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Height Control of Tulips, Hyacinths, and Narcissus With Topflor

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Controlling the height of bulb crops such as tulips, hyacinths, and narcissus is not always on the mind of growers producing these crops. And why should it be? These crops leave the wholesale greenhouse bound for retail centers when they are only a few inches tall; no need to add the extra expense of a PGR application. But what about when the plant is in the hands of the consumer? These crops can stretch to great lengths seemingly overnight on the consumer's dining table, or even worse, on the shelves of retailers. The effort put into bulb crops to control excessive postharvest stretch of tulips, hyacinth and narcissus will ensure your customers have a high quality plant to enjoy during its bloom time.

During the last three years we have been conducting research at North Carolina State University to investigate the use of the newly released plant growth regulator (PGR) Topflor on bulb crops. Topflor has shown to be very effective in controlling postharvest stem stretch when applied as a preplant bulb soak or as a substrate drench.

Preplant bulb soaks have been gaining popularity in the past several years due to the ease of treating large quantities at once. However, when using a preplant bulb soak the grower must rely on past experience with species and cultivars to predict the dose needed. The PGR is applied before the plants begin to grow; therefore, the ability to react to the plants growth is limited. Substrate drenches are applied one to two days after forcing begins and allows the grower a little more flexibility by analyzing growth before applying any PGRs.

For all of our studies over the past three years we have grown our bulbs under a standard forcing schedule. Bulbs were potted (and treated with preplant soaks) during the last week of October. The pots were stored in a cooler set at 41 °F for 10 weeks, then held for an additional 5 weeks at 34 °F. Plants were then moved to the greenhouse to begin forcing.

Tulips

In our first year of experiments we applied a preplant bulb soak of Topflor for 10 minutes to the

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- ▶ tulip cultivar 'Prominence'. The most desirable results using Topflor occurred when bulbs were treated with 25 ppm. Comparable results were obtained from treatments of Bonzi at 50 ppm and A-Rest at 10 ppm.

The following year we tested Topflor preplant bulb soaks on three different cultivars, 'Page Polka', 'Prominence', and 'Red Present', to determine if there was any variability in response to Topflor among cultivars. As seen in other floriculture crops, there were different responses from one cultivar to the next. Therefore a rate range of 15 to 40 ppm is recommended as a starting point, with adjustments needing to be made for cultivar vigor and responsiveness.

Substrate drenches of Topflor are also effective. We applied drenches to the pots one day after forcing began in the greenhouse. Topflor at a concentration of 0.5 mg active ingredient (a.i.) per pot resulted in satisfactory height control. A-Rest label recommendations are to use 0.125 to 0.5 mg a.i. per pot and Bonzi label recommendations for tulips are to drench with 0.31 to 2.5 mg a.i. per pot. In our study A-Rest at 0.5 mg a.i. per pot and Bonzi at 1 mg a.i. per pot gave us similar results as Topflor at 0.5 mg a.i. per pot.

We also trialed the application of Topflor as a foliar spray; unfortunately, the results were unsatisfactory. The small amount of foliage present at the time when foliar sprays must be applied may have limited the uptake of the active ingredient.

Hyacinths

There has been limited research on PGR use on hyacinths. Florel as a foliar spray has been reported to be effective at concentrations between 500 and 2000 ppm. However in our trials concentrations as high as 2000 ppm were ineffective. We also used Topflor as a foliar spray but the highest concentration, 80 ppm, was ineffective. We suspect that, like the tulips, the

amount of foliage present 7 days after removing plants from the cooler (when applications were made) was too small for adequate uptake of the active ingredient. We used rates up to 80 ppm and growers may want to conduct their own trials using foliar sprays after more foliage has emerged and/or using higher rates.

Topflor soaks were successful on hyacinths. They were applied to the cultivar 'Anna Marie' for 10 minutes. Commercially acceptable plants were obtained with the application of 25 ppm preplant bulb soaks. These plants were comparable to those treated with preplant bulb soaks of Bonzi at 100 ppm and Sumagic at 30 ppm.

As with the tulips, we trialed three different hyacinth cultivars, 'Delft Blue', 'Jan Bos' and 'Pink Pearl', to determine if the efficacy of Topflor varied among cultivars. And as we saw with tulips, Topflor had variable effects on hyacinths. To obtain plants approximately 12 inches tall, a Topflor soak at a concentration of 20 ppm was needed for 'Pink Pearl', while a 30 ppm soak was needed for both 'Jan Bos' and 'Delft Blue'.

Topflor drenches were applied to the pots one week after forcing began. At the concentrations applied (0.25, 0.5, 1, 2, or 4 mg a.i. per pot) Topflor did not control the height of the plants in the greenhouse, but during the post harvest evaluation a concentration of 1 mg a.i. per pot resulted in plants 14% shorter than the non treated plants. Applying the drench within 48 hours after removal from the cooler may increase the responsiveness of hyacinths to substrate drenches.

Narcissus

In the past, the standard height control procedure for 'Tete a Tete' plants was a 1000 to 2000 ppm Florel foliar spray. We found comparable results when plants were treated with 0.69 mg a.i. Topflor substrate drenches as when a 1500 ppm Florel foliar spray was used. Also, results were similar when a 2 mg a.i. Bonzi substrate

► drench was used.

Topflor preplant bulb soaks were also effective on 'Tete a Tete'. A 10 minute soak at 25 ppm gave similar results as the 1500 ppm Florel spray. The recommended rate for bulb soaks on the Bonzi label is a concentration of 80 ppm, soaked for one hour. We soaked 'Dutch Master' in Topflor for 2 minutes and had adequate control at 100 ppm. When Topflor was used on 'Dutch Master' and 'Sweetness' concentrations of 20 ppm and 37.5 ppm, respectively, gave similar results as observed with Bonzi.

Additional Thoughts

Topflor has shown to be very effective in controlling height of bulb crops as a preplant bulb soak or a substrate drench. As a foliar spray, Topflor does not have adequate efficacy as compared to the other application methods.

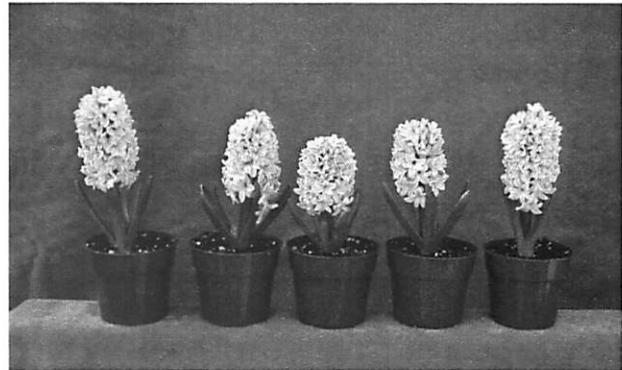
Cost is often a driving factor when determining which PGR to use. The recommended retail cost of Topflor is \$210.00 for two liters. The cost of soaking a hyacinth bulb at 25 ppm would be \$0.007 (less than one penny). If applied as a substrate drench at 1 mg a.i. the cost of treating one hyacinth bulb would be about \$0.03.

Before using any new technique or product, we suggest you experiment on a small portion of your crop. The concentrations recommended in this article were established for growing conditions in North Carolina. Actual concentrations for your conditions may vary.

This fall, when potting your spring bulb crop don't forget about the option of using a Topflor preplant bulb soak. Or, this spring when bringing the bulbs out of the cooler to start forcing them, consider a Topflor substrate drench. Regardless of which application method, the use of a PGR on your bulb crop will provide your customers with a higher quality plant for them to enjoy.

Topflor Pre-plant Bulb Soak Guidelines

- Bulbs can be soaked up to 7 days in advance of planting.
- Bulbs can be soaked for 2 to 40 minutes.
- 378 bulbs can be treated with 1 gallon of solution without loss of efficacy.
- Keep soak solution above 46 °F.
- At least half of each individual bulb should be submerged in solution.
- Cultivar responses do exist.
- Left over soak solution can be disposed of as a substrate drench on other crops.



'Anna Marie' hyacinth bulbs treated with pre-plant bulb soaks for 10 minutes. From left to right – Untreated control, 25 ppm Topflor, 50 ppm Topflor, 100 ppm Bonzi, and 20 ppm Sumagic.



'Tete a Tete' narcissus bulbs treated with Topflor pre-plant bulb soaks for 10 minutes. From left to right – 0, 25, 30, and 40 ppm.

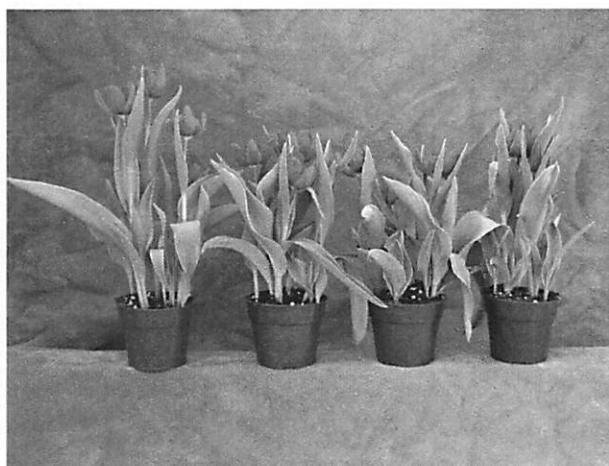
Plant	Soak (ppm)	Drench (mg a.i./pot)	Spray (ppm)
Tulip	15 to 40	0.5	NR at up to 80
Hyacinth	10 to 25	1.0	NR at up to 80
Tete a Tete Narcissus	30	0.69	NR
Dutch Master Narcissus	20	NT	NT
Sweetness Narcissus	37.5	NT	NT

*NR – At the concentrations trialed there was no plant response
 NT – Not tested..*

These concentrations are based on North Carolina growing conditions. Growers should experiment with small amounts of plants and adjust for their individual growing conditions.



'Prominence' tulip bulbs treated with Topflor. From left to right – Untreated control, 25 ppm pre-plant bulb soak, 0.5 mg a.i./pot substrate drench, and 80 ppm foliar spray.



'Prominence' tulip bulbs treated with substrate drenches (in mg a.i./pot). From left to right – Topflor 0.5, Bonzi 1, and A-Rest 0.25.

Poinsettia Open House Mitchell's Nursery & Greenhouse, King, NC

Mitchell's Nursery & Greenhouse will have a Poinsettia Open House displaying 63 varieties of poinsettias on Sunday, Dec. 3, 2006 from 12:30-4:30 PM. Free refreshments will be served and there will be drawings for doorprizes. For additional information, call Judy and Jim Mitchell, 336-983-4107.