

## Research on a New Plant Growth Regulator Delivery Method

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**O**ver the past two years, I have been conducting research at The University of Connecticut on a new method of applying plant growth regulators (PGRs). The technique involves the incorporation of the growth regulating chemical into the potting medium before the crop is planted.

Potting medium amendments are used as carriers in order to introduce the chemicals into the medium in a uniform manner. I have tested this technique using both impregnated loose granulated rockwool and copolymer acrylamide acrylate or hydrogel as carriers. Lately we have been concentrating on the hydrogels.

Before planting the crop, a PGR solution is formulated and the dry hydrogel crystals are added. Once all of the PGR solution has been absorbed, the hydrogel is again dehydrated. I have stored this material for up to six weeks under room conditions with no apparent loss of chemical activity. As the potting medium is mixed, the hydrogel crystals are added, resulting in uniform distribution of the PGR impregnated crystals within the medium.

I was initially interested in preplant methods of applying PGRs because of the potential labor savings. With the newer chemicals such as Bonzi and Sumagic, the idea became even more appealing because these chemicals are so active in the root zone, requiring less active ingredient when applied as a drench than as a foliar spray. In addition triazole class compounds (which include Bonzi and Sumagic) persist in the soil without losing activity or leaching.

Preplant medium incorporation methods may also reduce or eliminate some of the undesirable effects associated with high dosage methods of chemical application such as stem collapse, lodging and delayed flowering.

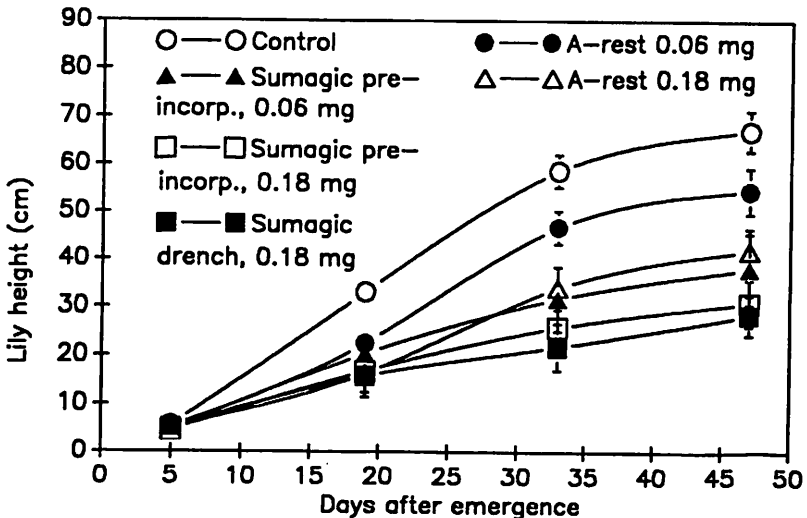
I started this research on poinsettias using the PGR uniconazole (also called Sumagic). More recently, we have been working with bulb crops, both Easter lilies and hybrid lilies, along with other growth regulating chemicals.

The results obtained so far have been promising. Relatively low amounts of chemical incorporated prior to planting successfully retarded stem elongation on both Easter lilies and Asiatic hybrid lilies.

Stem elongation decreased as the amount of chemical added increased. Manufacturer recommended rates of Sumagic range from 0.025 to 0.25 mg a.i. per pot when applied as a drench on bulb crops. In our studies, adequate control was obtained with 0.018 mg a.i. per 6" pot and Easter lily height appeared to be slightly shorter than desired when 0.18 mg a.i. was applied. The amount of control appeared to be similar to post-emergence drench applications when the same chemical was applied at comparable rates. No adverse effects on flower number, date of bloom or shoot emergence were observed when the preplant method of PGR application was used.

Presented in the graph below are the result of several experimental treatments on asiatic hybrid lily height (cultivar Enchantment). The treatments in the graph were selected from a larger study and are representative of the range of responses observed. The control line represents plants which received no PGR. The two rates of A-Rest plotted in this figure were applied as a drench following shoot emergence as was the curve labeled Sumagic drench. By comparison, Sumagic was also applied using the preplant method of incorporation at two different rates. Notice that the low rate of preplant Sumagic is roughly equivalent to the high rate A-Rest drench. Sumagic incorporated at a high rate produced lilies similar in height to the post-emergence Sumagic drench at the same rate.

Height of potted asiatic lilies over time in response to plant growth regulator treatments.



**In this particular experiment, old bulbs were used. Old bulbs typically emerge rapidly. In this case we were unsure whether root development would be rapid enough to allow the pre-incorporated chemical to be absorbed by the developing plant. However, from the slope of the curves in the graph, it is apparent that the rate of increase in stem elongation was affected immediately following emergence and continued to be controlled for the duration of the study.**

**Research on this technique is continuing, stay tuned for further developments.**