### specialty crops

# Alstroemeria It's Not Just A Cut Flower Anymore

This specialty crop can be propagated early and stored under cold conditions without negatively affecting final potted plant performance, allowing you control of greenhouse scheduling.

#### By Mark Bridgen and Eduardo Olate

Istroemeria, also known as the Lilyof-the-Incas or Inca Lily, has been grown in the United States since the 1970s, mainly as a cut flower crop. Among cut flower producers, alstroemeria is a favorite because of its long vase life, long flowering period, preference for cool temperatures and high flower yield. Alstroemeria are herbaceous plants that produce floral or vegetative shoots from an underground rhizome, which means flowers may be harvested anytime during the flowering season because flowering stems will continue to develop from the rhizomes. In addition, the plants produce beautiful, large inflorescences of many different colors including purple, lavender, red, pink, yellow, orange, white and bicolors.

Initiating alstroemeria plants for spring flowering requires a primary cold temperature and a secondary long photoperiod requirement, meaning the cool temperature requirement must be fulfilled prior to the long photoperiod. Each cultivar has a unique requirement for cool temperatures and the length of time exposed to that temperature. Once flowering begins, plants will continue to produce flowering shoots indefinitely until the soil temperature rises above 65-70° F for extended periods. Vegetative shoots will be produced after the plants receive the warm temperatures.

## IS IT A BUTTERFLY OR AN ORCHID?

Alstroemeria cultivars are often divided into two main classifications that generalize their flowering habits: the butterfly-type and the orchid-type. The butterfly-type is a group that is more suited as potted plants. They will flower for 9-12 months each year, depending on the cultivar and environmental conditions. Butterfly types have shorter growth habits and larger, more open flowers than the orchid-type.

The orchid-type of alstroemeria is a group that is mostly used for cut flowers. They have 3-5 months of major flower production in the spring, with little or no flowering during the remainder of the year. These cultivars have tall growth habits, remain vegetative until spring and produce a large number of flowers in a short period.



Photos courtesy of Mark Bridgen.

ing potted crop and as a garden flower (perennials or annuals). Potted plants offer new alternatives for growers who are trying to diversify and find new products for a demanding market. However, this new alternative also brings new challenges and problems.

There are several multiplication systems available for alstroemeria: rhizome division, micropropagation and seed propagation, but rhizome division is the most commonly used propagation system.

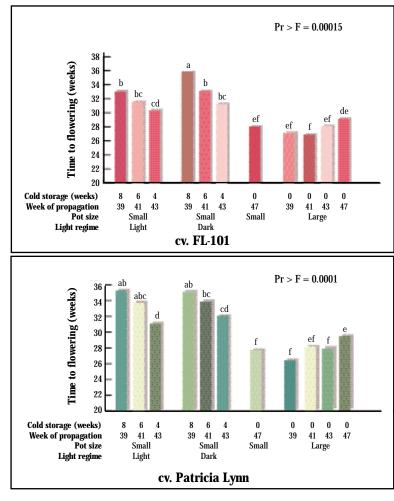
The timing of propagation, utilization of labor, efficient use of greenhouse bench space and cold storage of rhizomes are important problems that growers may encounter when producing alstroemeria as a potted crop. Cold storage is not an environmental requirement for growing alstroemeria. However, cold storage can be used to adjust greenhouse scheduling during busy times of the year (October to February).

#### **COLD STORAGE PROCEDURES**

A study was conducted to evaluate the effect of different dates of propagation and cold storage periods on the growth and flowering of alstroemeria potted plants. Two butterfly-type cultivars of alstroemeria from the University of Connecticut breeding program were used for this study: 'Patricia Lynn' and a new hybrid, 'FL-101,' which has not yet been released. Plants were propagated during four different dates in 1997: weeks numbered 39, 41, 43 and 47. They were propagated in either large (1-gallon) or small nursery pots (2-inch liners).

Following division, all plants were grown for four weeks in a "warm" greenhouse (68° F nights). After this period of establishment, plants in the large nursery pots were transferred directly to the final growing greenhouse (61° F nights) and plants in the small pots were refrigerated at 39° F for 8, 6, 4 or 0 weeks, with either complete light or complete dark conditions.

Fig. 1. Time to flowering of Alstroemeria cultivars 'FL-101' and 'Patricia Lynn' under different propagation strategies.



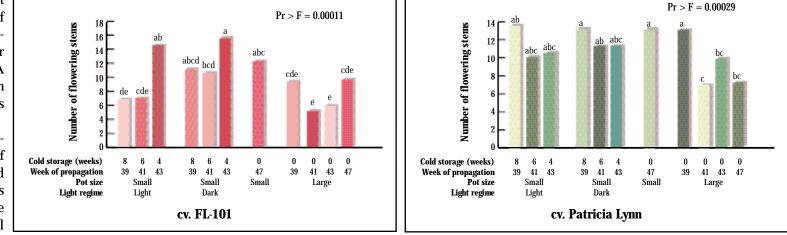
#### GROWING INTERNATIONAL INTEREST

In recent years, there has been increasing interest in the United States, Europe and Japan for growing alstroemeria as a flowerOnce the cold treatment was completed, all plants were transferred on the same date to large nursery pots for finishing, along with those plants that had been initially propagated in large pots.

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All plants were cut back on week 3 of 1998 to follow commonly-used grower techniques. A detailed description of the treatments is shown in Table 1.

Plants were evaluated at the time of anthesis (determined when two florets were open) for time to flowering, visual evaluation, fresh aerial weight, number



evaluation, fresh aer- Fig. 2. Number of floral stems per plant at the time of first flower opening of Alstromeria cultivars 'FL-101' and 'Patricia Lynn' under different propagation strategies.

and length of flowering stem, and number of florets per flowering stem.

#### **POSITIVE RESULTS**

Refrigerated storage treatments delayed the time of flowering in Patricia Lynn and FL-101 when compared to plants that were grown with no refrigeration (Figure 1). This effect is due to the greater time under cold storage.

Table 1. Environmental treatments for thepropagation of Alstroemeria.

				d storage 39; F)	
Week of propagation (Week #)	Pot size <sup>1</sup>	Weeks in warm greenhouse (68; F nights)	Period (Weeks in cold)	Light/Darkness	
39	Large	4	0	NA <sup>2</sup>	
39	Small	4	8	Light	
39	Small	4	8	Darkness	
41	Large	4	6	NA	
41	Small	4	6	Light	
41	Small	4	6	Darkness	
43	Large	4	0	NA	
43	Small	4	4	Light	
43	Small	4	4	Darkness	
47	Large	4	0	NA	
47	Small	4	0	NA	

<sup>1</sup> Large pots = 1-gallon; small pots = 2-inch liners <sup>2</sup> NA = not applicable Differences of time to flowering between light and dark treatments were not noticed other than with FL-101 plants that were propagated in small pots on week 39.

The stem length of flowers from plants that were not refrigerated was less than or equal to those plants that were refrigerated. There was no difference in flower stem length among Patricia Lynn plants propagated in small pots, either under cold storage or with no cold at all. However, final height of Patricia Lynn plants that were refrigerated was about 20 inches in length, and the plants that did not receive cold treatments were about 12 inches in length. The difference in height did not affect the overall appearance of the potted plants. FL-101 plants showed the same general tendency, but were

about two inches shorter than Patricia Lynn plants. Aerial fresh weight values followed a similar tendency as stem length; if a plant received cold storage, it had a fresh weight greater than or equal to those control plants that were not stored.

The number of flowering stems that were produced from plants that were refrigerated was either greater than or the same as plants that were not refrigerated (Figure 2). Greater differences between large- and small-pot plants were observed with Patricia Lynn plants: a greater number of flowering stems was observed in treatments with cold storage.

Overall, the presence or absence of light during refrigeration had no effect on subsequent plant growth and development. When a visual evaluation was given for all plants at the time of flowering, there were no significant differences observed between treatments, and the number of florets produced per inflorescence was equal. It is important to mention that a low percentage of plants under cold storage of the earliest dates of propagation (weeks 39 and 41) showed *Botrytis* attack with medium to severe damage. This is something that the grower should be watchful for during refrigerated storage. The longer the time in cold storage, the more time it will take for the finished plants to flower. In addition, differences between cultivars are to be expected, and there is no advantage to lighting alstroemeria that are stored cold.

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#### SUMMARY

This research demonstrates that alstroemeria plants can be propagated early and stored under cold conditions without these procedures negatively affecting final plant performance. However, the process will affect the scheduling of the crop. An additional 4-7 weeks of production time may be required if the plants are stored cold.

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