Topics covered in the talk included the effects of gibberellins 4+7 on lily leaf senescence, and flower longevity. Certain gibberellins are very effective in inhibiting leaf yellowing and browning, and they are also great for increasing lifespan of lily flowers. A new product, Fac- cination, is not available in the US and Canada, and is labeled and legal to use on pot lilies (especially oriental hybrids). Dr. Anil Ranwala of the program is continuing to look into possible uses of Facci- nation for cut lilies.

Miller also spoke about the Ph.D. work of Alex Chang looking into “leaf scorch”, “bladverblonting”, or “Upper Leaf Necrosis”. Alex has very nicely shown that this is a calcium deficiency problem that is caused by very low levels of calcium in the bulbs (when harvested), as well as “leaf overlapping” during early shoot growth. When the leaves are overlapped, water cannot be lost, and calcium is not moved into the young leaves. Alex’s work has indicated that a very effective means of preventing upper leaf necrosis, even with large bulbs, is to blow air down onto the plant. Sufficient airflow to cause the upper leaves to gently move is enough. This leaf movement helps the young leaves draw water (and calcium) into them, and thereby reduces the problem.

Other topics touched upon include the use of growth regulators on pot hybrid lilies. The research program has developed great information on the use of Bonzi or Sumagic dips (before planting) for height con- trol in a wide range of lily cultivars. Again, full details have been already given in the CD. Also, lily growth regulation is the topic of the first Research Newsletter, which should be available very soon. An update on Garry Legnani’s work on low oxygen storage to reduce the problem.

Finally, come indications of new tulip evaluation, and growth regu- lator use were made, as well as the potential for using growth regula- tors on Tete-a-Tete narcissus....not for reducing height of the plants in the greenhouse, but to keep plants more compact in the marketing and consumer chain (even Tete-a-Tete gets very tall and droopy in the consumer’s home).

Hyacinths were, on balance, much better than the tulips, and the spe- cial bulbs were very variable, depending on species.

Making Use of Growth Regulator Bulb dips. Excellent and sometimes startling effective height control is ob- tained by dipping bulbs into Bonzi or Sumagic solutions prior to planting. As mentioned above, we typically use a 1 minute dip. There is very little additional height reduction when 5 minute dips are used. We do, however, recommend that growers be consistent and keep to a single protocol, within 1 to 5 minutes.

Optimum dip rates vary by cultivar, bulb size, and growth regulator product used. Cultivar variability is a difficulty with PGR dips, and each cultivar needs to be tested individually. In general, larger bulbs need higher concentrations than smaller bulbs, mainly due to the more vigorous and larger plants that develop from larger bulbs. Or- entals require somewhat higher dip rates than LA’s. Asias require the least of all, and in many cases Asias are “hyper sensitive” to dips.

We recommend thinking of bulb dips as the tool to provide 60-80% of needed height control. We commonly see the effects of a dip “wearing off” in the last few weeks of crop growth. In cultivars such as ‘Fangio’ or ‘Tresor’, this leads to substantial stretching of the “neck” (see photos). Thus, be prepared for a late season foliar spray of Ancymidol (A-Rest) or Sumagic to control this stretch.

Of course, economics must be considered. The key to cost effective- ness is how many times a dip solution can be used. We have evalu- ated this, and our recent work indicates that if a Bonzi or Sumagic solution is used up to 15 times within a short time period, there is no noticeable change in the effectiveness of the solution.
Treatments are (L to R): Control, Bonzi at 50, 100, 200, or 300 ppm, and Sumagic at rates of 2.5, 5, 7.5 or 10 ppm given as a 1 minute dip.

### Bulb Arrival, Planting and Growth

If bulbs arrive frozen, they should be thawed gradually in a cooler. In North America, lilies are commonly planted in 15 cm diameter pots, that are "deep", to allow deeper planting and better stem root development. A variety of soil-less, well drained mixes are appropriate. Fertilizer regimes commonly are 200 ppm N at each irrigation, with occasional (weekly) application of clear water. Asiatics are commonly forced at 15-16C, LA’s at 16-17C, and Orientals at 16-18C.

### Preharvest quality and use of gibberellin spray

In the last few years, the beneficial effects of gibberellin 4+7-containing products has been studied and publicized. In North America, a commercial product, Fascination, is now legal to use on lilies. Fascination is a combination of gibberelin (GA4+7) and cytokinin (benzyladenine) that has two main effects on hybrid lilies: 1) it is a powerful inhibitor of leaf yellowing, and 2) it substantially improves flower longevity. Fascination also allows hybrid lilies to tolerate short-term dark cold storage (2-4C, for up to 2 weeks). While this is an excellent tool, it should not be abused, and it is always best to minimize cold-storage. In most cases, a foliar spray of 25 mg/L (ppm) of the gibberelin 4+7 component within 2 weeks of harvest is sufficient. Caution must be used on types that continue stem elongation throughout the whole crop (for example, longiflorums, Asiatic and LA-hybrids), as unwanted stem elongation can occur.

### Other Height Control Methods

Soil drenches. While soil drenches are often effective, they are used less commonly than pre-plant dips. One reason is the unevenness of rooting in hybrid lilies, especially oriental hybrids, where roots only develop after plants are at least 15-20 cm tall. Drenches simply cannot be absorbed in the absence of roots.

Sprays. While much of the height control requirement can be met through drenches, sprays can also be a critical component of height management in pot lilies, especially to control late-crop stretch as the dip begins to wear off. A-Rest (Acmiymid) is broadly effective at 33 ppm, and Sumagic at rates of 2-5 ppm. Sumagic is becoming more commonly used, due to reduced cost per plant. It is critical to spray so that the crop is evenly covered with a volume of 2 qts/100 sq. ft. Using a uniform spray volumes assures even coverage of the crop. Although Sumagic is absorbed only by stems and roots, it is important to spray the crop, rather than the stems per se.

### Additional tips

Precooling. Most Asiatic hybrids are precropped at least 6 weeks at 34-36F Orientals and LA’s are cooled 8-10 weeks at 34-35F. Additional time at these temperatures can be used for short-term holding. For later plantings (past January), bulbs are frozen-in at 28-29F (Asiatics and LA’s) or 30-31F (Orientals). Usually, the freezing process is done by the bulb supplier, and periodic shipments to the forcing area are arranged.

### Acknowledgments

We are grateful to the Dutch Wholesalers’ Association for Flowerbulbs and Nursery Stock, the North American Flowerbulb Wholesalers’ Association and to the Fred C. Gloeckner Foundation for financial and material support of this work. Also, thanks are extended to the Ken Post Greenhouse staff for their skill with plant care.

### Published in FloraCulture International 13(5): 18-23, May 2003