

Altering Retardant Spray Rates Helps Growers Adapt to Varying Conditions

James E. Barrett and Terril A. Nell, University of Florida

Plant size and shape are important components for high quality floriculture crops. These are often controlled by the proper use of growth retardants. Optimum rates vary considerably with crop, can vary from one grower to another, and may vary with time of year. Thus, growers need to be able to alter application rates to fit different growing conditions.

The volume of spray solution applied varies with grower and chemical. Some chemical labels recommend a "spray to runoff" and others recommend a certain volume, commonly 2 qt. per 100 ft². Application volume may vary from 1 to 3 qt. per 100 ft² for different growers.

Spray volume can greatly affect the amount of height control obtained with Bonzi and Sumagic. With some practice, growers can estimate the amount of spray they apply per 100 ft² and calculate the total volume of spray solution needed for a given application.

A-Rest. A-Rest is the trade name for ancymidol and comes as a 264-ppm liquid with 250 mg of active ingredient per quart bottle. It can be applied as either a foliar spray or soil drench. Calculations for spray applications are simpler than for drenches, with recommendations for spray applications generally at a rate of 25 to 150 ppm.

Bonzi. Bonzi is a new growth retardant that is very active on a broad range of plant species. It is a liquid with 4000 mg of paclobutrazol per liter and is sold in quart bottles. It can be used either as a spray or drench. Recommendations for application rates are most commonly given in ppm or fl. oz. per gallon spray solution.

B-Nine. B-Nine SP is a white powder containing 85% daminozide, and comes in 1-lb and 5-lb containers. It is applied only as a foliar spray, with recommendations usually given in percent or ppm. It can be measured by the teaspoon, as suggested on the label, or by weight, which may be more convenient.

Table 3 gives amounts in volume and weight needed per gallon or liter of final solution. The volume measurements are only approximate: the weight measurements should be used whenever possible. Some growers find it convenient to use an entire 1-lb container at one time. When less spray mixture is needed, it is convenient to measure B-Nine by the cup. Volume of water needed for one pound and one cup at each rate is also given.

Cycocel. Cycocel is a liquid with 11.8% chlormequat chloride and is applied either as a drench or foliar spray. Recommended treatment rates for both spray and drench applications are given in dilution ratios (such as 1 part Cycocel to 30 parts water) or in ppm. The rates in Table 4 are given in both ppm and the approximate, equal dilution ratio.

Sumagic. Sumagic is a new growth retardant that will probably be on the market in early 1989. It contains uniconizol, which is chemically very similar to paclobutrazol, the active ingredient in Bonzi. Sumagic can be applied either as a spray or drench and is considerably more active than Bonzi on a ppm basis.

Growth retardants fall under the same regulations as pesticides, and growers are reminded to use growth retardants only in compliance with the label.

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Desired ppm	fl. oz. per gal.	ml. per liter	ml. per gallon
25	12	95	359
33	16	125	473
50	24	189	717
66	32	250	947
75	36	284	1076
100	49	379	1435
125	61	473	1793
132	64	500	1894
150	73	568	2152
200	97	758	2869

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Table 2: Bonzi Spray Dilutions

Desired ppm*	fl. oz. per gal.	ml. per liter	ml. per gallon
1	0.032	0.25	0.95
6	0.2	1.6	6.0
8	0.25	2.0	7.5
10	0.32	2.5	9.5
16	0.5	3.9	15.0
25	0.8	6.3	24.0
31	1.0	7.8	30.0
47	1.5	11.7	44.0
50	1.6	12.5	47.0
63	2.0	15.5	59.0
75	2.4	18.8	71.0
94	3.0	23.4	89.0
100	3.2	25.0	95.0
109	3.5	27.3	105.0
125	4.0	31.2	120.0
200	6.4	50.0	190.0
300	9.6	75.0	285.0

* approximate

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Table 3: B-Nine Spray Dilutions

Desired %	Desired ppm	Teaspoon per gallon of final solution	Ounces per gallon of final solution	Grams per liter of final solution	Gallons of water for 1 lb. B-Nine	Gallons of water for 1 cup B-Nine*
0.08	800	1.3	0.13	0.9	127	37.5
0.1	1000	1.6	0.16	1.2	101	30.0
0.15	1500	2.4	0.24	1.8	68	20.0
0.2	2000	3.2	0.31	2.4	50	15.0
0.25	2500	4	0.39	2.9	41	12.0
0.3	3000	4.8	0.47	3.5	33	10.0
0.35	3500	5.6	0.55	4.1	29	8.6
0.375	3750	6	0.59	4.4	27	8.0
0.4	4000	6.4	0.63	4.7	25	7.5
0.5	5000	8	0.79	5.9	20	6.0
0.75	7500	12	1.18	8.8	14	4.0
1.0	10000	16	1.57	11.8	10	3.0

* Approximate, use weight measurements whenever possible.

Table 4: Cycocel Spray Dilutions

Dilution Ratio*	Desired ppm*	fl oz per gal.	ml per liter	ml per gal.
1:118	1000	1.1	8.5	32.1
1:80	1500	1.6	12.7	48.1
1:70	1685	1.8	14.3	54.1
1:60	2000	2.2	16.9	64.2
1:50	2500	2.7	21.2	80.2
1:40	3000	3.3	25.4	96.2
1:34	3500	3.8	29.7	112.3
1:30	4000	4.3	33.9	128.8
1:25	4500	4.9	38.1	144.4
1:23	5000	5.4	42.4	160.4
1:21	5500	6.0	46.6	176.5
1:20	6000	6.5	50.8	192.5

* ppm are accurate; dilution ratios are approximate.

Table 5: Sumagic Spray Dilutions

ppm	fl oz per gallon	ml per liter	ml per gallon
1.0	0.25	2	7.5
2.0	0.5	4	15.0
2.5	0.625	5	18.75
3.0	0.75	6	22.5
4.0	1.0	8	30.0
5.0	1.25	10	37.5
6.0	1.5	12	45.0
8.0	2.0	16	60.0
10.0	2.5	20	75.0
12.0	3.0	24	90.0
15.0	3.75	30	112.5
16.0	4.0	32	120.0
20.0	5.0	40	150.0
24.0	6.0	48	180.0
30.0	7.5	60	225.0
40.0	10.0	80	300.0

Table 6: Helpful Information and conversions.

<p><u>Volume</u> 1 gallon (gal) = 128 fluid ounces (fl oz) 1 fl oz = 29.6 milliliters (ml) (rounded to 30) 1 gal = 3785 ml = 3.785 liters 1 cup = 48 teaspoons 1 tablespoon = 3 teaspoons 1 fl oz = 2 tablespoons = 6 teaspoons</p>	<p><u>Bonzi</u> 4000 mg ai per liter 4 mg ai per ml 118 mg ai per fl oz</p>
<p><u>Weight</u> 1 ounces (oz) = 28.3 grams (g) 1 pound = 16 oz = 454 g</p>	<p><u>B-Nine</u> 385.5 mg ai per pound 24.1 mg ai per oz 850 mg ai per g</p>
<p><u>Concentration</u> 1% = 10,000 ppm 1 ppm = 1 milligram (mg) per liter</p>	<p><u>Cycocel</u> 118,000 mg ai per liter 118 mg ai per ml 3489 mg ai per fl oz</p>
<p><u>A-Rest</u> 264 mg. of active ingredient (ai) per liter 7.81 mg ai per fl oz 0.264 mg ai per ml</p>	<p><u>Sumagic</u> 500 mg ai per liter 0.5 mg ai per ml 15 mg ai per fl oz</p>



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