



## What Do Dendrobium Orchid Producers Want in Their Potted Flowers?—Results of a Grower Survey

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Potted orchids occupy a strong position among horticultural commodities in Hawaii and the USA. Various cultivars of *Dendrobium* orchid sold as potted plants ranked fourth in wholesale value of sales among floriculture and nursery products in the state in 2001, after palms, dracaenas, and cut-flower anthuriums. Potted dendrobiums also ranked fourth in out-of-state sales for flower and nursery crops, after foliage plants, anthuriums, and other potted orchids. Data from 76 growers reported sales of 1 million dendrobium plants in bud or bloom and 140,000 propagules (community pots), for a combined farm-gate value of \$6.6 million (\$4.9 million reported at the point the commodity left the state for out-of-state sale). Nationally, potted orchid value of sales increased dramatically to 12 percent of the total of all potted flowering plants in 2001, surpassing potted chrysanthemums, florist azaleas, and Easter lilies.

The College of Tropical Agriculture and Human Resources, the University of Hawaii's land-grant college, has a mandate to provide Hawaii's agricultural industry with new plant varieties suitable for commercial cropping. Attributes that have been considered desirable for flowering potted plants in the UH breeding program, described in Kamemoto et al., 1999, include the following:

- attractive, relatively short plant with upright to arching sprays
- long-lasting flowers
- a minimum of two sprays per plant per flowering period
- more than one flowering period per year
- upright pseudobulbs under 24 inches (61.0 cm) tall
- multiple pseudobulbs
- green, pliable leaves free of disease.

In 2001, a survey titled "Potted dendrobiums for export: Future market and production desires," was sent to producers of potted dendrobiums throughout the state to determine how these traits were regarded and which other traits the growers would like to see in future varieties that might be suitable for export to the continental USA.

A total of 34 growers responded, or 45 percent of the commercial growers in the state; 22 were from the island of Hawaii (also referred to as "the Big Island"), representing 58 percent of the growers in that county (A. Osaki, Hawaii Agricultural Statistics Service, Hawaii Department of Agriculture, personal communication). The other 12 were located on Oahu (41 percent of Oahu growers).

The top three products sold by the respondents were larger size plant materials that were nonflowering (near-blooming or blooming size) or plants in bud or bloom (Table 1). Half of the growers produced only one product type, while the other half produced two or more of the product types (Table 2).

### Survey results

Results of the market survey indicate that varietal improvement for the mass market should focus on compact growth (less than 3 feet overall plant height, or 2 feet pseudobulb height), early flowering, full flowers, and an array of color. Examples of UH cultivars that have one or more of these attributes are given in Table 3. A considerable amount of flexibility in desire for product attributes exists among the grower groups, suggesting that a wide range of attributes in new hybrids would find grower acceptance.

**Table 1. Products sold by survey respondents.**

Product sold	Oahu		Big Island		Total	
	Frequency	%	Frequency	%	Frequency	%
Flasks	3	25	3	14	6	18
Compots	2	17	1	5	3	9
Liners	3	25	4	18	7	21
Near-blooming size	3	25	9	41	12	35
Blooming size	6	50	10	45	16	47
Plants in bud or bloom	10	83	21	95	31	91

Percentages total greater than 100 because of overlap in products sold.

**Time to finish**

Acceptable finishing times for marketable plants were less than 24 months from flask (Fig. 1) and less than 18 months from compot (Fig. 2). However, for 25 percent of Oahu growers, less than 24 months from compot was also acceptable.

**Finished plant height**

Growers preferred compact finished growth with pseudobulbs ranging from 12 to 14 inches in height (Fig. 3). Oahu growers (43 percent) preferred the plant height to be about 12–14 inches, while Big Island growers seemed to accept a wider range of plant heights. Some growers in both locations preferred more than one size. When the finished plant height including sprays is considered, growers in Oahu preferred 15–24 inches finished size, while Big Island growers preferred 25–36 inches (Fig. 4). A number of growers indicated no preference for overall plant height and indicated that all sizes

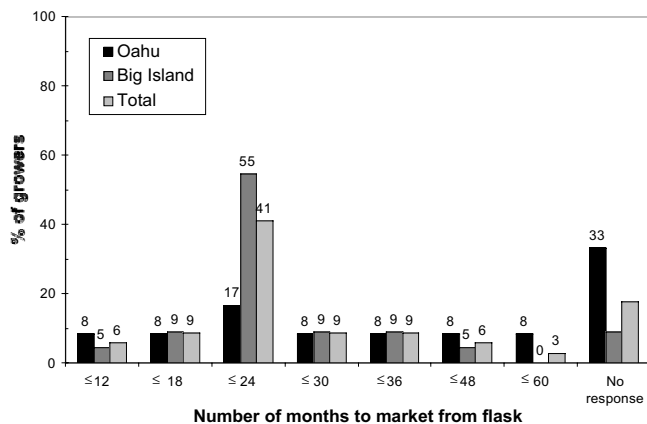
**Table 2. Survey respondent production types.**

Production type	Oahu		Big Island		Total	
	Freq.	%	Freq.	%	Freq.	%
Single	7	58	11	50	18	53
Multiple	5	42	11	50	16	47
Total	12	100	22	100	34	100

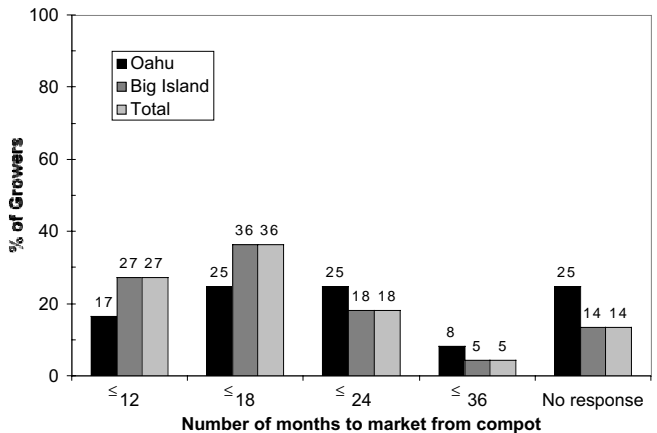
have a market. For instance, intermediate size materials, such as cut-flower varieties beyond their first year of flowering, are used in containers for interior decoration of larger spaces.

The use of dwarf varieties produced genetically was preferred by 62 percent of responding growers (Fig. 5), and 65 percent of respondents indicated that they would not or probably would not use growth regulators to in-

**Fig. 1. Acceptable time frame from flask to finished product.**



**Fig. 2. Acceptable time frame from compot to finished product.**

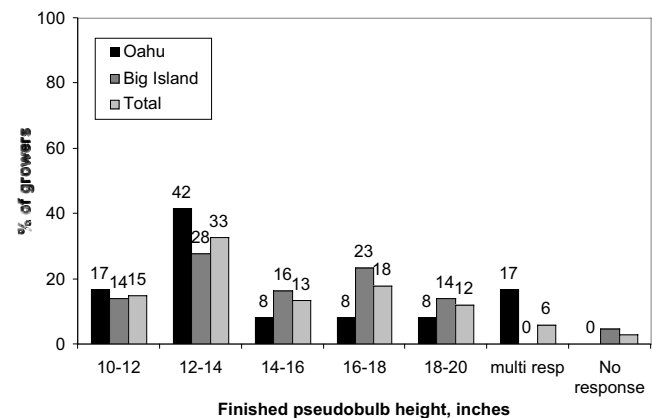


**Table 3. Attributes of some University of Hawaii seed-propagated *Dendrobium* potted plant cultivars.**

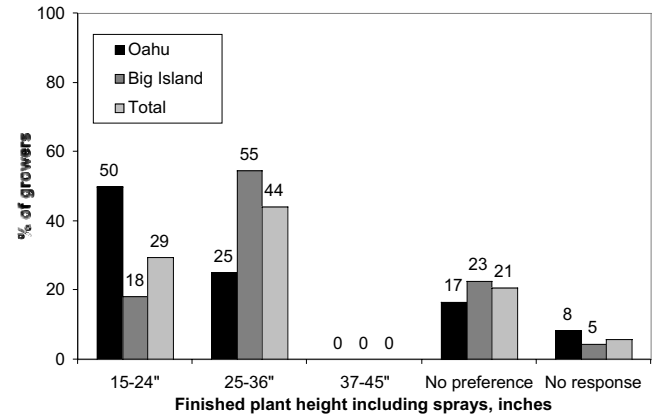
Name	Color	Attributes
Sylvia Yuen (UH1101)	Yellow petals with purple lip	Twisted petals, long-lasting flowers on compact plants
Susan Takahashi (UH999)	Dark purple	Dark purple medium sized flowers
Cathy Beck (UH1221)	Lavender	Compact growth, precocious flowering
Pua'ala (UH1182)	Purple	Star shaped flowers with white margins
Remy Hartmann (UH1307)	Lavender	Compact growth
Lim Chong Min (UH1382)	Lavender	Compact growth, free flowering
Miyoko Azuma (UH1121)	Dark purple	Full rounded flower
Sharon Sewake (UH1419)	Purple	Small, rounded flower
Uniwai Sunrise (UH1323)	Red-purple	Robust growth
Mari Marutani (UH1420)	Purple	Full rounded flower
Lorrie Mortimer (UH1577)	Lavender turning yellow-green	Spray longevity on plant
Winifred Ogata (UH1371)	Two-tone lavender	Full rounded flower

duce dwarfing (Fig. 6). Growers will use growth regulators for height control provided that results are consistent and plants are not deformed. Added cost, markup, labor, and health concerns were reasons for not adopting this production practice.

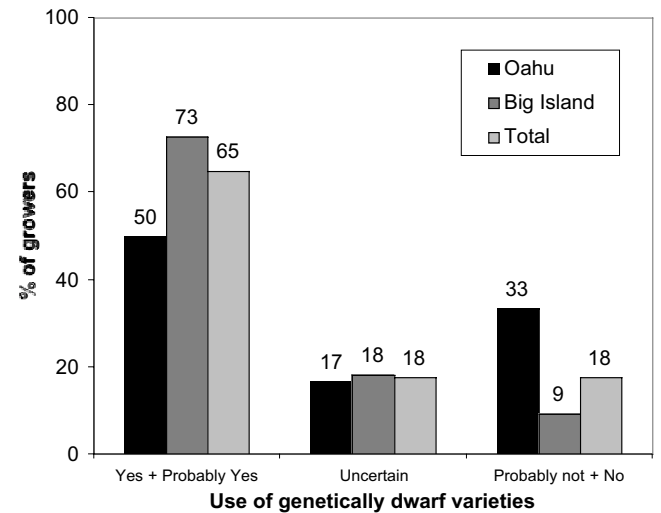
**Fig. 3. Growers' preference for finished plant (pseudobulb) height.**



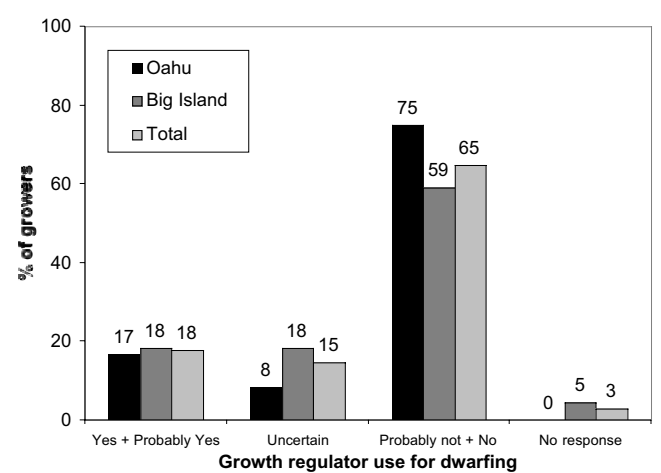
**Fig. 4. Growers' preference for finished plant height, including sprays.**



**Fig. 5. Growers' attitudes toward utilizing genetically dwarf varieties.**



**Fig. 6. Growers' attitudes toward growth regulator use for height control.**

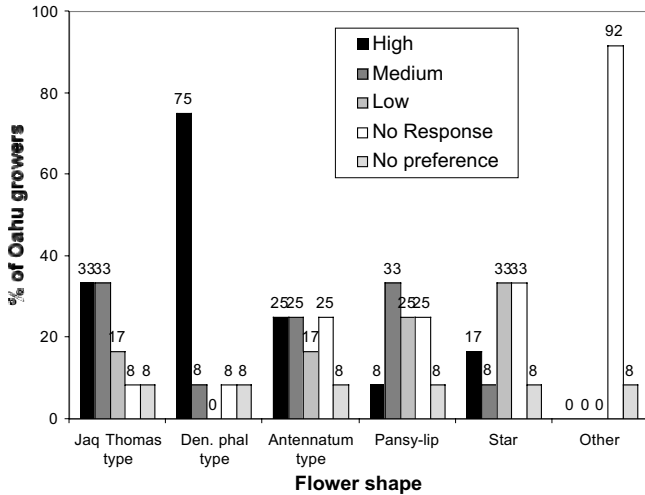


**Flower shape**

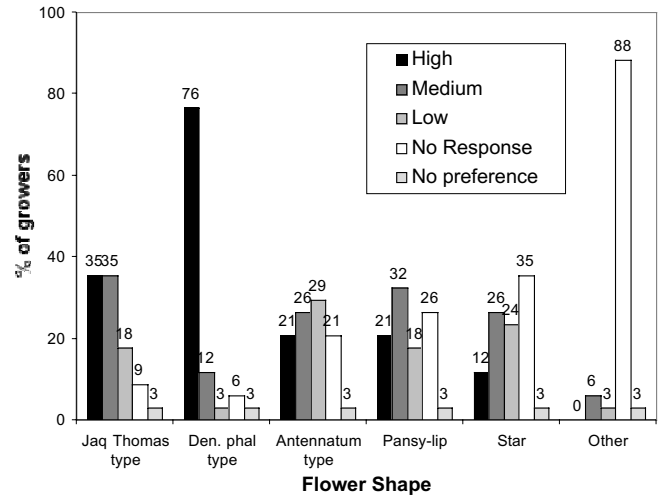
The rounder and fuller shape of *Dendrobium phalaenopsis* is preferred by about 75 percent of respondents, followed by the Jaquelyn Thomas types (Figs. 7–9). Oahu growers had a higher preference for antennatum

types and star shapes (Fig. 7), unlike the Big Island growers, who preferred pansy-lip over antennatum types or star shapes (Fig. 8). Over 70 percent of respondents are willing to utilize novelty shapes in their product mix (Fig. 10).

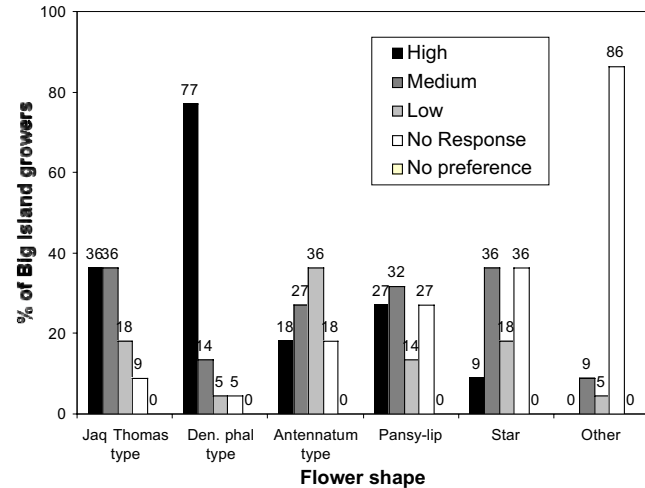
**Fig. 7. Flower shape preferences of Oahu growers.**



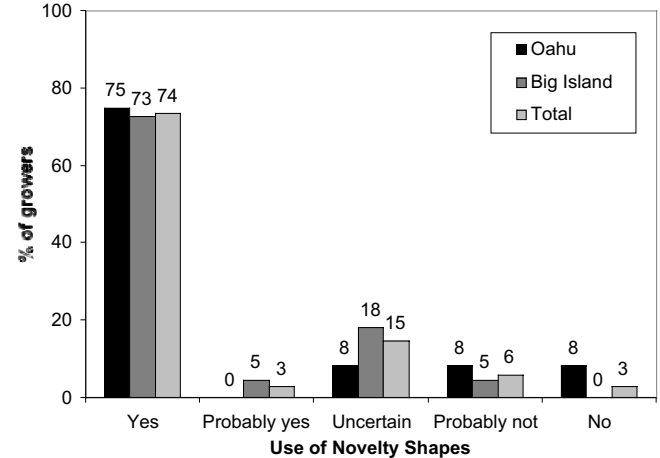
**Fig. 9. Flower shape preferences of combined counties.**



**Fig. 8. Flower shape preferences of Big Island growers.**



**Fig. 10. Attitudes toward using novelty shapes.**



**Flower color**

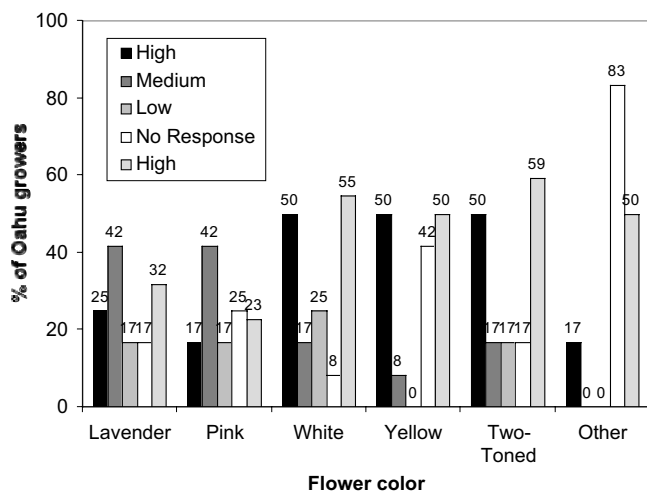
White, yellow, and two-tone flowers were mostly preferred by Oahu (Fig. 11) and Big Island (Fig. 12) growers. The latter also indicated interest in other colors, including purple, red, green, blue, and brown. Lavender and purple belong to the same color group but differ in intensity: lavender is lighter, while purple is darker. Purple was not included among the survey choices, but several respondents wrote this is in under

the “Others” category. Lavender and pink ranked highest among the medium-preference group.

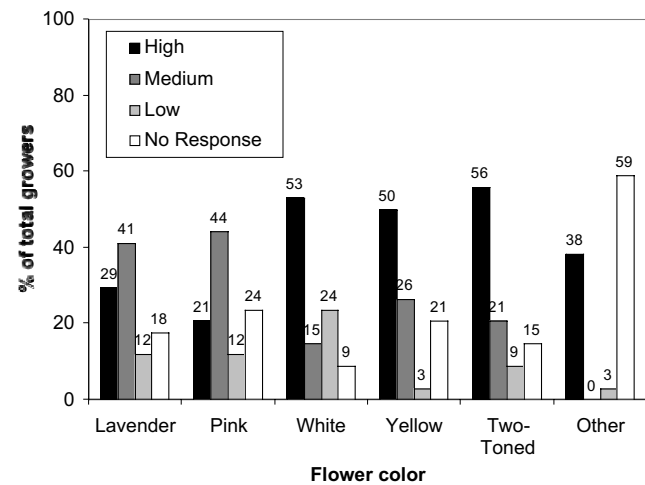
**Flower size**

Growers preferred individual flower sizes ranging from 2 to 3 inches, although sizes from 1½ to 2 inches, up to 3–4 inches, were likewise acceptable (Figs. 14–16). Growers indicated a medium preference for smaller sized flowers ranging from 1 to 1½ inches. However, flower sizes ranging from ½ to 1 inch were the least preferred.

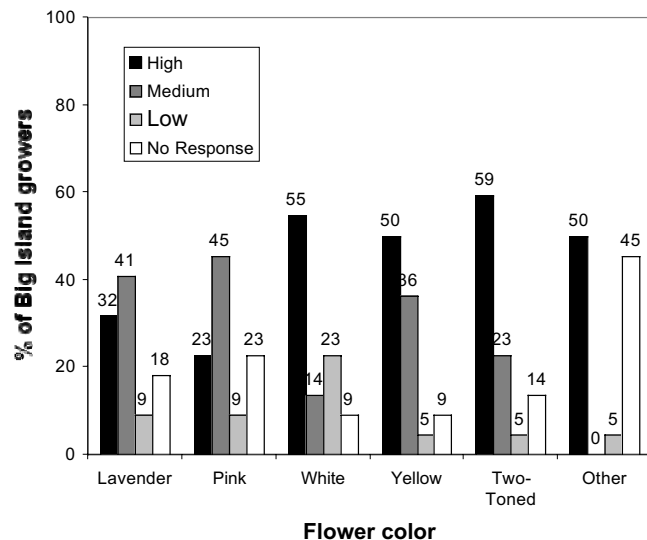
**Fig. 11. Flower color ranked by Oahu growers.**



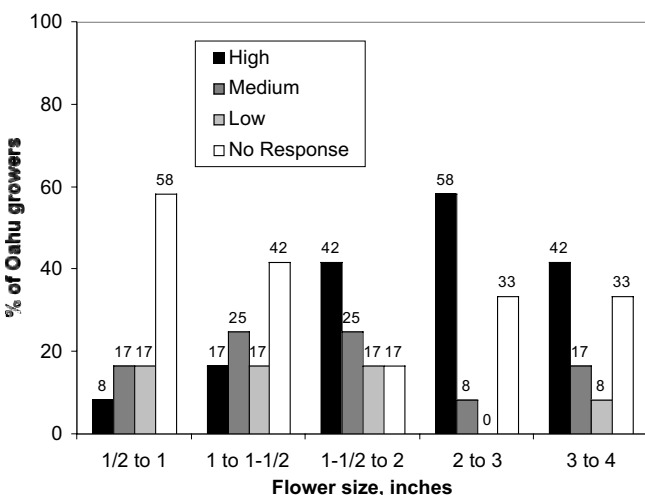
**Fig. 13. Flower color preferences of combined counties.**



**Fig. 12. Flower color preferences of Big Island growers.**



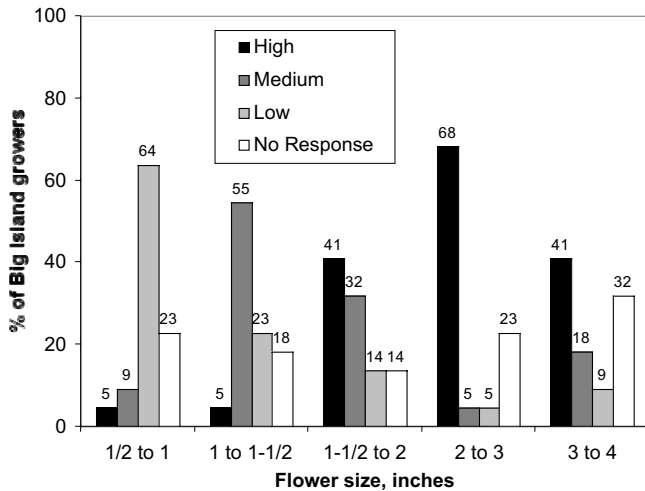
**Fig. 14. Flower size preference ranked by Oahu growers.**



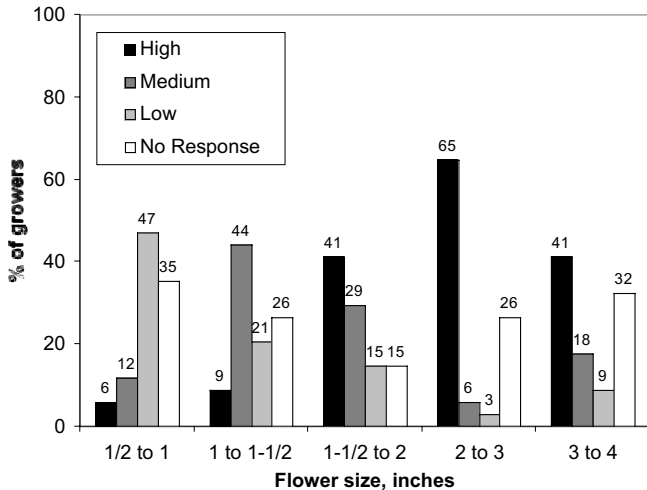
**Number of sprays per plant**

Most growers considered their product to be marketable with two sprays (Fig. 16). While a larger flower size is preferred, growers indicated that the overall appearance of the product is more important than larger flower size alone. Smaller size flowers are acceptable if the plant produces more sprays or more flowers per spray. Fewer sprays or fewer flowers per spray are acceptable if individual flowers are large size.

**Fig. 15. Flower size preference ranked by Big Island growers.**



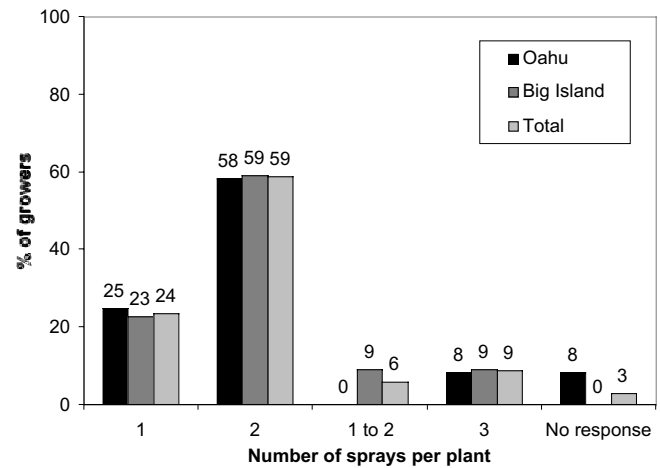
**Fig. 16. Flower size preference ranked by combined counties.**



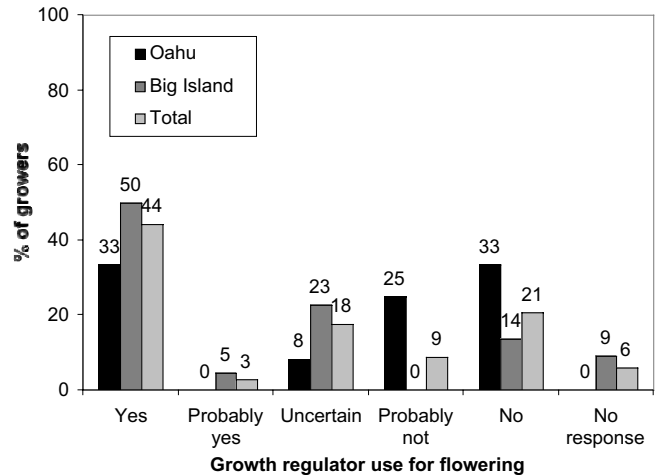
**Early flowering**

Growth regulators to promote flowering was acceptable for 55 percent of growers from the Big Island, while 58 percent of Oahu growers indicated that they would not or probably would not use growth regulators to promote flowering (Fig. 18). However, most growers would use early flowering varieties if they were available to them (Fig. 19).

**Fig. 17. Preference for spray number per plant.**



**Fig. 18. Growers' attitudes toward growth regulator use for flowering.**



**Growers’ future desires**

Growers identified traits consistent with the UH breeding program’s criteria for potted plant desirability. In particular, growers wanted future cultivars produced by the program to be competitive with Thai varieties in terms of flower size, color, and robust growth. A wide range of flower colors, particularly yellow, green, blue, red, and “art” shades, and a wide range of flower shapes and sizes were considered important. Floriferous (multi-spiking) varieties are desired for the market. Resistance to flower and leaf pests and diseases was also desired.

The strength of the UH breeding program is the seed-propagated strategy of producing potted plants. This approach may be an advantage for some Hawaii growers and therefore should be continued. While the attributes indicated by the growers are being addressed through conventional breeding methods, genetic dwarfing and early flowering may be addressed through genetic engineering if genome breeding by traditional pollination is unsuccessful.

**References**

Kamemoto, H., T. D. Amore, and A. R. Kuehnle. 1999. Breeding *Dendrobium* orchids in Hawaii. University of Hawaii Press, Honolulu. 166 pp.  
 Hawaii Dept. of Agriculture. 2002. Hawaii Flowers and Nursery Products Annual Summary. <<http://www.nass.usda.gov/hi/flower/flower.htm>>.  
 National Agricultural Statistics Service. 2002. USDA-NASS Agricultural Statistics 2002. <[http://www.usda.gov/nass/pubs/agr02/02\\_ch5.pdf](http://www.usda.gov/nass/pubs/agr02/02_ch5.pdf)>.

**Fig. 19. Growers’ attitudes toward utilizing early flowering varieties.**

