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Executive Secretary/Treasurer, Ann Reilly
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Colorful Garden Lilies for Potted Plants

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Garden lilies provide colorful, attractive potted plants for spring retail sales, expanding our offerings to consumers. Einert (3) found good consumer acceptance and a potential market, especially as an Easter potted plant or as a spring gift. After flowering, bulbs may be planted in the garden for double satisfaction.

In 1951 (before modern growth regulators) Seeley grew 9 cultivars with a December planting handled along with Easter lilies (7). Most cultivars flowered in late March or early April. Seven cultivars averaged from 11 to 19 inches tall, without a growth retardant application. Vagabond, Joan Evans, Serenade, Campfire, Enchantment, and Pagoda were listed as worthy of further trial as spring-flowering potted plants.

More recent studies in Europe and the U.S. with various cultivars, especially Mid-Century and *Lilium rubrum* hybrids, have shown that growth retardants, primarily Ancymidol (A-Rest) are useful in producing high-quality potted plants. (1,2,5,6,8,10,11,12).

Figure 1. Firecracker. Planted 1/14/81; photographed 4/22; grown at 50°F N.T. Left to right: 0; 0.125 mg; 0.25 mg A-Rest per pot as soil drench at time of emergence. Note lack of response to these levels of A-Rest. Excellent for cut flowers.

To obtain information on the response of some newer cultivars to environmental conditions of central New York and the value of the growth retardant A-Rest for controlling height, bulbs of 9 cultivars listed in Table 1 were planted January 14, 1981 in 5-inch pots of a mixture of ⅓ soil by volume, ⅓ coarse perlite, and ⅓ coarse peat moss, with limestone and superphosphate as in Cornell Lily Guidelines (4).

The bulbs, donated by the Vandenberg Bulb Co. of Chester, N.Y., were of the 4 to 5-inch grade, except for 5 to 6-inch Chinook and 6 to 7-inch Sans Souci. Bulbs were pre-cooled 6 weeks at 40°F before planting. After 1 week in a 60°F night temperature (N.T.) greenhouse, the plants were grown with 50°F N.T. and 60-65° day temperature.

The growth regulator, ancymidol (A-Rest), at rates of 0, 0.125 milligrams (mg) or 0.25 mg active ingredient per plant was in a single drench application of 100 milliliters (3⅓ fluid ounces) of solution to the soil surface

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Figure 2. Sans Souci. Planted 1/14/81; photographed 6/8. Same temperature and A-Rest treatments as in Figure 1.

Colorful Garden Lilies (cont.)

when plants emerged from the soil medium. This was in late January and early February except for Sans Souci, with the average time of emergence in Table 1.

Height was measured from the rim of the pot to the point where the lowest flower was attached to the stem because the effect of the growth retardant is primarily on the elongation of the stem. For overall height, one has to add the additional height of the cluster of flowers which may be horizontal, erect, or pendulous according to cultivar. Time of flowering was considered to be the date that the first flower opened on each plant. There were 6 plants of each cultivar in each growth regulator treatment.

Table 1. Effect of growth retardant treatments on height and number of flowers, from 4-5-inch bulbs (5-6 inch for Chinook), planted January 14, 1981. Average of 6 plants per treatment.

Cultivar	Average date of Emergence	Height (inches) Amt. of A-Rest (mg) 0	0.25	0.50	Number of Flowers Per Plant Amt. of A-Rest (mg) 0	0.25	0.50
Charisma	2/8	5.2	4.1	3.8	2.3	2.0	1.5
Sunkissed	2/5	14.0*	7.2*	4.3*	5.3	5.7	6.0
Sunray	2/1	14.6**	7.1**	5.9**	4.3	3.3	3.5
Firecracker	2/10	18.3	17.9	15.8	7.2	7.7	7.5
Enchantment	2/3	17.6	7.7	4.5	5.8	7.8	7.2
Connecticut King	2/9	19.5	13.6	7.3	4.2	5.3	5.8
Chinook	1/26	28.2	19.9	15.3	5.8	5.8	5.0
Connecticut Lemon Glow	2/6	18.0	14.8	8.1	5.7	7.7	6.2
Sans Souci	2/21	13.9	12.1	11.9	3.8	2.7	3.0

*add 6-7 inches for flowers.
**add 2½-3 inches for flowers.

RESULTS AND DISCUSSION

It should be realized that these results are from only one trial in spring of 1981 at Ithaca, and the results may vary in other plantings with different bulbs and environments but the observations can serve as a guide.

HEIGHT: Height of all cultivars was reduced by the growth regulator treatment (Table 1). Even without a treatment, Charisma was short. Firecracker (Fig. 1) remained tall even with 0.5 mg A-Rest per pot; really it is a cut flower type. Chinook also was a bit tall. Sans Souci was shortened only a little by the A-Rest application (Fig. 2).

Figure 3. Connecticut Lemon Glow. Planted 1/14/81; photographed 4/16. Same temperature and A-Rest treatments as in Figure 1.

Some cultivars responded strongly to A-Rest. For instance, the stem length of Sunkissed, Sunray, and Enchantment was reduced approximately 49-56% by the 0.25 mg treatment, whereas Connecticut King and Connecticut Lemon Glow were reduced 30 and 18% by the same treatment (Table 1 and Fig. 3, 4 and 5).

White (12) reported a height of 12 to 20 inches from the rim of the pot to the highest bud gave the best appearance of garden lilies in 5-inch pots. On this basis, Charisma was too short even without treatment, and Firecracker too tall even with the 0.5 mg A-Rest treatment.

To the stem length presented in Table 1, there must be added the height of the flower cluster. Adding 7-8 inches to Sunkissed gives an overall height of 20-21 inches even without A-Rest. For flowers of Sunray, add about 3-4 inches and untreated plants of that cultivar would fit White's criterion. However, A-Rest shortened the plants making them of better proportion to the size of the pot (Fig. 3, 4, 5).

Enchantment, Connecticut King, and Connecticut Lemon Glow, when untreated, were too tall but good for cut flowers. Enchantment and Connecticut King were good for potted plants with 1 application of 0.125 mg A-Rest whereas Connecticut Lemon Glow was best with 0.25 mg.

White (11) in 1971, with 16 cultivars of DeGraaff garden lilies, applied 0, 0.25, and 0.50 mg of A-Rest per pot when plants were approximately 6 inches tall. He reported Enchantment, Cinnabar, Harmony, Joan Evans, Prosperity, and Rainbow hybrid plants to be within a desirable 16 to 20 inches height **without** a growth retardant. Retardant would be applied if less height were desired. Harlequin, Golden Chalice, and Amber Gold were within this height range when given 0.25 or 0.50 mg of A-Rest per pot. Paprika was too short even without retardant while Sonata, Pink Glory, Imperial Crimson, Gold, and Silver, and Jamboree were too tall even at the 0.50 mg A-Rest rate. White suggested that perhaps greater concentrations or earlier applications would have reduced the height but all except Sonata required more than 90 days to flower when forced at 60°F N.T., and had relatively few though large flowers.

An earlier application would be expected to be effective because Kiplinger and associates (5) found that A-Rest application of 0.5 mg A-Rest at emergence was about 31% more effective than when applied at 6-inch height.

Some commercial tests have led to general guidelines of a 0.25 mg A-Rest drench at time of emergence of En-

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Table 2. Effect of growth retardant treatments on time of first and last flowering plant, and average per treatment.

TIME OF FLOWERING

Cultivar	Amount of A-Rest (mg) per plant 0 First	Last	Avg.	0.25 First	Last	Avg.	0.50 First	Last	Avg.
Charisma	4/8	4/11	4/9	4/4	4/9	4/8	4/9	4/10	4/9
Sunkissed	4/15	4/18	4/16	4/12	4/15	4/14	4/8	4/17	4/13
Sunray	4/13	4/24	4/20	4/15	4/24	4/18	4/17	4/23	4/20
Firecracker	4/14	4/24	4/20	4/19	4/22	4/20	4/19	4/27	4/20
Enchantment	4/26	4/30	4/28	4/25	4/28	4/26	4/25	5/1	4/28
Connecticut King	4/30	5/15	5/6	4/30	5/8	5/5	5/4	5/14	5/7
Chinook	5/2	5/11	5/7	5/1	5/12	5/8	5/3	5/12	5/7
Connecticut Lemon Glow	5/4	5/15	5/9	4/28	5/9	5/4	5/2	5/13	5/7
Sans Souci	5/30	6/11	6/3	6/2	6/13	6/9	6/2	6/11	6/7

Colorful Garden Lilies (cont.)

chantment, Sunray, and Connecticut Lemon Glow with a second application 7 to 10 days later. For Sunkissed, Connecticut King and Chinook, 0.50 mg has been recommended at emergence followed by a second application 7-10 days later. For Charisma the guideline is use of 5 to 6-inch bulbs and no A-Rest application.

Growers need to conduct trials under their own conditions because a survey by Seeley (8) showed that in various experiments Enchantment lilies grown without a retardant varied in height from 12.4 to 23.9 inches. It also is possible that temperatures during bulb storage can have an effect on height because Miller and Kiplinger (6) found that, with 6 to 7-inch Enchantment bulbs in 13 different temperature treatments, plant height ranged from 12 to 23.5 inches; also, there was an important effect on number of flowers and date of flowering.

NUMBER OF FLOWERS PER PLANT. In general, the number of flowers per plant was not affected by the growth regulator treatment (Table 1). It is suspected that the high counts in an occasional treatment such as the 0.25 mg treatment for Enchantment and Connecticut Lemon Glow were due to the specific bulbs in the treatment. Sometimes the number of flowers of the untreated plants was lower than the treated plants and sometimes higher. All cultivars, except Charisma, and perhaps Sunray, had enough flowers to make an attractive plant. Although Sans Souci averaged only about 3 flowers, they were large and showy.

Similarly Kiplinger and associates (5) in tests with Enchantment, Seeley (8) with *Lilium rubrum* hybrids, and White (12) with 8 garden lily cultivars found no significant effect of A-Rest on the number of flowers and buds.

TIME OF FLOWERING: The cultivars in Table 2 are in the general order of time of flowering with Charisma first in early April, 85 days after planting, when grown at 50°F N.T. Sunkissed, Sunray, and Firecracker were 7-11 days later, followed by Enchantment. Connecticut King, Chinook, and Connecticut Lemon Glow bloomed in early May, and Sans Souci in early June.

If grown with a higher night temperature such as 55°F, one would expect earlier blooming. A few plants were grown in an adjacent house at 60°F N.T. and 70-75° D.T. Charisma and Sunkissed bloomed two weeks earlier than

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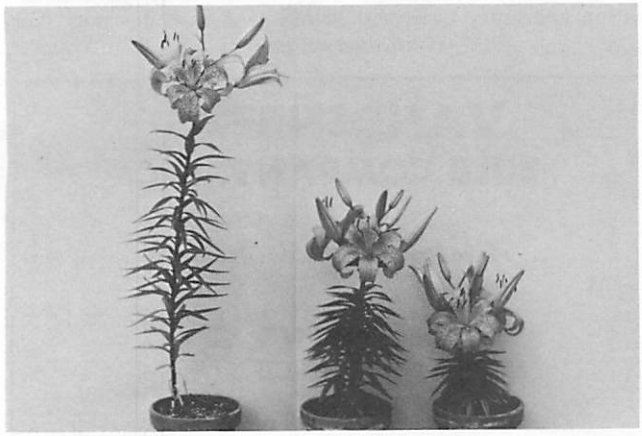

Figure 4. Enchantment. Planted 1/14/81; photographed 4/27. Same temperature, and A-Rest treatments as in Figure 1.

Colorful Garden Lilies (cont.)

at 50° while Sunray, Firecracker and Connecticut King were 3 weeks earlier, and Enchantment and Chinook, 4 weeks earlier than at 50°F. The higher temperatures speeded up the average flowering of Connecticut Lemon Glow and Sans Souci by 5 weeks.

White (12) with 8 cultivars and 60°F N.T. found the time from start of forcing until opening of the first flower ranged from 49 to 84 days depending on the cultivar.

In the Ithaca studies, growth retardant treatments had no effect on time of flowering (Table 2). Kiplinger and associates (5) and White (12) also found no delay due to growth retardants.

Data in Table 2 also show that the time span for a cultivar from the first plant to the last plant in flower was not extended, ranging from as low as 3 or 4 days for untreated Charisma, Sunkissed, and Enchantment to 7-10 days for Sunray, Firecracker, Chinook, Connecticut Lemon Glow, and Sans Souci. Connecticut King had a span of 15 days. Thus we can conclude that flowering time was quite uniform for most cultivars.

LOSS OF LOWER FOLIAGE: Sunray, Firecracker, Connecticut King, Connecticut Lemon Glow had good green leaves down to the base and Charisma had a few brown dried leaves. The problem with loss of lower foliage was more serious for Sunkissed, Enchantment, and Chinook; however, the retardant treatment tended to make the problem less noticeable because of the shortened internodes. The lower several inches of Sans Souci were completely bare (Fig. 2) and resembled the problem reported by Seeley (8) for rubrum hybrids. There did not appear to be much difference in loss of lower leaves in the different A-Rest treatment. No leaf scorch was seen on any of the cultivars.

GENERAL OBSERVATIONS AND CONCLUSIONS

1. Although the leaves on many garden lilies are not as large as on the Easter lily, when treated with a retardant, leaves are closer together making a more compact attractive plant as shown in Figures 3, 4, and 5. The yellow, orange, salmon, and pink colors are appealing, especially for spring sales.

2. In this test, the best cultivars on the basis of height, number of flowers, time of bloom and general appearance were Sunkissed, Sunray, Enchantment, Connecticut King and Connecticut Lemon Glow. Sunray was attractive but would benefit from a few more flowers; perhaps bulbs larger than the 4-5 inch grade in these tests, would give more flowers.

Sans Souci was very good but required a long period of forcing and had bare lower stems. Charisma had a low flower count and all were in bloom at almost the same time reducing the period over which this cultivar was attractive. Firecracker responded very little to the retardant and was too tall for a potted plant, although the color was bright and an appealing "lobster red".

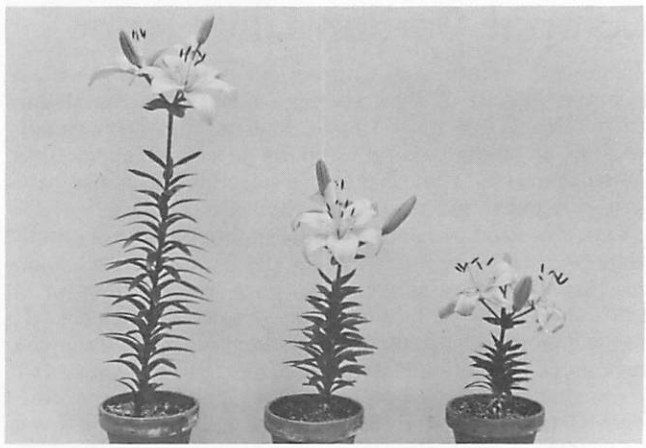

Figure 5. Sunray. Planted 1/14/81; photographed 5/9. Same temperature, and A-Rest treatments as in Figure 1.

Chinook was not shortened adequately by the 0.25 mg A-Rest treatment but might be satisfactory with a second application.

3. Under the conditions of this experiment, the lilies grew well at 50°F N.T. and can be considered a cool crop. However, the forcing time can be reduced with 55°F N.T. and one should calculate the energy saving versus a shortened forcing time.

4. This is a crop worth trying to find out how the cultivars respond under your growing conditions. It would be desirable to grow some without a retardant, but grow most with an 0.25 mg application of A-Rest to give a shorter plant of more appropriate character for 5-inch pots.

5. When treating lilies with a drench of the retardant, it is important to practice with plain water to determine how to apply the proper amount. Too much will give excessive retardation. For a slightly moist soil mix in a 5-inch pot, 100 millimeters (ml) or 3⅓ fluid ounces per pot gives a good drench without losing retardant solution out of the bottom of the pot. Then calculate the concentration necessary to give 0.25 mg of A-Rest per pot. Not

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only is the amount of solution per pot important but equally important is the concentration of the solution to avoid excessive retardation (9).

6. Single plants in 4½ or 5-inch pots, as in these trials, give an excellent product for every-day sales and cash-and-carry trade. For larger plants, especially for the traditional retail florist, there is good acceptance of 3 plants in a 6 or 6½-inch pot. The canopy of flowers offsets the narrow foliage of the garden lilies. Grow some of each size.

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More Info About Calceolaria 'Anytime'

John G. Seeley

Flowering of calceolaria in April from seed sown in January 1981 was described and illustrated in NYSFI Bulletin 134. In a subsequent planting, an August 13 seeding of calceolaria 'Anytime' was ready for sale about 14 weeks later, in mid-November.

Studies in Canada (1) showed that a February 11 planting with seedlings planted into 10 cm (4-inch) clay pots a month later began to flower in about 3 months. Red shades began to flower April 27, yellow with spots April 28, and clear-rose on May 2.

Flowers were 4 cm (1.6 inches) or more in diameter and plants started to flower when reaching a height of 12 cm (4.7 inches). The plants were grown with a night temperature of 16°C (about 60°F) and day temperature of 21-24°C (70-75°F).

REFERENCE

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Hoping Your Valentine's Day Was Successful

Photographs Courtesy of Teleflora and FTD

Garden Writers Association Honors Ann Reilly

The Garden Writers Association of America has presented its 1981 Quill & Trowel Communication Award for the First Place Book to Ann Reilly, horticultural writer and association executive from Massapequa Park, NY. The award was presented during GWAA's Annual Meeting held at the Harvard Faculty Club in Cambridge, Mass.

The award winning book authored by Ann Reilly is "*Success with Seeds*", published by the George W. Park Seed Company, Greenwood, SC. The 364-page, full color book is unique in the gardening field, as it is a complete reference to the germination and care of hundreds of different plants—flowers, vegetables, herbs, bulbs, trees, shrubs—that can be grown from seed. The book also contains the largest collection of seeding photographs ever assembled along with the descriptions of each plant.

Ann Reilly, in addition to authoring "Success with Seeds", has authored four other gardening books and numerous articles for the consumer and trade press. She is also the Executive Director for four horticultural trade associations in addition to NYSFI. As a member of the Publications Committee of Bedding Plants Inc., Ann was also awarded this year for an article contributed to the "Bedding Plant News".