Sumagic on Bedding Plants

Usage of this highly active PGR on bedding plants is a risky move; find out how to use it, when it's best used and how much is recommended based on this MSU research.

By Cathy Whitman, Mike Olrich and Erik Runkle

Producing compact bedding plants often involves a chemical means of height control. Sumagic (uniconazole, Valent USA Corp.) is a plant growth-regulating chemical that reduces stem elongation and is used to control height of ornamental plants. In addition to being more compact, treated plants may also have darker green foliage, thicker leaves and stronger stems than untreated plants. The active ingredient in Sumagic is chemically similar to that in Bonzi and Piccolo (paclobutrazol, Syngenta Profes-sional Products and Fine Agro-nomics, respectively), but Sumagic is more active on a ppm basis.

Sumagic is very powerful and highly effective on a wide range of plants but has not been widely used on bedding plants. Some growers have been hesitant to use a product with high activity due to the potential for overdose and stunting. Another concern is that the effects of Sumagic could persist through the growing season and inhibit plant growth in consumers' gardens. In some cases, late applications of Sumagic can delay flowering. However, Sumagic can be a very effective tool when used correctly.

Like other plant growth regulators, the effectiveness of Sumagic is influenced by environmental conditions and cultural practices. During bright warm weather, plants grow faster. Cultural practices such as spacing, pot size, and water and fertility levels will affect growth rates. Cultivars within the same bedding plant species often vary in sensitivity. Recommended label rates for spray applications are broad, ranging from 1-50 ppm for bedding plants. In Northern climates, rates up to 15 ppm are generally used.

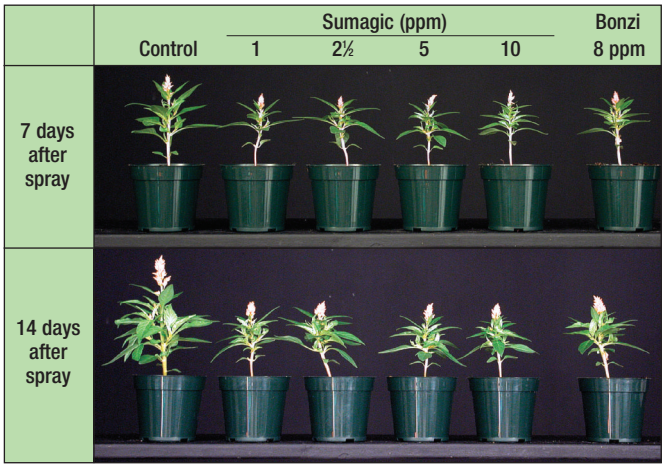
Our objective was to evaluate the effects of a single spray application of Sumagic to bedding plants soon after transplant and refine appropriate rates for Northern conditions. Another objective was to compare and contrast applications of Sumagic with a common Bonzi spray application rate.

Experimental protocol

Plants were received from Raker's Acres, Litchfield, Mich., in 288-cell plug trays on April 22, 2004. Seedlings were grown without any plant growth retardant applications until plants adequately filled the plug cell. Plants were

Plant	Sumagic spray rates	Bonzi spray rate
Celosia plumosa 'Apricot Brandy'	0, 1, 1½, 5 or 10 ppm	8 ppm
Salvia splendens 'Vista Red'	0, 1, 2½, 5 or 10 ppm	8 ppm
Petunia multiflora 'Prostrate Wave Rose'	0, 2½, 5, 10 or 20 ppm	8 ppm
Tagetes erecta 'Inca II Orange'	0, 2½, 5, 10 or 20 ppm	8 ppm

Figure 1. Plants (10 plants per treatment) and rates used in this research.



Effect of Sumagic or Bonzi on celosia 'Apricot Brandy'. A single spray application was made to plants (at 2 quarts per 100 feet2) eight days after transplant. Plants were grown under a 16-hour day in a glass greenhouse set at 68° F. (All photos courtesy of Erik Runkle)

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transplanted into 4-inch-round pots containing Suremix (Michigan Grower Products) on May 5 and grown under a 16-hour day in the floriculture research glass greenhouses at Michigan State University. The temperature setpoint was a constant 68° F.

A single spray application of Sumagic or Bonzi was applied to plants (at 2 quarts per 100 feet^2) eight days after transplant. See Figure 1, page 1, for more details. By this time, plants were actively growing and roots had reached the pot.

Results

Responses to Sumagic and Bonzi differed among species. However, a single application of Sumagic had a long-lasting effect on all four plant species studied, even at the lowest rates we tested (1 or 2½ ppm). Further increases in concentration generally produced a stronger height reduction. We observed a slight flowering delay of two or three days in Sumagic-treated petunia and tagetes. Even at the lowest rates tested, Sumagic was generally more effective for height control than the 8 ppm Bonzi treatment.

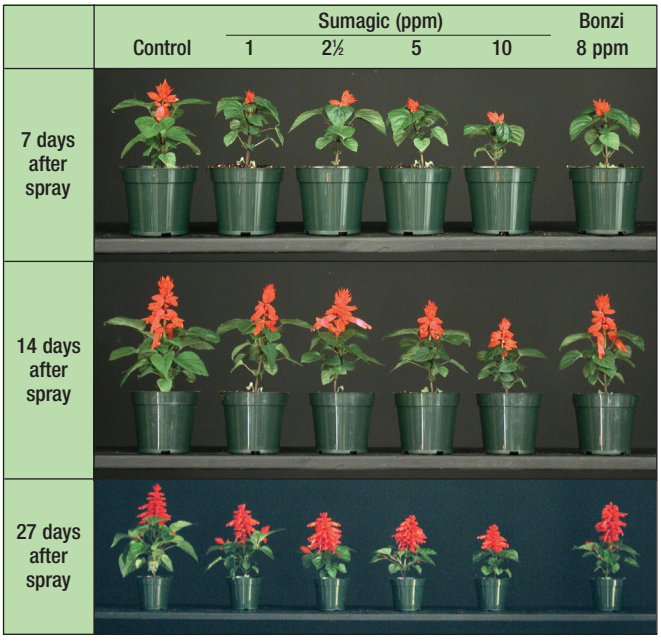
Celosia plumosa *'Apricot Brandy'*. A single application of Sumagic at 1 ppm had a strong effect on stem elongation of celosia. As the concentration increased, there was little or no increase in the magnitude of the response. Plants treated with 1-10 ppm were approximately 1⅗ inches, or 23 percent, shorter than untreated plants two weeks after spray. Therefore, Sumagic applications of ½-1 ppm are suggested soon after transplant. The 8 ppm Bonzi treatment reduced height by approximately 1 inch, or 17 percent, when measured two weeks after spray.

The celosia plugs had initiated flowers in the plug tray when they arrived, so we could not determine Sumagic's effect on time to flower.

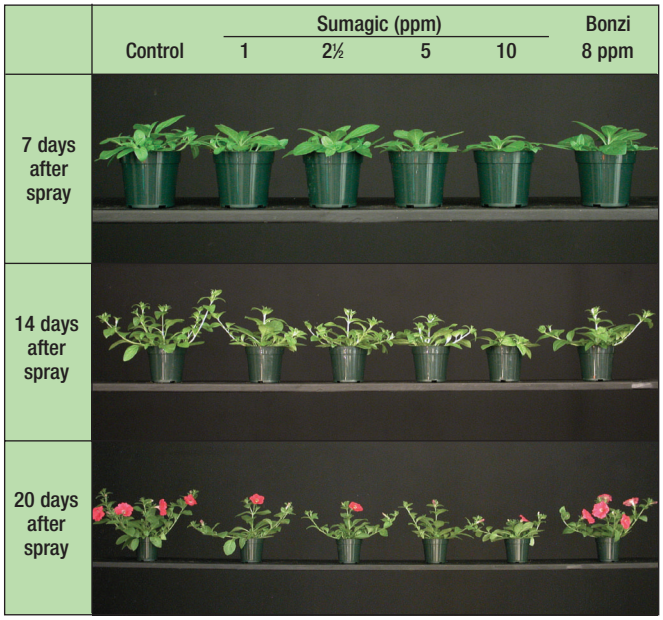
Salvia splendens *'Vista Red'*. Salvia was quite sensitive to low rates of Sumagic as a spray. A single 1- to 2½-ppm spray was effective at controlling stem elongation and resulted in height reductions at flower of approximately ½-1½ inches, or 10-20 percent. Higher rates resulted in excessive height reduction and should be avoided unless a stronger response is desired. The Bonzi treatment reduced plant height at flower by ½ inch, or less than 10 percent.

Salvia plants began flowering less than two weeks after the spray applications were made. The maximum flowering delay we observed was approximately two days in the 10 ppm Sumagic treatment. There was no delay in flowering with Bonzi.

Petunia multiflora *'Wave Rose'*. Growth of petunia is often difficult to control, but Sumagic controlled elongation effectively. At the lowest concentrations tested, 2½ or 5 ppm, Sumagic reduced plant height at flower by approximately 1 inch or 14 percent. An increase in the rate caused a stronger response, but also a slight delay in flowering. Therefore, spray rates of 2½-5 ppm are suggested soon after transplant if a flowering delay is unacceptable. The 8-ppm Bonzi spray reduced height at flower by a little over ½ inch or 10 percent.



Effect of Sumagic or Bonzi on salvia 'Vista Red'. A single spray application was made to plants (at 2 quarts per 100 feet2) eight days after transplant. Plants were grown under a 16-hour day in a glass greenhouse set at 68° F and began flowering an average of 7-10 days after sprays were applied.



Effect of Sumagic or Bonzi on petunia 'Wave Rose'. A single spray application was made to plants (at 2 quarts per 100 feet2) eight days after transplant. Plants were grown under a 16-hour day in a glass greenhouse set at 68° F and began flowering approximately 19-22 days after sprays were applied. Application of Sumagic at 10 or 20 ppm delayed flowering in petunia by an average of two days.

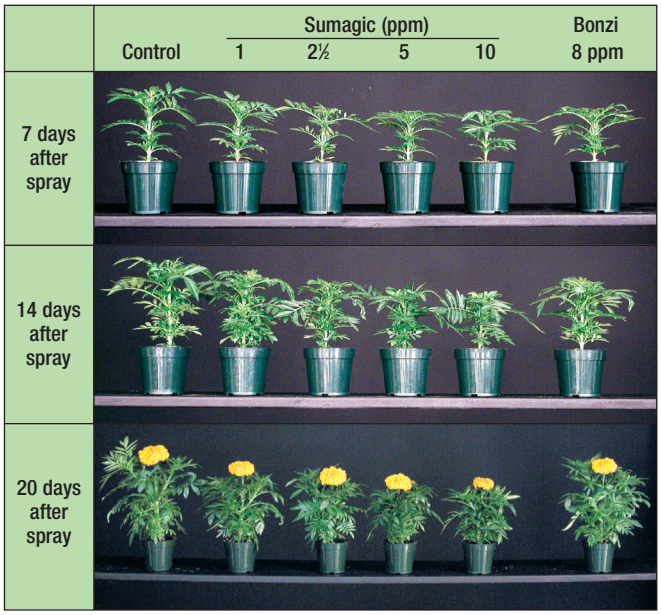
Average time to flower was 19-22 days after treatments were made, and application of Sumagic at 10-20 ppm delayed flowering in petunia by approximately two days. This delay in flowering has also been observed with other chemicals (e.g., Bonzi) on other species (e.g., dianthus). In this trial, Bonzi did not delay flowering.

Tagetes erecta *'Inca II Orange'*. Marigold is one of the more aggressively growing bedding plants. A single spray application of Sumagic at 5-10 ppm reduced plant height at flower by approximately 1½ inches, or 17 percent, a desirable level of control. A second application of Sumagic (or another PGR) before transplant may be considered to inhibit growth of the plug. Bonzi had virtually no effect on plant height at the rate tested (8 ppm).

Plants flowered 26-28 days after sprays were made, and Sumagic resulted in an average flowering delay of 2-3 days. Bonzi delayed flowering by approximately one day.

Conclusions

These results indicate that Sumagic can be used on these bedding plants as a spray at low rates (1-2 ppm) soon after transplant to achieve a moderate reduction in height with minimal flowering delay. If a stronger height reduction is desired, or for more aggressive plants, we suggest making a second application as needed. For less aggressive plants, lower rates (¼-½ ppm) of Sumagic may be more appropriate. Sumagic begins controlling stem elongation soon after application, so the magnitude of response is evident within one week, and the need for more applications can be determined then.



Effect of Sumagic or Bonzi on tagetes 'Inca II Orange'. A single spray application was made to plants (at 2 quarts per 100 feet2) eight days after transplant. Plants were grown under a 16-hour day in a glass greenhouse set at 68° F and began flowering approximately 26-28 days after sprays were applied. Sumagic resulted in an average flowering delay of 2-3 days.

The effects of Sumagic on stem elongation may persist for 3-5 weeks or even longer, depending on the rate, the plant treated and its growing conditions. In this experiment, the effect of Sumagic was still quite evident on salvia 27 days after spray, on petunia 22 days after spray and on tagetes 32 days after spray.

Sumagic is absorbed primarily by stems, so good stem coverage is critical for effective control of elongation. Uniform spray volume is important because roots readily absorb Sumagic, and excess solution that drips into the media can be taken up by the plants. Since Sumagic is so active, applicators should develop good spray technique in order to supply their crop with a thorough, uniform treatment.

Spray applications should be made in the morning or late afternoon and on cloudy days whenever possible. Avoid treating water-stressed plants since they are more vulnerable to phytotoxicity, and wilting affects their ability to absorb the chemical.

These recommendations are based on the growing conditions in Michigan during mid-spring. Lower rates may be more appropriate during the early spring, and higher rates may be needed in locations with warmer temperatures and higher light levels. For optimal results, growers should perform their own trials to determine the best rates for their growing conditions and their specific crops. GPN

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