RESEARCH RESULTS FOR ORNAMENTAL HORTICULTURISTS

January 1976
Horticulture Series No. 23
Auburn University
Agricultural Experiment Station
R. Dennis Rouse, Director Auburn, Alabama

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Florist Crops

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CONTENTS

Effect on Several Growth Regulators on the Growth of Clerodendron thomasoniae Balf.

Kenneth C. Sanderson and Willis C. Martin, Jr.

Nature of Work: Previous work indicated that drenches containing ancymidol were most effective in retarding the growth of Clerodendron thomasoniae. Ancymidol's effect on flowering was not recorded in this work and is subject to question. Work was conducted in 1975 to consider flower stalk number along with height reduction. Growth regulators tested were: chlormequat, ethephon, ancymidol, PBA, Bayer 102613 (a morphactin) and Armak's experimental chemical TD-6733 MO. Plants were propagated from eye-cuttings in 5 in. pots in January of 1975. Soil, sphagnum peat moss, and perlite (1:1:1, v/v/v)was used as a propagation-growing medium. Fertilization consisted of preplant incorporation of 41 g superphosphate, 21 g $CaNO_3$, 1 g $FeSO_4$, 8 g FTE, and 227 g Osmocote™ 14-14-14 per bushel. Plants were pinched 5 times (monthly) starting in February. At the time of treatment the plants were being grown in a lightly shaded (approximately 10%), evaporative cooled (70°F. when possible), glasshouse. A Halaby mist blower was used to apply the treatments shown in Table 1 on June 2. Approximately 150 ml of spray material was applied to 12 plants. Drenches were applied at the rate of 150 ml per 5- in. pot. Data on height and flower stalk number were recorded on July 1.

Results and Conclusions: A 4,000 ppm ethephon spray caused the greatest retardation in growth, however, it also inhibited flowering (Table 1). A 2 ppm ancymidol drench alone or in combination with 3,000 ppm chlormequat drench or 200 ppm PBA spray and a 150 ppm ancymidol spray produced the shortest plants with the most flowers. While all the growth regulators caused some height reduction, the number of flower stalks was only directly reduced by ethephon treatments, Bayer 102613, TD-6773 MO spray, and a 4 ppm ancymidol drench plus 200 ppm PBA spray. In some situations ancymidol treated plants had more flower stalks than untreated plants.

Publications: Sanderson, K. C. and W. C. Martin, Jr. 1975. Cultural concepts for growing Clerodendron thomasoniae. Fla. Sta. Hort. Soc. Proc. 86:439-441.

Table 1. Effect on Several Growth Regulator Treatments on Growth of Clerodendron thomasoniae Balf.

Treatment	Rate (ppm)	Height (cm)	Number of flower stalks
Chlormequat drench	3,000	39.7	7.7
Chlormequat-ancymidol drench	3,000-2	30.3	8.3
Ancymidol drench	2	25.5	8.3
Ancymidol drench	4	26.0	7.0
Ancymidol drench-PBA spray	2-200	27.8	8.3
Ancymidol drench-PBA spray	4-200	25.2	6.8
PBA spray	200	54.3	7.5
Ancymidol spray-PBA spray	150-200	26.0	7.7
Ancymidol spray	150	27.5	8.2
Ethephon drench	200	33.5	6.0
Ethephon drench	400	29.3	6.3
Ethephon spray	2,000	27.2	3.8
Ethephon spray	4,000	20.2	----
Bayer 102613 spray	2	61.2	6.2
Bayer 102613 spray	4	48.8	6.7
TD-6773MO spray	500	39.5	6.8
Check		64.2	7.2

Effects of Three Growth Regulating Chemicals on Shoot Growth in Garden Chrysanthemums

Kenneth C. Sanderson and Willis C. Martin, Jr.

Nature of Work: Garden chrysanthemums are one of the most popular flowers used in American landscapes. It is a standard commercial practice to pinch garden chrysanthemums one or two times to induce branching. Branching is important for adequate flower yield and display. Cultivar selection, pinching methods, and culture influence the number of branches per plant. If these methods fail, the grower's only recourse has been to increase the number of plants per container, thus increasing production costs. Plant growth regulating chemicals such as cytokinins,ethylene releasing substances, and auxin-antagonists have been reported to increase lateral branching of plants. Foliar sprays of 6-benzyl-amino-9- (2-tetrahydropyranyl-9H-purine (PBA) have been found to induce branching in poinsettias, geraniums and cut and potted chrysanthemum cultivars. This study was initiated to evaluate the effects of three growth regulating chemicals on shoot growth of garden chrysanthemums.

The plant growth regulating chemical 3,3 α Dihydro-2-(p-methoxy-phenyl-8H pyrazolo-(5,1 α)isoindol-8-one (Dupont DPX 1840), 6(Benzylamino)-9-(2-tetrahydropyranyl)-9H-purine (PBA or Shell Development Company's Accel™) and N, N - bis (phosphonomethyl glycine) (glyphosine or Monsanto Company's Polaris™) were applied as sprays, one week prior to pinching, to garden chrysanthemum cultivars 'Festive Cushion', 'Jackpot', 'Stardom', and 'White Grandchild' in a replicated greenhouse experiment.

Results and Discussion: Sprays of PBA effectively induced increased branching (Table 2). The 200 ppm PBA treatment produced more shoots per plant than all other treatments except 100 ppm PBA. Glyphosine and DPX 1840 reduced plant height. Cultivars differed from each other in the number of shoots per plant and 'Festive Cushion' plants had more shoots than any of the other cultivars. 'White Grandchild' plants were taller than the other cultivars.

The results of this study indicate that a 200 ppm PBA spray could be a beneficial method to supplement pinching for increasing shoot number in the commercial production of garden chrysanthemums. Such a spray would be especially useful on cultivars with poor branching habits and desirable flower characteristics because the increase in shoot number might eliminate the expensive necessity of using additional plants per container to increase flower yield.

Publications: Sanderson, K. C. and W. C. Martin, Jr. 1974. Effects of DPX 1840, PBA and glyphosine on shoot growth in garden chrysanthemums. Fla. State Hort. Soc. Proc. 87:558-560.

Table 2. Effect of growth regulator sprays on the number of shoots per plant and height of garden chrysanthemums

Treatment	Rate ppm	No. shoots per plant	Height cm
Untreated		3.6 b[z]	27.9 ab
DPX 1840	1.0	3.6 b	26.8 bc
DPX 1840	2.0	3.6 b	26.4 c
Glyphosine	2.1	3.7 b	26.7 c
Glyphosine	4.3	3.5 b	26.9 bc
PBA	100.0	3.8 ab	28.3 a
PBA	200.0	4.0 a	28.0 ab

[z] Mean separation, in columns, by Duncan's multiple range test at 5% level.

A Survey of the Interior Plant Design Business in Alabama

Susan Dean and Kenneth C. Sanderson

Nature of Work: To develop a better understanding of the size of the interior plant design market in Alabama, a survey of 100 florists and garden centers was conducted in 1975. Thirty-three florists were randomly picked each from the December 1974 membership list of Florafax International Inc., Tulsa, OK, and the membership list of Teleflora Inc., Redondo Beach, CA. Thirty-four nurserymen with greenhouses were randomly selected from the list of Alabama Nurseries Certified Jan. 9, 1974. One questionnaire was sent to Everett Conklin, Inc., so that an interior landscape firm's answers would be available for comparison. A questionnaire, letter of introduction and self-addressed, stamped envelope were mailed to each participant. The questionnaire consisted of 23 check-off-type answer questions.

Results and Discussion: A survey of 42 Alabama florists and greenhouse nurserymen revealed that 46% of these businesses did not engage in the sale, rental or use of foliage plants for interior designs. Of the 19 firms involved in the interior foliage plant business, 68% reported that foliage plant business accounted for only 10% to 25% of their total income. This percentage of their total income is below the 30% figure reported by Bachman's, Inc., of Minneapolis, one of our nation's largest florists .

Only 37% of the businesses rented foliage plants with the rental being concentrated on weddings. Mrs. Debbie Semprott, an interior designer for Everett Conklin, Inc., Montvale, N. J. noted that most of their renting was "commercial work" of all types. When asked what type building received their plants the most, Mrs. Semprott indicated office use was the greatest. However, Alabama's largest category, homes (57%), was not marked on the Conklin survey. This may indicate that foliage plant sales to banks, malls, and offices could be expanded in Alabama.

Only 44% of the businesses in Alabama had planted an interior according to a planned design. Nineteen percent of the florists and nurserymen had their own designer and only 15% had ever consulted a designer. Only 5% of the firms had engaged in planting shopping malls. Two-thirds of the firms engaged in mall plantings were in large cities, and all were in income brackets of $70,000 or over. The most commonly used plants in mall designs were scheffleras, dieffenbachias, dracaenas, Boston ferns, Norfolk Island Pines and philodendrons. Large plants were not listed indicating that the malls or plantings were small in scale. Seventy-one percent of the businesses had not bid on an interior landscape in the last year.

Eighty-one percent of the businesses did not contract for the maintenance of foliage plants.

Most plant guarantees were found to be based on a certain number of days and a 30-day guarantee was offered by 53% of the businesses. Most of the firms (37%) said that they usually experienced 75 to 100 percent survival of their foliage plants.

Approximately half (45%) of them believe that there is a market for planning, planting and the caring of interior plants, however 62% of the firms did not encourage this market in their advertising.

This survey indicates that the interior plant design market in Alabama remains to be developed.

Publications: Dean, S. and K. C. Sanderson. 1976. A Survey of the interior plant design business in Alabama. Florist's Rev. 158:31-32, 73-78.

Growth and Foliar Analysis of Standard Chrysanthemums Grown in Municipal Compost-Amended Media

G. Jay Gogue and Kenneth C. Sanderson

Nature of Work: Peat moss, the most widely used soil amendment, has become less available, more expensive and more variable. Many substitutes for peat moss including residues of the lumber, rice, peanut, oil cake, and sugar industries have been tried with some success. Unfortunately, many of the successful substitutes are not universally available and are often limited in supply. Present concern for our environment quality has precipitated a solid waste excess crisis and offered a universally available material, municipal refuse. The purpose of the present investigation was to determine the feasibility of using municipal compost, produced by the windrow method (piling outside in mounded rows which are turned over frequently) as a soil amendment in media for growing standard chrysanthemums.

Rooted cuttings of 'Improved Albatross' and 'CF No. 2 Good News' chrysanthemums were used in 2 greenhouse experiments. Forty-two cuttings of each cultivar were planted in 6 media treatments using 18 X 18-cm spacing per cutting. Two ground beds were divided into 4 replications containing the following media treatments mixed on a volume basis: 1) 1:1 soil:peat, 2) 1:1:1 soil:perlite:peat, 3) 1:1 soil:municipal compost, 4) 1:1:1 soil:peat:municipal compost, 5) 1:1:1 soil:perlite:municipal compost, and 6) 2:2:1:1 soil:perlite:peat:municipal compost. Fibrous, acid sphagnum peat moss, horticultural grade perlite, and a fine textured sandy loam were used to formulate media. Municipal compost was produced by the City of Mobile, Alabama from refuse after most of the metals, rags, and large items were removed. The remaining materials were ground in a hammermill and composted in windrows for at least 16 weeks. The resulting product was fibrous in texture with much visible plastic and was ground so that glass, metal, and other rigid materials did not present a problem in handling. Analyses of municipal compost were as follows (ppm):N,12,600; P, 5,500; K, 6,600; Ca, 26,400; Mg,1,200; Na,4,900; Zn,1,000; Mn,510; Fe, 5,080; Cu, 490; and B, 51. Spurway analysis of extracts revealed (ppm):NO_3,2-5;P,0-1; K,20-40; and Ca,150-300. Municipal compost had a pH of 8.6, and a solubridge reading (1:5) of 70-195. Media were adjusted to pH 6.0 using either $CaCO_3$, or sulfur. Gypsum was added to sulfur-adjusted media at the rate of 0.8 kg per m^3. Superphosphate was added to all media at the rate of 1.6 kg per m^3. Media were steam pasteurized prior to planting. The same media were reused for Exp. 2

Standard commercial cultural procedures were as follows: Photoperiods controlled according to schedules for cut flowers, high fertility (200 ppm N, 88 ppm P, and 166 ppm K applied at each watering); and proper pinching, pruning (to 2 breaks), and disbudding. Minimum night temperature of 16° C. was maintained from planting until flowering, while day temperatures were approximately 22° C.

During the vegetative stage, leaf samples were taken at the fifth or sixth node (counting from the base of the plant) from randomly selected lateral shoots. Sampled leaves were dipped twice for 10 sec. in distilled water to remove pesticide residue and possible fertilizer contamination, dried at 67° C. for 24 hr., and ground in a Wiley Mill (20-mesh). Total N was determined from a 0.50-g sample using a direct reading emission spectrograph.

Growth data was taken when half the flowers in a treatment were mature. Twenty stems of each cultivar were selected for stem fresh weight and length, and flower head weight was determined on 5 flowers from each cultivar in each medium after drying at 67° C. for 24 hours.

Exp. 1 cuttings were benched on July 29 and subjected to photo-control so that flowering occurred Oct. 24-28. Vegetative foliar samples were taken on Sept. 9. Exp. 2 cuttings were benched on Dec. 15 in the same beds as Exp. 1 with the media being remixed, pH readjusted, amendment added when required. On Jan. 9 and 21, single applications of 1.2 g $MgSO_4$/l and 1 application of 2.4 g/l $Ca(H_2PO_4)_2$. Foliar samples were taken on Feb. 5, and growth data at flowering (March 22-24).

Experiments were designed as randomized complete blocks. Separate (when treatments did not rank the same) and combined analysis of variance were conducted on the experiments along with separation of means by Duncan's multiple range test. Correlation coefficients between growth and foliar content were also determined.

Results and Discussion: Foliar analysis data (N,P,K,Ca,Mg,Na,Zn,Mn,Cu, and B) and growth parameters (flower diameter and dry weight and flowering stem weight and length) indicated that municipal compost could be used as a soil amendment for chrysanthemum culture (Tables 3,4,5). Compost amendment produced plants high in foliar K, Cu, B, and Zn., a marginal leaf injury was observed in compost-grown plants. While K, Cu, and Zn toxicities were disproven, B toxicity still remained a possible explanation for the symptoms. Plants grown in perlite media were high in K, Ca, Cu, Al, B, and Zn, and perlite amendment may have accented the leaf injury observed in compost media. Negative correlations of growth parameters occurred with foliar K,Cu,Al,Na, and Zn concentrations (Table 6).

Publications: Gogue, G. J. and K. C. Sanderson. 1975. Municipal compost as a medium amendment for chrysanthemum culture. J. Amer. Soc. Hort. Sci. 100: 213-216.

Table 3. Foliar element concentration of chrysanthemum grown in various media

Media x/	N		P		K		Ca		Mg	
	Exp. 1	Exp. 2	Exp. 1	Exp. 2	Exp. 1	Exp. 2	Exp. 1	Exp. 2	Exp. 1	Exp. 2
	Percent dry weight									
	y/									
1	5.45	5.74a	0.72a	0.76a	5.71b	5.16de	1.00b	1.10c	0.42a	0.53a
2	4.80b	5.56a	0.52c	0.48d	7.96a	5.39cd	1.31a	1.44a	0.22b	0.28c
3	4.70b	5.63a	0.56a	0.60c	8.00a	6.30a	1.39a	1.30b	0.24b	0.29c
4	5.29a	5.67a	0.74a	0.71b	6.26b	4.58e	1.19b	1.16c	0.42a	0.52a
5	4.79b	5.58a	0.55cb	0.50d	7.82a	5.95ab	1.33a	1.44a	0.24b	0.29c
6	4.68b	5.64a	0.58b	0.60c	8.10a	5.64bc	1.35a	1.36ab	0.24b	0.33b
Mean	4.95b	5.63a	0.61a	0.61a	7.30a	5.71b	1.26a	1.30a	0.30b	0.37a

x/ Media were (v:v): 1) 1:1 (soil:peat), 2) 1:1:1 (soil:perlite:peat), 3) 1:1 (soil:municipal compost), 4) 1:1:1 (soil:peat:municipal compost), 5) 1:1:1 (soil:perlite:municipal compost), and 6) 2:2:1:1 (soil:perlite:peat:municipal compost).

y/ Mean separation in a column by Duncan's multiple range test, 5% level.

Table 3.(Con't.) Foliar element concentration of chrysanthemum grown in various media

ppm

Media	Mn	Fe	Cu	Al		B	Na		Zn	
	Exp. 1 & 1	Exp. 1 & 1	Exp. 1 & 2	Exp. 1	Exp. 2	Exp. 1	Exp. 2	Exp. 1 & 2	Exp. 1	Exp. 2
1	287a	101ab	25c	168c	65a	103d	49b	301a	67c	99b
2	306a	95bc	41a	240a	51a	191a	77a	522a	124a	117a
3	289a	92cd	36b	210ab	49a	162bc	64ab	298a	98b	114ab
4	279a	103a	23c	209ab	63a	117d	48b	277a	62c	81c
5	308a	88d	32b	205b	47a	169b	74a	300a	107b	104ab
6	299a	92cd	31b	216b	48a	150c	61ab	285a	98b	100b
Mean	294	95	31	208a	54b	148a	62b	330	92a	102a

Table 4. Effect of media on mean flower diameter, dry weight and fresh weight, and length of flowering stems of Chrysanthemum morifolium

Media x/	Flower Diam.(cm)	Flower Dry wt(g)	Flowering Stem wt(g)		Flowering Stem length(cm)	
	Exp. 1 & 2	Exp. 1 & 2	Exp.1	Exp.2	Exp. 1	Exp. 2
1	12.7a y/	4.0a	66.1a	66.3a	84.4a	74.8a
2	11.8b	3.4c	41.9c	52.3c	61.8b	63.9c
3	12.4a	3.6bc	54.3b	59.5b	70.9b	69.0b
4	12.7a	3.9ab	67.0a	60.9ab	83.4a	73.0a
5	12.3a	3.6bc	47.3c	56.8bc	65.9b	66.8bc
6	12.6a	3.7abc	55.5b	58.3bc	75.5b	67.9b
Mean	12.4	3.7	55.3	59.0	73.3	69.2

x/ Media were (v:v): 1) 1:1 (soil:peat), 2) 1:1:1 (soil:perlite:peat), 3) 1:1 (soil:municipal compost), 4) 1:1:1 (soil:peat:municipal compost), 5)1:1:1 soil:perlite:municipal compost), and 6) 2:2:1:1 (soil:perlite:peat:municipal compost).

y/ Means in a column followed by the same letter are not significantly different in the 5% level by Duncan's multiple range test.

Table 5. Element concentration and growth of two chrysanthemum cultivars

	Improved Albatross	CF 2 Good News
Element concentration		
	x/	
N %	5.34a	5.25b
P	0.56b	0.65a
K	6.43a	8.59a
Ca	1.02b	1.54a
Mg	0.24b	0.42a
Mn ppm	252b	337a
Fe	99a	91b
Cu	32a	31a
Al	129a	133a
B	109a	102a
Na	410a	251b
Zn	96a	99a
Growth measurements		
Flower diam. (cm)	11.2b	13.6a
Flower dry wt. (g)	16.9b	20.0a
Flowering stem wt. (g)	51.7b	62.6a
Stem length (cm)	65.2b	77.7a

x/ Means in a row followed by the same letter are not significantly different at the 5% level by Duncan's multiple range test.

Table 6. Correlations between growth and foliar element content of chrysanthemum, Exp. 1 and 2 and cvs. Improved Albatross and CF 2 Good News combined

Growth	Element											
	N	P	K	Ca	Mg	Mn	Fe	Cu	Al	B	Na	Zn
Flower diameter	-.12	.41 xx	.41 xx	.65 xx	.60 xx	.49 xx	-.20	.00	.10	-.04	-.16	-.13
Flower dry wt.	.58 xx	.27 xx	-.59 xx	.31 xx	.59 xx	.02	-.20	-.63 xx	-.64 xx	-.64 xx	-.33 xx	.03
Flowering stem fresh wt.	.29 xx	.57 xx	-.45 xx	.22 x	.67 xx	.20 x	-.05	-.36 xx	-.23 x	-.44 xx	-.32 xx	-.35 xx
Stem length	.02	.63 xx	-.20 x	.30 xx	.66 xx	.35 xx	-.02	-.07	.10	-.14	-.24 x	-.47 xx

x Significant at 5% level.

xx Significant at 1% level.

Effects of Growth Regulators on *Lilium longiflorum* Thumb.cv. Georgia[1]

Kenneth C. Sanderson, Willis C. Martin, Jr.,
Karen A. Marcus, and William E. Goslin[2]

Nature of Work: 'Georgia' Easter lilies produce taller potted plants than desired. Height reduction chemicals such as ammonium (5-hydroxycarvacryl) trimethylchloride piperidine carboxylate or Amo-618 (2-chloroethyl) phosphonic acid (CEPA) (2 chloroethyl) trimethyl-ammonium chloride (chlormequat) 2, 4-dichlorobenzyltributylphosphonium chloride (CBBP) and succinic acid-2, 2-dimethyl-hydrazide (SADH) have been tested on various lily cultivars for height reduction. CBBP has been found to be the most effective chemical and has been accepted commercially, however, CBBP treated plants often have weak stems that bend and break easily. This stem weakness has been attributed to a reduction in cell wall thickness in portions of the stem. Recently, a-cyclopropyl-a(p-methoxyphenyl)-5 pyrimidinemethanol or ancymidol has been found to be effective in reducing lily height. Ancymidol's effect on stem anatomy has not been reported.

The objective of this research was to compare the activity of several growth regulators on 'Georgia' lily growth and flowering, and stem anatomy.

Precooled Japanese Georgia Easter lily bulbs 15.0-17.5 cm size were potted in 15 cm clay pots, using steam pasteurized, 1:1:1 (v/v/v) soil, sphagnum peat moss and horticultural perlite as a potting medium on December 20, 1971. Dolomitic limestone (4.3 kg per m^3) and superphosphate (0.8 kg 8.8% P per m^3) were incorporated into the medium prior to pasteurization. Plants were fertilized every 2 weeks alternating 2.4 g per liter of 25.0 N-0.0 P -7.7 K with 3.0 g per liter of 15.0 N - 0.0P - 5.8K. Plants were grown at a minimum night temperature of 17° C.

A randomized block design with 2 replications, 20 treatments and 10 plants per treatment was used in applying the growth regulator drenches and sprays shown in Table 7). Drenches were applied directly to the media surface. Spray treatments were applied with a high pressure, low volume sprayer until the leaves glistened. Upon commencement of anthesis of the first flower bud on a plant, data were recorded on days to flowering from potting, number of flowers per plant and plant height. An AOV and appropriate mean separation were conducted on the data. Stem samples for cross-sectioning were also taken at flowering with the base and middle (as determined by leaf number) of the stem being sampled on 1 randomly selected plant per replication and treatment. The stem segments were killed and fixed in formalin-acetic acid-alcohol (5:5:90 v/v/v), dehydrated through a tert-butylalcohol series, and infiltrated with paraplast. Cross sections at 12 were made, using an A0820 microtome and stained with azure blue B.

Results and Discussion:

Concentration drenches and sprays of a-cyclopropyl-a (p-methoxphenyl)-5 primidinemethanol (ancymidol) were comparable to 2,4-dichloro-benzyltributylphosphonium chloride in inhibiting stem growth in 'Georgia' Easter lily (Table 7). Both materials produced plant stems with enlarged, thin-walled cells. Cross sections of stems from plants receiving split applications of

CBBP drenches or ancymidol drenches and sprays exhibited slightly thicker cell walls in some instances. Some of the higher rates of ancymidol delayed flowering and reduced the number of flowers per plant. Drenches of (2-chloroethyl) phosphonic acid and sprays of ethyl hydrogen 1- propylphosphonate, aborted flower buds and showed some promise as deflowering agents in commercial lily bulb production.

Publications: Sanderson, K. C., W. C. Martin, Jr., Karen A. Marcus and W. E. Goslin. 1975. Effects of plant growth regulators on *Lilium longiflorum* Thumb. cv. Georgia. HortScience 10:611-613.

Table 7. Effect of application method, chemical and rate of growth regulators on days from planting to flowering number of flowers per plant and height of 'Georgia' Easter lily

Application and chemical	Code name	Rate[z] (ppm)	Days from planting to flowering	Number of flowers per plant	Plant height (cm)
Check	---	---	107.5f[y]	2.8abc	54.2a
Drenches 240 ml/15 cm pot applied					
(2-chloroethyl) phosphonic acid . .	CEPA	100	110.8bcd	1.6d	36.6f
2,4-dichlorobenzyl tributyl-phosphonium chloride . .	CBBP	2,400	109.8cd	3.2ab	42.9e
2,4-dichlorobenzyl tributyl-phosphonium chloride . .	CBBP	800 (3x)	110.6bcd	3.1ab	49.3cd
a-cyclopropyl -a-(p-methoxy- . . . . phenyl)-5-pyrimidinemethanol	Ancy-midol	2	109.8cd	3.0ab	37.5f
a-cyclopropyl-a-(p-methoxy- . . . . phenyl)-5-pyrimidinemethanol	Ancy-midol	4	111.5bc	2.9ab	29.2g
a-cyclopropyl-a-(p-methoxy- . . . . phenyl)-5-pyrimidinemethanol	Ancy-midol	6	112.1b	2.8abc	27.0gh
a-cyclopropyl-a-(p-methoxy- . . . . phenyl)-5-pyrimidinemethanol	Ancy-midol	8	114.2a	2.5cd	23.9h
a-cyclopropyl-a-(p-methoxy- . . . . phenyl)-5-pyrimidinemethanol	Ancy-midol	2(3x)	110.4bcd	3.1ab	29.7g
Sprays applied until leaf glistened					
a-cyclopropyl-a-(p-methoxy-. . . . . phenyl)-5-pyrimidinemethanol	Ancy-midol	100	109.4de	2.9ab	46.9cde
a-cyclopropyl-a-(p-methoxy- . . . . phenyl)-5-pyrimidinemethanol	Ancy-midol	125	108.8def	3.5a	46.6cde
a-cyclopropyl-a-(p-methoxy- . . . . phenyl)-5-pyrimidinemethanol	Ancy-midol	150	109.8cd	3.3a	44.9de

Continued

Table 7. Continued

Application and chemical	Code name	Rate[z] (ppm)	Days from planting to flowering	Number of flowers per plant	Plant height (cm)
a-cyclopropyl-a-(p-methoxy- . . . . phenyl)-5-pyrimidinemethanol	Ancy-midol	200	110.2cd	2.9ab	43.7e
a-cyclopropyl-a-(p-methoxy- . . . . phenyl)-5-pyrimidinemethanol	Ancy-midol	50(2x)	108.8def	2.7abc	48.3bcd
Ethyl hydrogen 1-propylphosphonate	EHPP	250	100.1cd	2.8ab	51.1ab
Ethyl hydrogen 1-propylphosphonate	EHPP	500	111.2bc	2.8ab	50.9abc
Ethyl hydrogen 1-propylphosphonate	EHPP	1000	107.7ef	1.9ced	49.3cd
3,3a-dihydro-2(p-methoxyphenyl-8H-pyrazolo[5,1-a]isoindol-8-one	DPX1840	50	107.3f	3.0ab	54.5g

z Rates marked 2-3x indicate a split application with rate being applied 2-3 times.

y Mean separation for growth parameter in columns, by Duncan's multiple range test, 5% level.

A Survey of the Advertising Practices of Alabama Retail Florists

Hugh Deese and Kenneth C. Sanderson

Nature of Work: Many florists fail to realize the true value of good advertising. Some consider money and time spent on advertising a waste and do very little advertising. With the increasing availability of flowers from outlets other than retail flower shops, it has become of great importance to the retail florist to develop a solid, appealing advertising campaign to successfully compete for a fair share of the flower business. Therefore, a study was made involving a survey of 100 Alabama retail florists to obtain information about their advertising practices. This survey sought to determine 1) how many florists advertised; 2) how many of the advertising florists employed a long range, carefully planned advertising campaign; 3) the most widely used methods of advertising; 4) the most successful methods of advertising.

The 100 florists surveyed were selected at random from all Teleflora affiliates (193) and all Florafax[1] affiliates (173) in Alabama as listed in the October 1974 issue of the Teleflora Spirit and the October 1974 issue of Florafacts, respectively. The sampling was divided equally among affiliates of the two organizations. A questionnaire was devised containing 22 objective questions which could be easily and quickly answered. A short letter of explanation and a self-addressed stamped envelope accompanied the questionnaire to the 100 selected florists during the fall of 1974. The replies were totaled, and percentages were calculated for the various questions.

Results and Discussion: Of the 100 florists receiving the questionnaire 57 completed and returned it. The following concluded from the results:

Eighty-six per cent of the florists advertised to some extent. Sixty-six percent directed their advertising campaign toward selling services. Of these, eighty-five percent were also concerned with selling products.

Sixty-five percent of the florists who advertised did not have a budget for advertising. Most of the shops were old established shops who advertised only when they felt the need.

The 35 percent that did have a special budget for advertising determined it by: percentages of sales (41%); past experience (53%); or guess work (6%).

Approximately 8 percent of the advertising florists employed yellow pages, word-of-mouth, high school yearbooks and charitable donations as their primary advertising forms. Sixty-five percent used newspaper and radio advertising.

Most florists consider word-of-mouth the most effective form of advertising. Effective window display is considered to be second and charitable gifts, etc., third.

[1] Teleflora, Inc., a division of Reuben H. Donnelly Corp., 2400 Compton Blvd. Redondo Beach, Calif. Florafax Delivery Inc., P.O. Box 9, Leachville, Ark. "Wire organizations" offering many services to the public and retail florists, in addition to delivering flowers over long distances.

Florists are concerned about good will for their shops as indicated by the number who donate to charities (79%) while only 18 percent found it to be a very effective advertising technique.

Most florists have been in business long enough to have come up with the best suited advertising campaign for their shop. Ninety-one percent of the florists are satisfied with their advertising campaign.

Publications: Deese H., and K. C. Sanderson. 1976. Advertising practices of Alabama retail florists. Florists' Rev. April 15, 1976. p. 56-57.

An Evaluation of Snapdragon Cultivars Grown in Central Alabama

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Nature of Work: Growth and quality parameters (fresh plant height and weight, flower spike length, and stem strength) were measured on snapdragon, Anthirrium majus L. cultivars grown under Central Alabama conditions. Plants were grown in a glasshouse at a minimum temperature of 62° F. Tests were conducted in full sun from October to May and under very light shade (10%) from May to October. A fan and pad cooling system was also used from May to October. Appropriate cultivars were selected for testing according to their response to light, temperature and photoperiod. Seedlings were transplanted into a steam pastuerized 1:1:1 (v/v/v) soil, peat moss, perlite medium. All plants were spaced 16 sq. in. per plant and grown single stem. Fertilization consisted of 2 lbs. of either 25-10-10 or 20-20-20 per 100 gal. every 2 weeks. Growth data were taken on 20 plants at harvest, i.e., when 1/3 to 1/2 of the florets were open.

Results and Discussion: Group II cultivars (Dec. 1 - Apr. 30 flowering) equalling or exceeding the growth parameters measured were 'McKinley', 'Phoenix', and 'Rocky Mountain'. The Group II cultivars 'Potomac Ivory', 'Potomac Pink', 'San Francisco', and 'Winchester' performed best for May 1 to June 30 flowering. 'Miami' was the only outstanding Group IV (June 10-Sept. 30 flowering) cultivar. For Oct. 1 - Nov. 1 flowering, 'Potomac Ivory', 'Tampico', 'Roanoke', 'Idaho', 'Kentucky', 'Virginia' were the best vultivars. 'Kansas' was the only Group III cultivar to equal or exceed Group growth parameters when flowered out-of-season (Dec.- March).

Publications: Sanderson, K. C. 1975. Snapdragons - A crop to meet the energy crisis. Florists' Rev. 156.

Sanderson, K. C. and W. C. Martin, Jr. 1975. Evaluation and scheduling of snapdragon cultivars. Agric. Expt. Sta. Auburn University Bul. 468. 21p.