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Characteristics of the Florida Nursery Industry: 2003-04 National Nursery Survey Results¹

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Acknowledgments

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Summary

The value of nursery and greenhouse crops produced in Florida has grown over the last 10 years at a compound annual rate of 2.5 percent in constant dollar terms, reaching \$1.63 billion in 2004. Information on the Florida nursery industry in 2003 was generated by the Fourth *National Nursery Survey* conducted in early 2004. These results are presented

for employment, firm size distribution, product sales, growing media types, market channels, marketing methods, irrigation and pest management practices, trade flows, advertising expenses, and use of technology. A total of 476 firms responded to the survey, representing a response rate of 17 percent. The average number of employees per firm was 18.7 persons, with 76 percent as fulltime employees and 24 percent as temporary. About 2 percent of firms also had operations in other states. Sales in 2003 reported by survey respondents totaled an estimated \$603 million. Some 44 percent of firms had sales of less than \$250,000, while 29 percent of firms had at least \$1 million in sales. About 8 percent of firms had \$10 million or more in sales, which accounted for 38 percent of total sales reported. Plant types that constituted the largest volume of sales were flowering potted plants (13%), tropical foliage (11%), vines and ground covers (8%), annual bedding plants (8%), propagation materials (7%), and "other" miscellaneous unspecified plants (16%). Native plants accounted for 15 percent of total sales. Container production was the predominant growing system, accounting for 74 percent of sales. Within the wholesale market, the largest channels were

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re-wholesalers and landscape firms, representing 31 percent and 24 percent of sales, respectively, while retail garden centers, retail mass merchandisers, and home improvement centers each represented about 10 percent. Plant brokerage for other growers was reported by 47 percent of growers, and represented nearly 17 percent of total sales. Advance contracting of production was engaged in by 45 percent of firms, but accounted for less than 1 percent of sales. Sales to repeat customers represented 74 percent of total sales. The predominant sales methods used were telephone and personal (in-person) sales, which accounted for 52 and 34 percent of sales, respectively. Published price discounts to large volume customers were offered by 20 percent of firms. Trade shows were the most common type of advertising, accounting for 51 percent of such expenses. Sales to customers within Florida accounted for 71 percent of total sales, while sales to the neighboring states of Georgia and Alabama represented 10 percent of total sales. Exporting to foreign countries was done by 17 percent of firms, and represented 5 percent of sales, with the top export destinations being Canada, Holland, and the Caribbean Basin countries. The most common method of nursery irrigation was overhead sprinklers, used by 76 percent of respondents, followed by drip irrigation (48%), and the predominant source of irrigation water was groundwater wells, supplying 77 percent of water used. The most commonly reported integrated pest management (IPM) practices used were removing infested plants or plant parts (87%), cultivation and hand weeding (81%), and spot treatment with pesticides instead of broadcast spraying (76%). Computers were most commonly used for the business management functions of word processing (62%), accounting and cost analysis (58%), and communications/email (57%). The most important factors identified for price determination were cost of production, grade of plants, and market demand, while important factors affecting general business and business expansion were market demand, weather uncertainty, competition, production, and personnel.

Introduction

According to official USDA estimates, the value of nursery and greenhouse crops in Florida was around \$1.63 billion in 2004 (Jerardo, 2005). Florida

is the second largest state, behind California, in nursery and greenhouse sales. Since 1995, this value has grown at a compound annual rate of 2.5 percent in constant 2004 dollars (Figure 1). Total value has remained steady since 2001 in nominal dollar terms, but declined in inflation-adjusted terms (GDP Implicit Price Deflator, U.S. Commerce Department). Floriculture crops, including foliage, flowering potted plants, bedding plants, and cut flowers/foilage, were valued at \$826 million, while other nursery crops, such as landscape woody ornamentals and miscellaneous greenhouse crops, were valued at \$803 million. The nursery crops grew rapidly during the 1995-97 period, but the trend has been flat since that time.

The economic impacts of the environmental horticulture industry in Florida were assessed in two previous studies (Hodges and Haydu, 1999, 2002). The nursery and greenhouse segment of the industry in Florida had total impacts in 2000 of \$3.48 billion in output or revenue, \$2.52 billion in value added or net income, and employment of 54,288 jobs.

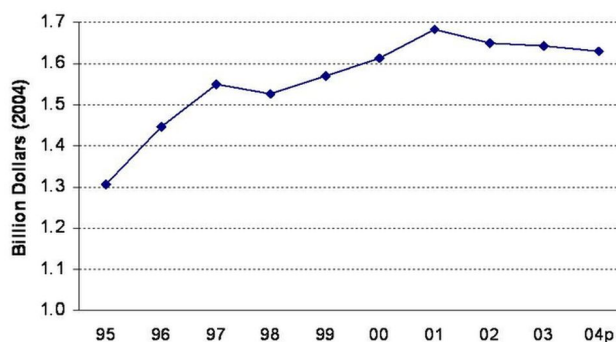


Figure 1. Value of Florida nursery and greenhouse crops, 1995-2004.

Survey Methods

The *National Nursery Survey* has been conducted four times at five-year intervals: 1988, 1993, 1998, and 2003. Mailed surveys collected information on selected production and marketing practices, such as distribution channels, interstate and international shipments, advertising expenditures, selling methods, and other information, to help fill the void of publicly available information on management characteristics of the nursery and greenhouse industry, and to provide information useful to growers, allied industry

professionals, Extension personnel, and researchers. Results of this and previous *National Nursery Surveys* were reported for all states by Brooker and Turner (1990) and Brooker et al. (1995, 2000, 2005), and previous results for Florida were reported by Hodges and Haydu (2000).

For the first time, the *National Nursery Survey* in 2003-4 was conducted using a standard sampling methodology, with a total of 44 states participating, including Florida, giving unprecedented coverage for the survey. Questions on the survey have evolved over time, reflecting changes in the industry. Questions about market channels have been revised to capture sales to mass merchandise chain stores, home centers, multiple-location garden centers, and re-wholesalers. Several new questions were added to the latest survey, to address water use and sources of irrigation water, sales of native plants, and integrated pest management (IPM) practices.

The list of nurseries surveyed in Florida was obtained from the Florida Department of Agriculture-Division of Plant Industry, the agency responsible for licensing nursery producers and enforcing phytosanitary regulations. All producers of plants in the state are legally required to be licensed, so this list is exhaustive. The list contained over 7,700 registered firms, which were stratified in four sized classes based on number of units in plant inventory: large (100,000+), medium (10,000 to 99,999), small (1,000 to 9,999), and very small (less than 1,000). Firms in the very small class were excluded from the survey, since many of these are not *bona fide* commercial enterprises, leaving a total of 4,498 firms eligible for the survey. From this, a sample of 2,854 firms was selected to survey, including 100 percent of the large firms, and a random selection of 60 percent of the medium- and small-sized firms.

Two complete mailings of the survey were conducted in January and March of 2004. Selected firms were initially contacted by a letter from the investigators to explain the purpose of the survey and encourage their cooperation. Questionnaires were mailed to selected firms, along with postage-paid return envelopes. Reminder postcards were also mailed to respondents about one week after the survey

mailings. Respondents were identified by a code number printed on the questionnaire. A copy of the survey questionnaire is presented in the Appendix.

A total of 476 usable questionnaires were returned from Florida growers, including 151 large firms, 148 medium firms, 171 small firms, and 6 firms of undetermined size. This represented an overall response rate 16.7 percent, with response rates somewhat higher (26%) for large firms (Table 1). A small number of selected questionnaires were returned as undeliverable. The survey data were coded and entered into worksheets for analysis. Annual sales for each firm were estimated at the midpoint or average of the sales range indicated, unless actual sales were specified (Table 2). Sales for each product type, market channel, and region were estimated from the annual sales, together with the percentage breakdown reported by each firm.

Results

Sales Distribution

Estimated sales in 2003 reported by Florida survey respondents totaled \$603 million as shown in Table 3. Overall sales per firm averaged \$1.34 million. The largest share of firms (44%) was in the smallest sales size class of less than \$250,000; however, this group accounted for only 1.5 percent of total sales reported. Firms with at least \$1 million in sales represented 24 percent of respondents and accounted for 88 percent of total sales reported. About 5 percent of respondents declined to provide sales information.

Employment

Survey respondents reported a total of 8,030 employees in 2003, of which 76 percent were full-time and 24 percent were temporary, including part-time and seasonal employees (Table 4). The average number of employees per firm was 18.7 persons. Some 43 percent of respondents reported hiring temporary employees. Over half (57%) of the firms indicated that their employment had remained the same over the past 5 years, while 29 percent reported that it had increased, and 15 percent said it had decreased. Total sales per employee averaged \$75,112.

Nursery Products

Information on sales reported by survey respondents for various types of nursery products is summarized in Table 5. The largest share of respondents reported selling deciduous shade and flowering trees (31%), tropical foliage (27%), broad-leaved evergreen shrubs (25%), evergreen trees (24%), and potted flowering plants (20%). Other unspecified types of ornamental plants were reported by 26 percent of respondents, which was the largest product group in terms of sales volume, representing 16 percent of total sales reported. The next largest product categories in terms of sales were flowering potted plants (13%), foliage (11%), vines and ground covers (8%), annual bedding plants (8%), and propagation materials (7%). Lesser products accounting for 3 to 6 percent of total sales were broad-leaved evergreen shrubs, evergreen trees, deciduous shade and flowering trees, edible bedding plants, and fruit trees. Minor products specified included deciduous shrubs, narrow-leaved evergreen shrubs, azaleas, roses, herbaceous perennials, and Christmas trees. Plant categories whose share of total sales increased significantly from the previous survey in 1998 were bedding plants (vegetables, fruits, and herbs), flowering potted plants, fruit trees, and other unspecified plants.

Respondents were also asked to indicate the overall share of their products that were native plants, defined as plants present in North America prior to European settlement. Sales of native plants were reported by 59 percent of respondents, and accounted for 15 percent of total sales.

Growing systems or media types used by Florida nurseries are summarized in Table 6. Container production was the predominant system used by 84 percent of Florida nurseries, accounting for 74 percent of sales reported. Although this was decreased slightly from previous surveys (80%), container growing remains the standard in Florida nurseries because of the convenience for handling and marketing, high product quality, and low risk of freeze damage. Balled and burlapped production accounted for 10 percent sales, while bare-root production accounted for 3 percent, and other unspecified media/production systems for 9 percent

of sales. Balled/potted, field grow bag, and pot-in-pot systems all accounted for less than 3 percent of sales.

Market Channels and Marketing Practices

Market channels used by Florida nurseries are summarized in Table 7. Some 87 percent of respondents marketed products through wholesale channels, accounting for 91 percent of sales reported, while 38 percent marketed through retail channels, representing 9 percent of sales. Within the wholesale market, the largest channels were re-wholesalers and landscape firms, which were used by 64 percent and 57 percent of firms, and accounted for 31 percent and 24 percent of sales, respectively. Other important wholesale channels were retail garden centers, retail mass merchandisers, and home improvement centers, each representing about 10 percent of sales reported. Retail chain garden centers accounted for only 4 percent of sales. The share of sales to retail mass merchandisers and home improvement centers has declined slightly from the previous survey. However, they retain a large sales volume, in spite of a relatively small number of growers, indicating that these are very concentrated market channels, held mostly by large producers.

Respondents were asked about brokerage for other growers and contract production. Plant brokerage (i.e., buying and reselling finished plants) was reported by 47 percent of growers, and this activity represented nearly 17 percent of total sales. Production contracted with a buyer in advance was also a common activity engaged in by 45 percent of firms, but represented less than 1 percent of sales, which is significantly lower than reported in previous surveys. Sales were negotiated with customers as to price and terms by 67 percent of respondents, accounting for 34 percent of total sales. Published volume discounts were offered to preferred customers by 20 percent of firms. Sales to repeat customers represented about 74 percent of total sales.

Sales methods used by Florida nurseries are summarized in Table 8. The most commonly used method was in-person sales, used by 84 percent of respondents, which accounted for 34 percent of sales volume; however, telephone sales accounted for a higher share of sales (52%) although they were used by a slightly lower share of respondents (73%). Trade

shows were also commonly used (21%), but accounted for a small share of sales (4%). Mail order and internet sales were used by 7 and 13 percent of respondents, and accounted for 2 percent and 1 percent of sales, respectively.

Survey respondents reported expenses for various forms of advertising, as shown in Table 9. The most common type of advertising was trade shows, reported as used by 25 percent of respondents, and accounting for over half (51%) of total expenses. Growers exhibited at an average of 0.8 trade shows annually. Other important advertising methods were trade journals (15%), gardening publications (5%), and catalogs (5%). Other unspecified types of advertising were reported by 15 percent of respondents, and accounted for 7 percent of expenditures. Web sites were used by 18 percent of respondents, but represented only 3 percent of expenses.

Market Areas

Survey respondents were asked to indicate the share of their total sales to markets within their home state (Florida) and to the top five other states or countries. Sales to customers within Florida accounted for 71 percent of total sales reported; therefore 29 percent of sales were to out-of-state markets (Table 10). The neighboring states of Georgia and Alabama represented 10 percent of total sales reported. The large populated states of Texas and California each represented over 2 percent of total sales. Other states receiving at least 1 percent of sales were North and Carolina, New York, and Michigan. Approximately 78 percent of plants purchased for growing (liners) were from within Florida.

Exporting to foreign countries was done by 17 percent of respondents, and represented 5 percent of sales, which was increased from previous surveys. The top export markets were Canada, Holland, and the Caribbean Basin countries (Table 11). Some sales were also reported to Spain, Belgium, Germany, Australia, and Central and South America.

Production and Management Practices

Irrigation methods and water sources used by Florida nurseries are summarized in Table 12. The predominant source of water for irrigation was wells, accounting for an average of 77 percent of water used, followed by natural surface water (14%), municipal (5%), and recaptured water (3%). The most common method of irrigation was overhead sprinklers, used by 76 percent of respondents, followed by drip irrigation (48%), subirrigation or ebb-flood (5%), and other unspecified types (10%).

Integrated pest management (IPM) has become an established approach to pest management in the nursery and greenhouse industry. Use of IPM practices was assessed for the first time in the 2003 National Nursery Survey. Use of various practices by Florida growers is summarized in Figure 2. The most commonly used practices, reported by at least half of respondents, were removing infested plants or plant parts (87%), cultivation and hand weeding (81%), spot treatment with pesticides instead of broadcast spraying (76%), inspecting incoming stock for insects/diseases (73%), alternating pesticides to avoid pesticide resistance (72%), elevating plants for air circulation (66%), managing irrigation to reduce pests (53%) and adjusting fertilization rates to control weed/pest growth (53%).

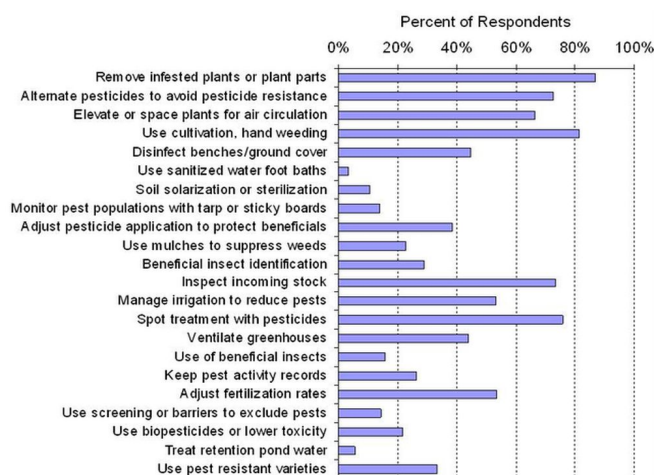


Figure 2. Integrated pest management (IPM) practices used by Florida nurseries, 2003.

Use of computers has become widespread in the nursery and greenhouse industry. Use of computers for various production and management functions reported by Florida nursery respondents is shown in

Figure 3. For each function, respondents were asked to indicate whether they currently use, plan to use, or do not use computers. The functions for which computers were currently used by at least half of respondents were word processing (62%), accounting and cost analysis (58%), and communications/email (57%). In addition, computerized inventory management was used by 37 percent currently, and 11 percent plan to do so, and internet commerce was reportedly used by 27 percent, with 7 percent expecting to use in the future. Computerized production scheduling was used by only 16 percent, but an additional 9 percent expect to adopt these applications in the future.

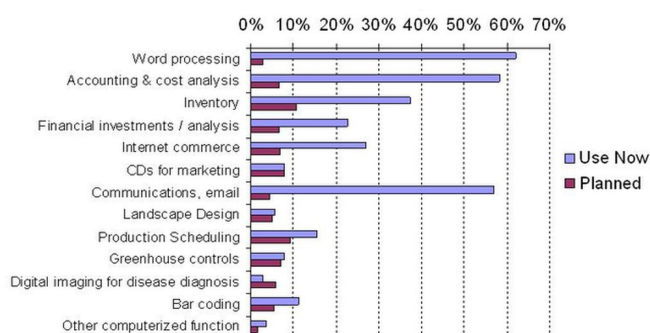


Figure 3. Computer usage by Florida nurseries, 2003.

Nursery Industry Issues

The nursery and greenhouse industry faces a variety of issues that represent both threats and opportunities that are useful to understand from a public policy standpoint. Survey respondents were asked to rate the importance of a number of issues on a scale of 1 to 4, with 4 representing “very important” and 1 representing “not important.” Results are summarized in Figures 4, 5, and 6. Among the most important factors for price determination were cost of production (3.3), grade of plants (3.1), and market demand (3.0). The high importance of cost of production is consistent with findings in previous surveys. Regarding factors affecting business expansion, the most highly rated factors were production (2.5), personnel (2.4), and marketing (2.4). For general business factors, the most important were market demand (3.2), weather uncertainty (2.7), and competition (2.6).

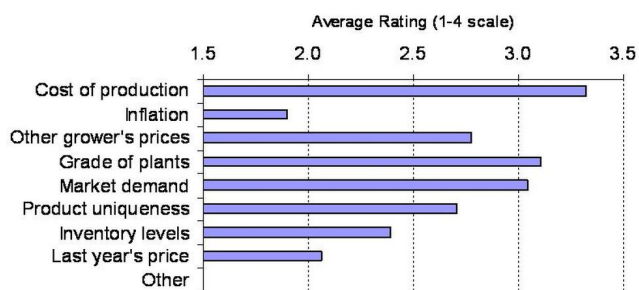


Figure 4. Factors influencing prices for Florida nurseries, 2003.

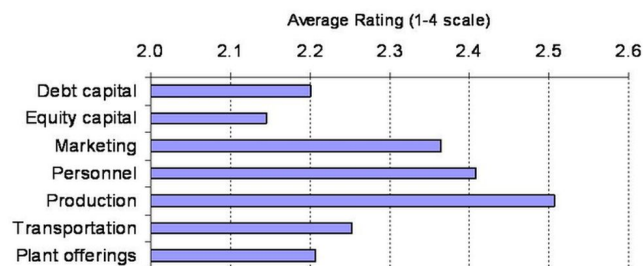


Figure 5. Factors influencing business expansion for Florida nurseries, 2003.

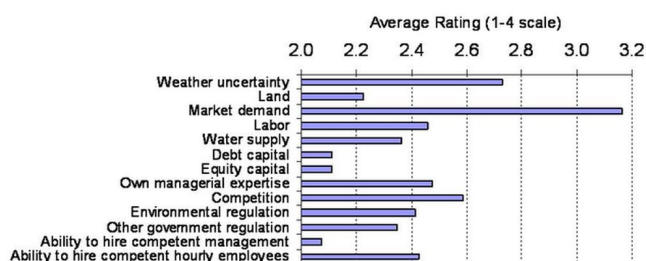


Figure 6. Factors influencing general business for Florida nurseries, 2003.

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Table 1. Florida nursery firm population, survey sample size and response rate, by size class, 2003.

Nursery Size Class	Population	Firms Sampled	Respondents	Response Rate
(Plant Inventory Units)	(Number)	(Number)	(Number)	(Percent)
Large (100,000+)	586	582	151	25.9%
Medium (10,000 to 99,999)	1,528	907	148	16.3%
Small (1,000 to 9,999)	2,419	1,365	171	12.5%
Very Small (less than 1,000)	3,189	0	0	N/A
Unknown			6	N/A
Total	7,722	2,854	476	16.7%

Table 2. Survey sales ranges.

Annual Sales Range	Midpoint or Average* Value
	(\$1,000)
Less than \$249,999	40.6
\$250,000 to \$499,999	367.4
\$500,000 to \$999,999	703.5
\$1,000,000 to \$1,999,999	1,447.7
\$2,000,000 to \$2,999,999	2,388.5
\$3,000,000 to \$3,999,999	3,440.0
\$4,000,000 to \$4,999,999	4,250.0
\$5,000,000 to \$9,999,999	7,425.0
\$10,000,000 to \$14,999,999	12,500.0
\$15,000,000 to \$19,999,999	17,500.0
\$20,000,000 or more	20,000.0
* Firms reporting actual sales	

Table 3. Florida nursery sales reported, by sales range, 2003.

Annual Sales Class	Respondents		Total Sales Reported	Share of Total Sales Reported
(Range)	(Number)	(Percent)	(\$1,000)	(Percent)
Small (less than \$250,000)	211	44.5%	9,292	1.5%
Medium (\$250,000 to \$999,999)	124	26.2%	64,694	10.7%
Large (\$1 to \$9.9 million)	103	21.7%	299,842	49.7%
Very Large (\$10 million or more)	12	2.5%	230,000	38.1%
Not Available	24	5.1%	0	0.0%
Total	474	100%	603,828	100%

Table 4. Florida nursery employment reported, 2003.

Employees (Type)	Respondents		Average Employment Per Firm (Number)	Total Employment	
	(Number)	(Percent)		(Number)	(Percent)
Permanent	407	85.5%	15.0	6,104	75.9%
Temporary	206	43.3%	9.4	1,935	24.1%
Total	430	90.3%	18.7	8,039	100.0%

Table 5. Product types sold by Florida nurseries, 2003.

Product	Respondents		Sales Reported	
	(Number)	(Percent)	(\$1,000)	(Percent)
Other Plants	122	25.7%	97,867	16.2%
Flowering Potted Plants	96	20.3%	77,039	12.8%
Foliage	130	27.4%	67,463	11.2%
Vines & Ground Covers	91	19.2%	47,336	7.8%
Bedding Plants (annuals)	57	12.0%	45,146	7.5%
Propagated Materials	83	17.5%	41,691	6.9%
Broad-leaved Evergreen Shrubs	119	25.1%	37,045	6.1%
Evergreen Trees	112	23.6%	35,067	5.8%
Deciduous Shade & Flowering Trees	146	30.8%	34,872	5.8%
Bedding Plants (vegetables, fruits, & herbs)	24	5.1%	31,423	5.2%
Fruit Trees	45	9.5%	26,104	4.3%
Herbaceous Perennials	59	12.4%	15,476	2.6%
Roses	30	6.3%	9,761	1.6%
Narrow-leaved Evergreen Shrubs	68	14.3%	8,554	1.4%
Deciduous Shrubs	65	13.7%	8,137	1.3%
Azaleas	67	14.1%	4,119	0.7%
Christmas Trees	10	2.1%	325	0.1%
Native Plants (not included in product types)	279	58.9%	91,351	15.1%

Table 6. Media/growing system types used by Florida nurseries, 2003.

Medium	Respondents		Sales Reported	
	(Number)	(Percent)	(\$1,000)	(Percent)
Containerized	397	83.8%	447,021	74.0%
Balled & Burlapped	88	18.6%	58,259	9.6%
Other Growing System	31	6.5%	55,654	9.2%
Bare Root	58	12.2%	19,463	3.2%
Balled & Potted	30	6.3%	13,801	2.3%
In-ground Container (pot-in-pot)	18	3.8%	5,948	1.0%
Field Grow Bag	24	5.1%	3,212	0.5%
Process Balled	4	0.8%	226	0.0%

Table 7. Florida nursery sales by market channel, 2003.

Market Channel	Respondents		Sales Reported	
	(Number)	(Percent)	(\$1,000)	(Percent)
Wholesale	414	87.3%	547,072	90.6%
Retail	179	37.8%	53,391	8.8%
Re-wholesalers	301	63.5%	186,999	31.0%
Landscape Firms	270	57.0%	146,218	24.2%
Retail Garden Centers (single location)	163	34.4%	61,839	10.2%
Retail Mass Merchandisers	47	9.9%	61,036	10.1%
Home Improvement Centers	49	10.3%	58,041	9.6%
Retail Garden Centers (multiple locations)	86	18.1%	25,323	4.2%
Brokered for Other Growers	223	47.0%	101,394	16.8%
Contracted Production	214	45.1%	1,167	0.2%

Table 8. Sales methods used by Florida nurseries, 2003.

Method	Respondents		Sales Reported	
	(Number)	(Percent)	(\$1,000)	(Percent)
Telephone	344	72.6%	314,790	52.1%
In-person	397	83.8%	204,737	33.9%
Trade Shows	100	21.1%	24,706	4.1%
Mail Order	33	7.0%	14,780	2.4%
Internet	61	12.9%	4,987	0.8%

Table 9. Florida nursery advertising expenses, 2003.

Advertising (Type)	Respondents		Expenses Reported	
	(Number)	(Percent)	(\$1,000)	(Percent)
Trade Shows	123	25.9%	6,078	51.4%
Trade Journals	115	24.3%	1,723	14.6%
Other Types Advertising	70	14.8%	876	7.4%
Gardening Publications	37	7.8%	614	5.2%
Catalogs	65	13.7%	602	5.1%
Yellow Pages	65	13.7%	410	3.5%
Web Sites	85	17.9%	387	3.3%
Newsletters	44	9.3%	217	1.8%
Radio/TV	10	2.1%	120	1.0%
Billboards	6	1.3%	7	0.1%
Total Advertising Expenses	278	58.6%	11,836	

Table 10. Florida nursery sales to specific states, 2003.

Destination State	Total Sales Reported		Destination State	Total Sales Reported	
	(\$1,000)	(Percent)		(\$1,000)	(Percent)
Florida	352,761	70.7%	Wisconsin	1,416	0.3%
Georgia	28,330	5.7%	Minnesota	921	0.2%
Alabama	19,547	3.9%	Kentucky	837	0.2%
South Carolina	18,765	3.8%	Maryland	821	0.2%
Texas	12,147	2.4%	Nevada	793	0.2%
California	10,880	2.2%	Arkansas	702	0.1%
North Carolina	8,520	1.7%	Arizona	592	0.1%
New York	8,244	1.7%	Indiana	488	0.1%
Michigan	5,493	1.1%	Connecticut	422	0.1%
Illinois	3,379	0.7%	Colorado	380	0.1%
Ohio	3,311	0.7%	Oklahoma	358	0.1%
Pennsylvania	3,159	0.6%	Missouri	331	0.1%
New Jersey	2,721	0.5%	Hawaii	156	<0.1%
Louisiana	2,705	0.5%	Massachusetts	156	<0.1%
Mississippi	1,792	0.4%	Iowa	72	<0.1%
Tennessee	1,688	0.3%	West Virginia	72	<0.1%
Virginia	1,471	0.3%			

Table 11. Florida nursery sales to specific countries or regions, 2003.

Destination Country/Region	Total Value Reported	
	(\$1,000)	(Percent)
Canada	2,376	0.5%
Holland	1,011	0.2%
Carribbean Basin	819	0.2%
Bahamas	503	0.1%
Spain	434	0.1%
Belgium	358	0.1%
Australia	149	<0.1%
South America	24	<0.1%
Puerto Rico	15	<0.1%
Central America	2	<0.1%
Costa Rica	2	<0.1%
Germany	2	<0.1%
St. Croix	2	<0.1%
St. Thomas	2	<0.1%

Table 12. Water sources and irrigataion methods used by Florida nurseries, 2003.

Irrigation Water Source Used	Share of Average Total Water Used	Irrigation Method Used	Respondents Using
(Type)	(Percent)	(Type)	(Percent)
Wells	77%	Overhead	76%
Natural Surface	14%	Drip	48%
Recaptured	3%	Subirrigataion, ebb-flood	5%
Municipal	5%	Other	10%

Appendix. Survey Questionnaire

1.	<p>From what state are you reporting? What is your ZIP code? Does your business operate a nursery in another state? (yes / no) If yes, please list the state(s)</p>
2.	<p>In what year was your firm established?</p>
3.	<p>How many people does your firm employ at this location? Permanent employees Temporary employees (average number during your peak season) Has the number of employees over the last five years increased, stayed the same, decreased? Permanent Temporary If employment has changed, indicate by what percent?</p>
4.	<p>What functions of your firm are computerized now, and which ones are planned within the next five years? Word processing Accounting / cost analysis Inventory Financial investments / analysis Internet commerce (B2B or B2C) CDs for marketing Communications - E-mail Landscape designing (CAD) Production scheduling Greenhouse production controls Digital imaging for disease diagnosis Bar coding Other (please list)</p>
5.	<p>What percentage of your sales are in the following plant categories? Deciduous shade and flowering trees Deciduous shrubs Broad-leaved evergreen shrubs (excluding Azaleas) Narrow-leaved evergreen shrubs Evergreen trees Azaleas Vines and grounds covers Roses Herbaceous perennials Bedding plants - flowering annuals Bedding plants - vegetables, fruits, and herbs Flowering potted plants Christmas trees (live or cut) Tree fruits Foliage Propagated material (liners, cuttings, plugs, etc.) Other</p>

Appendix. Survey Questionnaire

6. What is your firm's source of irrigation water?
- Natural surface
 - Recaptured
 - City
 - Well
7. Has your use of irrigation water on a per acre basis changed over the past five years? Has it increased, remained the same, or decreased. If irrigation water has changed, indicate by what percent?
8. What irrigation methods do you use?
- Overhead
 - Drip
 - Subirrigation (Ebb / flood)
 - Other
9. Please place a check mark beside each of the following IPM activities that you practice.
- Remove infested plants or plant parts
 - Alternate pesticides to avoid chemical resistance
 - Elevate or space plants for air circulation
 - Use cultivation, hand weeding
 - Disinfect benches/ground cover
 - Use sanitized water foot baths
 - Soil solarization/sterilization
 - Monitor pest populations with tarp or sticky boards
 - Adjust pesticide application to protect beneficials
 - Use mulches to suppress weeds
 - Beneficial insect identification
 - Inspect incoming stock
 - Manage irrigation to reduce pests
 - Spot treatment with pesticides
 - Ventilate greenhouses
 - Use of beneficial insects
 - Keep pest activity records
 - Adjust fertilization rates
 - Use screening/barriers to exclude pests
 - Use biopesticides/lower toxicity
 - Treat retention pond water
 - Use pest resistant varieties
10. What percentage of your sales are in the following forms?
- Bare root
 - Balled and potted
 - Balled and burlapped
 - Processed balled
 - Container
 - Field grow bag
 - In-ground containers (pot-in-pot)
 - Other (please list, e.g., cut Christmas trees)
11. What are the top five states (or countries), including your own state, from which you purchase seedlings, liners, whips, grafted material, tissue culture plantlets, cuttings, or plugs?

Appendix. Survey Questionnaire

12. What percent of total sales is from native plants? Native plants are defined as those present in your state before European settlement.
13. At how many trade shows was your firm represented in 2003? With an exhibit / Without an exhibit.
14. What percentage of your sales are to repeat customers?
15. Do you publish discount (price) information for large-volume purchases? (yes / no)
16. What percent of your sales are negotiated sales? (Negotiated means there was discussion/debate over price, quality or other terms of sale)
17. What percentage of your sales transactions are made using the following methods
 - Trade show orders
 - Telephone orders
 - In-person orders
 - Mail orders
 - Internet sales
18. What percent of your 2003 total annual sales were Wholesale or Retail?
19. If you sell wholesale, what percentage of your wholesale sales (from question 18) are to:
 - Mass merchandisers (general merchandise stores, supermarkets, etc.)
 - Home Centers (home improvement, building supply outlets, hardware, etc.)
 - Garden centers (single location)
 - Garden Centers (multiple locations)
 - Landscape firms (in-house or external)
 - Re-wholesalers (brokers, other growers, etc.)
20. Do you export nursery products out of the U.S.? (yes / no)
 - If yes, what percentage of total sales are from exports?
 - If you export, please list the countries:
21. What are the top five states (or countries), including your own state, that are destinations for your firm's total sales?
22. Do you handle/resell items from other growers? (yes / no)
 - If yes, what percent of your total sales does this account for?
23. What percentage of your total sales are on contract, in other words, sold or committed before being planted/potted?
24. What types of buyer(s) are contracting for production with your firm?
 - Other producers
 - Retail garden centers
 - Mass merchandisers
 - Cooperatives
 - Other (please specify)

Appendix. Survey Questionnaire

25. Regarding price determination, please rate the level of importance of each factor by using the 1 to 4 scale, with 1= not important; 2= minor importance; 3= important; and 4= very important.
- Cost of production
 - Inflation
 - Other growers' prices
 - Grade of plants
 - Market demand
 - Product uniqueness
 - Inventory levels
 - Last year's price
 - Other (please specify)
26. Regarding factors that might limit the expansion of the geographic scope of your trading area, please rate the level of importance of each factor by using the 1 to 4 scale, with 1= not important; 2= minor importance; 3= important; and 4= very important.
- Debt capital
 - Equity capital
 - Marketing
 - Personnel
 - Production
 - Transportation
 - Plant offering
27. Please rate each of the factors listed below according to how much they impact your business by using the 1 to 4 scale, with 1= not important; 2= minor importance; 3= important; and 4= very important.
- Weather uncertainty
 - Land
 - Market demand
 - Labor
 - Water supply
 - Debt capital
 - Equity capital
 - Own managerial expertise
 - Competition / Price undercutting
 - Environmental regulations
 - Other government regulations
 - Ability to hire competent management
 - Ability to hire competent hourly employees
28. What percentage of total sales did your firm spend on advertising in 2003?
How do you allocate these advertising dollars?
- Web sites
 - Yellow pages
 - Radio / TV
 - Billboards
 - Gardening publications
 - Catalogs (print or CD)
 - Trade journals
 - Newsletters
 - Trade shows
 - Other (please specify)

Appendix. Survey Questionnaire

29. What was the gross value of product sales from your nursery in 2003, or your most recently completed fiscal year? Please check the appropriate category below, or enter the value here \$_____.

Less than \$249,999

\$ 250,000 - \$ 499,999

\$ 500,000 - \$ 999,999

\$ 1,000,000 - \$ 1,999,999

\$ 2,000,000 - \$ 2,999,999

\$ 3,000,000 - \$ 3,999,999

\$ 4,000,000 - \$ 4,999,999

\$ 5,000,000 - \$ 9,999,999

\$10,000,000 - \$14,999,999

\$15,000,000 - \$19,999,999

\$20,000,000 or above