

Characteristics of Kentucky's Nursery and Greenhouse Industries

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Introduction

The nursery and greenhouse industry, distributed throughout Kentucky, is diverse and contributes significantly to the local and state economy. This industry represents the largest segment of Kentucky's sales of horticultural products and is comprised almost completely of farm families. Nursery and greenhouse crops are produced and marketed in containers or grown in the field and dug and sold as balled and burlapped or bare root plants. Most of Kentucky's nursery and greenhouse crops are marketed in Kentucky and surrounding states.

Kentucky's nursery and greenhouse industry has grown at a rate of 8 to 10 percent per year for many years. The most significant U.S. industry growth was in the 1980s and 1990s, but the most rapid growth of Kentucky's industry has been since 2000. A recent publication based on a national survey reported U.S. sales of nursery and greenhouse crops to be more than \$27 billion in 2008, and Kentucky's sales were more than \$147 million. Approximately one-third of the Kentucky nursery and greenhouse industry's 2,090 employees in 2008 were permanent employees. These sales and employment data do not include firms engaged strictly in providing landscape installation and maintenance services.

Economists knowledgeable of this industry describe it as a "maturing" industry with a slower growth rate (3 to 5%) and tighter profit margins than during the rapid growth period. The demand for landscape plants by new home sales decreased dramatically during the recession of 2007–2009. However, the downturn in the industry associated with global recession of 2007–2009 is historic, and shortages of some landscape plants were expected by 2011. Changes in the market to reflect environmental quality considerations (reforestation of cities, phytoremediation, and carbon offsets) could impact the size of the market as well as the diversity of products necessary to satisfy that market.

The purpose of this publication is to characterize Kentucky's nursery and greenhouse industry in relation to the national and regional industry by gleaning information from the Green Industry Research Consortium's 2008 and 2003 national survey data. Survey data will be augmented by information obtained from the experiences of the authors and from conversations with nursery owners. Information is presented relative to employment, plant types sold, production types, markets and marketing channels, sales methods and marketing practices, purchases of propagation materials, advertising expenditures, integrated pest management practices, water

sources and irrigation methods as well as the economic impact of the Kentucky nursery and greenhouse industries.

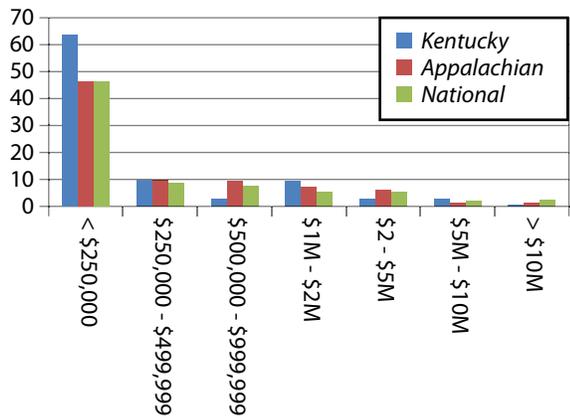
The Green Industry Research Consortium, a Multi-state Research Project of the Southern Region's Agricultural Experiment Stations (S-1051), conducts a survey of the U.S. nursery and greenhouse industries every five years. The University of Kentucky's Agricultural Experiment Station is a member institution in the consortium, represented by Dr. Dewayne Ingram. The most recent survey was conducted in 2009 in all 50 states, reflecting 2008 data. Drs. Alan Hodges, Charles Hall and Marco Palma took the lead on this survey and published the results in the Southern Cooperative Series Bulletin #411, *Trade Flows and Marketing Practices with the U.S. Nursery Industry, 2008* (available at <http://www.greenindustryresearch.org>). The Kentucky data have been extracted from SCS Bulletin #411, and additional computations have been made from the original data for this circular. Kentucky's nursery and greenhouse industry firms were identified through the state's licensing and certification program. Questionnaires were mailed to 165 of the 352 commercial firms on that list. Later through telephone calls and other avenues, it was determined that the validated business population was 238. The 2008 data were compared to the 2003 data for selected characteristics. Results of the 2003 national survey were published as Southern Cooperative Series Bulletin #404, *Trade Flows and Marketing Practices with the U.S. Nursery Industry, 2003*, also available at <http://www.greenindustryresearch.org>.

General Characteristics

The majority of Kentucky firms responding to the survey had both wholesale and retail sales with 35 percent of total sales being wholesale. Seventy percent of the firms responding sold in wholesale markets, and 70 percent had retail sales. The ratio of wholesale to retail sales in Kentucky was lower than in other states in the region with a larger nursery and greenhouse industry. For example, 88 percent of Tennessee and 87 percent of North Carolina total annual sales were to the wholesale market.

The average annual sales reported by Kentucky respondents were \$617,000 per firm, and the national and Appalachian region average was \$1.7 million. Sixty-three percent of Kentucky firms responding had annual sales less than \$250,000; 10 percent had sales of \$1-2 million; and 7 percent had sales of \$2-10 million (Figure 1). The statistics are similar to national data; 50 percent of respondents had less than \$250,000 in annual sales, and 17 percent had sales of \$1 million or greater.

Figure 1. Percentage of responding firms in size categories of annual sales for Kentucky, the Appalachian Region and the United States.



The authors of SCS Bulletin #411 used detailed characteristics of the industry firms and the survey sample to expand the total annual sales to describe the entire national industry by state. The projected annual sales for the U.S. nursery and greenhouse industry in 2008 were more than \$27 billion. Kentucky's annual sales were more than \$147 million. Kentucky's 2008 sales were less than a third of that in most states in the Appalachian Region (NC, TN, VA) with the exception of West Virginia, which was only \$47.8 million. A review of the data from this survey indicates the authors were conservative on their projections of annual sales and the results are more than defensible. Typically, government reports of sales in the horticultural industries are significantly less than reality due to a variety of reasons. In 2003, the value of the Kentucky nursery and greenhouse industry published by the USDA was slightly more than \$75 million. This reflects significant growth in the industry from 2003 to 2008 but may also include underreporting in 2003 compared to 2008.

One-half of Kentucky respondents established their nursery or greenhouse operations since the year 2000. Thirteen percent were established in the 90s and 23 percent in the 1980s or 1970s. In contrast, only 10 percent of Tennessee respondents' firms were started since 2000. Nationally, the highest growth rate in terms of number of firms was in the 1980s and 1990s. Generally, Kentucky has experienced the greatest entry into the industry since the turn of the century, lagging somewhat the timing of the U.S. growth trajectory. The timing of the growth trajectory of the Kentucky nursery and greenhouse industry coincides with state investments (KY Agricultural Development Fund) in research, extension, marketing assistance and advertising cost-share programs through the Kentucky Horticulture Council.

Employees

The average number of employees of responding Kentucky firms was 3.8 permanent employees and 5.0 temporary employees. The projected total employment (permanent and temporary) for Kentucky was 2,095 in 2008. Although the percentage of responding firms in various annual sales categories were similar to the national average, Kentucky's average employment was lower than the regional and national average (Table 1). The

absence of a few of the larger firms from the survey data could have skewed these numbers. Kentucky respondents to the 2003 survey averaged 7.2 permanent employees and 6.2 temporary employees at that time. On the average, Kentucky respondents reported reducing their permanent employees by 9 percent and decreased temporary employees by 17 percent over the five years from 2004 to 2008. On the average, respondents had increased their permanent employees by 11 percent and had increased temporary employees by 14 percent over the previous five-year period, 1999–2003. Nationally, there was no change in number of employees per firm between 2003 and 2008 surveys.

Table 1. Average number of permanent and temporary employees per firm in 2008.

	Permanent Employees	Temporary Employees
Kentucky	3.8	5.0
Appalachian Region	9.8	6.6
United States	11.5	9.0

Plant Types Sold

Approximately 12 percent of total sales by Kentucky growers were deciduous shade or flowering trees in 2008, compared to 42 percent in 2003 (Figure 2). The vast majority of deciduous shade trees are produced by six field nurseries in Kentucky. It could be possible that a significant portion of the deciduous tree production could have been missed in 2008 due to sampling or lack of response. The authors did not observe a major decrease in tree sales during this five-year period. The percent of total sales for deciduous shrubs, evergreen trees, and broadleaf evergreens were also down slightly in this five-year period. Plant types showing an increase in percentage of total sales included roses, herbaceous perennials, bedding plants and vines/ground covers. Bedding plants, both flowering annuals and vegetable, fruit and herb transplants, represented 8.6 percent of sales in 2003 and 17.5 percent in 2008. Given the fact that overall sales increased dramatically in that five-year period, a doubling of the percentage of sales from bedding plants is even more impressive. This growth is likely from the expansion of larger greenhouse operations as well as an increased number of smaller growers adding "color" to their product mix. Likewise, roses were 1.2 percent of sales in 2003 but 12.7 percent in 2008. New continuous-bloom, low-maintenance landscape roses such as the Knock Out® rose surely contributed to that increase. Herbaceous perennials increased from 6.6 percent of sales in 2003 to 12.2 percent in 2008.

Kentucky industry respondents reported that 3.9 percent of plant sales were from native plants of all types in 2008, which was less than reported for 2003 (11.6%). This was less than half of the 2008 average for the Appalachian region (8.2%) and significantly less than for Tennessee (16.1%) and the national average (13.4%). The national average was similar for 2003 and 2008. It is important to note that total sales increased significantly during this period, so a decrease in the percentage of sales from a given plant type may not reflect a decrease in production of that plant type but perhaps increased sales of other plant types.

Product Forms

Containerized plants comprised 57 percent of total sales in 2008, compared to 39 percent in 2003 (Figure 3). This is consistent with the reported increases in that five-year period for bedding plants, roses, herbaceous perennials and others that are primarily grown in containers. Balled and burlapped plants averaged 12.8 percent of survey respondents' sales in 2008, down from 49 percent in 2003. These findings are consistent from our observations in terms of the range of individual producers; however, they differ somewhat from our assessment of a relatively small number of large nursery operations that account for a significant portion of the production and may not have responded to the survey. For these nurseries, a significant portion of their sales come from field-produced trees.

The percent of total plant sales as bare-root plants increased to 24.7 percent in 2008 from less than 1 percent in 2003. Advancement of several hybridizers of herbaceous perennials (daylily and hosta in particular) in Kentucky could account for the increase in bare-root plants sold as well as the increased mail order sales and herbaceous plants sold in that five-year period.

Markets and Marketing Channels

Seventy-seven percent of respondents' total annual sales were to landscape firms in 2008, up slightly from 2003. The percentage of total sales to mass merchandisers doubled from 4 percent in 2003 to 8.2 percent in 2008. The percentage of total sales to home centers (0.4%) in 2008 was similar to that in 2003. The percentage of total sales to single-location garden centers (2.2%), multiple-location garden centers (0.4%) and re-wholesalers (10.9%) were down slightly from 2003. However, remember that total production and sales were significantly greater in 2008 than 2003.

The percentage of plants grown in Kentucky by survey respondents that were sold in Kentucky increased from 74 percent in 2003 to 79 percent in 2008. This is consistent with a landscape plant buyers' intentions survey in Kentucky, Ohio, Tennessee and Indiana in 2004, in which it was noted that buyers in the other states expected to purchase less than 10 percent of their plants from Kentucky. More than 80 percent of plants grown in Kentucky and sold out of state were sold in the Appalachian Region, and 19 percent were sold in the Midwest Region in 2008, which was similar to 2003.

Nationally, consolidation among larger growers and increased plant sales by the larger retailers such as home centers and mass merchandisers in recent years appears to be related. In many cases, the big box stores are limiting the number of vendors who supply plants to their stores. This and the general economic climate have encouraged consolidation of production nurseries. As one might expect, independent garden centers,

Figure 2. Average percentage of total annual sales by plant type for Kentucky respondents in 2003 and 2008.

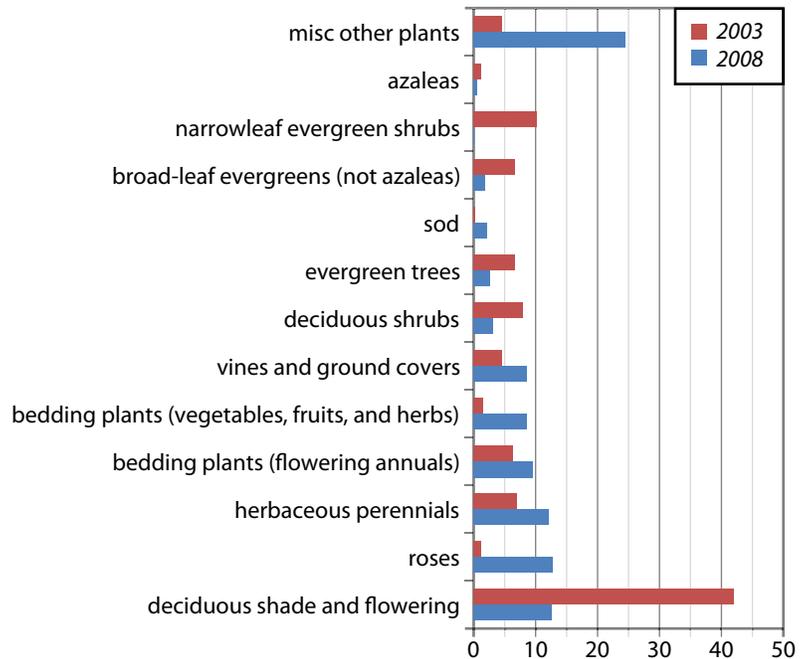
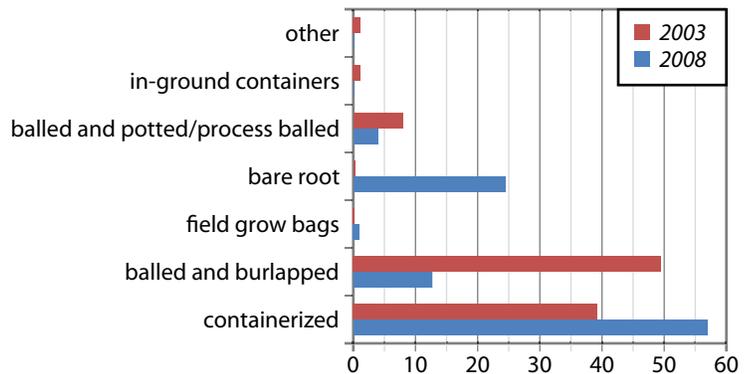


Figure 3. Average percentage of total annual sales by product form for Kentucky respondents in 2003 and 2008.



retail nurseries and small landscapers purchase from small growers and larger nurseries, depending upon product mix. This seems to be the case in Kentucky. Retail nurseries and garden centers are offering a diverse plant selection and related products and focus on value-added services to customers through knowledgeable staff and consistent high quality throughout the seasons. A regional buyers' survey in 2004 showed that plant quality was the most important characteristic for wholesale purchases, followed by ease/speed/cost of delivery, wholesaler relationship, variety and volume available and then price. Some changes in the market from consumer landscaping to environmental quality considerations (reforestation of cities, phytoremediation, and carbon offsets) might have a positive effect on Kentucky's sales of field-grown trees suitable to northern markets.

Sales Methods and Marketing Practices

More than 80 percent of total sales of Kentucky respondents in 2008 were through in-person orders (Figure 4). That is almost double the national and Appalachian region averages. Less than 10 percent each were from trade show orders, telephone orders, and mail orders and internet sales accounted for less than 1 percent of total sales in 2008. A similar trend was noted in 2003, except for a smaller percentage of sales (9.7%) were from telephone orders in 2008. Firms in the Appalachian region (39.7%) and nationally (43.3%) averaged at least 4 times the percentage of sales made by telephone than in Kentucky. Almost two-thirds of 2008 sales for Kentucky respondents were to repeat customers compared to 79.8 percent and 80.5 percent for the Appalachian and national averages, respectively. Twenty-three percent of sales were through negotiated sales, i.e. sales in which price or terms were discussed and/or adjusted upon negotiation between buyer and seller. About 6 percent of Kentucky growers reported forward contracted sales, i.e. sales in which price and quantity were agreed upon in advance. The parties with which growers engaged in forward contracts were other producers and cooperatives. Also, about 7 percent of total sales were for brokerage of finished plants purchased from other growers and immediately resold.

Purchases of Propagation Materials

Of the propagation materials (seedlings, whips, grafts and liners) purchased in 2008 by Kentucky nurseries and greenhouses responding to the survey, 80.8 percent came from the Appalachian region (KY, NC, TN, VA, WV) and 19.2 percent were from the Midwest region. This compares to 47.6 percent and 11.9 percent from these two regions, respectively, in 2003. Respondents to the 2003 survey purchased 16.8 percent of their propagation materials from Oregon while none of the respondents to the 2008 survey purchased propagation materials from

Oregon. Although these data are consistent with our knowledge of many Kentucky nurseries, we are aware of significant purchases of bare-root liners and grafted whips by a few larger field production nurseries from the Pacific Northwest.

Advertising Expenditures

Kentucky survey respondents spent an average of 6.2 percent of their total 2008 annual sales in advertising, compared to 7.8 percent in the Appalachian region and 4.6 percent nationally. This represented a significant increase in advertising spending by Kentucky respondents since the 2003 survey when they spent an average of 2.5 percent of total annual sales for advertising (Figure 5). In 2008, respondents reported that almost 50 percent of their advertising expenditures were for catalogs (print and CDs). Twenty-three percent of advertising expenditures were in radio/television, up from 6 percent in 2003. Trade show expenses constituted almost 12 percent of advertising expenditures in 2008, up from 6.1% in 2003. Trade show participation with an exhibit (1.4 per year) or without having an exhibit (1.4 per year) were similar in 2003 and 2008. Nationally, growers attended an average of 2.3 trade shows annually with an exhibit and 1.8 shows without an exhibit. Yellow pages advertising accounted for 36 percent of expenditures in 2003 but only 9 percent in 2008. The decreased use of yellow pages advertising in Kentucky follows the national trend and may relate to wholesale nurseries utilizing internet sites such as the plant availability guide on the Kentucky Department of Agriculture website. Many nurseries have developed their own webpage which includes up-to-date inventory information.

The increased expenditures for advertising from 2003 to 2008 could be due to the use of advertising cost-share funds available through a Kentucky Horticulture Council grant from the Kentucky Agricultural Development Fund. Participation drastically increased in the advertising cost-share program

Figure 4. Average percentage of total annual sales by sales method for Kentucky respondents in 2003 and 2008.

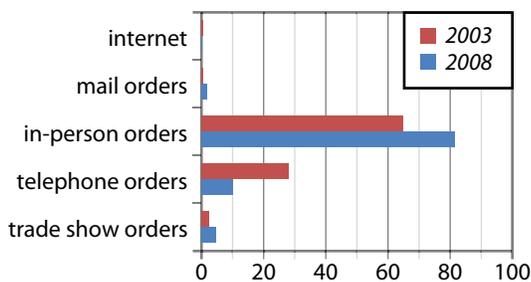
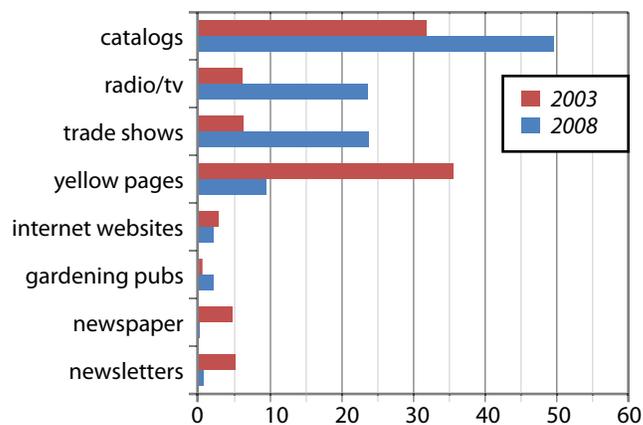


Figure 5. Percent of advertising dollars invested by Kentucky respondents in various media, 2003 and 2008.



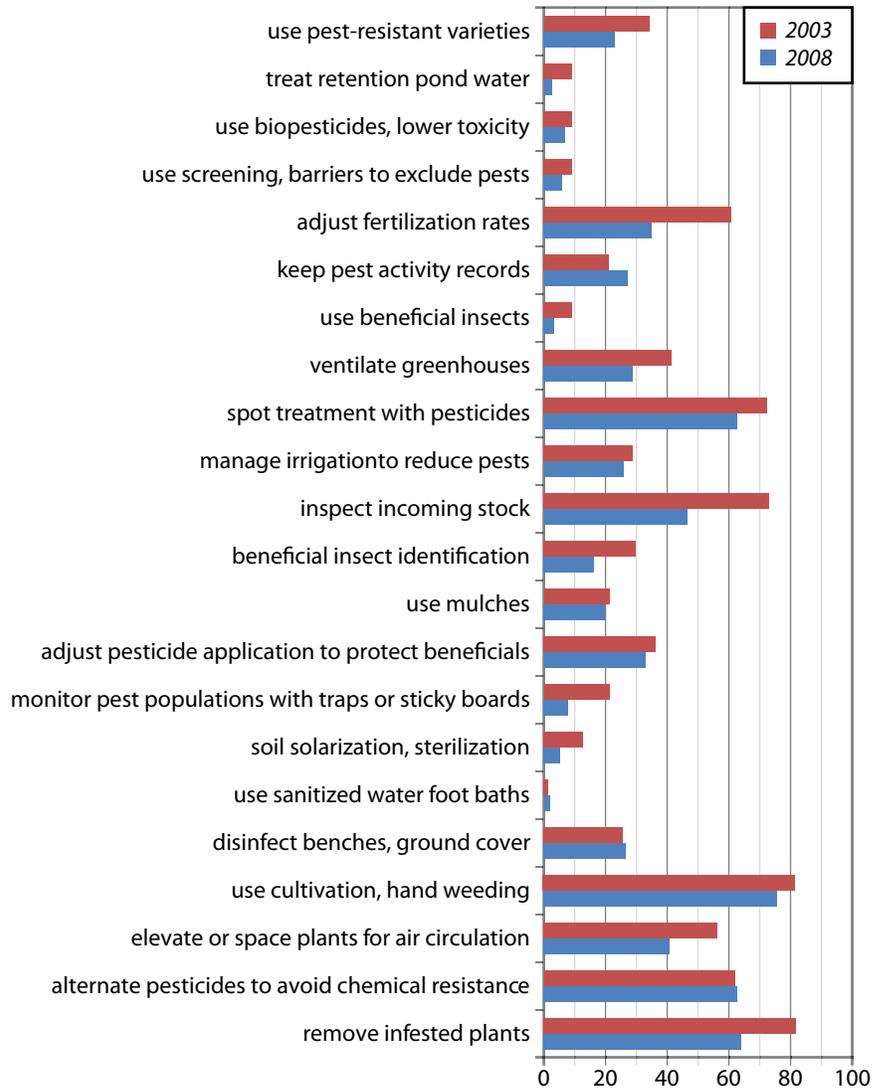
from 2002 through 2007 when over \$514,000 was invested into grass roots projects in all segments of horticulture across the Commonwealth. In 2005 alone over \$165,000 was invested and matched with \$174,817 producer dollars. The advertising cost-share program helped fund such advertising strategies as market signage, print and radio advertising, brochures, websites and point-of-purchase materials and helped producers learn how to plan their own marketing campaigns as well as featuring the Kentucky Proud logo in all of the advertising. This cost sharing has increased participation in the Kentucky Proud Program from 200 businesses in 2004 to nearly 1,100 in early 2008. These data were provided by the Kentucky Department of Agriculture's Marketing and Value-added Division, which administered the advertising cost-share program for the Kentucky Horticulture Council.

Integrated Pest Management Practices

Several IPM strategies were widely practiced by survey respondents. The majority used removal of infested plants, cultivation and hand weeding, and spot treatment with pesticides (Figure 6). Other practices important to respondents included alternating pesticides to avoid chemical resistance, elevating or spacing plants for air circulation, adjusting pesticide application to protect beneficials, identifying beneficial insects, inspecting incoming stock, mulching, managing irrigation to reduce pests, ventilating greenhouses, adjusting fertilization rates, and using pest-resistant varieties.

A primary focus of Kentucky IPM education for nursery production has been targeted pest identification and pesticide application for best efficacy to reduce pesticide use and cost and increase plant quality. Although the national survey data indicate a slight decrease in the use of IPM strategies, a scouting educational program including on-nursery workshops appears to have increased the use of such strategies in 2009 and 2010. Educational workshops offered in 2008, 2009 and 2010 introduced a pest-control strategy for reducing pesticide use by one half. Independent surveys of wholesale nursery managers participating in these programs reported reduced pesticide use through pest identification as well as improved plant quality through pest and nutrient management and refined scheduling of pesticide applications. Growers using scouting data in conjunction with the Half-Rate Program reduced the volume of pesticide applied per acre (same concentration) by half. The six-year cumulative economic impact for the state, as estimated by growers, was \$1.7 million.

Figure 6. Percent of Kentucky respondents practicing specific integrated pest management practices, 2003 and 2008.



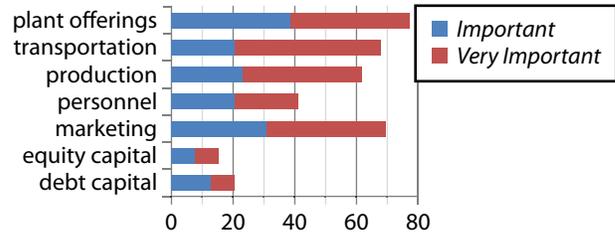
Water Sources and Irrigation Methods

More than 60 percent of Kentucky respondents in 2008 used water from municipal sources and 60 percent of growers applied irrigation water via overhead sprinklers. A third of the growers used water from natural surface water, and 16.6 percent used water from wells. In contrast, the dominant sources of water for nursery irrigation in the Appalachian region were wells (46%) and natural surface waters (43%). A third of the Kentucky respondents used drip irrigation. It would appear that municipal water sources are predominately used in retail and small wholesale establishments, and many of Kentucky nurseries have retail sales. Wholesale producers, especially the larger ones, depend much more on surface water and wells. Future water availability will likely limit the location of wholesale nurseries in Kentucky as it has in other states, and the price of municipal water is expected to continue to increase.

Figure 7. Percentage of Kentucky respondents ranking specific factors important or very important to establishing price.



Figure 8. Percentage of Kentucky respondents ranking specific factors important or very important for geographic expansion.



Factors Affecting Price, Geographic Expansion and Business

Nursery and greenhouse managers were asked about factors impacting their businesses in 2008 that affected their decisions regarding product price and geographic expansion of the business. The predominant factors (Figure 7) in establishing product price for Kentucky nursery and greenhouse managers were grade of plants, cost of production, market demand, other growers' prices, product uniqueness and last year's prices. These responses mirrored the national data as well as responses from the Appalachian region.

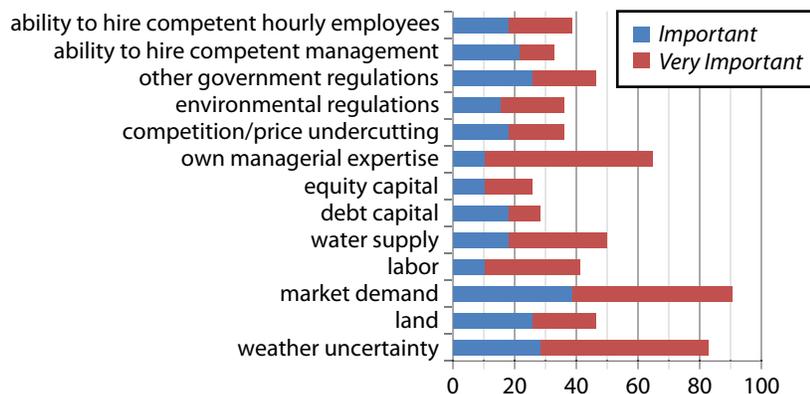
Interestingly, the respondents ranked plant offerings, marketing, transportation availability and cost and production factors as important or very important to their consideration of expanding their business to other geographic areas (Figure 8). Available personnel were somewhat less important, with equity capital and debt capital the least important among the choices given. The national and Appalachian region rankings of these factors were similar to Kentucky respondents.

Market demand and weather uncertainty were the dominant factors affecting overall business success as perceived by Kentucky respondents (Figure 9). Other important factors included their own managerial expertise, water supply, land, competition, labor and governmental issues. Again, Kentucky rankings were similar to the national and Appalachian region averages.

Summary and Implications

The nursery and greenhouse industry is a significant portion of Kentucky's horticulture industry and the state's important agricultural economy. Industry leaders can utilize this information when working with other agricultural leaders and state government. The characteristics of the industry can be used not only by those looking at the larger scale of the agricultural economy but can help individual nursery and greenhouse owners compare their activities with the state, regional and national averages. Among the important issues to be addressed on the industrywide scale are the dependence on municipal water, required changes in marketing strategy as dictated by market demands, as well as the need for continued Kentucky educational IPM programs and more efficient and sustainable production systems.

Figure 9. Percentage of Kentucky respondents rating specific factors as important or very important to their business.



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