

# A New Height Control Option For Easter Lilies

Flurprimidol drenches have been shown to successfully control height of oriental lilies and Dutch bulbs such as hyacinth, narcissus and tulips, but there is no data that shows how effective flurprimidol drenches are on Easter lilies. Researchers decided to find out.

by **CHRISTOPHER J. CURREY, ROBERTO G. LOPEZ, BRIAN A. KRUG, INGRAM MCCALL** and **BRIAN E. WHIPKER**

**H**EIGHT control is one of biggest challenges in potted Easter lily production. There are several factors that contribute to the difficulty in controlling Easter lily height, including: year-to-year variation in bulbs, the date Easter falls on and, of course, the weather.

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crop a unique challenge. Fortunately, there are several tools available for growers to control unwanted stem elongation. For instance, a warmer night air temperature than day air temperature creates a negative DIF (DIF is day temperature minus night temperature), which has been shown to minimize stem elongation of Easter lilies.

However, with today's high energy costs, it can be cost prohibitive. Therefore, a more practical and economical tool is to control stem elongation using plant growth regulators (PGRs).

While flurprimidol is a PGR that has been available in Europe for more than 20 years as a 1.5-percent formulation, it has been recently introduced into the U.S. market as a 0.38-percent formulation (Topflor, SePRO). Flurprimidol has a similar chemical structure to ancymidol (Abide, A-Rest) and a degree of activity and uptake comparable to paclobutrazol (Bonzi, Piccolo, Paczol) and uniconazole (Concise, Sumagic) in which it can be absorbed by both roots and shoots. As a result, flurprimidol can be applied as a foliar spray, liner dip, bulb dip, and/or substrate drench.

Flurprimidol drenches have been shown to successfully control height of oriental lilies and Dutch bulbs such as hyacinth, narcissus and tulips. However, there is no published information on using flurprimidol drenches on Easter lily. As a result, we wanted to see if flurprimidol drenches would successfully control Easter lily height.

### The Experiments

**Experiment 1 (North Carolina State).** Case-cooled 'Nellie White' Easter lily bulbs (9/10 size) were potted, one bulb per pot, in 6-inch-diameter round plastic pots filled with a soilless substrate. The substrate contained 75 to 80 percent Canadian sphagnum peat and 20 to 25 percent perlite (Berger BM 6; Berger Peat Moss).

Plants were placed in a greenhouse under natural day lengths with day and night temperature set points of 68 and 65°F, respectively. Plants were fertilized weekly with 150 parts per million

Figure 1.  
Flurprimidol Substrate Drench



Figure 1. 'Star Gazer' oriental lilies (size 16/18 bulbs) treated with 4.0-fluid-ounce drenches providing flurprimidol at 0.0 to 4.0 mg a.i. per pot. Applying a single drench of 0.5 mg active ingredient (a.i.) per pot or two split applications of 0.25 mg a.i. controlled excessive stretch of Oriental lilies.

Figure 2.  
Flurprimidol Drenches



Figure 2. 'Nellie White' Easter lilies (size 9/10 bulbs) treated with 4.0-fluid-ounce drenches providing flurprimidol at 0.0 to 0.24 mg active ingredient (a.i.) per pot at North Carolina State. Flurprimidol drenches between 0.02 to 0.04 mg a.i. controlled excessive stretch of Easter lilies.

(ppm) N using 15-0-15. When shoots were about 3 to 4 inches tall, a single 4-fluid-ounce drench was applied to the substrate surface of each pot providing flurprimidol at 0.02, 0.04, 0.08, 0.16 or 0.24 mg active ingredient (a.i.) per pot or uniconazole (Sumagic; Valent USA) at 0.03 or 0.06 mg a.i. per pot. Untreated controls were also included.

**Experiment 2 (Purdue).** Case-cooled 'Nellie White' Easter lily bulbs (10/12 size) were potted, one bulb per pot, in 6-inch-diameter round plastic pots filled with a soilless substrate, which contained 80-percent Canadian sphagnum peat and 20-percent perlite (Fafard 1P; Conrad Fafard). Plants were placed in a greenhouse under natural day lengths with a constant air temperature set point of 65°F. Plants were fertilized with 200 ppm N using 15-5-15 at each irrigation.

Continued on page 64 ►

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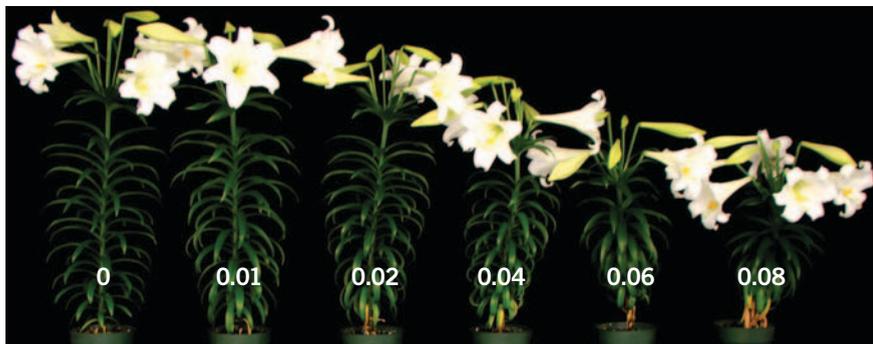
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◀ Continued from page 62

**Figure 3.**  
Flurprimidol Drenches



**Figure 3.** 'Nellie White' Easter lilies (size 10/12 bulbs) treated with 4.0-fluid-ounce drenches providing 0.0 to 0.08 mg active ingredient flurprimidol per pot at Purdue. (mg a.i.)

When shoots were about 3 to 4 inches tall, a single 4-fluid-ounce drench was applied to the substrate surface of each pot, providing flurprimidol at 0.01, 0.02, 0.04, 0.06 or 0.08 mg a.i. per pot. Untreated controls were also included.

### What We Saw

Overall, flurprimidol was effective in controlling stem elongation of Easter lily in both experiments, with subtle differences in the results. In Experiment 1 at North Carolina State, as the amount of flurprimidol increased from 0.02 to 0.24 mg a.i. per pot, plant height was 9 percent (2.4 inches) to 59 percent (15.6 inches) shorter than untreated plants (Figure 2). While drenches providing 0.02 to 0.08 mg a.i. flurprimidol resulted in plants of a commercially acceptable height, applying 0.16 or 0.24 mg a.i. flurprimidol provided too much control. When 0.03 or 0.06 mg a.i. of uniconazole was applied to each pot, plant height was 8 percent (2.2 inches) and 36 percent (9.4 inches) shorter, respectively. Neither flurprimidol nor uniconazole drenches had any effect on flower bud number or time to flower as compared to the untreated controls.

For Experiment 2 at Purdue, we observed a similar trend in height in response to flurprimidol to that seen in Experiment 1. For instance,

as the amount of flurprimidol applied increased from 0 to 0.08 mg a.i./pot, stem elongation was suppressed by 25 percent (Figure 3). Similar to Experiment 1, flurprimidol drenches had no effect on flower bud number or time to flower. While we did observe some lower leaf yellowing, this was not due to the PGRs, but to slight overwatering as a result of all treated Easter lilies being on drippers with the same irrigation program.

### Using Flurprimidol Drenches On Easter Lilies

Based on what we observed, flurprimidol drenches can be an effective PGR treatment to control Easter lily stem elongation without affecting time to flower or flower bud count. In order to

**Figure 4.**  
Drenches



**Figure 4.** 'Nellie White' (9/10 bulbs) treated with 0.04 mg active ingredient (a.i.) flurprimidol or 0.06 mg a.i. uniconazole per pot or left untreated. For height control using drench applications, less flurprimidol was required than uniconazole for comparable control. (mg a.i.)

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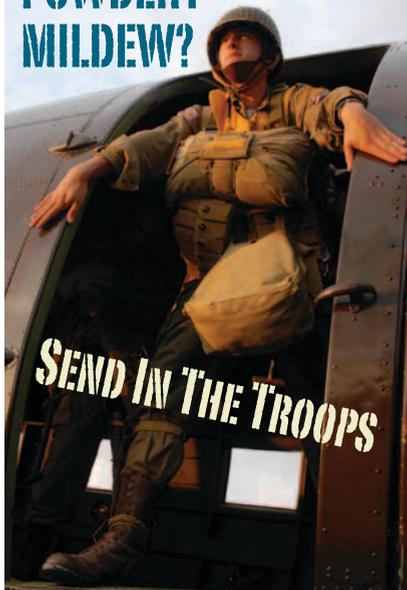
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## Academics Dedicated To Sustainability Research

Authors Roberto G. Lopez of Purdue University and Brian Krug of the University of New Hampshire, as well as the University of Maine's Stephanie Burnett and Cornell University's Neil Mattson, established the Floriculture Sustainability Research Coalition (FSRC) three years ago. The FSRC's goal is to provide information to the greenhouse industry about sustainable growing and business practices through multi-state research and Extension activities.

Visit [GreenhouseGrower.com/](http://GreenhouseGrower.com/) **January 2012** to learn about some of their collaborative projects, including research on bedding plant production with low or no heat; controlled release fertilizers and organic substrates and fertilizers.

maximize the benefits of a flurprimidol drench on Easter lilies, there are a few key points to remember. First, apply drenches when the growing substrate is moderately dry. In doing so, you won't lose any of the PGR from leaching out of the bottom of the pot.

Secondly, be sure to apply a sufficient volume of solution to each pot. For example, for a 6-inch standard container, 4-fluid ounces is the suggested volume of solution. The amount of active ingredient applied will also depend on the pot size, number of bulbs per pot and bulb size.

As observed in Experiment 2, larger bulbs (i.e. 10/12) may require more PGR than smaller bulbs (i.e. 9/10) to achieve the desired growth control.

Lastly, time your applications correctly. For best results, apply drenches to Easter lilies when the shoots have emerged approximately 3 to 4 inches above the surface of the growing substrate.

Flurprimidol drenches are not only effective at controlling Easter lily stem elongation, they may also be effective in controlling your production costs. If you currently drench your Easter lilies

with uniconazole, you will find a cost savings by using flurprimidol. With the drench rates of the two chemicals being similar for comparable control, a flurprimidol drench application costs 60 to 80 percent less than uniconazole due to the percentage of active ingredient in the formulation and cost of the chemicals (Figure 4).

### Other Flurprimidol Application Options

If growers want to continue using foliar sprays, how does flurprimidol compare? Flurprimidol rates of 80 ppm, applied twice, controlled excessive stretch in limited trials conducted in the northern U.S. It must be emphasized that the trial size was small, and further

in-house trialing should be done before that rate is used by commercial operations. At this point, it appears the lower rates of uniconazole may still be the preferred foliar spray option for Easter lily growers.

We have also conducted extensive pre-plant bulb soak trials with flurprimidol on Easter lilies. Easter lilies are extremely responsive to flurprimidol. We found the optimal rate window to be very narrow, so much that the year-to-year variation in bulb lots makes it impossible to provide a consistent optimal rate. At this point, we are reluctant to recommend flurprimidol pre-plant bulb soak for Easter lilies.

### Takeaways

Remember, always start with a small-scale, on-site trial in your greenhouse when using new PGR applications to see what works optimally for you and your production methods. This is especially important with Easter lilies that have a great amount of year-to-year variation. Our research results provide a starting point for your in-house trials. You may also want to trial lower drench rates of flurprimidol to provide initial control, and then follow up with uniconazole spray applications as needed to finish off the crop. Flurprimidol drenches clearly control stem elongation of Easter lily and may be a useful addition to your toolkit for controlling stem elongation of Easter lily. **GG**

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