Special Research Report #415: Postproduction

Preventing Leaf Yellowing of Fresh Cut Oriental Hybrid Lilies

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BACKGROUND

Since it occurs prior to flower senescence, postharvest leaf injury of cut Oriental hybrid lilies is a major problem. This detracts from the overall appearance of the flower stem and adversely affects quality and customer satisfaction. Symptoms can occur after storage or upon arrival to the florist, but most often are manifested after plants have been maintained in an interior consumer environment.

MATERIALS AND METHODS

Four varieties of California grown cut Oriental lilies were harvested at commercial maturity and hydrated in water for 2 hours at 41°F. Stems were then sleeved, boxed and transported by air to the University of Florida within 24 hours.

Upon arrival, stems were cut and pulsed for one hour in: (1) Chrysal BVB (1 ml/liter), a proprietary mixture of cytokinin and gibberellic acids manufactured by Pokon&Chrysal, (2) Fascination (0.3ml/liter) a commercial mixture of 1.8% each of BA (benzyladenine) and GA_{4+7} (gibberellins) manufactured by Valent BioSciences Corporation, or (3) water as a control.

After the pulsing treatments, flowers were stored in boxes, and maintained at 38°F for 5 days. Subsequently, stems were recut and placed in water for 2 days at 68°F and 70 ftc. for retail simulation. Stems were then cut to 40 cm, placed in vases containing tap water and maintained at 70°F and 70 ftc. (12 hour/day).

A second study maintained cut lilies in vases of water or Chrysal Clear Lily and Alstroemeria floral preservative (Pokon&Chrysal) without pulsing treatments.

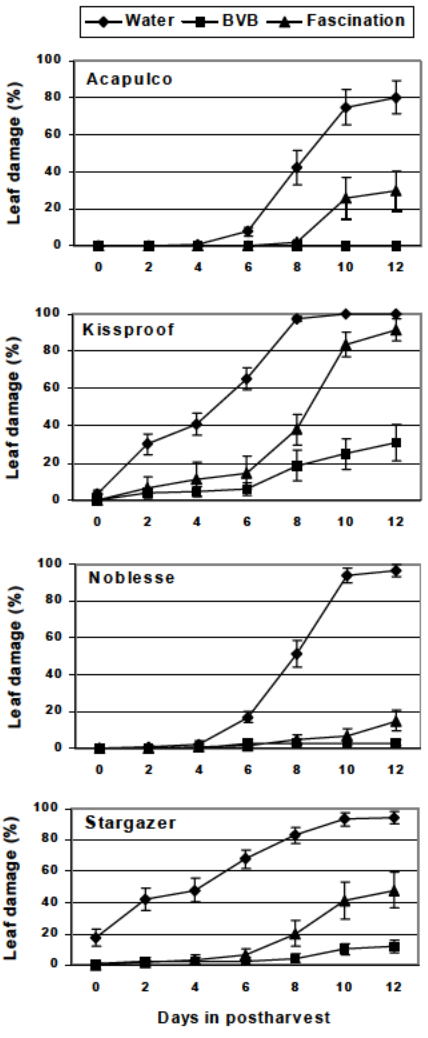
RESULTS

Effect of Pulsing

Leaf injury was significantly reduced and/or eliminated when stems were pulsed with BVB or Fascination as compared to water controls where no chemical was used. BVB was more effective than Fascination for all varieties except 'Noblesse', where both chemicals were equally effective.

Fig 1. Pulsing effects on leaf damage of cut Oriental lilies.

BVB prevented leaf damage



on 'Acapulco' and 'Noblesse' and significantly reduced it 82% on 'Star Gazer' and 69% on 'Kissproof', varieties extremely sensitive to early leaf senescence. Fascination reduced leaf yellowing by approximately 50% for 'Acapulco' and 'Star Gazer' after 12 days, but it was no longer effective on 'Kissproof' after this period. Fascination, however, was effective in delaying the onset of leaf senescence in 'Kissproof' as compared to control plants.

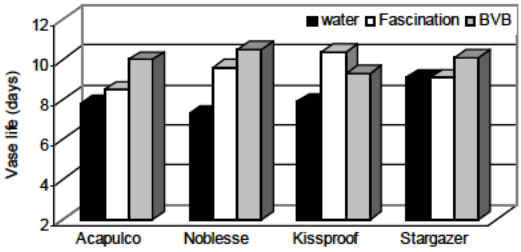
BVB reduces leaf yellowing on 'Star Gazer' lily.

Control BVB

Bud Opening and Vase Life

The pulsing treatments did not have a detrimental effect on bud opening. All buds opened equally on control plants verses those treated with the pulsing solutions. Also, vase life was either not affected or increased when stems were treated with pulsing solutions. Vase life increased 2 and 3 days for 'Acapulco' and 'Noblesse', respectively, when pulsed in BVB as compared to control plants. No differences were observed in 'Kissproof' or 'Star Gazer'. Fascination increased vase life of 'Noblesse' and 'Kissproof', while vase life was not different for other varieties.

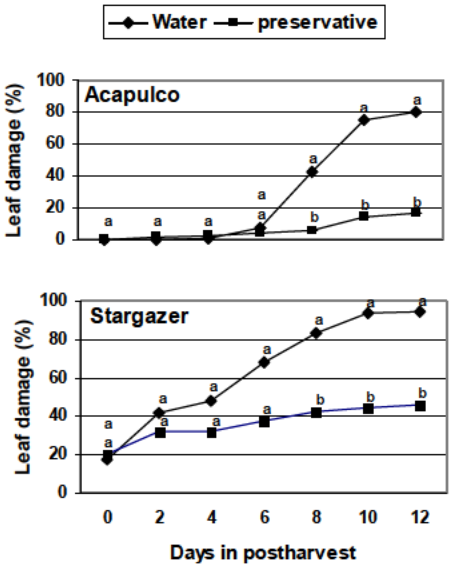
Fig. 2. The effect of pulsing on vase life of Oriental lilies.



Effect of Preservative

Maintaining the stems in the specialized bulb preservative significantly reduced leaf injury on all varieties compared to water when no pulsing pre-treatment was used.

Fig 3. Bulb preservative effects on leaf injury.



The amount of reduction and the number of days leaf injury was delayed was variety dependent. The bulb preservative was very effective and almost eliminated leaf injury on 'Acapulco' and 'Noblesse', while 'Kissproof' and 'Star Gazer' were less responsive.

CONCLUSIONS

Pulsing fresh cut lilies after harvest can delay or prevent leaf injury with no adverse effects on bud opening or vase life. BVB was the most effective pulsing treatment. Fascination was also effective, but is not labeled for cut flowers. Maintaining stems in the bulb preservative also reduced leaf yellowing. Buyers and florists should request that their cut oriental lilies be treated prior to shipping. The specialized bulb preservative should also be provided to customers. Similar results have been found with Asiatic lilies and Alstroemeria. (See Special Research Report No. 413)

IMPACT TO THE INDUSTRY

The postharvest leaf quality problems of cut Oriental lilies can be eliminated or reduced by using preventive treatments.

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