

## ALSTROEMERIA



### *Other Names*

Peruvian lily, Lily of the Incas, Ulster Mary

### *Taxonomy*

*Alstroemeria* spp. L., Alstroemeriaceae, Liliales. This genus was formerly classified as a member of the Amaryllidaceae. It was named by the famous Swedish botanist Carolus Linnaeus (Carl von Linné) after his friend the Swedish baron Clas Alströmer (Claus von Alstroemer), who brought the seeds to Europe in 1754. The plant was first described by the French botanist Louis Feuillée.

### *Botany*

*Alstroemeria* is a South American genus of about 58 species native to one of two centres of diversity, central Chile and eastern Brazil. The Chilean species are winter-growing and the Brazilian ones summer-growing. The most popular and distinctive commercial *Alstroemeria* varieties are evergreen hybrids between Chilean and Brazilian species. Many hybrids and more than 190 cultivars have been developed with various distinctive colours and markings. A dwarf *Alstroemeria* hybrid (Princess Lilies) was introduced to the market in 2006 by Künst Alstroemeria BV in the Netherlands.

The *Alstroemeria* plant is a herbaceous, perennial monocotyledon with broad, lanceolate, parallel veined leaves. The alternately arranged leaves are smooth-edged and twisted at the base so that the

lower surface faces upwards (i.e. the leaves are resupinate). Internally the anatomy of the leaf has adapted to this reversed position. The rootstock consists of a rhizome (horizontal underground stem tuber) to which thick water storage roots are attached. Fertile flowering and sterile non-flowering stems arise from the rhizome. The latter are produced especially when the soil temperature rises consistently above 21°C. Flowers are trumpet shaped, have 6 tepals (3 petals and 3 sepals of similar colour and texture) and are solitary or arranged in an umbel (flat-topped or rounded inflorescence in which the individual flower stalks arise from about the same point with the youngest flowers at the centre). The inner 3 tepals are characteristically streaked or speckled. Each flower has six curved stamens, an inferior ovary and a three-lobed stigma on a single pistil.

### ***Harvesting and Quality Indices***

Alstroemeria stems should be long and straight with bright green leaves, free from any form of damage. The flowers in a bunch must be uniform and the flower heads symmetrical with at least 7-10 florets per stem depending on the cultivar. Alstroemeria flowers are harvested by simply pulling the stems out of the rhizome or by cutting it at soil level, depending on variety and damage to underground parts. Alstroemeria is graded according to stem length and number of florets per stem. Stems destined for long-distance markets are harvested when the first flower buds are about to open and start to show colour. Those destined for local markets are harvested when the first 2-3 flowers have opened and most buds show colour. Due to the delicate nature of the leaves, Alstroemerias should be handled and packed with special care.

### ***Postharvest Care***

Alstroemeria flowers are sensitive to ethylene, which causes petal drop. Petal drop can be delayed by pre-treatment with anti-ethylene agents such as silver thiosulfate (STS) or 1-methylcyclopropene (1-MCP).

Some cultivars are prone to premature leaf yellowing before flower senescence. This can be prevented by a pulse treatment with gibberellins or cytokinins or a combination of the two.

### ***Precooling and Storage***

Alstroemeria flowers should be cooled down to storage temperature soon after harvest. Flowers can be stored for 1 week at 0-1 °C. When kept at 2-5 °C in water, the flowers can be stored for 2-3 days.

### ***Vase Life***

Alstroemerias have a good vase life and will last for 1-2 weeks, during which time the flowers will continue to open. Vase life can be extended by pre-treatment with anti-ethylene and anti-yellowing agents as described above. Prior to placing them in the vase solution, stems should be re-cut to remove the whitish bottom part for maximum solution uptake. Although excess foliage is removed

prior to placing the stems in the vase, excessive leaf removal will reduce vase life because it reduces solution uptake.

### ***Ethylene***

Alstroemeria flowers are sensitive to ethylene and exposure to ethylene results in petal drop. Ethylene-induced petal drop is minimised by prompt cooling to storage temperature and pre-treatment with an anti-ethylene agent (e.g. STS or 1-MCP).

### ***Physiological Disorders***

Some cultivars are prone to postharvest ***leaf yellowing*** before the flowers start to senesce. Maintaining leaf quality is of utmost importance since leaf discoloration reduces quality and adversely affects the appearance of the flower stem. Leaf yellowing can be controlled by treatment with preservatives (flower food) that contain gibberellins or cytokinins or a combination of the two.

Due to a strong negative geotropic response, the flower pedicel (stalk) **bends upward** when the stems are placed horizontally and the temperature is above 3 °C. Such bending is caused by the rapid expansion of cells on the lower side of the pedicel. Geotropic bending can be suppressed by keeping the temperature below 3 °C, which slows down cell expansion.