I’t’s been such a long time since we’ve had a new plant growth regulator (PGR) in floriculture. Actually, flurprimidol, the active ingredient in the new SePRO product being labeled in the United States as Topflor, is not a new compound. In fact, Paul Thomas and I tested its effects on vining groundcovers back in the early 1990s — and it was very effective. At that time, we were testing a granular turfgrass formulation called Cutless, which is still in use today on turfgrasses. However, the registrant decided not to pursue a label for ornamentals, and the research was dropped shortly thereafter.

Now, working with SePRO, we have had the opportunity to test the Topflor formulation of flurprimidol on several perennials and have some very promising results to present to you. Topflor has been in use on greenhouse crops in Europe for more than 10 years and is a very active compound. It is taken up by plant stems and, since it is soil-active, by roots. For most perennials tested, it does not appear to be as potent as Sumagic but is more or less as potent as Bonzi. Like other research we’ve done on perennials, there is considerable variability in the response of different perennials to different PGRs.

Results from several studies are reported here. Plugs for The Flower Fields perennials and the Tradescantia were donated by Yoder/Green Leaf and plugs for the Proven Winners perennials were donated by Euro-American Propagators. Plugs were planted in quarts or gallons filled with Scotts Perennial Mix and irrigated as necessary with 200 ppm nitrogen using Peters 20-10-20. Treatments were applied about two weeks after transplanting when plants had resumed active growth. The PGRs were applied as foliar sprays using a 2-liter, hand-held, carbon dioxide pressurized sprayer with an 8002VS nozzle at 26 psi. Sprays were evenly applied at a volume of two quarts per 100 sq. ft., which is the label-recommended volume for Bonzi and Sumagic.

TEST RESULTS

Fall 2001 results. In fall 2001, we tested Scabiosa ‘Butterfly Blue’ and Perovskia atriplicifolia for responsiveness to Topflor, in comparison with previously established rates of Sumagic (15 ppm) and Bonzi (30 ppm).
Topflor was applied at 15, 30, 45, 60 or 75 ppm. Butterfly Blue showed little response to the PGR treatments, with reductions in plant height with Sumagic and Topflor but not with Bonzi. However, the plants put on little growth under the fall growing conditions.

However, in the same study, Perovskia height was very responsive to all PGRs, even though the control plants maintained rapid growth rates throughout the experiment. Height of plants treated with 30 ppm Bonzi or 15 ppm Sumagic was reduced 27 or 39 percent, respectively, at four weeks after treatment. Topflor treatments resulted in significant height reductions at rates of 45 ppm or greater, with 32-44 percent reductions. These reductions in height persisted through the six weeks after treatment measurement date.

Spring results. In spring 2002, we found that Tradescantia virginiana ‘Red Cloud’ was also very responsive to Topflor, with noticeable height reductions at all rates. However, Bonzi treatments resulted in little height control at rates up to 160 ppm, and only the higher Sumagic rates, 45 or 60 ppm, reduced plant height. Two other Tradescantia cultivars, ‘Angel Eyes’ and ‘Blue Stone’, were similarly evaluated and were less responsive to all the PGRs tested. Significant height reductions required 60 or 75 ppm Topflor. Cultivar variability is a common problem in establishing PGR rate recommendations for perennials.

The Flower Fields results. Also in spring 2002, we evaluated several of The Flower Fields perennials to test the use of multiple applications of Topflor on growth regulation. We compared a single application of a PGR to one-half that rate applied either once or twice (at zero and two weeks after treatment). Topflor rates were estimated from previous research with Bonzi and Sumagic. Topflor at 75 ppm applied once to Monarda didyma ‘Jacob Cline’ reduced plant height 40 percent, whereas two applications at half that rate (37 ppm) reduced plant height 45 percent at four weeks after treatment. However, in this case, the single application at 37 ppm resulted in sufficient height control, 30 percent at four weeks after treatment, which persisted less than the other treatments at six weeks after treatment.

Perovskia atriplicifolia was again evaluated using the information gained in the fall study. A single application of 45 ppm Topflor reduced plant height by 35 percent at four weeks after treatment, but two applications of 22 ppm only reduced plant height by 22 percent. The single application of 22 ppm did not significantly reduce height. The rapid growth rate of Perovskia would require that the multiple applications be applied more frequently than the 2-week interval used in this study. Persistence of the treatment should also be considered in selecting rates and application frequency. The effects of the single application at the higher rate persisted through six weeks after...
treatment with a final height reduction of 25 percent, whereas the two applications at the lower rate were no longer significant. As a grower, you would need to make additional applications to maintain growth control further into the season.

On the other hand, Sedum ‘Autumn Joy’ responded in a very similar manner to both the single high rate and the two applications of the low rate. At four weeks after treatment, 75 ppm Topflor applied once resulted in a 33-percent height reduction, whereas two applications of 37 ppm reduced height 25 percent. The single application of 37 ppm reduced height 20 percent, which may have been sufficient for four weeks after treatment. Both the single application of the higher rate and the two applications of 37 ppm were still significantly controlling growth at eight weeks after treatment with a final height reduction of 16 and 15 percent, respectively.

Echinacea ‘Ruby Star’ was also very responsive to Topflor, with 45 ppm reducing plant height 42 percent at four weeks after treatment and persisting at eight weeks after treatment with a 30-percent height reduction. Two applications of 22 ppm gave similar results, whereas the single application of 22 ppm Topflor provided more desirable control, 30 percent height reduction at four weeks after treatment, 24 percent at six weeks after treatment, and eight percent at eight weeks after treatment.

Proven Winners test results. In early fall 2002, we tested Proven
Winners Fall Magic perennials, Erysimum linifolium, Sedum ‘Matrona’, Euphorbia ‘Despina’ and Euphorbia ‘Efanthia’, for responsiveness to a variety of PGRs. Erysimum was very responsive to Topflor, Bonzi and Sumagic, and the persistence of Topflor and Sumagic at the higher rates was significant. In anticipation of the more vigorous plants selected and the good growing conditions, the rates of Topflor in these tests were higher than those used in spring tests. Topflor rates twice those of Sumagic yielded comparable growth control and persistence. Topflor rates were lower than those of Bonzi, but Topflor resulted in greater growth control and greater persistence. Height of Erysimum was adequately controlled with 30-60 ppm Topflor, 90-120 ppm Bonzi or 15-30 ppm Sumagic. Although the highest rate of Topflor (120 ppm) resulted in a slight reduction in height of Matrona, the difference was not statistically significant at four or six weeks after treatment. Since there was no significant response to Topflor at two weeks after treatment, multiple applications of higher rates of Topflor may not provide adequate control. Matrona was responsive to the highest rates of the other PGRs tested, with 160 ppm Bonzi resulting in a 33-percent reduction in height and 60 ppm Sumagic resulting in a 19-percent reduction in height at four weeks after treatment.

Both Euphorbia cultivars, Despina and Efanthia, were only moderately responsive to Topflor and Sumagic. The maximum height reductions of Despina plants treated with Topflor were 22 percent with 30 ppm at four and six weeks after treatment. Higher rates did not result in greater growth control; in other words, the growth response was saturated at the low rate. Similar reductions in height were found with 30 ppm.
Sumagic. However, this cultivar was more responsive to Bonzi, with 27- and 40-percent height reductions with treatments of 40 and 80 ppm Bonzi, respectively, at four weeks after treatment.

Efanthia required higher rates of these PGRs but the height reductions were slightly greater. Topflor at 90 ppm reduced plant height about 30 percent at four and six weeks after treatment. Similar height reductions resulted from treatment with 30 ppm Sumagic or 80 ppm Bonzi.

USING THE RESULTS

Topflor is an effective and potent PGR for use on perennials. However, it is not possible to make rate recommendations for perennials based on its activity relative to that of Bonzi or Sumagic. In most cases, Topflor is less active than Sumagic. However, with Despina, the two compounds produced the same results at the same rate, whereas Efanthia required treatment with three times the amount of Topflor to obtain growth control similar to that found with Sumagic. Comparisons to Bonzi are even more erratic. We observed no incidences of phytotoxicity in our trials. However, overdose symptoms are similar to those of Sumagic or Bonzi, and these excessive rates may delay flowering.

Based on our perennial trials to date, Topflor rates between 30 and 90 ppm appear to be excellent test rates for new perennials. Multiple applications may be necessary with lower rates or with more vigorous crops. Persistence of the growth response depends on the rate and seems to vary with crop species and cultivar — just like it has with all of the other PGRs that we have tested. Remember to perform your own trials on a small number of plants before treating your entire crop. Application methods, consistency and growing conditions can make a significant difference in PGR effectiveness, and therefore in the amount of growth regulation of the crop.

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