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ALSTROEMERIA CULTURE

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With propagation season close at hand, growers should now be making decisions concerning Alstroemeria. This article covers cultural operation and observations on Alstroemeria production at Colorado State University.

Introduction

The original South American Alstroemeria species grow in climates ranging from the desert to the snowlines of the Andes Mountains, and have different environmental requirements. Radiation has been used to induce mutations in order to produce the new commercial varieties, which often have characteristics dominated by their native parent plants. Cultivars do not respond the same in greenhouse environments. Although many cultivars are available, cultural recommendations have resulted primarily from studies on 'Regina' and 'Orchid' (also known as 'Walter Fleming'). Consequently, growers must experiment with Alstroemeria in their own setting, while cautiously sorting through cultural information from outside sources.

General Observations

Large size differences can be observed in the underground structures of various Alstroemeria species. When rhizomes are laid side-by-side, 'Canaria', 'Luciana', and 'Monika' have smaller rhizomes, roots, and shoots compared to those of 'Regina', 'Campfire', 'Atlas', 'Rosario', and 'Orange Beauty'. The larger rhizomes tend to survive transplant in better condition than the first group. The small-rhizomed cultivars must be handled with greater care. For example, it is especially critical to apply a fungicidal drench to smaller divisions at transplant time. It may also be necessary to cut the first flowers from those varieties since they can be uprooted more easily. If cutting is done on any cultivar, the stubs must be removed later or else lateral rhizomes will not form and production will be decreased. In addition, a previous Colorado State University study showed that less vigorous cultivars should be planted at higher densities because they do not produce as well as sturdier varieties (1).

Exceptional care should be taken when watering rhizomes of small cultivars as they may rot in a wet soil. Well-drained media, like gravel or a 1:1:1 to a 2:2:1 soil, peat, perlite, can reduce this problem. At the opposite extreme, not enough water will cause damage to smaller cultivars more quickly. Bud blasting (drying of the buds) has been observed in 'Monika' when insufficient amounts of water were applied to a gravel medium during the summer. Furthermore, water stress may adversely affect plant height. The "short shoot" phenomenon appears to have occurred in a group of plants which were allowed to become too dry. Healy (2) suggests that any stress resulting in decreased root area may cause the short shooting.

Alstroemerias are generally pest-free, but growers need to be cautious when spraying becomes necessary. Pyrethroid compounds should not be used since they may burn the foliage. The pesticide label will state if a pyrethroid is included. Look for any chemical name that has "methrin" or "thrin" in part of the word, and the majority of pyrethroid compounds will be avoided. Resmethrin is an example of a product to avoid on Alstroemeria.

Recently, several Alstroemeria viruses have been identified. The damage appears as rusty lesions blending into an overall mosaic pattern on leaf surfaces. Healy (3) has observed that the symptoms disappear when the air temperatures fall to 55 to 70°F. Pests in the *Trichodorus* (nematode) family

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have been shown to transmit Alstroemeria viruses (4). Cutting knives may also spread the disease. Cultivars vary in their viral resistance. Symptoms have been observed on varieties 'Atlas', 'Mona Lisa', 'Monika', 'Luciana', and 'Red Sunset'. The only known viral control is roguing out infected plants. Currently, researchers in the Netherlands are trying to develop virus-free plants.

At Colorado State University, varieties that have performed well include: 'Canaria', 'Orchid', 'Regina', and 'Rosario'. In the present research, 'Atlas' appears to have growth habits similar to 'Regina' and has outperformed 'Monika' thus far. R.J. Schwartz and John Balistreri, two local Colorado growers, found the following to be good producers under their conditions: 'King Cardinal', 'Campfire', 'Appleblossom', 'Pink Triumph', 'Jubilee', 'Mona Lisa', and 'Rosario'. They further stated that 'Red Sunset' and 'Luciana' were poorer varieties.

Research Progress Report

The Colorado State University Horticulture Department is currently investigating the effects of cooling the growth medium in various air temperature regimes using the cultivars 'Atlas' and 'Monika'. Four adjacent greenhouse compartments have been assigned different daytime air temperature ranges: House A 58-68°F, House B 68-78°F, House C 73-83°F, and House D 63-73°F. All treatments are set to a 52°F night temperature. Each house contains 8 plots — four with submedium cooling, four without. The cooled medium treatment is expected to keep the plants flowering during the hot summer months when Alstroemeria normally go vegetative in this climate.

Fig. 1 shows production by the 'Atlas' cultivar from February through July, 1986. All air temperature treatments were virtually the same until outside temperatures began to climb. By the end of May, the two coolest houses produced better than the warmer houses.

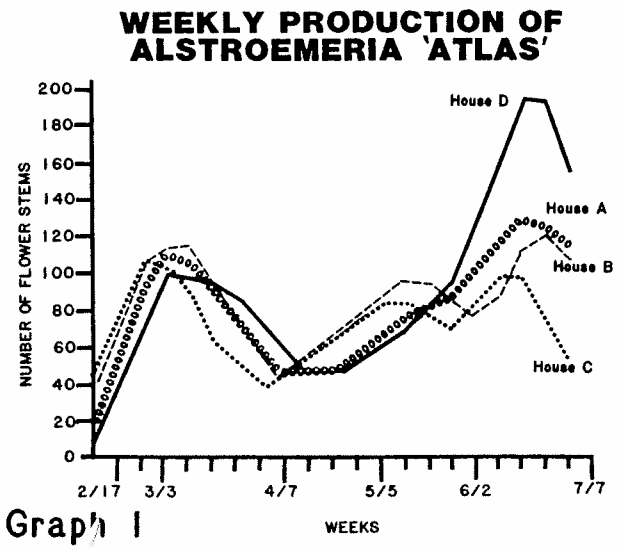

Figure 1: Smoothed weekly yield of 'Atlas' from February through July, 1986. Night temperature in all houses heating to 52°F. Day temperature setpoints are:
House A — heat to 58; cool at 68
House B — heat to 68, cool at 78
House C — heat to 73, cool at 83
House D — heat to 63, cool at 73

Preliminary air temperature results have shown that plants in the coolest compartment have shorter cymes and stems. A cyme is the segment between the main stem and the flowers. Although the statistics are not complete, there is a trend toward thicker stems and more flowers per cyme at cooler temperatures. In contrast, the plants grown in the warmest treatment produce very tall, weak stems with long cymes. Fig. 2 shows the large difference in cyme length at 62-71°F, vs. 71-82°F. Warm temperatures produce taller plants; however, the long cymes and thin weak stems may be undesirable for the consumer and difficult to handle in the marketing chain.

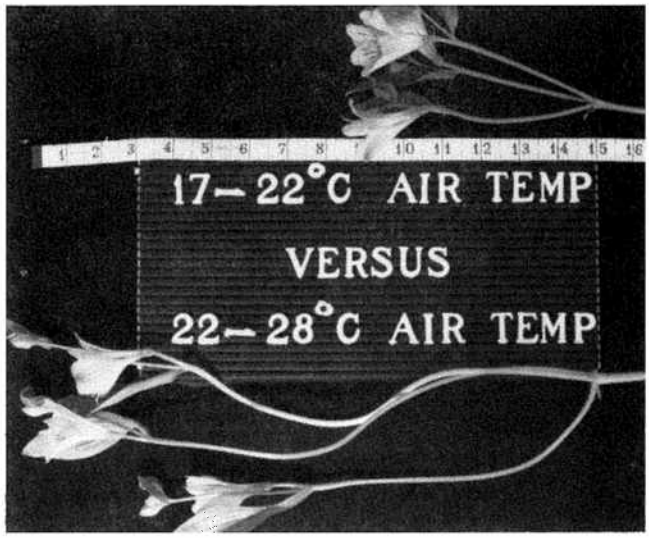

Figure 2: Cyme length differences at two air temperature ranges, 62-71°F (upper), and 71-82°F (lower).

Several plants in the warmest house have exhibited shoot reversion, where a flowering stem aborts and then continues to grow vegetatively (Fig. 3). This response has been previously observed (5), but the exact cause has not been determined. Elevated air temperatures (>70°F) appear to be involved.

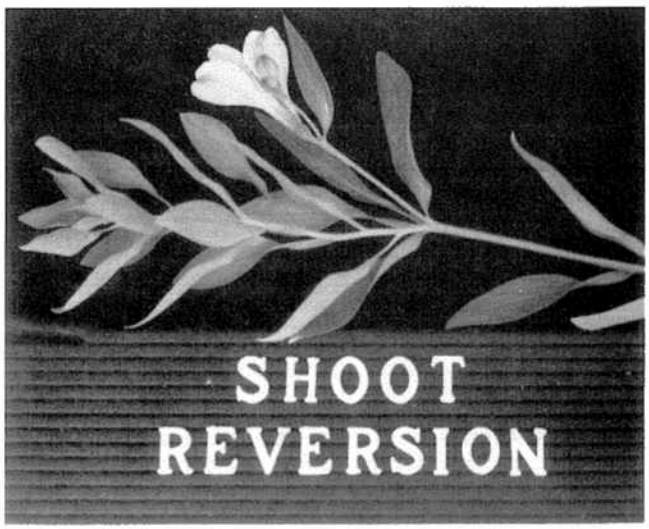

Figure 3: Shoot reversion in Alstroemeria thought due to high temperature.

One of the biggest problems facing Alstroemeria growers has been the cyclic production, which lowers prices during peak periods. In the future, Colorado State University research may help create continuous high quality yields.

References

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