



# Expanding Your PGR Toolbox Part 1

Insight gained through extensive trials conducted at North Carolina State University will help you learn about using flurprimidol with potted plants.

**By Brian Whipker, Ingram McCall,  
Brian Krug and James Gibson**

flurprimidol  
paclobutrazol  
uniconazole  
daminozide  
ethephon

**T**here have not been many plant growth regulators introduced for greenhouse crops over the past 15 years. One of the newer PGRs is Topflor (flurprimidol). At North Carolina State University, we have conducted extensive trials over the past five years for both potted plants and annuals, and we wanted to share some of our insights into how Topflor works with potted plants.

#### Caladium

Topflor was applied to the vigorous caladium cultivar 'Red Flash' as a pre-plant tuber soak at concentrations from 1¼ to 40 ppm. These concentrations did not control plant height or diameter. Longer soaking time and/or higher concentrations

of Topflor may be needed for growth control of vigorous caladium cultivars, but due to the potential spread of bacterial diseases with a pre-plant soak, it may not be a practical option.

Trials also were conducted with substrate drenches of one-fourth to 4 mg. active ingredient (AI), which were applied after the shoots appeared. Topflor provided acceptable height control for 'Red Flash' when applied as a substrate drench at a concentration of 2 mg. AI, resulting in 16.8 percent shorter plants than the untreated control. Growers in areas similar to North Carolina should trial rates of around 2 mg. per pot for vigorous cultivars; adjustments should be made for other locations and less vigorous cultivars. ♦



Growth control of caladium 'Red Flash' with Topflor substrate drenches (left to right: untreated control, .25, .5, 1, 2 and 4 mg. AI).



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and important competitor variety (right)

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## pests & diseases



Growth control of calla lily 'Crystal Blush' with Topflor substrate drenches (left to right: untreated control, 1, 1½, 2, 3 and 4 mg. AI)



Growth control of the vigorous calla lily 'Sunshine' with Topflor substrate drenches (left to right: untreated control, 3 and 4 mg. AI).

### Calla Lily

Three calla lily cultivars were used in a Topflor substrate drench trial. Drenches of 1-4 mg. AI were applied when the new shoots were 1-3 inches tall. In our trials, drenches of 1-1½ mg. controlled growth of the less vigorous cultivars 'Crystal Blush' and 'Garnet Glow'. Higher rates of 2-4 mg. worked better for the more vigorous cultivar 'Sunshine'.

### Easter Lily

We found Topflor pre-plant bulb soaks to be effective with Easter lilies. In our trials, we soaked the bulbs for five minutes in solutions ranging from 1¼ to 20 ppm. The bulbs were allowed to drain and air dry overnight before being potted. Concentrations of 1½

2½ ppm provided sufficient control, depending if you want a baseline control with 1¼ ppm or season-long control with 2½ ppm. Higher rates would be considered excessive. Consider doing your own small trial to determine what concentrations work best for your location.

We also conducted Topflor substrate drench trials using rates of .02-.24 mg. AI. The drenches were applied when the new growth was 3-4 inches tall, using 4 fl.oz. per 6-inch standard pot. From our first-year trials, it appears that drenches of .04-.08 provided optimal height control.

### Exacum

We trialed both Topflor foliar sprays (12½, 25, 37½, 50 or 62½ ppm) and substrate drenches (.015,

## pests & diseases



Growth control of Easter lily 'Nellie White' with Topflor pre-plant bulb soaks (left to right: untreated control, 1/4 and 2 1/2 ppm).



Growth control of Easter lily 'Nellie White' with Topflor substrate drenches (left to right: untreated control, .02, .04 and .08 mg. AI).

.03, .06, .12 or .24 mg. of AI per pot) on exacum 'Blue Champion' grown in 6-inch pots. Topflor drenches were more consistent in controlling plant growth than foliar sprays. Substrate drenches of .03 mg. or foliar sprays greater than or equal to 50 ppm resulted in an acceptable degree of plant growth control.

### Pot Chrysanthemum

We also used pot chrysanthemums 'Yellow Blush' and 'Duluth' in our trials. The plants were potted on Oct. 18 and grown under long-day conditions until Oct. 25 for 'Duluth' and Nov. 8 for 'Yellow Blush'. Both cultivars were pinched on Nov. 1. Topflor foliar sprays were applied two weeks after pinching. Foliar

sprays of 20-30 ppm provided optimal growth control in our experiment. Adjustments will have to be made for other locations, cultivars or time of year.

### Pot Sunflower

Both foliar sprays (10-50 ppm) and substrate drenches (one-half to 4 mg. AI per pot) were trialed on pot sunflower 'Pacino'. The Topflor applications were made to 4-week-old seedlings. Substrate drenches of 1 1/2-2 mg. provided more consistent control than a 30-ppm foliar spray.

### Conclusion

Topflor is a new chemistry that works well for controlling excessive stretch, and it is especially active as a soil drench, pre-plant

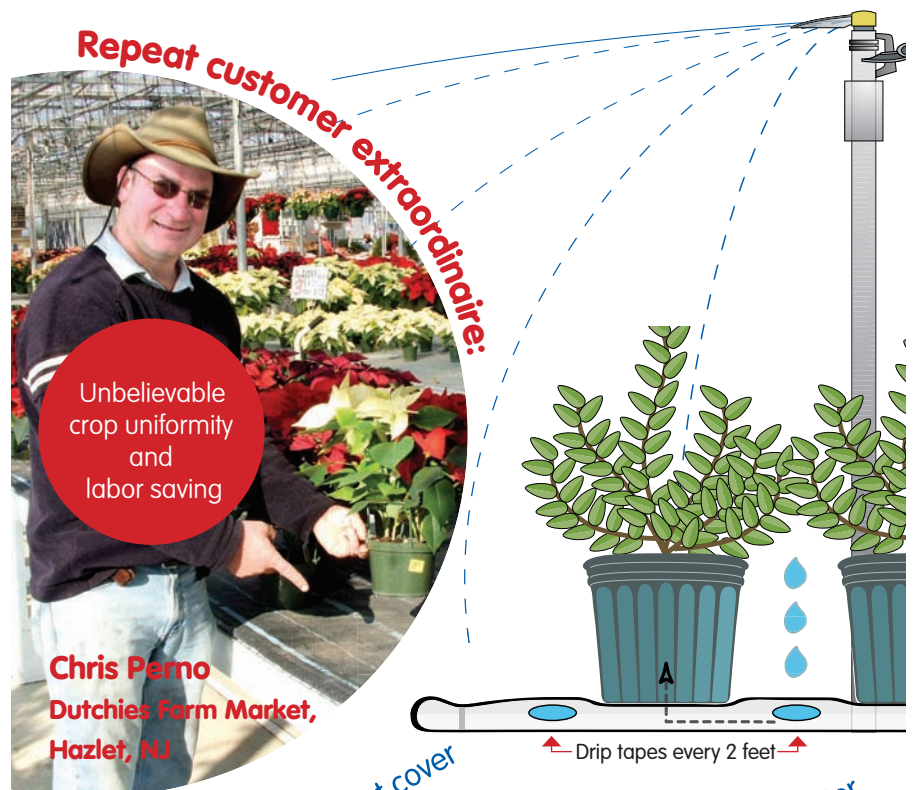
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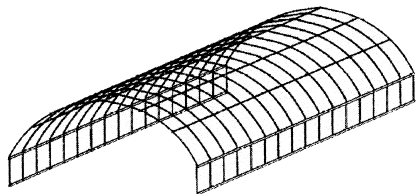
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Growth control of exacum 'Blue Champion' with Topflor substrate drenches (left to right: untreated control, .03, .06 and .12 mg. AI).



Pot chrysanthemum 'Yellow Blush' sprayed once with Topflor (left to right: untreated control and 30 ppm).



Growth control of pot sunflower 'Pacino' with Topflor substrate drenches (left to right: untreated control, .5, 1, 2, 3 and 4 mg. AI).

bulb soak or pre-plant liner dip. Consider starting a trial with Topflor to determine optimal rates and where it might fit into your production schedule. 

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