with nozzles, on soil level.

### ***Support material.***

To guide and support the shoots one needs nets. Normally you need 1 layer of netting each 50 cm. of crop length. The size of the meshes in the nets should be 20x20 cm. The nets are supported by poles which one places on both sides, every 2 meter. The poles should be at least 2 meter high.

After planting the nets should be on the soil, and moved up together with the stretching crop.

### ***Irrigation.***

Alstroemeria likes water and prefers a regular humidity in the soil. The watersupply depends on the variety, climate, etc.

### ***Thinning of shoots.***

Thinning is removing shoots which are bend, too thin, too old, broken and forgotten old flowers. Leaving blooming flowers on the plants will stimulate dormancy of the plant after a flush. If the crop is still young and thin, bad shoots are not removed but pinched, in order to save leaves for assimilation and to protect the soil from the heat of the sun.

If the crop allows, it is preferable to pull the stems as this will stimulate the development of new shoots.

When the crop is over 1 year old, it should be thinned on a regular base (1-3 times per year). This will improve the ventilation in the crop, stimulation of development of new shoots and a regularly growing crop.

### ***Shoot-adjustment.***

Stems that stick out of the netting have to be adjusted with in the meshes of the nets. Varieties that grow wide easily can be planted more towards the middle of the bed.

### ***Shading.***

Shading can be necessary to protect the crop and soil from the sun. Different shadings are used: movable shades, chalk on the greenhouse roof. It is important to find a good balance between shading for cooling/protection and to keep a sufficient light intensity in the greenhouse.

**Harvest.**

Alstroemeria flowers often in flushes. The development of generative shoots usually is stimulated in cool periods. In warmer periods often blind shoots are produced. In Holland this means that there will be a good flush after Winter

**Post harvest**

Why post harvest?

- prevention of bacterial growth in water;
- protecting flowers against ethylen;
- serving of nutriments;
- prevention of yellowing of leaves by using growth regulating substances;
- to improve absorbtion of water by use of a spreader.

Alstroemeria has to be preliminary treated supplied to the Auction. Generally, the vasselife of Alstroemeria is good. However, yellowing of leaves can appear rather rapidly. Alstroemeria's can be preliminary treated as follows:

Per 100 litres water:

- 300 ml. Ciro Alstro (against yellowing of leaves)
- 200 ml. Florisant 100 (for well-opening flowers)
- 100 ml. Agral LN (spreader)

Always use clean water. When the solution gets turbid, it has to be refreshed.

HilverdaKooij can not be hold responsible for the result/effect on a crop due to the advise and information in the growing manual.