



Sumagic®

PLANT GROWTH REGULATOR



For Commercial Greenhouse Use Only

Active Ingredient	By Wt.
* Uniconazole-P055%
Other Ingredients	99.945%
Total	100.000%
* (E)(S)-1(4-chlorophenyl)4,4-dimethyl-2(1,2,4-triazol-1-yl)pent-1-ene-3-ol	
Contains 0.064 oz active ingredient per gallon (0.5g/litre).	
U.S. Pat. Nos. 4,435,203 and 4,554,007	
EPA Reg. No. 59639-37	

KEEP OUT OF REACH OF CHILDREN CAUTION

SEE BELOW FOR ADDITIONAL PRECAUTIONARY STATEMENTS.

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS & DOMESTIC ANIMALS CAUTION

Causes eye irritation. Avoid contact with eyes, skin and clothing.

FIRST AID

If in eyes: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.

If on skin or clothing: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.

If swallowed: Call a poison control center or doctor immediately for treatment advice. Have a person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by a poison control center or doctor. Do not give anything by mouth to an unconscious person.

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FIRST AID (continued)

If inhaled: Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. Call a poison control center or doctor for further treatment advice.

HOT LINE NUMBER

Have the product container or label with you when calling a poison control center or doctor or going for treatment. You may also contact **1-800-892-0099** for emergency medical treatment information.

PERSONAL PROTECTIVE EQUIPMENT (PPE):

Applicators and other handlers must wear: long-sleeved shirt and long pants, chemical-resistant gloves made of any waterproof material, and shoes plus socks.

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

USER SAFETY RECOMMENDATIONS

- Users should:
- Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.
 - Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
 - Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

ENVIRONMENTAL HAZARDS

Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwaters.

DIRECTIONS FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

READ ENTIRE LABEL AND PAMPHLET. USE STRICTLY IN ACCORDANCE WITH PRECAUTIONARY STATEMENTS AND DIRECTIONS, AND WITH APPLICABLE STATE AND FEDERAL REGULATIONS.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE), and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted-entry interval (REI) of 12 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is: coveralls, chemical-resistant gloves made of any waterproof material, and shoes plus socks.

DISCLAIMER, RISKS OF USING THIS PRODUCT, LIMITED WARRANTY AND LIMITATION OF LIABILITY

IMPORTANT: Read the entire Label including this Disclaimer, Risks of Using this Product, Limited Warranty, and Limitation of Liability before using this product. If the terms are not acceptable THEN DO NOT USE THE PRODUCT; rather, return the unopened product within 15 days of purchase for a refund of the purchase price.

RISKS OF USING THIS PRODUCT

The Buyer and User (referred to collectively herein as "Buyer") of this product should be aware that there are inherent unintended risks associated with the use of this product which are impossible to eliminate. These risks include, but are not limited to, injury to plants and crops to which this product is applied, lack of control of the target pests or weeds, resistance of the target pest or weeds to this product, injury caused by drift, and injury to rotational crops caused by carryover in the soil. Such risks of crop injury, non-performance, resistance or other unintended consequences are unavoidable and may result because of such factors as weather, soil conditions, disease, moisture conditions, irrigation practices, condition of the crop at the time of application, presence of other materials either applied in the tank mix with this product or prior to application of this product, cultural practices or the manner of use or application, (or a combination of such factors) all of which are factors beyond the control of Valent. The Buyer should be aware that these inherent

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unintended risks may reduce the harvested yield of the crop in all or a portion of the treated acreage, or otherwise affect the crop such that additional care, treatment and expense are required to take the crop to harvest. If the Buyer chooses not to accept these risks, THEN THIS PRODUCT SHOULD NOT BE APPLIED. By applying this product Buyer acknowledges and accepts these inherent unintended risks AND AGREES THAT ALL SUCH RISKS ASSOCIATED WITH THE APPLICATION AND USE ARE ASSUMED BY THE BUYER.

Valent shall not be responsible for losses or damages (including, but not limited to, loss of yield, increased expenses of farming the crop or such incidental, consequential or special damages that may be claimed) resulting from use of this product in any manner not set forth on the label. Buyer assumes all risks associated with the use of this product in any manner or under conditions not specifically directed or approved on the label.

LIMITED WARRANTY

Valent warrants only that this product conforms to the chemical description on the label and is reasonably fit for the purposes stated in the label, under average use conditions, when used strictly in accordance with the label and **subject to the Risks of Using This Product as described above. EXCEPT AS SET FORTH ABOVE, VALENT MAKES NO OTHER WARRANTIES, EITHER EXPRESSED OR IMPLIED.** No agent or representative of Valent or Seller is authorized to make or create any other express or implied warranty.

LIMITATION OF LIABILITY

In no event shall Valent or Seller be liable for any incidental, consequential, indirect or special damages resulting from the use or handling of this product. The limitation includes, but is not limited to, loss of yield on all or any portion of the treated acreage, increased care, treatment or other expenses required to take the crop to harvest, increased finance charges or altered finance ratings, emotional or mental distress and/or exemplary damages. THE EXCLUSIVE REMEDY OF THE BUYER, AND THE EXCLUSIVE MAXIMUM LIABILITY OF VALENT OR SELLER FOR ANY AND ALL CLAIMS, LOSSES, INJURIES OR DAMAGES (INCLUDING CLAIMS BASED ON BREACH OF WARRANTY, CONTRACT, NEGLIGENCE, TORT, STRICT LIABILITY OR OTHERWISE) RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT SHALL BE THE RETURN OF THE PURCHASE PRICE OF THIS PRODUCT OR, AT THE ELECTION OF VALENT OR SELLER, THE REPLACEMENT OF THE PRODUCT.

PROMPT NOTICE OF CLAIM

Valent must be provided notice as soon as Buyer has reason to believe it may have a claim, but in no event later than twenty-one days from date of

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planting, or twenty-one days from the date of application, whichever is latter, so that an immediate inspection of the affected property and growing crops can be made.

If Buyer does not notify Valent of any claims, in such period, it shall be barred from obtaining any remedy.

NO AMENDMENTS

Valent and Seller offer this product, and Buyer accepts it, subject to the foregoing **Disclaimer, Risks of Using This Product, Limited Warranty** and **Limitation of Liability**, which may not be modified by any oral or written agreement.

TANK MIXES

NOTICE: Tank mixing or use of this product with any other product which is not specifically and expressly authorized by the label shall be the exclusive risk of user, applicator and/or application advisor.

Read and follow the entire label of each product to be used in the tank mix with this product.

DIRECTIONS

SHAKE BEFORE USING

GENERAL INFORMATION

Do not apply this product through any type of irrigation system.

FOR USE IN: COMMERCIAL GREENHOUSES, LAT-HOUSES AND SHADEHOUSES (WHERE PLANTS ARE GROWN IN CONTAINERS)

Sumagic® Plant Growth Regulator is an effective growth retardant on a wide variety of ornamental crops. *Sumagic* reduces plant height by reducing internode elongation through inhibition of gibberellin biosynthesis. The result is more desirable compact and marketable plants. *Sumagic* has also been shown to increase the quality of plants even in the absence of growth reduction. Some of these desirable qualities include darker colors, higher chlorophyll content, greater leaf thickness, stronger stems, increased water retention and in some cases, increased flower number and size.

Plant response to *Sumagic* is strongly influenced by cultural and environmental variables such as growing media, water/fertilizer management, temperature, light, growing house composition, and other cultural practices. Plant/container size and cultivar or variety can also affect height. **First time users of *Sumagic* should treat a limited number of plants at the lowest recommended rate. Rate adjustments may then be made according to plant response. Sequential applications of lower rates may be made as necessary.**

Decisions regarding application of *Sumagic* may be

made using the Graphical Tracking technique developed at Michigan State University. Graphical Tracking is a grower management tool where over time actual plant height or development is compared with desired plant height or development. The technique involves plotting plant height onto a graph once or twice a week and making height control decisions after comparing actual and target heights.

APPLICATION INFORMATION

Sumagic may be applied through four different application methods: Foliar Spray, Drench, Bulb or Cutting Dip, and as a Pre-Plant Application to the Soil Surface.

Sumagic is an extremely active plant growth regulator. Caution must be exercised in measuring, diluting, and applying *Sumagic*. Excessive doses will result in severe growth retardation and possible adverse effects on flowering, plant appearance, quality and marketability.

Differences in plant response to *Sumagic* due to plant surface area in relation to soil surface area are possible. Extreme temperatures can influence plant response to *Sumagic*.

It is recommended that *Sumagic* be applied during morning or late afternoon hours, or when plants are not under environmental stress. *Sumagic* retards elongation almost immediately after application. Assessment of rate response for most species can be made within five to seven days after treatment. If desired results are not evident, reapplication or an increased rate may be warranted.

Temperature and light level are important factors in determining the proper application rate of *Sumagic*. In general lower rates and fewer applications are required for plants grown in lower temperatures/less light intensity and higher rates and/or more applications are required for plants grown in higher temperatures/higher light intensity. Data from experiments used to make recommendations found in this label were generated in northern and southern climates for most plant species.

Cultural practices may affect the plant(s) response to *Sumagic*. Plants which are grown at close spacing or in small pots and using high water and fertility levels may require an increase in the amount of *Sumagic* needed. The media in which the plants are grown can influence the effectiveness of plant growth regulator drench applications. *Sumagic* drench applications will be less active in growing media with a high amount of pine bark.

Different varieties or cultivars within a given plant species may require a higher or lower rate of *Sumagic*. Taller, more vigorous varieties generally require more chemical than do the shorter, less vigorous varieties. Growers should consult with plant and seed suppliers for vigor and other growth characteristics for newly released varieties.

FOLIAR APPLICATIONS

Apply foliar applications with standard spray equipment. Effective dose is strongly dependent on application volume. Plant response can vary if a given rate is applied at different spray volumes. Uniformity of spray is equally important. **Except where noted, uniformly apply 2 qts of finished spray solution to 100 sq ft of bench area.**

Applying foliar applications of *Sumagic* to plants on water collectors or on sub-irrigation benches may lead to more growth reduction than desired due to *Sumagic* being taken up through the soil with the irrigation water. When making applications under these conditions, the rate of application may need to be reduced.

PRE-PLANT APPLICATION TO SOIL SURFACE

Sumagic may be applied to the soil surface just prior to planting plugs. A pre-plant soil surface spray often results in more uniform plant height. *Sumagic* is readily absorbed by roots and translocates in xylem tissue to the plant terminals. In general, only one half or less of the typical foliar spray rate will be required when spraying *Sumagic* on the soil surface prior to transplanting plugs. The required rate will vary across plant species, and the grower should conduct trials on a small number of plants under actual use conditions to determine the optimum rate. Soil media can strongly influence response to *Sumagic*. Soil media high in pine bark may require higher rates. Research conducted to support this application technique was conducted under normal surface irrigation, not sub-irrigation.

DRENCH APPLICATIONS

Drench application allows a more uniform application of *Sumagic* resulting in more uniform height control. *Sumagic* is readily absorbed by the roots and translocated in xylem tissue to terminals. Growing media should be moist but not wet at time of drench application. This may be achieved by water-

ing the day before application. Response may vary if the media is too dry to allow for even distribution at application.

Generally, 4.0 fl oz of drench solution is required for a 6 inch pot. For larger or smaller pots, adjust volume up or down, depending on pot size. A suitable drench volume is application of enough solution to achieve total run through of no more than 10%, assuming that soil media is properly moist prior to application (example: if 4.0 fl oz of drench solution is applied, no more than 0.4 fl oz should run through the bottom of pot). Growers should determine proper volume per pot on pot sizes other than 6 inches by conducting small trials on a few plants with water.

PRE-PLANT BULB SOAKS

Bulb soaks are an effective and economical method of reducing height of bulb crops. This method allows for a uniform application of *Sumagic* prior to planting. In general, bulbs are soaked in a solution of *Sumagic* for 1 to 5 minutes and then planted. Please see section titled 'Bulb Crops' for further information.

DETERMINING OPTIMUM RATES OF APPLICATION

The rates recommended on this label are rate ranges and should be used only as a guideline.

Optimum *Sumagic* rates depend on the desired final size and many physical and environmental factors. Specific growing practices such as watering potting media, fertilization, and temperature and light conditions will also affect the growth response to a given rate.

When using *Sumagic* on plants not specifically listed on the label, use the following table as a guideline to determine a starting point. To determine optimum use rates, conduct trials on a small number of plants under actual use conditions using the lowest recommended rates.

RECOMMENDED TRIAL RATE TABLE (PPM)

PLANT TYPE	RECOMMENDED SPRAY CONCENTRATION (PPM)			
	SPRAY	SOIL SURFACE	DRENCH	BULB SOAK
Bedding Plants	1 to 50	0.5 to 20	0.1 to 2	n/a
Bedding Plant Plugs*	0.5 to 10	0.5 to 10	Not recommended	n/a
Flowering/Foliage Potted Crops**				
Herbaceous Species	5 to 40	0.5 to 10	0.1 to 1	n/a
Woody Species	20 to 50	1.5 to 20	0.5 to 2	n/a
Woody Landscape Ornamentals	10 to 50	1 to 20	1 to 2	n/a
Bulb Crops	2.5 to 20	0.5 to 10	1 to 3	1 to 10

* Bedding plant plugs can be especially sensitive to *Sumagic*.

** Annual or Perennial

NOTES:

- For drench applications, it is recommended that about 4 fl oz of solution be applied to a 6 inch pot. Adjust volume according to pot size.
- For pre-plant bulb soaks, it may be necessary to adjust both rates and soak time in order to achieve the desired affect.

RESTRICTIONS AND LIMITATIONS

Do not apply *Sumagic* under conditions that can cause drift to food, forage or other plantings that might be damaged or the crops thereof rendered unfit for sale, use or consumption.

Avoid spray drift onto non-target species.

Do not apply directly to soil or to plants/pots in direct contact with soil in Greenhouses, Lathouses or Shadehouses with soil flooring of high porosity and low organic content.

This product has a potential to leach into groundwater or to run off into surface water.

Apply *Sumagic* to well watered vigorously growing plants.

Application to media containing pine bark will reduce *Sumagic* activity.

Do not mix *Sumagic* with pesticides, fertilizers, wetting agents, spreader stickers or other adjuvants.

Do not apply *Sumagic* to any food crops.

Do not reuse soil from plants treated with *Sumagic*.

MIXING INSTRUCTIONS AND RATE CONVERSION TABLE

Sumagic mixes readily with water.

FOLIAR AND SOIL SURFACE APPLICATIONS: Always make sure application equipment is thoroughly clean before mixing. When preparing *Sumagic* for use as a spray, fill tank to one half full. Shake *Sumagic* container well before using. Add the recommended amount of *Sumagic* according to the Rate Conversion Table below. Complete filling the tank.

DRENCH AND BULB DIP APPLICATIONS: Add the recommended amount of *Sumagic* to the appropriate volume of water for use as a drench or dip solution.

RATE CONVERSION TABLE

PPM	ML/L	ML/GAL	FL OZ/GAL
1	2	8	0.26
2.5	5	19	0.6
3	6	23	0.8
5	10	38	1.3
10	20	76	2.6
15	30	114	3.8
20	40	151	5.1
25	50	189	6.4
30	60	227	7.7
35	70	265	9.0
40	80	303	10.2
45	90	341	11.5
50	100	379	12.7
75	150	568	19.2

POINSETTIA

IMPORTANT: Test on a small number of all new cultivars before widespread use to determine appropriate rates and timing under your growing conditions. Repeat applications of lower rates may be necessary and may sometimes yield superior results to a single application of a higher rate. First time users of *Sumagic* should make single or sequential applications at the lowest labeled rate to determine optimum dose for specific cultivars under local conditions. Late season application (after short-day initiation) may have negative effects on bract size, plant quality, and marketability.

FOLIAR SPRAY: Apply *Sumagic* as a foliar spray when lateral shoots are 1.5 to 2.5 inches (about 10 to 14 days after pinching). Use rates listed below and apply uniformly at a spray volume of 2 qts per 100 sq ft of bench area. Multiple applications of the lower labeled rate may be applied as necessary.

RATE TABLE

GROWING REGION	RECOMMENDED SPRAY CONCENTRATION		
	FL OZ/GAL	ML/GAL	PPM
All states except Florida	0.6 to 2.6	19* to 76	2.5 to 10
Florida	2.5 to 3.8	76 to 114	10 to 15

* In most locations, multiple applications at this rate will be necessary.

DRENCH APPLICATION: Optimum rates for drench applications to Poinsettia have not been determined. Users can conduct trials based on recommendations in the section titled 'Determining Optimum Rates'.

NOTES:

- Certain varieties such as Supjibi and Freedom are more sensitive to *Sumagic* than others, and should be treated with the lowest recommended rate for each growing region.
- **DO NOT APPLY *SUMAGIC* TO POINSETTIAS AFTER THE INITIATION OF SHORT DAYS.**
- **FLORIDA ONLY: DO NOT APPLY *SUMAGIC* TO POINSETTIAS AFTER OCTOBER 25.**

POINSETTIA TREES

For use in Florida only:

DRENCH APPLICATION: Apply *Sumagic* at a solution concentration of 0.5 to 0.8 fl oz/gal (15 to 23 ml/gal, 2 to 3 ppm) when breaks are 1.5 to 2.0 inches (about 10 to 14 days after the second pinching). Apply 8 fl oz of diluted solution to each pot.

NOTE:

- **DO NOT APPLY *SUMAGIC* TO POINSETTIA TREES AFTER OCTOBER 25.**

BEDDING PLANTS (ANNUAL AND PERENNIAL)

IMPORTANT: Some of the data for perennial bedding plants was generated in southern climates where more *Sumagic* is required for growth control. In more northern climates, application rates of 5 to 15 ppm (with multiple applications as needed) are commonly used to achieve desired results on many types of annual and perennial plants. First time users of *Sumagic* should make single or sequential applications at the lowest labeled rate to determine optimum dose for specific cultivars under local conditions.

Do not use on Begonias as they are exceptionally sensitive to *Sumagic*. Extreme care should be exercised to avoid spray drift onto Begonia cultivars.

FOLIAR SPRAY: Foliar applications of *Sumagic* will provide growth reduction in most commonly grown bedding plants when applied at 1 to 50 ppm. The rate range for some specific common bedding plants are listed below.

Apply *Sumagic* as a foliar spray as plant elongation begins (plant height approximately 2 to 4 inches). See exceptions for Periwinkle (*Vinca*), Pansy and Geranium (*Pelargonium*). Timing may vary with species, and the user should determine the appropriate growth stage for specific cultivars and environmental conditions. When applying to plants at the shortest growth stage (2 inches), use the lowest recommended rate. Use rates listed below and apply uniformly at a spray volume of 2 qts per 100 sq ft of bench area. Multiple applications of lower rate may be applied as necessary.

RATE TABLE

BEDDING PLANTS	RECOMMENDED SPRAY CONCENTRATION RANGE		
	FL OZ/GAL	ML/GAL	PPM
Ageratum	5.1 to 7.7	151 to 227	20 to 30
Alyssum	1.3 to 6.4	38 to 189	5 to 25
Bee Balm (Monarda)	3.8 to 7.7	114 to 227	15 to 30
Celosia	2.6 to 5.1	76 to 151	10 to 20
Coleus	2.6 to 5.1	76 to 151	10 to 20
Coneflower	7.7 to 10.2	227 to 303	30 to 40
Dahlia	2.6 to 5.1	76 to 151	10 to 20
Dusty Miller	7.7	227	30
Hollyhock	1.3 to 10.2	38 to 303	5 to 40
Impatiens*	1.3 to 2.6	38 to 76	5 to 10
Marigold**	2.6 to 5.1	76 to 151	10 to 20
Pansy	0.26 to 1.5	8 to 46	1 to 6
Periwinkle	0.26 to 0.8	8 to 23	1 to 3
Petunia**	6.4 to 12.8	189 to 379	25 to 50
Portulaca	3.8 to 7.7	114 to 227	15 to 30
Purple Coneflower	7.7 to 10.2	227 to 303	30 to 40
Salvia	1.3 to 2.6	38 to 76	5 to 10
Shasta Daisy	3.8 to 7.7	114 to 227	15 to 30
Snapdragon**	6.4 to 12.8	189 to 379	25 to 50
Speedwell (Veronica)	5.1 to 10.2	151 to 303	20 to 40
Verbena	3.8 to 7.7	114 to 227	15 to 30
Viola	0.26 to 1.3	8 to 38	1 to 5

* Seed Propagated

** Multiple applications may be necessary.

PRE-PLANT APPLICATION TO SOIL SURFACE: Test on a small number of plants before widespread use to determine appropriate rates under your growing conditions. When using *Sumagic* on plants not specifically tested using a soil surface application, begin by using a rate of one third of that required as a foliar spray on a small number of plants. Then adjust rates accordingly based on results.

Soil surface spray should be applied immediately prior to transplanting plugs.

Apply soil applications with standard spray equipment. Effective dose is strongly dependent on application volume. Uniformly apply 2 qts of finished *Sumagic* spray solution to 100 sq ft of bench area containing pots with potting mix. The soil surface should be moist at time of application and should not be allowed to dry before plugs are transplanted. After planting plugs in *Sumagic* treated soil, continue normal growing practices.

RATE TABLE

BEDDING PLANTS	RECOMMENDED SPRAY CONCENTRATION RANGE		
	FL OZ/GAL	ML/GAL	PPM
Ageratum	0.8 to 1.5	23 to 46	3 to 6
Coleus	1.3 to 2.6	38 to 76	5 to 10
Dahlia	0.2	6	0.75
Geranium	1.3 to 2.6	38 to 76	5 to 10
Impatiens	0.5 to 1.3	16 to 38	2 to 5
Lobelia	1.3 to 2.6	38 to 76	5 to 10
Marigold	0.5 to 1.0	16 to 32	2 to 4
Pansy	1.3 to 2.6	38 to 76	5 to 10
Petunia	1.3 to 2.0	38 to 57	5 to 7.5
Salvia	2.6 to 5.1	76 to 151	10 to 20
Snapdragon	0.26 to 0.5	8 to 16	1 to 2
Vinca	0.13 to 0.2	4 to 6	0.5 to 0.75

DRENCH APPLICATION: Optimum rates for drench applications to bedding plants have not been determined. Users can conduct trials based on recommendations in the section titled 'Determining Optimum Rates'.

NOTES:

- Some bedding plants are extremely sensitive to *Sumagic*. When using for the first time on a particular bedding plant, treat only a small number of plants and observe for activity.
- For use on bedding plants not specifically listed, determine optimum rate by treating a small number of plants with 1 to 50 ppm as a foliar spray. Try low rates first. Rates may then be decreased or increased to achieve the desired effect. Timing of the first application should begin when new growth reaches 2 to 4 inches in height with most species.
- Cultivars within the same species may respond differently to a given rate of *Sumagic* - dwarf cultivars generally require lower rates than tall cultivars (e.g. Marigolds).
- On plants that are more sensitive to *Sumagic*, multiple applications of lower rates often gives more satisfactory results than a single application of a higher rate. For example, make two applications of 5 ppm instead of one application of 10 ppm.
- Some bedding plants have shown improved color and overall appearance following use of *Sumagic*, even when growth retardation was not evident.
- For optimum results on Periwinkle and Pansy, it is recommended that *Sumagic* not be applied until plants reach a height of 4 inches.

BULB CROPS

IMPORTANT: Test on a small number of all new cultivars before widespread use to determine appropriate rates and timing under your growing conditions. Repeat applications of lower rates may be neces-

sary and may sometimes yield superior results to a single application of a higher rate. Cooler growing climates should utilize the lower rate, and if necessary a second application may be made.

GRAPHICAL TRACKING: Decisions regarding application of *Sumagic* to bulb crops may be made using the Graphical Tracking technique. Graphical Tracking is a grower management tool where over time actual plant height or development is compared with desired plant height or development. The technique involves plotting plant height onto a graph once or twice a week and making height control decisions after comparing actual and target heights.

FOLIAR SPRAY: Treat bulb type crops with *Sumagic* when shoots average 3 inches tall. Use a uniform spray volume of 2 qts per 100 sq ft of bench area. If a second application is made, it should be applied when shoots average 6 inches tall. Applications made after visible bud may adversely affect flowering.

Note: Usually, two applications of a foliar spray at a lower rate are more effective than one application at a higher rate.

DRENCH APPLICATION: Drench applications are very effective for controlling height in bulb crops and provide a uniform and precise application method. Application should be made to most bulb type crops when newly emerged shoots are 1 to 2 inches tall.

Note: For drench applications, it is recommended that about 4 fl oz of solution be applied to a 6 inch pot. Adjust volume according to pot size. Soil should be moist but not wet at time of application. Drench applications made early in the plant growth cycle generally cause a greater growth response than do later applications.

BULB SOAK: Treatment soak time should range from 1 to 5 minutes. Soak time will vary depending on bulb size, variety, cultivar, and desired final height. Lower rates may require longer soak times (5 to 10 minutes) while higher rates require shorter soak times (1 minute).

RATE TABLE

BULB TYPE	RECOMMENDED CONCENTRATION (PPM)		
	FOLIAR SPRAY	DRENCH	BULB SOAK
Asiatic Hybrid Lilies	2.5 to 10	Not Determined*	1 to 10
LA Hybrid Lilies	2.5 to 20	1 to 3	1 to 10
Oriental Hybrid Lilies	2.5 to 10	Not Determined*	1 to 10

* Rates for these uses have not been determined. Users should run trials using rates recommended in the 'Determining Optimum Rates' section.

NOTES:

- For bulb crops not listed (Tulip, Daffodil, Hyacinth, etc.), users should conduct trials on a small scale

using rates recommended in the 'Determining Optimum Rates' section.

- Effectiveness of height control for bulb crops varies greatly by cultivar more so than for non-bulb ornamental plants. It is strongly suggested that growers conduct small scale trials with any bulb type crop before widespread use.
- Various Hybrid Lily cultivars will respond differently to bulb soaks, sprays, or drenches.
- Depending on cultivar and rate of *Sumagic*, a touch-up spray may be desirable for control of late season stretch in certain Hybrid Lilies.

GERANIUMS (PELARGONIUMS)

FOLIAR SPRAY – SEEDED GERANIUMS: Apply *Sumagic* as a foliar spray when plant height is approximately 4 inches. Apply 0.5 to 1.0 fl oz/gal (16 to 32 ml/gal, 2 to 4 ppm) as a uniform spray at a volume of 2 qts per 100 sq ft of bench area.

FOLIAR SPRAY – VEGETATIVELY PROPAGATED GERANIUMS: Apply *Sumagic* as a foliar spray on an as needed basis once the growth of cuttings begins (dependent on growth rate and cultivar). Apply 0.8 to 2.0 fl oz/gal (23 to 61 ml/gal, 3 to 8 ppm) as a uniform spray at a volume of 2 qts per 100 sq ft of bench area. Choice of rate is dependent on growth rate. Use of 6 ppm or higher may delay flowering of some cultivars.

EASTER LILIES

IMPORTANT: The use recommendations for *Sumagic* on Easter Lilies were developed with plants grown under positive DIF temperature conditions (higher day temperature than night temperature). Easter Lilies grown under negative or zero DIF temperature conditions may require lower rates and fewer applications of *Sumagic*. Application of *Sumagic* may reduce the water requirement for Easter Lilies.

GRAPHICAL TRACKING: Decisions regarding application of *Sumagic* to Easter Lilies may be made using the Graphical Tracking technique. Graphical Tracking is a grower management tool where over time actual plant height or development is compared with desired plant height or development. The technique involves plotting plant height onto a graph once or twice a week and making height control decisions after comparing actual and target heights.

FOLIAR SPRAY: Treat Easter Lilies with 0.8 to 3.8 fl oz/gal (23 to 114 ml/gal, 3 to 15 ppm) *Sumagic* when shoots average 3 inches tall. Use a uniform spray volume of 2 qts per 100 sq ft of bench area. It is recommended that only one foliar application of *Sumagic* be made per crop.

SOIL DRENCH: All states except Florida: Apply *Sumagic* when shoots average 3 inches tall. Use a solution concentration of between 0.06 and 0.13 fl oz/gal (equal to 1.9 to 3.8 ml/gal or 0.23 to 0.5 ppm). Apply 4 fl oz of diluted solution to each pot. Use lower rates

on shorter cultivars such as 'Nellie White' under cool conditions, and higher rates on taller cultivars such as 'Ace' under warmer conditions. Avoid late season applications.

Florida only: 0.11 to 0.22 fl oz/gal (equal to 3.2 to 6.4 ml/gal or 0.4 to 1.0 ppm).

CHRYSANTHEMUMS

Sumagic applications provide growth control on pot Chrysanthemums as well as hardy (garden) Chrysanthemums.

IMPORTANT: Chrysanthemum cultivars vary widely in their response to *Sumagic*. Treat a small number of plants to confirm appropriate rates for local conditions and specific cultivars.

FOLIAR SPRAY: Apply *Sumagic* as a foliar spray when the length of the breaks is 1.5 to 2.0 inches (about 7 to 14 days after pinching). Make a uniform spray application at a volume of 2 qts per 100 sq ft of bench area (except in Florida on medium and tall cultivars where 3 qts per 100 sq ft is recommended). Make multiple applications as necessary. If escapes (random elongated stems) are a problem, use a lower rate and increase the volume of application from 2 qts/100 sq ft to 3 to 4 qts/100 sq ft.

RATE TABLE

GROWING REGION	RECOMMENDED SPRAY CONCENTRATION		
	FL OZ/GAL	ML/GAL	PPM
All states except Florida	0.6* to 2.6	19 to 76	2.5 to 10
Florida	1.3 to 2.6	38 to 76	5 to 10

* Cooler growing climates should utilize the lower rate and make a second application if necessary.

DRENCH APPLICATION: Optimum rates for drench applications to Chrysanthemums have not been determined. Users can conduct trials based on recommendations in the section titled 'Determining Optimum Rates'.

DIP TREATMENT ON CUTTINGS: *Sumagic* can be applied as a dip treatment on unrooted cuttings at 1.3 to 2.6 fl oz/gal (equal to 38 to 76 ml/gal or 5 to 10 ppm) followed by a foliar spray at the lower rate range. On rooted cuttings, the dip solution should be 2.5 ppm or less, followed by a foliar spray at the lower rate range.

NOTE:

- Chrysanthemums have shown improved color and overall appearance following the use of *Sumagic*, even when growth retardation was not evident.

AZALEAS (FLORIST)

IMPORTANT: Azalea cultivars may vary in their response to *Sumagic*. Treat a small number of plants to confirm appropriate rates for local conditions and specific cultivars.

Use of *Sumagic* on Azaleas can result in increased number of flowers and improved appearance on some cultivars. Rates at the upper end of the labeled range should be used for late season applications.

FOLIAR SPRAY: Apply as a uniform spray at a volume of 1.5 qts per 100 sq ft of bench area at approximately 4 to 6 weeks after final pinch.

SHORTER GROWING CULTIVARS (GLORIA, SOLITAIRE): Apply *Sumagic* as a foliar spray at 2.6 fl oz/gal (equal to 76 ml/gal or 10 ppm). If a second application is necessary, apply 1.3 to 2.6 fl oz/gal (equal to 38 to 76 ml/gal or 5 to 10 ppm) approximately 2 to 3 weeks after the initial application.

TALLER GROWING CULTIVARS (PRIZE): Apply *Sumagic* as a foliar spray at 2.6 to 3.8 fl oz/gal (equal to 76 to 114 ml/gal or 10 to 15 ppm). If a second application is necessary, apply 2.6 fl oz/gal (equal to 76 ml/gal or 10 ppm) approximately 2 to 3 weeks after the initial application.

DRENCH APPLICATION: Optimum rates for drench applications to Azaleas have not been determined. Users can conduct trials based on recommendations in the section titled 'Determining Optimum Rates'.

WOODY LANDSCAPE ORNAMENTALS

IMPORTANT: First time users of *Sumagic* for a specific plant species should treat a limited number of plants and make rate adjustments according to the plant response desired. The rate range for some specific woody landscape ornamentals are listed below.

For landscape ornamental crops not listed, users should conduct trials on a small scale using rates recommended in the 'Determining Optimum Rates' section.

FOLIAR SPRAY: Apply *Sumagic* as a foliar spray at a volume of 2 qts per 100 sq ft of treated area within 7 days following pruning. Make additional applications as necessary to obtain desired results.

RATE TABLE

PLANT	RECOMMENDED SPRAY CONCENTRATION		
	FL OZ/GAL	ML/GAL	PPM
Crape Myrtle	12.8	379	50
Hibiscus*	2.6	76	10
Ixora*	3.8	114	15
Photinia	6.4	189	25
Pyracantha	6.4	189	25

* All states except Florida. (For Florida Use Directions, see HIBISCUS & IXORA sections.)

DRENCH APPLICATION: Optimum rates for drench applications to woody landscape ornamentals have not been determined. Users can conduct trials based on recommendations in the section titled 'Determining Optimum Rates'.

NOTE:

- Treatment under cool temperatures may reduce activity.

HIBISCUS

For use in Florida only (Refer to WOODY LANDSCAPE PLANTS section for other states).

FOLIAR SPRAY: Use from 1.3 to 2.6 fl oz/gal (38 to 76 ml/gal, 5 to 10 ppm) and apply as a uniform spray at a volume of 3 qts per 100 sq ft of bench area. Make multiple applications as necessary.

IXORA

IMPORTANT: Timing of applications will depend on cultivar, time of year, and growing conditions. Treat a small number of plants to confirm appropriate rates for local conditions and cultivars.

For use in Florida only (Refer to WOODY LANDSCAPE PLANTS section for other states).

FOLIAR SPRAY: Apply *Sumagic* as a foliar spray at 5.1 fl oz/gal (151 ml/gal, 20 ppm) 4 to 8 weeks after the final pinch as a uniform spray at a volume of 1.5 qts per 100 sq ft of bench area. If a second application is necessary, apply 2.6 to 3.8 fl oz/gal (76 to 114 ml/gal, 10 to 15 ppm) approximately 3 to 4 weeks after the initial application.

STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage, disposal or cleaning of equipment.

PESTICIDE STORAGE: Keep pesticide in original container. Do not put concentrate or dilute into food or drink containers. Store in cool, dry place. Protect from temperatures below 32°F. This product may freeze. If freezing should occur, thaw and shake gently to unify the product. Do not store diluted spray. For help with any spill, leak, fire or exposure involving this material, call day or night 800-892-0099.

PESTICIDE DISPOSAL: Wastes resulting from use of this product may be disposed of on site or at an approved waste disposal facility. Open dumping is prohibited.

CONTAINER DISPOSAL

[Container Disposal language for container sizes less than 5 gals]

CONTAINER DISPOSAL: Nonrefillable container. Do not reuse or refill this container. Clean container promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then offer for recycling, if available or puncture and dispose of in a sanitary landfill, or by incineration, or if allowed by state and local authorities, by burning. If burned, stay out of smoke.

[Container Disposal language for container sizes greater than 5 gals or 50 lbs]

CONTAINER DISPOSAL: Nonrefillable container. Do not reuse or refill this container. Offer for recycling if available. Clean container promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. Offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

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