

'Albatross.' Most effective treatment was at 1.2% on 22 SD although the terminal peduncle was also stunted. Conc'n of 1.4% caused the terminal inflorescence to form a crown bud. Variability among plants was too large for any of the treatments to be of practical value.

An effective chemical which disbudded chrysanthemums would reduce production costs. Even if the chemical consistently retarded all but 3-4 of the laterals, it would have practical value. These remaining laterals could be removed manually at a reduced expense. P-293, which was reported to disbud chrysanthemums grown under research greenhouse conditions with a relatively constant temperature and humidity (2, 11, 15), was not effective in Florida when applied to chrysanthemums grown under ambient temp in a polypropylene shade house. A recent report (12) indicated adverse effects of P-293 when applied to mums grown under less than optimum growing conditions. P-293 has too narrow a tolerance range to environmental conditions to be of practical value on chrysanthemums grown in shade structures in Florida.

#### Literature Cited

1. Cathey, H. M. 1968. Report of cooperative trial of chemical pruning of chrysanthemums with fatty acid esters. *Florists' Review* 141: 19-21, 37-40.
2. ————. 1976. Influence of a substituted oxathiin, a localized growth inhibitor on the stem elongation, branching, and flowering of *Chrysanthemum morifolium* Ramat. *J. Amer. Soc. Hort. Sci.* 101:599-604.

3. ————, A. H. Yooman, and F. F. Smith. 1966. Abortion of flower buds in chrysanthemum after application of a selected petroleum fraction of high aromatic content. *HortScience* 1:61-62.
4. Hasek, R. F. and R. H. Sciaroni. 1973. Height control of pot chrysanthemums with A-Rest. *Florists' Rev.* 15:53-54.
5. Joiner, J. N. and G. D. Picklardt. 1970. Chemical pruning and disbudding of *Chrysanthemum morifolium*. *Proc. Fla. State Hort. Soc.* 83:462-465.
6. Kofranek, A. M. and R. A. Criley. 1967. Emulsifiable oils as disbudding agents for chrysanthemums. *Florists' Rev.* 139:24-25, 36, 57-58.
7. ———— and L. Markiewicz. 1967. Selected naphthalenes as disbudding agents for chrysanthemums. *Florists' Rev.* 140:20-21, 54, 57.
8. Larson, R. A. and R. K. Kimmins. 1971. Results of a new growth regulator. *Florists' Rev.* 148:22-23, 54.
9. Shabot, R., H. K. Tayama, and D. C. Kiplinger. 1975. The use of substituted oxathiin sprays as a means of suppressing lateral flower shoot development of *Chrysanthemum morifolium*. *HortScience* 10:309. (Abstr.)
10. Parups, E. V. 1972. "Ekatin" for disbudding of chrysanthemums. *Greenhouse, Garden, Grass* 11:75-79.
11. Parups, E. V. 1976. Use of 2,3-dihydro-5,6-diphenyl-1,4-oxathiin for disbudding of standard chrysanthemums. *Can. J. Plant Sci.* 56:531-537.
12. ————. 1977. Effectiveness of 2,3-dihydro-5,6-diphenyl-1,4-oxathiin for disbudding of chrysanthemums grown under different environmental conditions. *HortScience* 12:332-334.
13. Wilfret, G. J. 1974. Effect of B-9 and A-Rest on height of garden chrysanthemums grown as single-plant pots. *Proc. Fla. State Hort. Soc.* 87:483-488.
14. ————, J. A. Otte, and B. K. Harbaugh. 1976. Chrysanthemum peduncle elongation and a cost analysis of three production methods. *Proc. Fla. State Hort. Soc.* 89:316-319.
15. Zacharioudakis, J. N. and R. A. Larson. 1976. Chemical removal of lateral buds of *Chrysanthemum morifolium* Ramat. *HortScience* 11:36-37.

*Proc. Fla. State Hort. Soc.* 90:345-347. 1977.

## EVOLUTION OF A COMMUNICATION TOOL FOR THE TROPICAL FOLIAGE PLANT INDUSTRY<sup>1</sup>

A. DONNAN, JR.  
Oakdell, Inc.,  
Apopka, FL 32703

R. W. HENLEY  
IFAS Agricultural Research Center,  
University of Florida,  
Apopka, FL 32703

L. FALL  
Grower Information Service,  
Apopka, FL 32703

**Abstract.** With rapid expansion of all segments of the foliage plant industry—production, wholesale, retail and related products and service, there was a need to efficiently communicate between those persons producing plants and those purchasing products for resale.

In the winter of 1974 a proposal was submitted to the Central Foliage Chapter of F.N.G.A. which is now the Florida Foliage Association, Inc., for a foliage buyer's guide. Objectives of the publication were as follows: 1) Develop a general guide for sources of specific plant species and plant sizes; 2) Provide opportunities for more small specialty growers to be recognized for their area of excellence; 3) Improve communication between producers, wholesalers and those

buying plants for retail sales and to insure more extensive use of foliage plants in the future; 4) Establish a more uniform system of plant nomenclature using both complete horticultural names and most acceptable common names.

A report of the development and use of the Florida Foliage Buyer's Guide<sup>2</sup> is provided herein.

With the rapid increase in popularity in the 1970's of foliage plants as house plants and for interior landscaping, it became evident that certain sectors of the foliage industry were not developing at equal rates. Many potential buyers did not know what plant they were looking for or where to buy it. Growers were not aware of how much of a particular crop was grown or what the most popular container size was.

In 1974, several members of the then Central Foliage Chapter of the Florida Nurserymen and Growers Association and now the Florida Foliage Association proposed the establishment of a communication means between the growers of indoor tropical foliage plants in Florida and buyers throughout the United States. In 1975 the Florida Foliage Buyer's Guide Trust was formed, and the first edition of the Florida Foliage Buyer's Guide was published listing the products of 78 growers. In 1976 the trust was dissolved and the organization became known as the Florida Foliage

<sup>1</sup>Acknowledgement is given to other members of the Board of Directors of The Florida Foliage Buyer's Guide including: Mrs. Jane Rogers, Paul Bellinger, Alan Cone, Jim Ferguson, Florence Little and Will Webb.

<sup>2</sup>The FFBG can be purchased by writing to: The Florida Foliage Buyer's Guide or The Florida Foliage Association, Drawer Y, Apopka, FL 32703. Individual copies are available at a cost of \$35.00 and yearly computer updates are available at \$15.00 per year.

Buyer's Guide, Inc. (FFBG). The 1976 edition represented plants grown by 140 Florida producers. In 1977 the Guide was updated twice with a computer tabulation listing plants produced by 162 growers.

The FFBG has become a multipurpose publication. As an educational tool the publication has helped to standardize plant names and is an excellent pictorial identification guide that contains over 250 color photographs. The FFBG is beneficial to the foliage industry in numerous ways. The concept of a buyers guide is not unique, but contains several unique features. Color pictures for identification, maps showing locations of firms listed in the guide, a number code for growers and plants listed and a cross-reference of botanical and common plant names make the FFBG a useful and easy to use publication. Listing specific plants and approximate yearly production by growers affords the buyers some sort of idea as to availability. As the season and the market change, the plant availability will also change. The guide was meant to be a starting point in buying. The FFBG has been a means of allowing new firms to advertise and place their product in the market with the old established firms.

### Materials and Methods

Questionnaires were sent to all nurseries in the state of Florida listed in the Florida Certified Nursery List made available by the Division of Plant Industry. Information was retrieved from the questionnaires and data obtained through various computer programs were printed.

Data for this paper were generated by securing information on an IBM magnetic tape from the grower detail file from the 1977 FFBG update. The data were converted and formulated for a Datapoint 4520 disc computer system. The grower detail file records consisted of the following information: Grower number—4 digits, plant number—4 digits, plant type—2 alpha, pot size—5 digits, quantity code—1 alpha with estimated yearly production in 5 ranges. The converted files were sorted and accumulated by the various fields.

### Results and Discussion

In its brief 3 year existence, the FFBG has become a financial success as well as a valuable addition to the foliage industry. The number of growers listing plants has grown from 78 to 162. The 1977 edition contains information on over 350 plant species. A total of 260,528,000 units of plant material were listed in the 1977 FFBG. Over 4,000 issues of this publication have been distributed to buyers, academic institutions and other growers throughout the world. The information contained in the publication has helped buyers locate specific plant materials. The pictorial guide and the cross reference sections have begun to standardize plant nomenclature.

The majority of the growers listing plants in the FFBG grew 30 or less different plant species (Table 1). Seventy-four percent of the growers grew 30 species or less that amounted to 28.8% of the total volume of units listed. Only 1.2% of the growers listed 100 species or more, but this represented 21.5% of the total volume. Without having any previous statistics to compare with, it is difficult to ascertain whether there is a trend towards growing fewer species or if data were generated from smaller growers.

*Dracaena marginata* grown in 6 inch pots was the plant most frequently listed in the FFBG. Of interest is that the first plant listed that was grown in a 3 inch pot was ranked 11th (Table 2). It should be noted that in Table 3 the most popular pot size was the 3 inch pot. Although many

Table 1. Product mix and volume of growers listing in the Florida Foliage Buyer's Guide.

Number of species	Number of growers	% Growers	Volume*	% Total volume
1- 10	57	35.2	19.1	7.3
11- 20	37	22.8	30.1	11.6
21- 30	26	16.0	25.9	9.9
31- 40	12	7.4	25.7	9.9
41- 50	11	6.8	25.0	9.6
51- 60	7	4.3	24.6	9.4
61- 70	6	3.7	29.8	11.4
71- 80	3	1.8	14.5	5.6
81- 90	1	0.6	9.9	3.8
91-100	0	0.0	0.0	0.0
100+	2	1.2	55.9	21.5

\*Volume in millions.

Table 2. Frequency of listing of plants in the 1977 Florida Foliage Buyer's Guide.

Plant	Pot size*	% Growers listing	Volume <sup>†</sup>	% Total volume
<i>Dracaena marginata</i>	6	32.7	1.7	0.67
<i>Dracaena fragrans</i> Massangeana	6	30.9	1.4	0.52
<i>Dracaena marginata</i>	10	29.6	1.0	0.39
<i>Brassaia actinophylla</i>	10	29.0	1.1	0.43
<i>Chrysalidocarpus lutescens</i>	10	29.0	0.7	0.28
<i>Araucaria heterophylla</i>	6	28.0	1.3	0.50
<i>Brassaia actinophylla</i>	6	28.0	1.6	0.61
<i>Ficus benjamina</i>	10	27.8	0.7	0.27
<i>Chrysalidocarpus lutescens</i>	6	25.9	1.2	0.46
<i>Dracaena fragrans</i> Massangeana	10	25.9	0.9	0.34
<i>Philodendron oxycardium</i>	3	22.8	3.7	1.30
<i>Ficus benjamina</i>	6	21.6	0.7	0.27

\*Pot size in inches.

<sup>†</sup>Volume in millions.

Table 3. Rank by volume of sales according to growing container size.

Item	Pot size	Volume	% Total volume
Potted plants	3	69.3	26.6
	6	28.5	10.9
	4	19.9	7.7
	2½	15.2	5.8
Hanging baskets	8	5.3	2.0
	6	2.1	0.8
	5½	1.1	0.4
	10	1.0	0.4
Totem poles	6 x 24	1.7	0.7
	8 x 36	1.1	0.4
	10 x 48	0.7	0.3
	5 x 18	0.4	0.2

items were ranked high in frequency, they did not amount to a large volume. Most of the plant material grown in the large pot sizes is produced in the southern part of the state.

Three inch pots were most frequently listed of all pot sizes accounting for 69.3 million units and 26.6% of the total volume. Of the 12 plants and pot sizes listed in Table 3, 5 species were in 10 inch pots. However, the 10 inch pots were not ranked high compared with other pot sizes. Eight inch hanging baskets and 6x24 inch totem poles were ranked highest in their respective categories. More plant material is sold in pots than in hanging baskets or totem poles combined.

*Philodendron oxycardium* was the most popular plant in each of the highest ranked container sizes in each category (Table 4). In these container sizes it represented 50.3 million units. *Scindapsus* spp. are also listed in each of the categories.

Table 4. Most commonly listed plants in 3 different product types.

Item	Plant	Volume*
Potted plant— 3 inch	<i>Philodendron oxycardium</i>	37.4
	<i>Chamaedorea elegans</i> Bella	22.1
	<i>Brassaia actinophylla</i>	19.0
	<i>Scindapsus aureus</i>	18.8
	<i>Maranta leuconeura kerchoveana</i>	18.6
Hanging basket— 8 inch	<i>Philodendron oxycardium</i>	5.9
	<i>Scindapsus aureus</i>	3.6
	<i>Episcia cupreata</i>	3.4
	<i>Cissus discolor</i>	3.1
	<i>Gynura sarmantosa</i>	2.1
Totem poles— 6 x 24 inch	<i>Philodendron oxycardium</i>	7.0
	<i>Scindapsus aureus</i> 'Wilcoxii'	3.6
	<i>Monstera deliciosa</i>	1.9
	<i>Philodendron panduriforme</i>	1.6
	<i>Scindapsus aureus</i>	0.9

\*Volume in millions.

Proc. Fla. State Hort. Soc. 90:347-349. 1977.

## NURSERY PROPAGATION AND THE ANATOMICAL UNION OF CLEFT GRAFTED GARDENIAS<sup>1</sup>

MARGARET J. MUSTARD  
Department of Biology,  
University of Miami,  
Coral Gables, FL 33124

S. JOHN LYNCH  
Lynch's Ornamental Nursery,  
Bradenton, FL 33505

Additional index words. *Gardenia jasminoides* Ellis, histology of graft unions.

**Abstract.** The technique of cleft grafting *Gardenia jasminoides* Ellis on juvenile stock of *G. Thunbergia* Linn. is described. Grafts of both 'Amei' and 'Veitchii' varieties were collected at weekly intervals and prepared by standard histological methods for study. It was found that callus, produced primarily by cortex, phloem rays and pith of the stock, united stock and scion within 14 days after grafting. The cambial bridge was completed and produced secondary vascular tissue within 21 days. Isolated patches of xylem elements were observed within callus completely independent of the cambial bridge.

Vegetative propagation of plants by budding and grafting has been practiced for centuries. Roberts (13) published an excellent summary of the history and theoretical aspects of grafting. Since that time, much has been published concerning grafting and budding of plants but a

<sup>1</sup>The senior author wishes to acknowledge her indebtedness and that of the late Mr. S. John Lynch to Mrs. Lynch for her technical assistance throughout this investigation.

Proc. Fla. State Hort. Soc. 90: 1977.

Data were computed on each of the plants listed in the 1977 FFBG as to the volume grown in any particular container size. Table 5 is an example of this type of information for *Philodendron oxycardium*. Although 3 inch pots represent the most commonly produced unit, of interest was the total of rooted and unrooted cuttings produced. This type of general information is helpful to the grower contemplating growing a particular crop and is in need of what is being produced by the rest of the industry.

Table 5. Availability of *Philodendron oxycardium* ranked by production unit.

Item	Size*	Volume*
Potted plant	3	37.4
Rooted cutting	—	34.3
Potted plant	4	12.3
Unrooted cutting	—	11.8
Totem pole	6 x 24	7.0
Hanging basket	8	5.9

\*Size in inches.

\*Volume in millions.

survey of the literature has revealed no detailed description of gardenia cleft grafting.

Successful union of any stock and scion is dependent upon proliferation of callus tissue between graft components followed by union of vascular tissues. Eames and MacDaniels (3) state that vascular cambium is the major source of callus. Subsequent investigations have shown that proliferation of callus may occur from various tissues of stock and scion including cortex, phloem, xylem and pith with vascular cambium contributing little if any callus to the union (1, 2, 4, 6, 14, 15). Variations in callus origin are probably associated in part with differences in budding and grafting techniques employed and to inherent differences in respective stocks and scions. It is generally agreed that callus cells differentiate forming the cambial bridge between stock and scion (2, 10, 11, 14). As early as 1934, Crafts (2) observed that sieve tubes and xylem elements differentiate as strands in callus a few days after grafting connecting the younger vascular tissue of stock and scion prior to the differentiation of the vascular cambium. He suggested that orientation of the cambia initials may be determined by these vascular strands. Early differentiation of isolated cells, which might serve as conducting elements, within callus of grafts has since been reported (1, 4, 6).

### Materials and Methods

Young seedlings of *Gardenia Thunbergia* Linn., a nematode-resistant species, were used as stock and 2 varieties of *Gardenia jasminoides* Ellis 'Amei' and 'Veitchii', were used as scions. The seeds were planted in flats and the seedlings subsequently transferred to 2 by 2 inch (5 by 5 cm) plastic pots. At the time of grafting, both the stocks and scions were in a flush of new growth. 'Amei' grafts were