Poinsettia variety Elisabeth Ecke. Plants above received (left photo) single treatments applied October 11, one day after panning, including .5% B-Nine spray, 1% B-Nine spray, and control plant. Plants shown in right photo received single treatments applied October 11, one day after panning, including Cycocel drench at 3 ounces per gallon, Cycocel spray at 2 ounces per gallon, Cycocel spray at 4 ounces per gallon, and control.

GROWTH RETARDANT TESTS ON POTTED POINSETTIAS

SEWARD T. BESEMER

GREENHOUSE TRIALS were conducted on potted poinsettias in the fall of 1966 at the Paul Ecke Ranch, San Diego County, with the following objectives: (1) to compare the standard rates of the growth retardants, 2-Chloroethyltrimethylammonium choride (Cycocel) used as a pot drench and N-Dimethylaminosuccinamic acid (B-Nine) applied as a foliage spray; (2) to compare the two retardants when both are used as foliage sprays; and (3) to determine possible injury resulting from two spray applications 10 days apart.

The poinsettia varieties, Elisabeth Ecke and Paul Mikkelsen, were grown in 6-inch, three-quarter-filled clay pots. Four uniform plants in 2¼-inch peat pots were panned into the 6-inch pots on October 10, 1966. Two series of retardant treatments were applied the following day. Ten days later, October 21, two more series of treatments were applied. The chemical sprays were therefore compared as single, early (E) applications, single, late (L), or treated twice. The Cycocel drench treatment was limited to single applications on both dates. A control lot receiving no chemicals was also included. There were 10 pots of four stems each per treatment in the test. The pots were positioned in a completely randomized pattern and left in place on the bench during the entire trial period, with no pinching.

The growth retardants were commercial liquid formulations. No additional materials were added. The soil moisture was high in the pots when treatments were applied. Sprays were applied at a rate of 16 to 18 ml per pot. The drench treatment was applied at a rate of 250 ml per pot. Greenhouse temperature ranged from 75° to 80° F when treatments were made. Syringing of plants was delayed for at least 16 hours after treatment application.

Data were recorded on December 13 and 14, when all of the plants were marketable. Each stem was measured for height in inches from the top of the pot to the flowers. Each bract set was measured two ways to get an average diameter. The number of flowers with pollen was noted as a measure of maturity. A foliage injury rating was made on October 27, using a scale where 0 = no injury and 3 = severe injury. The summary table represents average data per treatment of 10 pots (40 stems).

All chemical treatments reduced plant height to various degrees. The single pot drench of Cycocel at 3 ounces per gallon resulted in the shortest plants. This treatment appeared to give more shortening when applied 10 days after panning than the day following panning. Comparing other single treatments, a 0.5% B-Nine spray reduced plant height the least, followed next by a 1.0% B-Nine spray. Gen-

SUMMARY OF 1966 TRIALS—AVERAGE BRACT DIAMETER, STEM HEIGHT, FLOWERS WITH POLLEN, AND INJURY RATING RESULTING FROM CYCOCEL AND B-NINE ON ELISABETH ECKE AND PAUL MIKKELSEN POINSETTIAS

Treatments	Averages per treatment							
	In. bract diameter		In. stem height		Flowers with pollen		Injury rating*	
	E.E.†	P.M.‡	E.E.	P.M.	E.E.	P.M.	E.E.	P.M.
B-Nine (0.5%) spray, once (E)	10.4	9.3	14.8	15.3	15.7	30.4	0.7	0.5
B-Nine (1.0%) spray, once (E)	10.0	8.6	12.2	14.2	15.2	26.8	0.7	0.3
Cycocel (3 oz/gal) drench, once (E)	9.3	9.2	7.7	11.9	10.2	32.2	0.6	0.0
Cycocel (2 oz/gal) spray, once (E)	10.4	9.6	11.5	15.1	14.5	35.4	0.6	0.2
Cycocel (4 oz/gal) spray, once (E)	10.0	9.4	10.6	13.3	16.0	34.5	1.1	1.9
B-Nine (0.5%) spray, twice	10.0	9.2	12.3	14.8	12.7	29.4	0.7	0.0
B-Nine (1.0%) spray, twice	9.9	8.8	12.1	14.0	14.7	23.3	1.3	1.3
Cycocel (2 oz/gal) spray, twice	9.9	9.2	10.0	14.5	14.4	34.1	0.9	0.1
Cycocel (4 oz/gal) spray, twice	9.9	9.1	8.4	12.0	11.6	34.7	1.4	1.6
B-Nine (0.5%) spray, once (L)	10.5	9.3	14.5	15.5	16.9	29.1	0.1	0.0
B-Nine (1.0%) spray, once (L)	10.4	9.1	14.1	15.6	12.5	29.1	0.4	0.1
Cycocel (3 oz/gal) drench, once (L)	8.8	8.6	7.2	9.8	14.3	30.0	0.2	0.0
Cycocel (2 oz/gal) spray, once (L)	9.9	9.5	11.2	14.9	11.7	35.8	0.1	0.0
Cycocel (4 oz/gal) spray, once (L)	9.7	9.3	10.7	12.7	10.7	36.0	0.5	0.2
Check	10.9	9.8	16.4	17.7	14.5	35.6	0.2	0.0

* highest rating = most injury
† Elisabeth Ecke variety
‡ Paul Mikkelsen variety
E = early treatment, day after panning (Oct. 11)
L = late treatment, 10 days after panning (Oct. 21)

erally, Cycocel sprays at both 2 and 4 ounces per gallon were more effective in reducing plant height than were the B-Nine sprays.

With most of the treatments there was little difference in response whether treated the day after panning or 10 days later. Double treatments (on both dates) consistently resulted in shorter plants than did a single treatment. However, a single treatment seemed to be sufficient in all cases.

Although the control plants in these trials were not excessive in height for most markets, a slightly reduced plant such as with the single B-Nine treatments, was considered to be most desirable. Most Cycocel-treated plants were too short, except possibly the 2 ounces per gallon, single spray.

Bract diameters were not seriously reduced with any treatment. Cycocel appears to have a greater tendency to reduce bract size than does B-Nine, particularly when used as a drench rather than spray.

Rate of flower development also was not seriously affected by any treatment. Other researchers had reported considerable delay of flower development particularly where treatments were applied at more advanced growth stages; however, treatments applied within the first ten days of panning, as in this trial, apparently have no great effect on maturity.

Foliage injury ratings were difficult to assess in this trial. Foliage distortion or spotting can be due to factors other than growth-retardant chemicals. Slight spray injury was observed frequently where 4 ounces per gallon of Cycocel spray was applied. Occasional spotting appeared when Cycocel was used as a drench. A drop of solution splashed onto a leaf will cause a yellowing which may later become necrotic. Since it appears that most treatments should be applied early in the development of the plant, any slight foliage injury is not apparent as the lower leaves which were injured abscissed before the plant was ready for sale.

Response to growth retardants of poinsettias is not only related to timing and environmental factors, but also to varieties. In this trial, the Paul Mikkelsen variety responded less than Elisabeth Ecke. Paul Mikkelsen also appears to be less susceptible to injury by the retardants. The author has observed that the USDA poinsettia introduction, "Stoplight," apparently shows little response to either B-Nine or Cycocel at the usual rates.

Seward T. Besemer is Farm Advisor, San Diego County.

Gerbera Propagation

D. EDWARD SMITH
ROBERT L. NELSON

TWO QUESTIONS yet to be fully answered in the development of the colorful Gerbera as a major cut flower in California include consumer acceptance and economy of production. The wide range of colors, both pastel and fluorescent, and of flower types including singles, doubles, quilled and frilled, would seem to promise a definite consumer demand. To date, insufficient production of quality flowers precludes an adequate test of the market potential. One of several production trials made at commercial nurseries throughout the state is described here.

Plants from 30 clones of U. C. hybrids representing a wide range of color and flower types were planted in raised, steam-sterilized ground beds at the Nakano Nursery in Redwood City. Cultural practices followed throughout this trial were similar to those used to produce high quality standard chrysanthemums in the same plastic-covered house. Twenty clones were selected, after 12 months' observation, and vegetatively propagated. These "single lead" divisions were planted September 3, 1966, on 1 × 1 ft spacings, filling a total of 500 sq ft of bench space. Total production of the 500 sq ft bench area averaged 42 salable flowers per square foot per year. Monthly production of all clones in the 500 sq ft bench area, in terms of dozens sold, included: October (1966), 35; November, 58; December, 80; January (1967), 95; February, 124; March, 166; April, 145; May, 230; June, 209; July, 247; August, 188; and September, 155. These data do not include flowers that were damaged by insects or insecticides, or that were otherwise unsalable.

Although cultural conditions throughout the trial were excellent and favored high yields, three factors undoubtedly depressed production: (1) plants from single lead divisions were slow to form the necessary number of growing points required for maximum production; (2) late propagation (September) probably depressed winter yield. Plants should be well established by August 1; and (3) wide differences in yields between clones were noted, some outyielding others threefold (see table).

Unacceptable differences in vase life were also noted; the most productive did not necessarily exhibit the most desirable vase characteristics. It is evident from this trial that each clone must be tested for yield and keeping quality as well as striking form and color. Continued selective breeding can undoubtedly minimize much of this variability. The Nakano Nursery plans further propagation of only 12 of the original 30 clones.

Considering the production observed during these tests, as well as the minimal labor expended (because of ease of harvest, lack of staking or disbudding, lack of lighting or blackcloth) it appears that Gerbera can be economically produced.

D. Edward Smith is Associate Specialist and Robert L. Nelson is Laboratory Technician, Department of Environmental Horticulture, University of California, Davis.

GERBERA PRODUCTION PER SQ FT OF BENCH AREA DURING A 3½ MONTH PERIOD IN A SEPARATE TRIAL AT THE AEBI NURSERY IN RICHMOND

Clone	No. of Flowers	Clone	No. of Flowers
1	15	25	19
2	19	26	19
3	10	38	24
5	27	49	19
11	28	71	18
20	19	73	24
22	25	77	27