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## Competition in the Market for Manufactured Horticultural Containers in the Southeastern United States<sup>1</sup>

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### Nature of Work

Manufactured plastic nursery containers are widely used for horticultural production because of their advantages of convenience and productivity over traditional field (in-ground) growing systems. A recent survey of nursery growers in 22 states found that container-grown plants represented two-thirds (67 percent) of overall production value, and in many states, including California, Florida, Alabama, and Mississippi, over 80 percent of production is in nursery containers (Brooker, Hinson, and Turner, 2000). The purchase of nursery containers is a significant production expense for growers, and is often the single largest direct cost item. According to data from Florida wholesale nurseries, expenses for

containers represented 5.4 percent of total operating costs, or 4.9 percent of gross sales (Hodges, Satterthwaite, and Haydu, 2000).

Economic theory typically assumes perfect competition in the marketplace, which brings about the most efficient allocation of scarce resources as costs of production and prices for consumers are minimized (Goodwin and Drummond, 1982). Attributes of perfectly competitive markets include the following:

- insignificance of the individual producing or consuming unit in relation to the total market, such that all participants are “price takers”;
- homogeneity of product;
- absence of artificial limitations on entry to or exit from the market;
- stable and adequate supply of product;

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- widely available information about product features and prices.

In reality, however, most markets are not purely competitive. In the extreme case of monopoly (a single producing firm), increased sales volume results in a lower sale price and lower marginal revenue, so rational monopolist firms may therefore restrict their production in order to maintain higher prices and profits per unit.

In recent years, the market for nursery containers has become more concentrated and is dominated by a small number of major firms. *Nursery Supplies Inc.* merged with *Lerio/IEM* in March 2000, leaving only two major producers of the commonly used blow-molded nursery containers in large sizes, *Nursery Supplies/Lerio*, and *ITML*. Allegedly, this action has resulted in reduced competition in this segment of the horticultural container market.

This study investigated the question of whether competitiveness in the horticultural container market in the southeastern United States has changed as a result of industry consolidation from three to two major manufacturers in 1999.

## Methods

A telephone survey was conducted during September and October 2000 with a representative sample of wholesale nursery firms that had open-field production of woody ornamentals in nine southeastern U.S. states: Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, and Tennessee. A total of 491 firms were interviewed for the study, representing a sampling rate of about five percent. Information was collected regarding purchases of horticultural containers by growers included type, size, manufacturer/brand, changes in prices paid, and availability of supplies. Also, information was gathered on firm characteristics such as annual sales, production area, and number and type of plants produced. Focus group sessions were held with growers at two locations in Florida to provide guidance for design of a the questionnaire. Interviewed firms were qualified as having open-field container production of woody ornamentals and producing nursery plants for sale in 1999, and

respondents were qualified as owner, manager, or other person knowledgeable about purchasing practices of the firm. Lists of telephone numbers for wholesale growers in each state were obtained from state government agencies and industry trade associations. Estimates of the value of container purchases and market share for the various container manufacturer-brands in years 1999 and 2000 were developed based upon survey data for the percentage of purchases of different types and brands of containers, weighted according to estimated sales and total container purchases. Company annual sales were estimated at the midpoint of the sales range indicated, and total value of container purchases were estimated at 4.89 percent of annual sales, based on cost data for Florida nurseries (Hodges, Satterthwaite, and Haydu, 2000).

## Results and Discussion

### *Container Purchasing Patterns*

Over three-quarters (79 percent) of respondents reported purchasing one to three gallon containers, while about half of respondents purchased five to seven gallon containers and 10 gallon or larger containers (55 percent and 49 percent, respectively), and about one-third (34 percent) purchased containers less than one gallon in size. A majority of respondents (61%) purchased blow-molded containers, 27 percent purchased injection-molded or vacuum-formed hard cans, 15 percent purchased injection-molded or vacuum-formed flower or greenhouse pots, and 11 percent purchased other unspecified types of containers. For those respondents who reported complete information on sales and percentage of purchases by type of container, the total value of container purchases was estimated at \$16.6 million, including \$11.4 million (68 percent) for blow-molded containers, \$3.6 million (22 percent) for hard cans, \$1.4 million (8 percent) for flower pots, and \$245,000 (one percent) for other types of containers. The mean value of purchases per firm ranged from \$47,220 for blow-molded containers to \$7,209 for other types of containers.

### **Container Brand Purchasing**

For 2000, 78 percent of respondents reported purchasing blow-molded containers from *Nursery Supplies/Lerio*, eight percent from *ITML*, and 19 percent from other manufacturers. By contrast, in the previous year, 34 percent of respondents purchased blow-molded containers from *Nursery Supplies*, 55 percent from *Lerio/IEM*, six percent from *ITML*, and 13 percent from other sources. Thus, the percentage of growers (78 percent) purchasing blow-molded containers from *Nursery Supplies/Lerio* in 2000 was not quite as high as the combined total (34 percent plus 55 percent) of those purchasing from *Nursery Supplies* plus *Lerio/IEM* in 1999. The *ITML* brand and other brands were purchased by a marginally higher percentage of growers in 2000 than in 1999 (eight percent versus six percent and 19 percent versus 13 percent, respectively). For injection-molded or vacuum-formed hard cans, there was a generally similar pattern of results, although the number of growers purchasing this type of container was much lower.

The estimated value of purchases of various types and brands of nursery containers by survey respondents, and their relative market share, are summarized in Table 1. Purchases of blow-molded containers by in year 2000 were estimated at \$9.8 million, including \$9.1 million (92 percent) from *Nursery Supplies/Lerio*, \$317,000 (three percent) from *ITML*, and \$465,000 (five percent) from other brands. Purchases of blow-molded containers in 1999 totaled \$9.6 million, with \$5.0 million (52 percent) from *Nursery Supplies*, \$4.0 million (42 percent) from *Lerio/IEM*, \$260,000 (three percent) from *ITML*, and \$307,000 (three percent) from other brands. So, the market share of *Nursery Supplies/Lerio* in 2000 was nearly equal to the combined market share of *Nursery Supplies* and *Lerio/IEM* the previous year. For hard can containers, a similar pattern of results was found. The total value of purchases of this type of container by survey respondents was estimated at \$2.2 million in year 2000. The market share of *Nursery Supplies/Lerio* in 2000 (82 percent), was nearly equal to the combined market share of *Nursery Supplies* and *Lerio/IEM* the previous year (24 percent and 61 percent, respectively).

### **Container Price Changes**

One of the most important indications of competitiveness in an industry is prices and price changes over time. In particular, rapid increases in price could potentially indicate an uncompetitive market in the absence of other factors. Surveyed growers were asked *Has your business experienced higher prices for containers this year compared to last year?* For blow-molded containers and injection-molded/vacuum-formed hard cans, two-thirds or more of respondents answered in the affirmative, indicating that prices in year 2000 were higher than in 1999. This finding was strongest for blow-molded containers, with 79 percent of respondents indicating that this type had increased in price. For injection-molded/vacuum-formed greenhouse pots, a lower percentage (49 percent) of respondents reported that prices had increased. For blow-molded containers, 79 percent of respondents who had purchased the *Nursery Supplies/Lerio* brand indicated that prices have increased compared to 100 percent of respondents for *ITML* and 74 percent for other brands. For those respondents indicating the magnitude of increased prices for blow-molded containers, the average percentage increase was 16.6 percent for the *Nursery Supplies/Lerio* brand, 14.5 percent for *ITML*, and 15.6 percent for other unspecified brands. For injection-molded or vacuum-formed hard cans, 88 percent of respondents indicated that prices have increased for *Nursery Supplies/Lerio*, 100 percent for *ITML*, and 68 percent for other brands. For those respondents indicating the magnitude of price increases for hard cans, the average percentage increase was 13.7 percent for *Nursery Supplies/Lerio*, 14.7 percent for *ITML*, and 8.5 percent for other brands. For injection-molded/vacuum-formed greenhouse or flower pots, 33 percent of respondents indicated that prices have increased for *Nursery Supplies/Lerio* brand compared to 20 percent for *ITML* and 23 percent for other brands. For those respondents indicating the magnitude of price increases, the average price increase was 13.3 percent for the *Nursery Supplies/Lerio* brand, 12.3 percent for *ITML*, and 18.2 percent for other brands.

### **Raw Material Costs for Container Manufacturing**

An important consideration in assessing the competitiveness of a market is the cost of production. In competitive markets, it is expected that changes in cost of production will be passed onto consumers as proportionate increases in the price of finished products. To examine the raw material cost for manufacturing horticultural containers, data were obtained on prices for high density polyethylene resins, including blow-molding and injection-molding types, from 1998 through 2000 (*Chemical Market Reporter*). Prices for these plastic resins decreased during the latter part of 1998, then increased during 1999, and stabilized during 2000. The price for blow-molding type resins increased from an average of \$0.411 per pound in 1999 to \$0.480 in 2000, representing a 16.8 percent increase, while the price for injection-molding resins increased from \$0.452 to \$0.500, a 10.7 percent increase. In comparison of material prices before and after the March 2000 merger of *Nursery Supplies* and *Lerio/IEM*, prices for blow-molding resins increased 17.4 percent (from \$0.409 to \$0.480 per pound), and prices for injection-molding resins increased 8.1 percent (from \$0.457 to \$0.494 per pound). The magnitude of these raw material price increases are similar to the magnitude of price increases for nursery containers. It should be noted that horticultural container manufacturers often use reprocessed plastics, which may be somewhat less expensive than virgin or food grade plastic resins; however, the price trends for virgin plastics are probably representative of recycled plastics as well.

### **Availability of Container Supplies**

Another indicator of industry competitiveness is product availability. Lack of availability of a product could potentially indicate that the market is less than perfectly competitive. Respondents were asked the question *Has your business experienced difficulty in obtaining the types and quantities of containers you require this year?* For blow-molded containers, 43 percent (plus-or-minus 4.7 percent) of survey respondents indicated yes that they have had difficulty in obtaining the containers needed. For injection-molded or vacuum-formed hard cans, a

similar percentage (42 percent, plus-or-minus 6.8 percent) said that they had difficulty in obtaining container supplies. For injection-molded or vacuum-formed greenhouse of flower pots, a substantially lower percentage (21 percent, plus-or-minus 6.3 percent) of respondents had this difficulty.

### **Preferences for Use and Substitution of Different Types of Containers**

A final indicator of competitiveness in the industry concerns the adoption of substitute products. It has been suggested that many growers are now using injection-molded or vacuum-molded "flower" or "greenhouse" pots for open field production because of limited availability or because prices for blow-molded containers have risen too high. Although flower or greenhouse pots are not designed for extended use in outdoor growing situations, they apparently can be used for this application with some sacrifice in utility. To address this issue, survey respondents were asked two questions:

1. *In open-field production, if a blow-molded container or an injection-molded or vacuum-molded hard can is available and adequate for a particular plant, do you ordinarily use that type of container?*
2. *In open-field production, do you ordinarily use injection-molded or vacuum-molded "flower" or "greenhouse" pots?*

For the first question, 73 percent (plus-or-minus 3.1 percent) of respondents answered in the affirmative. For the second question, 37 percent answered yes and 54 percent answered no (plus-or-minus 3.7 percent). In other words, nearly three-quarters of nursery growers would prefer to use blow-molded containers or injection-molded/vacuum-formed hard cans; however, about one third did use flower or greenhouse pots.

### **Conclusions**

A representative survey of wholesale nursery growers in nine southeastern U.S. states regarding their purchases of horticultural containers showed

that the consolidated manufacturer *Nursery Supplies/Lerio* currently has a dominant market position, with 78 percent of growers purchasing some of their blow-molded containers, 56 percent purchasing their injection-molded/vacuum-formed hard cans, and 92 percent purchasing their injection-molded/vacuum-formed flower pots. Taking into account size of firms and percentage of total purchases reported for each type and brand of container, the market share for *Nursery Supplies/Lerio* was estimated at 92 percent for blow-molded containers and 82 percent for hard cans. The market share of blow-molded and hard can containers for *Nursery Supplies/Lerio* in year 2000 was nearly equal to that for the previously separate manufacturers *Nursery Supplies* and *Lerio/IEM* in 1999. The market share for a third major manufacturer, *ITML*, and the other independent manufacturers has remained about the same. These results suggest that the nursery grower customers have rather strong brand loyalties and that the markets for *Nursery Supplies* and *Lerio* were largely independent and complementary. A majority of respondents indicated that prices paid for blow-molded and hard can containers increased by 10 to 20 percent between 1999 and 2000. However, this change in prices reflects a commensurate increase in raw material costs for plastic resins used in container manufacturing. About 43 percent of growers surveyed indicated that they had experienced difficulty in obtaining needed supplies of both blow-molded and hard can containers. About three-quarters of respondents indicated that they prefer to use blow-molded containers or injection molded hard cans for growing woody ornamentals; however, about a third of the growers reported using greenhouse/flower pots for open field production of woody ornamentals. A somewhat higher number of growers reported purchasing greenhouse/flower pots in 2000 than in 1999. Taken together, these results indicate that there certainly was the potential for competition in the horticultural container market in this region to be adversely affected by the dominance of *Nursery Supplies/Lerio*. However, the fact that price increases for containers were similar to increases in the cost of virgin plastic raw materials for container manufacturing suggest that normal market factors were in effect and that consumers have not yet suffered unduly increased costs for nursery containers.

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**Table 1.** Brand market share of blow-molded and hard can containers purchased in 1999 and 2000, surveyed ornamental plant nurseries in the southeastern United States.

Brand	Blow-Molded Containers		Hard Can Containers	
	<i>Percentage</i>	<i>95% Confidence Interval</i>	<i>Percentage</i>	<i>95% Confidence Interval</i>
(Purchased in 2000)				
Nursery Supplies/Lerio	92%	(97%-85%)	82%	(96%-64%)
ITML	3%	(7%-1%)	3%	(10%-0%)
Other Brands	5%	(9%-2%)	15%	(31%-4%)
(Purchased in 1999)				
Nursery Supplies	52%	(69%-36%)	24%	(44%-12%)
Lerio/IEM	42%	(59%-27%)	61%	(82%-39%)
ITML	3%	(7%-1%)	3%	(9%-0%)
Other Brands	3%	(8%-1%)	13%	(29%-3%)