SAAESD Southern Association of Agricultural Experiment Station Directors

Trade Flows and Marketing Practices within the U.S. Nursery Industry, 2008

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S-1021 Multistate Research Project

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Foreword

This report is one in a series of *Southern Cooperative Series* bulletins published under the auspices of the S-1021 Multi-state Regional Project, also known as the *Green Industry Research Consortium* to maintain a continuous identity over time. The lead agricultural experiment stations for this study were the Food and Resource Economics Department at the University of Florida., the Department of Horticultural Sciences, and the Department of Agricultural Economics at Texas A&M University. The Administrative Advisor of the project is Dr. Craig Nessler, Texas A&M University, and the USDA NIFA Representative is Dr. Henry Bahn

The Green Industry Research Consortium (GIRC) is a multi-state regional research committee sponsored by NIFA, which is the National Institute for Food and Agriculture (formerly the USDA Cooperative State Research, Education, and Extension Service - CSREES) and the Southern Association of Agricultural Experiment Station Directors (SAAESD) and has the official designation of Multi-state Regional Project S1021.

The committee is comprised of horticulturists and agricultural economists from land-grant universities who synergistically collaborate in conducting research in the following areas:

1. Investigate labor management practices and mechanization in the nursery and greenhouse industry.
2. Evaluate national and regional economic contributions of the U.S. Green industry.
3. Evaluate consumer preferences for environmental plants and their contribution to health and well being.
4. Investigate sustainable practices in ornamental crop production systems.

A full listing of S-1021 participants can be found at the committee website located at http://www.greenindustryresearch.org.

Abstract

The report presents information on marketing and production practices of the U.S. nursery and greenhouse industry in 2008, collected under the National Nursery Survey, the fifth such survey since 1988. Mail-back surveys have been used to collect information on selected production practices, sales by type of outlet, distribution of wholesale sales by state destination, advertising expenditures, and selling methods. For the most recent survey, the retailer category was segmented into four categories - mass merchants, home centers, single-location garden centers and multiple-location garden centers. Several new questions were added to the latest nationwide survey questionnaire. One question asked about water use and sources of irrigation water. Another question focused on sales of native plants, which was defined as those present in the state before European settlement. Twenty-two integrated pest management practices were listed and respondents asked to indicate which practices they enforced. Lists of nursery firms for each state were assembled from the respective Department of Agriculture (Plant Health Board) offices responsible for licensing nursery producers. The compiled state lists resulted in a combined listing of 38,000 certified nursery operations. A total of 3,044 usable questionnaires were returned from a sample of 17,019 firms. The survey was administered through both mail and internet questionnaires, with repeated contacts.

Survey respondents reported total annual sales of $4.45 billion in 2008, or an average of $1.73 million per firm, and total employment of 48,833 permanent and temporary jobs. Based on adjusted population of validated active firms (19,803), total U.S. nursery industry sales were estimated at $27.14 billion, and total employment was estimated at 262,941 jobs. The highest sales and employment were in the Pacific and Southeast regions, lead by the states of California and Florida. The leading plant types were deciduous shade and flowering trees and bedding plants. Native plants represented 13 percent of total sales. Containerized plants accounted for 65 percent of total sales. Overall, 77 percent of sales were through wholesale outlets, including landscape firms, single-location garden centers and re-wholesalers. Wells remain the most common source of irrigation water, and overhead sprinklers are the most common application method.

The most common current uses of computers are for word processing, communications (email) and accounting, while inventory management, internet commerce and production scheduling are expected to increase significantly in the next five years. The most common integrated pest management practices (IPM) followed were removal of infested plants, hand weeding and spot treatment with pesticides. A majority of propagated seedlings, whips, grafts and liners for nursery production were sourced by firms within their home same state and region. Likewise, most products were also sold within the same region, although producers in a few states sold a majority of product to other states. Exports to foreign countries represented 3.7 percent of total industry sales. The most common sales transaction methods were orders made by telephone and in-person. Most sales are to repeat customers. Brokerage and forward contracted sales are also common in the industry. Advertising expenditures represented 4.6 percent of total sales, and the most commonly used media were catalogs and trade shows. Growers attended an average of 2.3 trade shows annually with an exhibit and 1.8 shows without an exhibit. The most important factors affecting pricing of nursery products were cost of production, market demand and grade of plants. Transportation and plant offerings were rated as the most important factors affecting the geographic trade area. The biggest factors impacting the U.S. nursery industry in general were market demand and weather uncertainty.

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Acknowledgements

The 2009 *National Nursery Survey* was conducted under the auspices of the *Green Industry Research Consortium* of University Horticulturists and Economists, organized as a multi-state project under the U.S. Department of Agriculture, National Institute of Food and Agriculture, formerly known as the Cooperative State Research and Extension Education Service (USDA-CSREES). The project was supported partly by a grant from the Horticultural Research Institute (HRI), with cost sharing provided by the University of Florida and Texas A&M University. Assistance with survey data entry was provided by Alba Collart, Graduate Research Assistant at Texas A&M University. Mohammad Rahmani and Thomas Stevens of the University of Florida helped with preparation of the manuscript. Telephone surveys were conducted by the University of Florida, *Bureau of Economic and Business Research*.

Introduction

The 2009 *National Nursery Survey*, which gathered annual information for 2008, represented the fifth such effort by the *Green Industry Research Consortium*, following previous surveys for 1988, 1993, 1998, and 2003. Basic descriptive results of previous *National Nursery Surveys* were reported by Brooker et al. (1990, 1995, 2000, 2005).The objective of these surveys is to document production and management practices of the U.S. nursery and greenhouse industry, and provide information useful to growers, allied industry professionals, extension personnel and researchers.

The *Green Industry* complex includes input suppliers; production firms such as nursery, greenhouse, and sod growers; wholesales distribution firms, including importers, brokers, re-wholesalers, transporters; horticultural service firms providing landscape and urban forestry services such as design, installation, and maintenance; and retail operations, including independent garden centers, florists, home improvement centers, and mass merchandisers or other chain stores. The United States leads the world in the production and marketing of floriculture and nursery crops.

Participants engaged in producing Green Industry products include growers of floriculture crops, nursery crops, and turfgrass sod. Floriculture crops include bedding plants, potted flowering plants, foliage plants, cut cultivated greens, and cut flowers. As distinguished from nursery crops, floriculture crops are generally herbaceous and have

prominent floral features. Bedding and garden plants consist of young flowering plants (annuals and perennials) and vegetable plants. They are grown in flats, trays, pots, or hanging baskets, usually inside a controlled greenhouse environment, and sold largely for gardens and landscaping.

Potted flowering plants are largely sold in pots for indoor use. The major potted flowering plants are poinsettias, orchids, florist chrysanthemums, and finished florist azaleas. Foliage plants are also sold in pots and hanging baskets for indoor and patio use, including larger specimens for office, hotel, and restaurant interiors. Cut flowers are usually sold in bunches or as bouquets with cut foliage. The most popular cut flowers are roses, carnations, gladioli, and chrysanthemums. Leatherleaf ferns are the leading cut foliage. Combining cut flowers and cut greens in bouquets or other flower arrangements is a value-added retail option.

The market outlets for nursery and greenhouse crops are florists, garden centers, mass merchandisers, supermarkets, chain stores, discount stores, home improvement centers, hardware stores, landscape contractors, and re-wholesalers. Other retail outlets are farmers markets, flea markets, and street vendors. Since cut flowers are perishable and live floral crops are sensitive to variations in temperature, they usually require cool transportation and storage conditions that preserve and prolong their quality before final sale. The demand for floral crops, especially cut flowers, is highly seasonal. Sales are normally highest from February through May and in the fall. Sales of cut flowers peak during holidays such as Valentine's Day and Mother's Day. Poinsettia plants are sold mostly from Thanksgiving to Christmas. Cut flowers and foliage plants, however, are increasingly popular throughout the year as indoor home and workplace decorations.

Nursery crops are woody perennial plants that are usually grown in containers or in-ground. The Census of Agriculture defines nursery crops as ornamental trees and shrubs, fruit and nut trees (for noncommercial use), vines, and ground covers. They are primarily used for landscaping, not for producing edible products on a commercial scale. Trees and shrubs are classified as deciduous or evergreen. Deciduous includes shade, flowering, ornamental, fruit, and nut trees and shrubs. Evergreens include broadleaf and coniferous trees, and Christmas trees.

The location of nursery production is determined largely by soil, climate, availability of water, accessibility and distance to markets, and cost of land. Each plant species has a hardiness zone that sets the northern geographic latitude for in-ground growth. Trees and shrubs start out as "liners" (undeveloped, but rooted, trees and plants in pots or trays). As seedlings, they are typically protected from intense sunlight or severe weather by shade or temporary cover. The next step is transplantation into larger containers or the field for further growth. Sales can occur at any stage depending on the plants' commercial purpose.

Growers plant bare-root material (“liners”) in rows in the field, either in the fall, giving the roots time to develop before the plant breaks dormancy, or in the spring. Broadleaf shrubs and trees (holly, oak, and magnolia, for example) are often purchased as small container-grown liners, which are more expensive than bare-root plants because fewer die after transplanting. Liner production requires 6-12 months for the roots to develop and the plant

to reach the size needed for planting in the field. Bare-root material, the most economical nursery stock, is best planted in the early spring before growth begins.

Since nursery crops are usually grown in the field or in containers often without covered protection, the choice of crops is based on an area's natural vegetative species or the crop's ability to tolerate local climatic conditions. Thus, sales of most nursery crops, except Christmas trees, are more local or regional than floriculture crops, which are less costly to ship to farther markets. While homeowners are the typical consumers of trees, shrubs, and woody ornamental plants, markets also include developers, public utilities, golf courses, resorts, commercial parks, malls, as well as government agencies managing public parks, street and highway vegetation, and forests. Like many floral crops, demand for nursery crops (except Christmas trees) tends to coincide with normal planting seasons in the spring and fall.

Wholesale sales of green industry products are usually handled by salespersons who have established relations with large buyers. Marketing programs include numerous trade shows, advertising in trade publications, catalogs, and direct mail. Close planning with large buyers (referred to as partnering) is required to secure long-term markets and to ensure that the right product mix is produced; however, demand for different products can still vary substantially from year to year. Sales and many variable expenses (costs-of-goods-sold) are highly seasonal, with up to 50 percent of sales in the second quarter of a typical year. Cash flow is uneven throughout the year so cash management is important. Technical knowledge of plants and pests is important for nursery management, although many of the everyday tasks (cultural practices) are routine and do not require specialized labor. However, automation has proven to be difficult, aside from the widespread use of irrigation and fertilization systems. Nursery and greenhouse operations can be very sophisticated, with automatic irrigation and fertilization (sometimes referred to as fertigation), and air and lighting systems driven by a variety of sensors. Innovations demanded by big-box retailers (such as custom labeling, bar codes, scanners, and electronic data interchange between suppliers and buyers) are now used by many producers.

In recent years, there has been considerable consolidation among large growers, largely in response to consolidation occurring at the retail level. The rise of large, nationwide plant retailers like home centers and mass merchandisers has created a marketing opportunity for large growers who can supply the large volumes these customers require. Some nursery firms have grown rapidly through acquisition during the past decade, largely to service these big customers. Geared to serve big customers by handling large volumes, large growers actively discourage small-volume buyers. The big-box retailers and large landscape installation companies are supplied mainly by large nurseries, while independent garden centers, retail nurseries, and smaller landscape firms may be supplied by both large and small growers. Proximity and high product quality are more important to these buyers than low price because the end consumer is most interested in quality and the breadth of retail selection. Keeping plants alive and healthy is a challenge for many consumers, and small retail operations often have more technically knowledgeable staff than mass retailers to assist customers with plant care advice.

To even out the seasonal nature of demand throughout the year, many nurseries produce plants like Easter lilies and poinsettias that have demand at times other than late spring or fall. Large producers may also sell related products like soil, sod, and Christmas trees. Some growers may produce a range of soil mixtures made from peat moss, sand, bark, sawdust, lime, perlite, vermiculite, and other materials (including mulched product waste) to sell to other growers on a contract basis.

Turfgrass sod farms are specialized nurseries that usually only produce a subset of turfgrass varieties that are hardy for their particular region. Once sod leaves the nursery/farm, it usually passes through one or more marketing channels and is eventually used for new residential or commercial developments, for re-landscaping existing developments, for sports turf facilities such as athletic fields and golf courses, or for commercial applications that include businesses, public and private schools, and roadside uses. The final customer for sod can be the homeowner, a golf course, commercial businesses or public institutions. Each of them has different circumstances and, hence, different expectations. Thus, sod producers take these different needs into account. Although the customer generally decides the type of sod to purchase, the installer also plays an important role. Both the landscape contractor and sod installer often make the decision from whom to buy and may even recommend to the homeowner the type of sod to plant. Hence, although both the final consumer and the middleman are important, the latter is critical from the sod producers' perspective.

Competitive rivalry in the green industry is intensifying, especially at the retail level. The mass merchandising stores [often referred to as box store or chain stores] that sell truckloads of plants are continuing to ramp up their presence in the lawn and gardening industry. Their largest competitors include thousands of independent garden centers across the nation that charge higher prices but typically provide far more service and variety.

Box stores recognize that knowledge and service are key success factors and are attempting to reconcile deficiencies in that arena,. for example, through computerized gardening and landscaping training course organized by University horticulture departments to help increase the level of horticultural acumen their employees can provide to customers. These trained salespeople, in turn, offer workshops on such topics as weed control and garden planting much like the chain offers clinics on laying tile or hanging wall paper. Some box stores are installing larger garden center formats in new stores and expanding centers at some of their older, established stores. And in a move to help it overcome its traditionally poor care of its plants, box stores are changing their relationships with plant vendors though "pay-by-scan" compensation systems where vendors now will get paid only for plants that actually sell (much like a consignment system), putting the onus on them to make sure the flowers and shrubs sitting on the chain's shelves are attractive and in good shape. They will be expected to visit its 2,000+ stores daily with fresh deliveries if need be.

While big box stores and mass merchants have captured over half of the amount Americans spend a year on lawn and garden plants, the independent garden centers aren't surrendering. They do not have the volume to compete effectively on price, so they attempt to compete with better selection and more value-added services, which are especially attractive to new gardeners. They are introducing their own branded plants sold under house names or nationally available labels such as Proven Winners, Simply Beautiful, Flower Fields, Miracle Grow, and Plants

that Work. Specific products have also reached national brand status like the Wave Rave petunia campaign by Pan American Seed. Notable gardening personalities such as Martha Stewart and P.Allen Smith are marketing their own collection of gardening products and plants. Some garden centers are going further, adding cafes, coffee bars, meeting spaces, or other amenities. Others offer extensive how-to workshops or provide free landscaping advice and/or designs or plant shrubs for customers (though usually at an extra charge) and should a plant have problems, in-house "experts" will assist in diagnosing what went wrong.

There is little doubt that the impacts of mass marketers on the nursery and floricultural industry are far-reaching. To their credit, many would argue that the box store chains have exposed many more consumers to nursery and floral products, thereby increasing the "size of the pie". Undoubtedly this is true, as the presence of mass marketers has opened not only the consumers' eyes to the industry's products but provided additional marketing opportunities for growers as well.

Obviously, earlier discussion leads to conclusion that one of the impacts of the mass marketing of floricultural crops has been to promulgate an increase in overall size of growing operations. The capital requirements needed to afford the greenhouse infrastructures required to produce mass quantities of product in a confined marketing window exceed those that this industry has historically managed. Most firms have been able to generate the capital on their own, but the industry also has seen examples of investment brokers entering the industry to help finance some of these production operations. The financial returns of many of these venture capital acquisitions have seldom met Wall Street expectations however.

In some instances, chain store buyers have limited the number of approved vendors with whom they deal in any market area, as chains have come to realize certain procurement and merchandising efficiencies if fewer vendors are utilized. Chains have begun asking vendors to provide plant care for in-store displays, especially during the peak of the bedding/garden plant season, something that is easier to request if there are only a few firms handling most of the merchandise. Whether or not producers are adequately rewarded for the additional expense of providing fully managed retail displays is debatable, but some growers report that the improved product care leads to additional product turns, which in turn provide the needed financial (gross margin) results.
There are also several instances of large producers partnering (usually on a contract basis) with several smaller firms in order to handle the volumes required to supply large retail chains. In some instances, there may be several dozen growers involved in cross-docking activities to satisfy one chain's product supply needs in one market area. Depending upon the arrangements, this helps to spread the risk among several producers. Still, there are numerous examples of producers who supply 50 to 75 percent of their output to one chain. When asked about the market risk, these growers often respond with discussions about production efficiencies, economies of scale, and questions about what they could do even if they wanted to change, noting that their competitors would be more than happy to take over the account.

In contrast, the focus on mass marketers by large growers has created opportunities for smaller growers to develop niches serving independent retailers/landscapers or to go into retailing themselves, selling directly to the consumer. In our last national survey of growers, it was found that 59 percent of several thousand producers

surveyed did retail some portion of their product mix on their own, ranging from 1 to 80 percent of their production. Smaller growers appeared to sell higher percentages, on average, of their production on a retail basis either from drive-in customer traffic at the nursery/greenhouse or at wholly-owned retail sales yards. Yet, some larger producers have also used their own retail outlets as a tactic for risk diversification.

The other impact of mass marketers has been consolidation within the production sector. In recent years, grower numbers have appeared to decline from year to year, or at best, remain stable. One could debate as to the reasons producer numbers are diminishing, but many would argue that the stresses of either supplying mass marketers or competing with them as an independent grower-retailer are taking their toll. The capitalization requirements, increased input costs (e.g. fuel), reduced margins, increased demands from buyers, and the market power associated with fewer numbers of buyers have all created intense market pressures and heightened competitive rivalry among larger producers. The struggle to remain competitive in a viable niche for smaller producers can be equally trying in markets being inundated by competing chains.

The long-term consequences are uncertain, but the need to recognize and closely monitor consumer expectations, tastes, and preferences is imperative. If consumers were, for some reason, to develop a negative impression of the industry's products or for how those products are presented by a particular retail giant, this could have dire consequences for future growth in the entire industry. Keeping the consumer intrigued and sufficiently motivated is important, and will likely require collaborative efforts among participants in each sector of the industry-wide value chain.

A maturing industry is one that is moving from rapid growth to significantly slower growth. An industry is said to be mature when nearly all potential buyers are already users of the industry's products. Market demand consists mainly of replacement sales to existing users, with growth hinging on the industry's ability to attract new buyers and convince existing buyers to increase their usage. In the case of consumer goods industries, maturity means that they typically have a growth rate under 5 percent – roughly equal to the growth of the customer base or economy as a whole.

An industry's transition to maturity does not begin on an easily predicted schedule. Industry maturity can be forestalled by the emergence of new technological advances, frequent product innovations, or other driving forces that keep rejuvenating market demand. Nonetheless, when growth rates do slacken, the onset of market maturity usually produces fundamental changes in the industry's competitive environment including some of which we are seeing in the green industry:

- Slowing growth in demand is generating more head-to-head competition for market share. Firms that want to continue on a rapid-growth track are starting to look for ways to entice customers away from competitors. In such situations, price cutting, increased advertising, and other aggressive tactics to gain market share are common.
- Buyers are becoming more sophisticated, often driving a harder bargain or requiring additional services in order to repeat purchases. Since buyers have experience with the product and are familiar with competing

brands, they are better able to evaluate different brands and can use their market power (knowledge) to negotiate a better deal with vendors.

- Competition is producing a greater emphasis and cost and service. As growers all begin to offer the product attributes buyers prefer, buyer choices increasingly depend on which grower offers the best combination of price and service.
- Growers are experiencing a topping-out problem in adding new facilities. Reduced rates on industry growth mean slowdowns in capacity expansion for input manufacturers and slowdowns in new store growth for retails chains. With slower industry growth, adding too much capacity too soon can create oversupply conditions that adversely affect company profits well into the future.
- Product innovation and new end-user applications are becoming harder to come by. Breeders/growers find it increasingly difficult to create new product features and sustain buyer excitement.
- International competition continues to increase. Growth-minded domestic firms are starting to seek out sales opportunities in foreign markets. Some companies, looking for ways to cut costs, relocate growing operations to countries with lower wage rates. Industry leadership passes to companies that succeed in building strong competitive positions in most of the world's major geographic markets and in winning the biggest global market shares.
- Industry profitability is being influenced by tighter margins. Slower growth, increased competition, more sophisticated [and maybe fewer] buyers that place greater demands on their vendors, stagnant price levels, and occasional periods of overcapacity have put pressure on industry profit margins. Weaker, less-efficient firms are usually the hardest hit.
- Stiffening competition has induced a number of mergers and acquisitions among former competitors, driving the weakest firms out of the industry, and producing industry consolidation in general. Inefficient firms and firms with weak competitive strategies can achieve respectable results in a fast-growing industry with booming sales. But the intensifying competition of a maturing market throws second-and-third-tier competitors into a survival-of-the-fittest contest.

There is little doubt that the green industry has been characterized with unprecedented growth, innovation, and change over the last couple of decades. The fact that nursery and floral production still represents one of the fast growing sectors in agriculture means profitability in the industry has been evidenced otherwise such growth would not have occurred. However, slowing growth in demand and tighter margins (along with other aforementioned factors) point to a maturing market. Survival in the next decade will require a progressive mindset and perhaps a willingness to strengthen existing or develop new core competencies (which may incur greater risk). While the crystal ball may be somewhat fuzzy in terms of the growth and nature of consumer demand, there is little doubt that innovativeness will continue to be a requisite skill in ensuring the survivability and profitability of green industry firms in the future.

The objective of this research project is to obtain data regarding green industry growers to permit analyses of selected production and marketing factors in order to provide growers with additional information that could help them with strategic planning decisions. Also, this type of information is beneficial to other industry professionals, such as Extension personnel, researchers, and input suppliers. This data collection effort began because of the void of industry-wide data regarding production and marketing practices in the green industry. It should also be noted that the data collected by these surveys supplements rather than duplicates data collected by the National Agricultural Statistics Service.

Methods

Information collected in this survey included annual sales, fulltime and part-time employment, plant types produced, native plants, product forms, market distribution channels, interstate and international trade flows of finished products and propagation materials, selling methods, advertising forms, irrigation water sources and application methods, integrated pest management (IPM) practices, year of business establishment, computerized business functions, and factors affecting business growth and pricing. All information collected pertained to business operations in 2008. A copy of the questionnaire is provided in the Appendix. The questionnaire and survey protocol were approved for compliance with ethical standards for human subjects research by the *University of Florida Institutional Review Board.*

The content of the *National Nursery Survey* has remained very similar over time, but has evolved in response to changing characteristics of the industry. For example, questions about market channels have been revised to capture sales to mass merchandise chain stores, home centers, multiple-location garden centers, and re-wholesalers. New questions were added to the survey in 2003 to address water use and sources of irrigation water, sales of native plants, and integrated pest management (IPM) practices. Many questions in the survey asked respondents to indicate the percentage share of the total activity for each specific item, with all items supposed to sum to 100 percent. Other questions were posed as checklists or "Yes"/"No" answers, or asked the respondent to rate items on a 4 point scale of importance.

A list of over 38,000 U.S. nursery firms in all 50 states was developed for the survey, as summarized in Table 1. The largest ten states in terms of nursery business population were: Florida (7,848), California (5,105), Pennsylvania (2,894), New York (2,266), North Carolina (1,641), Texas (1,445), Ohio (1,114), Tennessee (1,062), Illinois (1,034) and Georgia (1,018). This number compares with 50,784 nursery/greenhouse operations in the U.S. in 2007 reported by the Census of Agriculture (USDA, 2007). The list contained information on company name, contact person, mailing address, and in some cases telephone numbers and email addresses. The listings for each state were obtained from representatives to the *National Plant Health Board*, an organization comprised of the heads of the relevant plant health regulatory agencies, which in most states is housed within the Department of Agriculture or its equivalent. All commercial growers and dealers of live plants are required to be registered and annually certified for compliance with phytosanitary regulations, so these lists of plant growers can be considered exhaustive to the extent of force of law. Some states make their lists of nursery growers available on website, while others provide it upon request. Lists of certified nurseries were obtained from *Plant Health Board* members of 47 states. Only the states of Arizona, Montana and Kansas did not provide this information, so a list of AZ nurseries was ultimately obtained from the state nursery association, while lists for MT and KS were obtained from the *OneSource* business directory, in order to provide coverage for all 50 states. The final lists used for the survey were screened to eliminate duplicate entries and companies not involved in plant production.

A stratified random sampling plan was used to select firms from the list for the mail survey. Firms were stratified in four size classes based on open production area (acres), greenhouse area (square feet) or plant inventory

(number units), whichever applied in each state, as shown in Table 2. Information on size of operation was available for 20 states. In cases where a firm had both open production and greenhouse areas, the larger size categorization was applied. A total of 14,964 firms were selected for a mail survey, including 100 percent of the large firms, 60 percent of the medium firms, 32 percent of small firms, 20 percent of very small firms, and 45 percent of firm of unknown size. The stratified sampling plan was designed to provide a greater sampling rate for large and medium-sized firms in order to maximize responses of these firms, which typically represent a dominant share of industry activity, while still representing small or very small firms and staying within budget constraints for the project. Firms selected to receive the mail survey were screened by the U.S. Postal Service to validate addresses, which resulted in 839 addresses being eliminated, or 5.6 percent of the original sample selected, leaving a total of 14,123 firms that actually received the mailings.

Two complete mailings of the printed survey were conducted in June and July of 2009. Questionnaires were mailed to selected firms, together with postage-paid return envelopes, and a cover letter from the investigators explaining the purpose and benefits of the survey. The questionnaires and letters contained the logos of the sponsoring organizations to enhance the credibility and legitimacy of the survey. Return envelopes accompanying the survey mailings were imprinted with a code number matched to the mailing list, in order to identify respondents for purposes of sample extrapolation and quality control. Reminder postcards were mailed to respondents about one week after each survey mailing. Completed surveys were returned to Texas A&M University for data entry.

In addition to the mail survey, for the first time in the history of the *National Nursery Survey*, a sample of 2,896 firms in 12 states were surveyed via electronic mail, including all firms for which an email address was available (Table 1). Firms to be surveyed via email were removed from the population considered for the mail survey to avoid duplication and minimize burdens on respondents. The online survey was implemented using the *SurveyMonkey* service (SurveyMonkey.com), which supports batch email invitations, security-encrypted data recording, and automatic tracking of respondents. Three email invitations to participate in the survey were made in June, July and August 2009, with the second and third email invitations sent only to those firms that had not previously responded. Firms were invited to participate in the survey by clicking on a link to the survey website. Respondents were then explicitly asked for consent to participate in the survey, and were given the option to decline or “opt-out”, as required by anti-spam laws governing electronic communications. Consenting respondents were asked a qualifying question: “Was your company actively involved in producing and marketing ornamental plants last year (2008)?” Respondents answering this question affirmatively were then directed to proceed with the survey, while those answering negatively were thanked and the survey was terminated. It should be noted that the online version of the questionnaire and emailed letters of invitation exactly matched the content of the printed/mailed surveys, except for the initial qualifying question, so the results are strictly comparable. Some 81 firms (2.8%) contacted for the email survey responded that they were inactive.

A total of 17,019 nursery firms were surveyed by both mail and internet methods. The survey sampled 44.8 percent of the U.S. nursery population overall, but this percentage ranged widely among individual states, from

100 percent for Arizona to 26 percent in Maine (Table 1). Valid responses were received from 3,044 firms, including 2,732 from the mail survey and 312 from the email survey, representing an overall response rate of 17.9 percent. These tabulations do not include questionnaires that were returned blank, or duplicate responses received from the same firms. States with the highest number of respondents were Florida (556), California (296), Pennsylvania (275), North Carolina (151), New York (147), Ohio (141), Texas (114), and Tennessee (101). A few states had less than 10 respondents (AZ, MT, ND, NW, UT, WV). Response rates were greater than 25 percent for the states of Wisconsin (35.8%), Montana (29.6%), Delaware (28.0%), Minnesota (26.2%), and Ohio (25.2%), but were less than 10 percent for New Hampshire, Oklahoma and West Virginia. Response rates for the mail survey (19.3%) were higher than for the internet (email) survey (10.8%). Overall, 85 percent of respondents reported the key information on annual sales. 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 the actual sales were specified (Table 3). Sales for each product type, market channel, etc. within each firm were estimated from the annual sales, together with the percentage breakdown reported, so that results represent sales-weighted averages.

Finally, a follow-up telephone survey was conducted in April 2010 with the purpose of testing for representativeness of the mail and internet surveys, and determining the share of the business population that is active and qualified, in order to estimate total industry sales and employment. Telephone interviews were subcontracted to the University of Florida-*Bureau of Economic and Business Research*. The survey contacted a random sample of 5,156 firms with telephone numbers available in 41 states. The firms were either not sampled previously or did not respond to the mail and internet surveys. Some 1,339 firms (26.0%) were judged to be ineligible or inactive based on the disposition of calls, including reasons such as no-answer, fax/data line, non-working number, or number changed. A total of 950 telephone interviews were completed, of which 29.5 percent of firms were currently inactive. Together, these two factors indicated that 52.1 percent of the U.S. population of firms [(1-0.260)x(1-0.295)] were active and qualified as valid nursery producers. The share of the business population that was validated ranged from 34 to 69 percent across states, as shown in Table 4. For states in which no telephone surveys were conducted, or in which the telephone survey sample size was less than 20, the population adjustment factor was set at the national average (52.1%).

Expanded estimates of annual sales and employment in each state were based on the adjusted population of firms, multiplied by the average sales or employment per firm, representing the subset of firms that provided this critical information. The estimates were developed by stratified firm size classes (see Table 2), in states where this information was available, in order to avoid bias introduced by skewed firm size distributions.

Table 1. United States nursery population, mail and internet survey sample, number respondents and response rates, by state.

State (Abbrev.)	Business Population	Survey Sample			Share of Population Sampled (percent)	Survey Respondents			Response Rate (percent)	Share of Respondents Reporting Sales (percent)
		Mail*	Internet (Email)	Total		Mail	Internet (email)	Total		
AK	64	16	47	63	98.4	7	8	15	23.8	93.3
AL	652	276		276	42.3	48	1	49	17.8	93.9
AR	94	92		92	97.9	22		22	23.9	95.5
AZ	55	25	30	55	100.0	3	4	7	12.7	71.4
CA	5,105	1,486	853	2,339	45.8	223	73	296	12.7	83.1
CO	243	95		95	39.1	23		23	24.2	82.6
CT	233	112		112	48.1	18		18	16.1	72.2
DE	90	75		75	83.3	21		21	28.0	76.2
FL	7,848	2,365	783	3148	40.1	456	100	556	17.7	81.8
GA	1,018	358	258	616	60.5	77	18	95	15.4	82.1
HI	180	4	161	165	91.7	3	16	19	11.5	63.2
IA	295	139		139	47.1	30		30	21.6	83.3
ID	418	170		170	40.7	40	1	41	24.1	82.9
IL	1,034	391		391	37.8	75		75	19.2	86.7
IN	348	141		141	40.5	27		27	19.1	88.9
KS	79	71		71	89.9	12		12	16.9	100.0
KY	352	165		165	46.9	29	1	30	18.2	93.3
LA	514	237		237	46.1	44		44	18.6	95.5
MA	188	88		88	46.8	16		16	18.2	81.3
MD	417	181		181	43.4	35		35	19.3	85.7
ME	703	179		179	25.5	34		34	19.0	88.2
MI	952	400		400	42.0	82	1	83	20.8	75.9
MN	508	183		183	36.0	48		48	26.2	91.7
MO	633	209		209	33.0	37	1	38	18.2	92.1
MS	492	182		182	37.0	28		28	15.4	85.7
MT	33	27		27	81.8	8		8	29.6	87.5
NC	1,641	521	284	805	49.1	113	38	151	18.8	80.8
ND	44	38		38	86.4	5	1	6	15.8	100.0
NE	88	75		75	85.2	11		11	14.7	100.0
NH	58	13	36	49	84.5	2	1	3	6.1	66.7
NJ	792	328		328	41.4	52		52	15.9	86.5
NM	176	71		71	40.3	17		17	23.9	76.5
NV	85	42	19	61	71.8	4	3	7	11.5	85.7
NY	2,266	783		783	34.6	147		147	18.8	87.8
OH	1,114	560		560	50.3	140	1	141	25.2	90.8
OK	419	98	120	218	52.0	11	8	19	8.7	63.2
OR	507	249		249	49.1	46		46	18.5	97.8
PA	2,894	1,304		1,304	45.1	275		275	21.1	83.6
RI	84	83		83	98.8	17		17	20.5	88.2
SC	698	284		284	40.7	45	1	46	16.2	76.1
SD	79	74		74	93.7	16		16	21.6	100.0
TN	1,062	541		541	50.9	100	1	101	18.7	88.1
TX	1,445	626		626	43.3	108	6	114	18.2	84.2
UT	137	51		51	37.2	9		9	17.6	88.9
VA	357	174		174	48.7	43		43	24.7	93.0
VT	335	25	225	250	74.6	2	24	26	10.4	76.9
WA	726	298		298	41.0	58		58	19.5	87.9
WI	264	109		109	41.3	39		39	35.8	87.2
WV	97	18	78	96	99.0	4	3	7	7.3	85.7
WY	98	91		91	92.9	20		20	22.0	85.0
Unknown						2	1	3		33.3
Total	**38,014**	**14,123**	**2,894**	**17,017**	**44.8**	**2,732**	**312**	**3,044**	**17.9**	**84.7**

*Number firms net of US Postal Service screening.

Table 2. Stratified sample classes for survey.

Size Class	Open production area (acres)	Greenhouse area (Sq. Ft.)	Plant Inventory (units)	Sampling Rate
Very Small	0-.99	0-19,999	0-999	20%
Small	1-4.9	20,000-99,000	1,000-9,999	32%
Medium	5-19.9	100,000-499,999	10,000-99,999	60%
Large	20 +	500,000 +	100,000 +	100%
Unknown	NA	NA	NA	45%

Table 3. Ranges for annual sales reported, and average value used to estimate sales.

Sales Range	Average Value
Less than $249,999	$51,426
$250,000 to $499,999	$347,069
$500,000 to $999,999	$700,757
$1,000,000 to $1,999,999	$1,324,466
$2,000,000 to $2,999,999	$2,303,556
$3,000,000 to $3,999,999	$3,325,000
$4,000,000 to $4,999,999	$4,162,889
$5,000,000 to $9,999,999	$7,217,964
$10,000,000 to $14,999,999	$12,325,000
$15,000,000 to $19,999,999	$17,500,000*
$20,000,000 to $29,999,999	$24,666,667
$30,000,000 to $39,999,999	$35,000,000*
$40,000,000 to $49,999,999	$45,000,000*
$50,000,000 or more	$50,000,000*

*Sales estimated at midpoint or lower end of range due to lack of specific information.

Table 4. Telephone survey sample, share of firms unqualified or inactive, and population validated.

State	Number calls made	Interviews completed	Firms unqualified (percent)	Firms inactive (percent)	Population validated* (percent)
AK	10	2	26.0	29.5	52.2
AR	34	8	14.7	29.5	60.1
AZ	20	2	35.0	29.5	45.8
CA	1,211	179	26.8	34.4	48.1
CO	1	0	26.0	29.5	52.2
FL	936	168	34.6	25.9	48.4
GA	118	29	27.1	41.4	42.7
ID	102	26	19.6	51.7	38.8
IL	150	31	21.3	30.3	54.8
IN	36	5	22.2	29.5	54.8
KS	39	8	28.2	29.5	50.6
KY	64	9	18.8	16.7	67.7
LA	85	12	32.9	7.1	62.3
MA	29	9	10.3	29.5	63.2
MD	1	0	26.0	29.5	52.2
MI	153	25	24.8	32.1	51.0
MN	66	12	25.8	14.3	63.6
MO	86	16	25.6	23.5	56.9
MS	67	11	34.3	27.3	47.8
MT	15	3	26.0	29.5	52.2
NC	188	39	21.8	25.6	58.1
ND	14	4	26.0	29.5	52.2
NH	1	0	26.0	29.5	52.2
NJ	1	1	26.0	29.5	52.2
NV	42	7	23.8	29.5	53.7
NY	310	60	21.3	21.2	62.0
OH	193	47	13.0	34.0	57.5
OK	51	13	21.6	57.1	33.6
OR	5	3	26.0	29.5	52.2
PA	476	88	22.5	25.5	57.8
SC	1	0	26.0	29.5	52.2
SD	18	4	26.0	29.5	52.2
TN	201	49	23.9	24.1	57.8
TX	258	34	32.2	38.1	42.0
UT	1	0	26.0	29.5	52.2
VA	69	14	24.6	37.5	47.1
VT	13	4	26.0	29.5	52.2
WA	1	0	26.0	29.5	52.2
WI	44	13	11.4	28.6	63.3
WV	10	2	26.0	29.5	52.2
WY	36	13	8.3	25.0	68.8
Total or Average	5,156	950	26.0	29.5	52.1

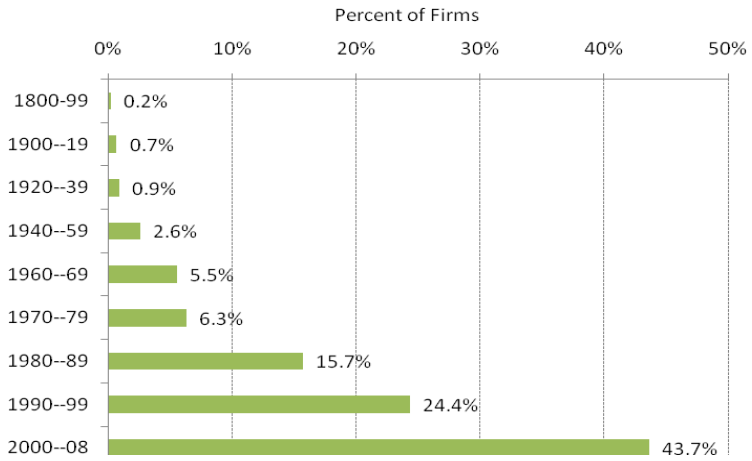
*Share of population validated calculated as (1-A)x(1-B), where A is share of firms unqualified, B is share of firms inactive; for states with less than 20 calls made of less than 10 interviews completed, share of population validated was set at national average (52.1%).

Results

Year Established

The U.S. nursery and greenhouse industry (green industry) has experienced substantial growth in the number of firms throughout history due to solid growth in sales. Entry of new firms into the nursery industry appears to be continuing. This is evidenced by the large number of firms established from 2000-2008 (43.7%), as shown in Figure 1. Rapid growth and expansion in the 1980s and 1990s is reflected in the number of firms currently operating that were established during those decades (15.7% and 24.4% respectively). The number of firms that have been in business since 1970 represented 15.5 percent of total firms. If the results of this survey are compared to our prior survey of 2003, it can be inferred that the substantial entry of new firms in this decade was accompanied by the exit or sale of older firms established in previous decades (Brooker et. al., 2003). This process occurs as part of the regular business cycle when firms enter and exit the industry as the overall industry becomes more efficient. These results stand in contrast to the U.S. Census of Agriculture, which reported that the total number of firms in the nursery industry has decreased in the last five years from 56,070 firms in 2002 to 50,784 in 2007 (USDA, 2009). Substantial turnover of firms is expected to continue in the nursery industry in the years to come, especially with the economic and financial crisis of 2008-09.

Figure 1. Year established of U.S. nurseries surveyed, 2008.



Annual Sales Distribution

Annual sales were reported either as a specific amount or as a range, from less than $250,000 to more than $50 million (Table 3). Over 50 percent of all respondents were firms with less than $250,000 in annual sales, while 9 percent of firms had sales of $250,000 to $499,000, 8 percent had sales of $500,000 to $999,999, and 17 percent had sales of $1 million or greater (Figure 2). There were 2.2 percent of firms with annual sales of $10 million to $49.99 million, and less than 1 percent indicated having annual sales of more than $50 million. Some 15 percent of survey respondents did not report annual sales. The Pacific region showed the highest percentage of firms in the over $50 million category (2.1%), followed by the Southcentral (1.4%), as shown in Table 5. The Great Plains region had the highest share of firms in the less than $250,000 range (68.9%).

Figure 2. Distribution of sales reported by U.S. nurseries, 2008.

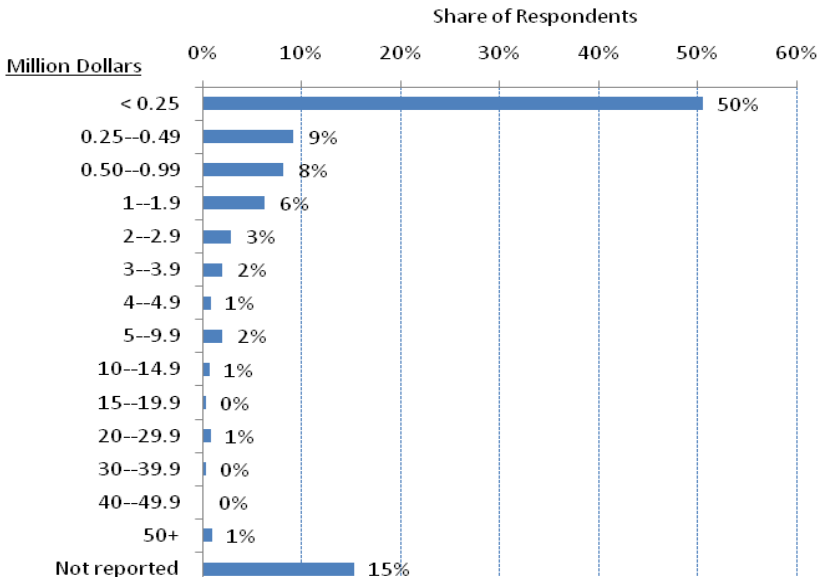


Table 5. Distribution of annual sales reported by nurseries in U.S. states and regions, 2008.

Region, State	Annual Sales Range (million dollars)														
	< 0.25	0.25-0.49	0.5-0.99	1 to 1.99	2 to 2.99	3 to 3.99	4 to 4.99	5 to 9.99	10 to 14.99	15 to 19.99	20 to 29.99	30 to 39.99	40 to 49.99	50+	Not reported
	Percent of firms in each region/state														
Appalachian	**46.4**	**10.2**	**9.9**	**8.1**	**4.2**	**1.5**	**1.2**	**1.8**	**0.3**	**0.3**	**0.3**	**0.3**	**-**	**1.2**	**14.2**
KY	63.3	10.0	3.3	10.0	-	-	3.3	3.3	-	-	-	-	-	-	6.7
NC	43.7	11.9	11.3	6.0	2.6	1.3	1.3	0.7	-	-	0.7	-	-	1.3	19.2
TN	42.6	10.9	11.9	11.9	6.9	2.0	-	1.0	-	-	-	-	-	1.0	11.9
VA	51.2	-	7.0	7.0	7.0	2.3	2.3	7.0	2.3	2.3	-	2.3	-	2.3	7.0
WV	57.1	28.6	-	-	-	-	-	-	-	-	-	-	-	-	14.3
Great Plains	**68.9**	**4.4**	**11.1**	**6.7**	**-**	**2.2**	**-**	**4.4**	**-**	**-**	**-**	**2.2**	**-**	**-**	**-**
KS	66.7	8.3	-	16.7	-	-	-	8.3	-	-	-	-	-	-	-
ND	83.3	-	16.7	-	-	-	-	-	-	-	-	-	-	-	-
NE	63.6	-	9.1	9.1	-	9.1	-	-	-	-	-	9.1	-	-	-
SD	68.8	6.3	18.8	-	-	-	-	6.3	-	-	-	-	-	-	-
Midwest	**58.8**	**7.9**	**6.0**	**4.8**	**2.5**	**0.6**	**1.7**	**1.5**	**0.6**	**0.2**	**1.0**	**0.4**	**-**	**0.8**	**13.1**
IA	63.3	3.3	3.3	3.3	3.3	-	3.3	-	-	-	3.3	-	-	-	16.7
IL	64.0	6.7	5.3	4.0	2.7	-	1.3	-	-	-	1.3	-	-	1.3	13.3
IN	48.1	11.1	7.4	11.1	3.7	-	-	3.7	-	-	-	-	-	3.7	11.1
MI	47.0	7.2	8.4	4.8	2.4	-	2.4	-	1.2	1.2	-	1.2	-	-	24.1
MN	60.4	8.3	6.3	4.2	-	2.1	2.1	4.2	-	-	2.1	-	-	2.1	8.3
MO	65.8	7.9	10.5	2.6	2.6	-	-	-	-	-	2.6	-	-	-	7.9
OH	58.9	9.9	5.7	4.3	2.8	1.4	2.1	2.8	1.4	-	-	0.7	-	0.7	9.2
WI	69.2	5.1	-	7.7	2.6	-	-	-	-	-	2.6	-	-	-	12.8
Mountain	**47.0**	**13.0**	**7.8**	**4.3**	**3.5**	**2.6**	**-**	**3.5**	**-**	**0.9**	**-**	**0.9**	**-**	**-**	**16.5**
AZ	-	28.6	14.3	-	-	14.3	-	14.3	-	-	-	-	-	-	28.6
CO	39.1	8.7	-	4.3	8.7	4.3	-	13.0	-	4.3	-	-	-	-	17.4
ID	48.8	12.2	12.2	4.9	2.4	2.4	-	-	-	-	-	-	-	-	17.1
MT	50.0	12.5	12.5	-	-	-	-	-	-	-	-	12.5	-	-	12.5
NV	42.9	14.3	14.3	-	14.3	-	-	-	-	-	-	-	-	-	14.3
UT	55.6	11.1	11.1	11.1	-	-	-	-	-	-	-	-	-	-	11.1
WY	65.0	15.0	-	5.0	-	-	-	-	-	-	-	-	-	-	15.0
Northeast	**55.4**	**9.2**	**6.7**	**5.3**	**2.0**	**1.6**	**0.6**	**1.6**	**1.1**	**0.2**	**0.2**	**0.2**	**0.3**	**0.2**	**15.7**
CT	22.2	5.6	5.6	11.1	11.1	-	-	5.6	11.1	-	-	-	-	-	27.8
DE	57.1	9.5	4.8	4.8	-	-	-	-	-	-	-	-	-	-	23.8
MA	31.3	6.3	25.0	6.3	-	-	-	12.5	-	-	-	-	-	-	18.8
MD	40.0	11.4	8.6	11.4	2.9	-	2.9	8.6	-	-	-	-	-	-	14.3
ME	67.6	8.8	2.9	-	5.9	2.9	-	-	-	-	-	-	-	-	11.8
NH	33.3	-	-	-	-	-	-	-	-	-	33.3	-	-	-	33.3
NJ	50.0	5.8	9.6	7.7	3.8	-	1.9	1.9	3.8	-	-	-	1.9	-	13.5
NY	59.9	6.8	6.1	8.2	1.4	2.7	1.4	0.7	-	-	-	0.7	-	-	12.2
PA	60.0	10.2	6.2	2.2	1.1	1.5	-	0.7	0.7	0.4	-	-	0.4	0.4	16.4
RI	29.4	23.5	5.9	17.6	5.9	5.9	-	-	-	-	-	-	-	-	11.8
VT	53.8	11.5	3.8	3.8	-	-	-	-	3.8	-	-	-	-	-	23.1
Pacific	**40.1**	**8.5**	**10.4**	**8.5**	**3.7**	**3.2**	**0.9**	**3.9**	**1.2**	**0.5**	**1.2**	**0.5**	**0.2**	**2.1**	**15.2**
AK	80.0	-	-	-	-	-	-	-	6.7	-	-	-	-	6.7	6.7
CA	31.8	8.8	11.5	10.8	3.7	4.1	1.4	4.7	1.4	0.7	1.7	0.7	-	2.0	16.9
HI	47.4	10.5	-	-	-	-	-	-	-	-	-	-	-	5.3	36.8
OR	54.3	10.9	13.0	4.3	6.5	2.2	-	4.3	-	-	-	-	2.2	-	2.2
WA	58.6	6.9	8.6	5.2	3.4	1.7	-	1.7	-	-	-	-	-	1.7	12.1
Southcentral	**53.7**	**9.7**	**6.5**	**7.4**	**1.4**	**1.9**	**-**	**0.9**	**0.5**	**-**	**0.9**	**0.5**	**0.5**	**1.4**	**14.8**
AR	63.6	13.6	9.1	-	-	4.5	-	-	-	-	4.5	-	-	-	4.5
LA	36.4	29.5	4.5	15.9	-	2.3	-	2.3	-	-	2.3	2.3	-	-	4.5
NM	58.8	5.9	-	-	5.9	-	-	-	-	-	-	-	-	5.9	23.5
OK	47.4	-	5.3	-	5.3	-	-	5.3	-	-	-	-	-	-	36.8
TX	58.8	3.5	7.9	7.9	0.9	1.8	-	-	0.9	-	-	-	0.9	1.8	15.8
Southeast	**47.3**	**9.3**	**9.0**	**5.8**	**3.4**	**2.6**	**0.5**	**1.6**	**0.4**	**0.4**	**1.3**	**-**	**-**	**0.9**	**17.6**
AL	57.1	20.4	2.0	6.1	4.1	-	-	-	-	-	4.1	-	-	-	6.1
FL	46.8	9.0	9.7	5.6	3.4	2.9	0.2	1.4	0.5	0.5	1.1	-	-	0.7	18.2
GA	36.8	9.5	10.5	8.4	3.2	3.2	3.2	2.1	-	-	2.1	-	-	3.2	17.9
MS	53.6	7.1	7.1	7.1	3.6	3.6	-	3.6	-	-	-	-	-	-	14.3
SC	60.9	2.2	6.5	2.2	2.2	-	-	2.2	-	-	-	-	-	-	23.9
United States	**50.5**	**9.1**	**8.2**	**6.2**	**2.9**	**2.0**	**0.8**	**2.0**	**0.7**	**0.3**	**0.8**	**0.3**	**0.1**	**0.9**	**15.3**

Employment Reported and Average Employment per Firm

A total of 48,833 employees were reported nationwide for all survey respondents in 2008, including 27,307 permanent employees and 21,526 temporary employees, as shown in Table 6. The Southeast and Pacific regions of the nursery industry had the highest employment reported, with 13,172 and 11,324 employees, respectively, lead by the dominant states of Florida and California. Among other regions, respondents in the Midwest reported 9,744 employees, followed by the Northeast (5,537), Appalachian (4,472), Southcentral (2,077), Mountain (1,724), and Great Plains (785). The average number of employees per nursery firm was 11.5 permanent and 9.0 temporary (Table 6). The state with the highest average number of permanent employees was California (27.2), followed by Arizona (25.5), Minnesota (23.2), Colorado (22.4), Hawaii (20.3), Virginia (20.1), Georgia (19.1) and Oregon (19.0). The states with the highest number of temporary employees per nursery were Kansas (40.1), Minnesota (39.0) and Wisconsin (33.8). The states with the lowest average number of permanent employees were Wyoming (1.2), Vermont (1.8), Alaska (2.1), Maine (2.3), South Dakota (2.3), Illinois (2.6) and West Virginia (2.7), and the lowest average number of temporary employees per nursery was found in Hawaii (1.2), Delaware (2.1) and South Carolina (3.0).

Annual Sales Reported and Average Sales per Firm

Total sales in 2008 reported by all survey respondents in the U.S. amounted to $4.45 billion (Table 6). The Pacific and the Southeast regions reported the highest annual sales of nursery products, $1.11 billion and $1.06 billion, respectively, lead by the states of California ($841 million) and Florida ($698 million). Among other regions, the Midwest reported annual sales of $646 million, followed by the Northeast ($573 million), Appalachian ($475 million), Southcentral ($396 million), Mountain ($122 million), and Great Plains ($63 million). The overall average sales reported per firm was $1.72 million. Sales per firm was highest in the Pacific region ($3.02 million), followed by the South central ($2.15 million). The other regions of the U.S. had average sales per firm ranging from $1.0 to $1.67 million.

Table 6. Employment and annual sales reported by survey respondents in U.S. states and regions, 2008.

Region, State	Permanent employment reported	Temporary employment reported	Total employment reported (permanent and temporary)	Annual sales reported (millions$)	Average number permanent employees per firm	Average number temporary employees per firm	Average annual sales per firm ($1000)
Appalachian	**2,668**	**1,804**	**4,472**	**475.1**	**9.8**	**6.6**	**1,667**
KY	72	95	167	17.3	3.8	5.0	617
NC	1,180	757	1,937	190.6	9.5	6.1	1,562
TN	675	486	1,161	111.1	7.7	5.5	1,248
VA	725	446	1,171	155.2	20.1	12.4	3,881
WV	16	20	36	0.9	2.7	3.3	155
Great Plains	**121**	**664**	**785**	**63.2**	**3.2**	**17.5**	**1,405**
KS	44	401	445	10.3	4.4	40.1	859
ND	19	46	65	1.1	3.2	7.7	187
NE	30	94	124	41.3	3.0	9.4	3,752
SD	28	123	151	10.5	2.3	10.3	658
Midwest	**3,187**	**6,557**	**9,744**	**646.4**	**8.3**	**17.1**	**1,546**
IA	86	194	280	35.3	3.6	8.1	1,413
IL	149	350	499	93.8	2.6	6.0	1,443
IN	181	443	624	67.0	7.5	18.5	2,791
MI	258	660	918	91.4	4.4	11.2	1,451
MN	905	1,522	2,427	105.9	23.2	39.0	2,407
MO	91	120	211	33.6	2.8	3.8	959
OH	1,274	2,422	3,696	186.4	10.4	19.7	1,456
WI	243	846	1,089	33.0	9.7	33.8	971
Mountain	**801**	**923**	**1,724**	**122.2**	**9.1**	**10.5**	**1,273**
AZ	153	30	183	13.4	25.5	5.0	2,683
CO	447	341	788	52.4	22.4	17.1	2,756
ID	111	299	410	14.0	3.8	10.3	411
MT	20	62	82	33.5	3.3	10.3	4,787
NV	25	29	54	3.5	4.2	4.8	584
UT	27	79	106	2.7	4.5	13.2	333
WY	18	83	101	2.8	1.2	5.5	165
Northeast	**2,375**	**3,162**	**5,537**	**572.9**	**5.2**	**6.9**	**1,005**
CT	169	278	447	40.5	11.3	18.5	3,113
DE	46	32	78	3.3	3.1	2.1	203
MA	128	162	290	20.0	11.6	14.7	1,540
MD	269	272	541	40.0	11.7	11.8	1,333
ME	56	115	171	10.5	2.3	4.8	351
NH	15	29	44	28.1	5.0	9.7	14,026
NJ	298	259	557	96.4	7.3	6.3	2,143
NY	395	722	1,117	98.9	3.9	7.1	767
PA	894	1,051	1,945	207.2	4.7	5.5	901
RI	68	143	211	12.3	5.2	11.0	821
VT	37	99	136	15.7	1.8	4.7	785
Pacific	**8,147**	**3,177**	**11,324**	**1,112.6**	**22.7**	**8.8**	**3,023**
AK	27	109	136	62.9	2.1	8.4	4,493
CA	6,782	2,112	8,894	840.8	27.2	8.5	3,418
HI	325	19	344	51.1	20.3	1.2	4,255
OR	741	727	1,468	81.7	19.0	18.6	1,816
WA	272	210	482	76.0	6.5	5.0	1,491
Southcentral	**1,221**	**856**	**2,077**	**396.0**	**7.4**	**5.2**	**2,152**
AR	105	209	314	36.0	5.8	11.6	1,714
LA	200	196	396	86.4	5.3	5.2	2,058
NM	124	76	200	53.4	8.9	5.4	4,106
OK	118	65	183	10.2	9.8	5.4	846
TX	674	310	984	210.1	8.1	3.7	2,188
Southeast	**8,788**	**4,384**	**13,172**	**1,057.2**	**14.3**	**7.1**	**1,657**
AL	137	150	287	58.5	3.5	3.8	1,272
FL	6,875	3,021	9,896	697.5	15.3	6.7	1,533
GA	1,508	901	2,409	267.6	19.1	11.4	3,431
MS	114	230	344	19.0	5.0	10.0	793
SC	154	82	236	14.5	5.7	3.0	415
United States	**27,307**	**21,526**	**48,833**	**4,445.6**	**11.5**	**9.0**	**1,725**

Expanded Industry Sales and Employment

Total nursery and greenhouse industry sales and employment in the United States were estimated based on mail and internet survey information (Table 6), telephone survey information (Table 4), and *a priori* information on the distribution of firm sizes (Tables 2-3), as described in the methods section. The validated nursery industry population of *bona fide* active firms was estimated at 19,803 firms, or about 52 percent of the original survey population (Table 7).

Total expanded industry sales in 2008 were estimated at $27.14 billion, and total industry employment was estimated at 262,941 permanent and temporary jobs. It is notable that the estimated sales are significantly larger than reported by USDA ($16.99 billion), however, the estimated employment was considerably smaller (351,064 workers) than reported in the 2007 Census of Agriculture (USDA-NASS, 2009, Table 62).

Expanded estimates of industry sales and employment in each state and region are presented in Table 7. The regions with the highest expanded sales were the Pacific ($8.35 billion), Southeast ($5.26 billion), Northeast ($4.55 billion), Midwest ($3.52 billion), and Southcentral ($2.82 billion). Individual states with the highest sales were California ($6.68 billion), Florida ($3.52 billion), Texas ($1.35 billion), Pennsylvania ($1.24 billion), and Georgia ($1.01 billion). In addition, several states had sales in excess of $500 million: Illinois, Louisiana, Michigan, New Jersey, North Carolina, New York, Ohio, Tennessee, Virginia, and Washington.

Regions with the highest expanded employment were the Southeast and Pacific, each with nearly 60,000 jobs, followed by the Midwest (49,142), Northeast (45,194), Appalachian (25,273) and Southcentral (12,943). Individual states with the highest employment were California (43,318 jobs), Florida (39,791), Ohio (14,239), Pennsylvania (14,132), Georgia (11,387), North Carolina (10,811), and New York (10,686). Other states with employment of at least 5,000 workers were Maryland, Michigan, Minnesota, New Jersey, Oregon, Tennessee, Texas, Virginia, and Wisconsin.

Table 7. Expanded sales and employment for the nursery/greenhouse industry in U.S. states and regions, 2008.

Region / State	Number Survey Respondents	Population of Firms	Validated Business Population*	Expanded Sales (million$)	Expanded Employment (permanent & temporary jobs)
Appalachian	**332**	**3,509**	**2,025**	**1,947.9**	**25,273**
KY	30	352	238	147.1	2,095
NC	151	1,641	954	588.0	10,811
TN	101	1,062	614	543.9	6,573
VA	43	357	168	661.1	5,490
WV	7	97	51	7.8	304
Great Plains	**45**	**290**	**150**	**247.8**	**2,966**
KS	12	79	40	37.4	1,779
ND	6	44	23	1.9	239
NE	11	88	46	181.3	429
SD	16	79	41	27.1	519
Midwest	**481**	**5,148**	**2,888**	**3,516.5**	**49,142**
IA	30	295	154	217.2	1,793
IL	75	1,034	567	830.6	4,873
IN	27	348	191	239.5	3,089
MI	83	952	486	715.7	7,555
MN	48	508	323	308.7	8,594
MO	38	633	360	182.8	1,720
OH	141	1,114	640	859.7	14,239
WI	39	264	167	162.3	7,281
Mountain	**115**	**1,069**	**516**	**436.0**	**8,181**
AZ	7	55	25	67.6	769
CO	23	243	127	171.0	2,687
ID	41	418	162	66.8	2,352
MT	8	33	17	82.5	235
NV	7	85	46	6.1	240
UT	9	137	72	30.9	1,444
WY	20	98	67	11.1	454
Northeast	**644**	**8,060**	**4,610**	**4,550.9**	**45,194**
CT	18	233	121	377.9	3,824
DE	21	90	47	10.0	238
MA	16	188	119	90.4	1,195
MD	35	417	218	309.6	5,287
ME	34	703	366	74.0	1,722
NH	3	58	30	423.8	443
NJ	52	792	413	916.7	5,632
NY	147	2,266	1,405	927.7	10,686
PA	275	2,894	1,672	1,235.0	14,132
RI	17	84	44	44.5	876
VT	26	335	175	141.3	1,159
Pacific	**434**	**6,582**	**3,224**	**8,353.0**	**59,564**
AK	15	64	33	150.1	349
CA	296	5,105	2,453	6,681.8	43,318
HI	19	180	94	475.6	1,588
OR	46	507	265	480.6	9,960
WA	58	726	379	565.0	4,348
Southcentral	**216**	**2,648**	**1,216**	**2,822.6**	**12,943**
AR	22	94	57	96.9	986
LA	44	514	320	872.0	2,273
NM	17	176	92	405.2	1,271
OK	19	419	141	98.2	1,826
TX	114	1,445	607	1,350.4	6,587
Southeast	**774**	**10,708**	**5,174**	**5,264.0**	**59,677**
AL	49	652	340	432.2	2,500
FL	556	7,848	3,800	3,520.9	39,791
GA	95	1,018	435	1,013.5	11,387
MS	28	492	235	146.3	2,815
SC	46	698	364	151.1	3,184
U.S. Total	**3,041**	**38,014**	**19,803**	**27,138.7**	**262,941**

*Validated population based on telephone survey respondents reported inactive and call disposition ineligible.

Plant Types Produced

The leading plant type produced by U.S. nurseries was deciduous and flowering trees representing 11.8 percent of total industry sales for all respondents, followed by miscellaneous other plants (10.5%), flowering annual bedding plants (9.8%), flowering potted plants (7.0%) evergreen trees (7.0%), broad-leaved evergreen shrubs (6.4%), tropical foliage (6.1%), deciduous shrubs (5.7%), herbaceous perennials (5.3%), sod (5.3%), vegetable and herb bedding plants (4.1%), roses (3.6%), propagated materials (3.5%), narrow leaved evergreen shrubs (3.4%), vines and ground covers (3.0%), Christmas trees (2.7%), fruit trees (2.6%), and azaleas (2.2%), as shown in Figure 3. Deciduous and flower trees were also produced by the highest percentage of respondents (37.5%), followed by evergreen trees (34.5%), deciduous shrubs (28.2%), and herbaceous perennials (26.2%).

The highest percentage sales of deciduous trees for individual states were reported in Missouri (79.1%), Illinois (41.4%), Tennessee (32.9%) and South Carolina (30.9%), while the states with the highest portion of sales of flowering annual bedding plants were Montana (93.7%), Alaska (72.0%), and Kansas (65.1%), as shown in Table 8 (continued). Vegetable and herb bedding plants constituted 68 percent of sales in Iowa. Evergreen trees accounted for 82 percent of sales in Arkansas and 42 percent of sales in Michigan. Tropical foliage represented 31 percent of sales in Florida. Azaleas represented 38 percent of sales in Louisiana.
Fruit trees comprised 39 percent of sales in Tennessee. Turfgrass sod represented 87 percent of industry sales in Utah, 67 percent in Washington, and 66 percent in Nevada. Miscellaneous other plants constituted 98 percent of sales in Hawaii, 69 percent in Arizona, and 67 percent in Alabama.

Figure 3. Nursery plant types sold in the U.S., 2008.

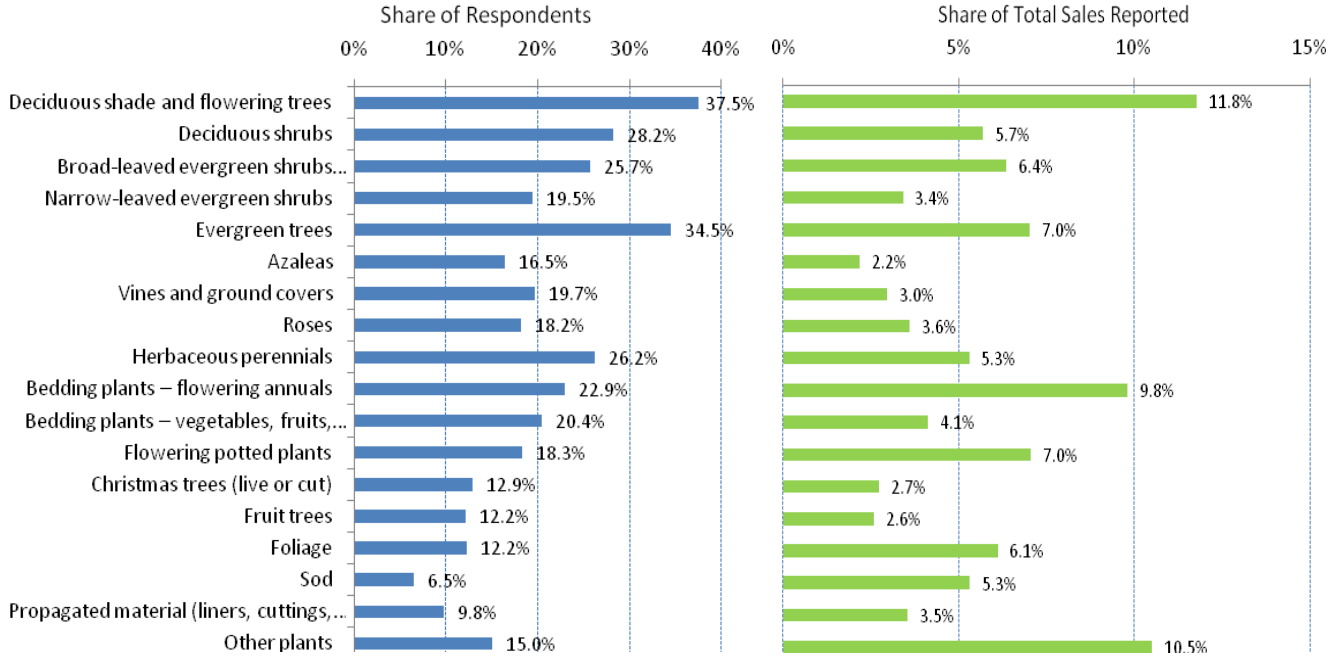


Table 8. Nursery plant types sold in U.S. states and regions, 2008

Region / State	Deciduous shade and flowering trees	Deciduous shrubs	Broad-leaved evergreen shrubs (excluding azaleas)	Narrow-leaved evergreen shrubs	Evergreen trees	Azaleas	Vines and ground covers	Roses	Herbaceous perennials
	Percent of total sales in each region/state								
Appalachian	**13.5**	**4.2**	**10.8**	**6.4**	**3.7**	**2.5**	**1.4**	**2.9**	**4.5**
KY	12.5	2.9	1.5	0.9	2.5	0.2	8.5	12.7	12.2
NC	5.7	2.0	15.8	12.0	4.0	3.6	0.4	1.6	2.4
TN	32.9	5.3	2.7	1.8	2.5	0.6	2.8	1.0	1.0
VA	9.7	6.4	11.4	3.5	4.2	2.8	1.0	4.8	8.5
WV	17.9	10.0	8.9	6.2	8.0	6.4	0.4	6.2	10.3
Great Plains	**6.0**	**7.1**	**2.8**	**2.8**	**17.6**	**1.1**	**3.3**	**2.3**	**3.8**
KS	0.8	0.5	0.1	0.1	0.3	0.2	2.7	2.9	8.9
ND	4.2	7.9	-	0.2	7.9	-	0.2	0.2	2.3
NE	6.4	9.5	4.2	4.3	8.0	1.7	4.3	2.6	2.8
SD	9.7	4.1	0.1	0.0	73.0	-	0.3	0.7	2.7
Midwest	**20.2**	**12.0**	**3.0**	**4.1**	**10.1**	**1.0**	**1.4**	**2.4**	**11.8**
IA	2.6	2.8	0.6	0.6	1.5	0.7	0.4	0.9	2.5
IL	41.4	18.8	0.2	0.3	8.8	0.0	0.1	0.1	3.0
IN	18.2	15.1	10.3	10.9	6.9	0.4	1.4	2.6	12.8
MI	6.6	7.3	1.0	1.1	41.8	1.2	1.8	2.7	3.4
MN	16.8	16.0	1.1	5.3	1.9	0.2	1.6	2.9	5.4
MO	79.1	2.1	0.5	0.1	3.6	0.2	0.4	0.3	1.8
OH	14.8	12.9	5.5	6.7	5.0	2.4	2.2	4.4	26.6
WI	1.0	1.2	0.1	0.2	1.6	0.0	0.3	0.1	19.0
Mountain	**9.1**	**3.5**	**0.9**	**1.1**	**10.0**	**0.2**	**0.8**	**0.7**	**5.7**
AZ	6.8	-	3.7	-	5.0	-	2.5	1.2	0.7
CO	15.8	5.7	0.8	2.7	14.8	0.5	0.5	0.5	11.9
ID	16.2	8.3	0.8	0.7	25.9	0.0	0.6	1.3	7.1
MT	-	0.0	-	0.0	0.0	-	0.6	0.4	0.1
NV	-	-	-	-	9.9	-	-	-	-
UT	0.5	0.9	-	-	2.1	-	0.0	-	1.4
WY	9.5	11.8	-	0.2	7.6	-	0.8	3.0	6.8
Northeast	**9.6**	**8.2**	**10.3**	**4.1**	**11.6**	**1.4**	**1.1**	**3.4**	**6.7**
CT	11.1	13.2	6.5	3.6	8.0	3.4	3.6	3.4	17.0
DE	16.9	6.7	13.8	19.2	12.4	2.7	0.1	7.7	5.8
MA	20.9	14.7	14.5	4.3	12.4	2.9	1.9	1.8	7.6
MD	12.6	5.6	8.7	7.9	12.7	1.9	0.4	2.9	10.3
ME	16.7	12.5	9.1	4.0	12.3	0.4	3.7	2.6	24.9
NH	5.0	5.0	5.0	2.0	3.0	1.0	1.0	3.0	10.0
NJ	12.4	16.2	34.6	2.6	4.8	0.8	0.5	5.4	1.4
NY	15.7	10.6	6.9	5.5	9.4	2.4	0.8	0.7	7.3
PA	4.4	3.1	3.2	2.6	17.9	0.5	1.0	4.5	3.3
RI	5.2	12.5	19.9	27.3	11.2	2.7	1.3	1.0	8.5
VT	3.0	1.8	1.4	1.4	2.1	1.0	0.3	0.5	22.7
Pacific	**6.8**	**3.7**	**5.2**	**3.8**	**3.2**	**0.8**	**5.6**	**6.6**	**4.9**
AK	1.8	1.8	0.0	0.8	0.8	0.0	0.0	1.0	12.7
CA	7.2	3.3	4.8	2.9	3.4	0.7	7.0	8.5	3.9
HI	0.0	0.0	0.1	-	-	-	0.0	-	-
OR	10.2	13.6	16.5	19.0	4.0	2.9	3.5	1.8	13.0
WA	7.1	1.5	4.4	1.2	4.9	0.5	1.6	0.2	3.6
Southcentral	**7.0**	**2.6**	**5.5**	**1.7**	**9.4**	**10.2**	**2.3**	**2.7**	**3.5**
AR	5.7	1.4	1.5	0.7	82.1	1.2	1.2	0.8	0.9
LA	4.0	1.1	13.1	1.7	1.7	38.3	1.8	0.6	0.5
NM	1.7	1.5	4.5	0.5	0.2	4.3	4.5	8.6	13.5
OK	23.3	6.7	19.9	6.7	7.2	5.6	5.6	0.7	3.6
TX	9.1	3.5	2.5	1.9	2.4	1.8	1.9	2.5	2.6
Southeast	**14.5**	**4.4**	**6.5**	**1.8**	**6.1**	**1.9**	**3.4**	**2.4**	**2.0**
AL	4.4	5.1	2.4	1.5	4.0	1.1	0.5	1.1	0.6
FL	12.1	5.2	5.4	0.9	5.0	2.0	4.0	2.8	1.7
GA	22.4	2.7	9.1	3.7	8.1	1.7	2.7	1.6	2.9
MS	9.5	1.1	18.0	4.8	7.2	6.0	2.3	4.3	2.2
SC	30.9	0.9	18.2	3.5	31.5	1.0	0.9	2.7	3.1
United States	**11.8**	**5.7**	**6.4**	**3.4**	**7.0**	**2.2**	**3.0**	**3.6**	**5.3**

Table 8 (continued). Nursery plant types sold in U.S. states and regions, 2008.

Region / State	Bedding plants – flowering annuals	Bedding plants – vegetables, fruits, and herbs	Flowering potted plants	Christmas trees (live or cut)	Fruit trees	Tropical Foliage	Turfgrass Sod	Propagated material (liners, cuttings, plug, etc.)	Misc. other plants	Native Plants*
	Percent of total sales in each region/state									
Appalachian	**13.6**	**2.1**	**5.6**	**1.2**	**9.3**	**0.3**	**14.7**	**0.3**	**2.9**	**8.2**
KY	9.3	8.4	0.1	0.9	-	-	2.0	0.9	24.5	3.9
NC	7.6	0.7	6.3	1.6	0.1	0.5	34.8	0.0	0.8	5.1
TN	2.5	1.7	1.1	0.5	38.8	0.2	2.7	1.0	0.9	16.1
VA	29.0	3.4	8.5	1.1	1.3	0.1	0.0	0.0	4.3	6.9
WV	2.7	6.1	0.3	14.9	-	-	-	-	1.8	13.6
Great Plains	**14.5**	**6.2**	**8.7**	**0.1**	**0.7**	**5.6**	**8.4**	**9.0**	**0.1**	**66.2**
KS	65.1	10.5	7.6	0.0	-	-	0.1	0.1	-	0.4
ND	9.2	60.2	1.8	4.2	0.7	-	0.9	-	-	18.9
NE	4.4	4.7	11.3	0.0	1.0	8.5	12.7	13.6	-	80.2
SD	5.0	2.5	0.2	0.1	0.1	-	0.5	0.7	0.4	80.7
Midwest	**11.0**	**6.4**	**2.9**	**5.9**	**3.9**	**0.8**	**0.7**	**0.9**	**1.3**	**9.6**
IA	3.2	67.8	11.1	0.8	0.3	2.1	0.4	1.4	0.0	1.6
IL	0.1	0.1	0.1	26.2	0.0	0.0	0.1	0.1	0.5	9.0
IN	12.9	1.4	0.8	0.8	0.2	1.3	3.9	0.1	0.1	3.5
MI	8.9	3.4	2.8	4.7	11.7	1.0	0.3	0.1	0.1	18.4
MN	27.1	7.3	4.1	0.8	5.3	0.7	0.0	2.9	0.5	9.1
MO	4.0	0.2	1.8	0.8	0.0	1.0	3.8	0.3	0.1	21.8
OH	5.0	1.4	2.8	3.6	4.6	1.0	0.1	0.8	0.1	8.6
WI	40.1	7.8	4.5	0.7	0.2	0.0	0.2	1.5	21.4	3.4
Mountain	**42.3**	**6.0**	**1.4**	**0.6**	**0.4**	**1.1**	**4.0**	**2.6**	**9.6**	**13.9**
AZ	2.9	1.3	2.7	-	0.7	1.2	-	2.6	68.6	63.3
CO	28.8	7.7	1.8	-	0.6	2.3	-	4.2	1.5	8.4
ID	16.9	9.6	1.6	4.1	0.6	-	1.0	5.2	0.0	27.3
MT	93.7	5.1	0.0	-	-	0.0	-	0.0	-	0.4
NV	0.0	0.0	5.7	-	0.1	-	65.7	-	18.6	0.0
UT	1.3	0.7	0.9	1.1	0.1	-	87.3	2.1	1.5	4.6
WY	36.0	7.4	0.2	4.0	1.3	1.9	0.2	-	9.4	2.5
Northeast	**8.8**	**5.4**	**12.7**	**6.9**	**0.6**	**1.2**	**0.5**	**4.4**	**2.8**	**15.9**
CT	6.0	3.2	6.7	0.9	0.1	0.9	1.2	0.6	10.7	8.2
DE	3.5	1.1	7.2	1.8	-	0.3	-	0.7	-	4.3
MA	5.3	1.7	7.6	1.6	1.4	0.5	0.4	-	0.5	19.0
MD	8.5	1.0	3.1	0.7	0.1	0.5	-	18.4	4.6	20.0
ME	2.8	1.5	0.4	3.1	0.6	0.3	-	1.5	3.6	21.2
NH	10.0	10.0	10.0	10.1	5.0	20.0	-	-	-	0.2
NJ	7.2	0.4	5.9	0.6	0.1	-	0.3	5.3	1.5	16.6
NY	14.7	3.3	8.6	3.4	1.0	0.2	1.8	0.3	7.6	38.0
PA	5.2	9.4	23.4	14.7	0.2	0.0	0.2	5.9	0.2	8.5
RI	3.9	2.3	2.5	0.9	0.0	0.3	-	0.2	0.4	16.7
VT	45.6	12.3	3.6	2.5	1.5	0.4	-	0.0	-	2.6
Pacific	**7.0**	**1.6**	**11.1**	**2.1**	**1.5**	**2.6**	**8.9**	**5.0**	**19.5**	**11.1**
AK	72.0	3.6	1.6	0.8	0.0	0.0	-	2.9	0.0	3.8
CA	3.3	1.7	14.8	1.6	2.0	3.4	5.6	6.2	19.6	12.6
HI	-	-	0.1	0.0	-	1.3	-	0.1	98.3	0.3
OR	0.3	0.2	-	11.6	0.2	0.0	-	2.2	1.2	14.4
WA	3.4	1.2	0.4	0.4	0.1	0.1	66.6	1.6	1.2	3.6
Southcentral	**5.7**	**16.7**	**1.7**	**3.2**	**1.8**	**2.5**	**0.6**	**0.4**	**22.5**	**15.0**
AR	1.4	0.6	0.1	0.1	1.1	0.4	0.1	0.1	0.5	11.1
LA	3.2	0.8	0.5	-	0.5	1.0	2.0	0.0	29.1	2.1
NM	17.6	17.2	0.1	17.0	4.3	4.3	0.2	0.0	0.1	4.9
OK	11.0	1.5	0.7	-	0.9	-	4.9	0.5	1.4	11.2
TX	4.1	27.0	2.8	1.6	1.9	3.1	0.1	0.7	30.5	23.8
Southeast	**8.4**	**0.4**	**5.5**	**0.1**	**1.5**	**20.3**	**4.5**	**5.6**	**10.7**	**15.5**
AL	3.1	0.8	3.3	0.5	0.8	1.0	1.7	1.2	66.8	12.1
FL	3.2	0.3	7.8	0.0	1.7	30.9	0.5	6.6	10.1	19.4
GA	21.6	0.4	0.7	0.0	1.1	0.2	15.4	4.5	1.3	6.4
MS	28.5	4.8	3.5	1.3	4.5	1.6	0.4	0.1	0.1	14.8
SC	1.6	2.3	0.7	0.0	0.1	0.1	-	0.4	2.2	9.1
United States	**9.8**	**4.1**	**7.0**	**2.7**	**2.6**	**6.1**	**5.3**	**3.5**	**10.5**	**13.4**

*Native plants independent of other plant types.

Native Plant Sales

Native plants were defined as plants present in the respondent's home state before European settlement. The share of total sales of native plants in each state and region are shown in Table 8 (right column; note that native plants are independent of other plant types). For the U.S. overall, native plants represented 13.4 percent of total sales. In the Great Plains region, native plants accounted for 66.2 percent of total sales, including more than 80 percent in South Dakota and Nebraska. Among other regions, the Northeast, Southeast, and Southcentral had native plant sales accounting for 15 to 16 percent. The states of Arizona had a high share of native plant sales (63.3%), as did New York (38%).

Nursery Product Forms

Respondents were asked to indicate the percentage distribution of their sales by product form (root media), including containerized, balled and burlapped, field grow bag, bare root, balled and potted/ process balled, in-ground containers (including pot-in-pot), and other types (e.g., cut trees, budwood, scions, seeds, tissue culture plantlets, unrooted cuttings). Container-grown products were the dominant root packaging category in the survey with an overall weighted average of 65.4 percent of sales (Figure 4). Balled and burlapped was a distant second with 12.9 percent, followed by the "other" category (8.5%), and bare root (8.3%). There were thirteen states for which containerized production constituted over 90 percent of sales, including Alaska (99.9%), Montana (99.9%), Hawaii (99.7%), Kansas (98.6%), Arizona (97.6), Iowa (95.8%), New Hampshire (94.9%), Vermont (94.6%), New Mexico (93.4%), Wisconsin (92.6%), Mississippi (92.5%), North Dakota (92.2%), and Louisiana (90.0%), as shown in Table 9. Balled/burlapped products represented over half of sales in Missouri (82.8%), Illinois (65.6%), South Carolina (57.1%), and Michigan (51.9%). Bare root product had a dominant share in Nebraska (63.6%). In-ground containers were most popular in Texas (16.7%). Other product forms were an important share of sales in Arkansas (72.6%) and South Dakota (70.2%).

Figure 4. Nursery product forms sold in the U.S., 2008.

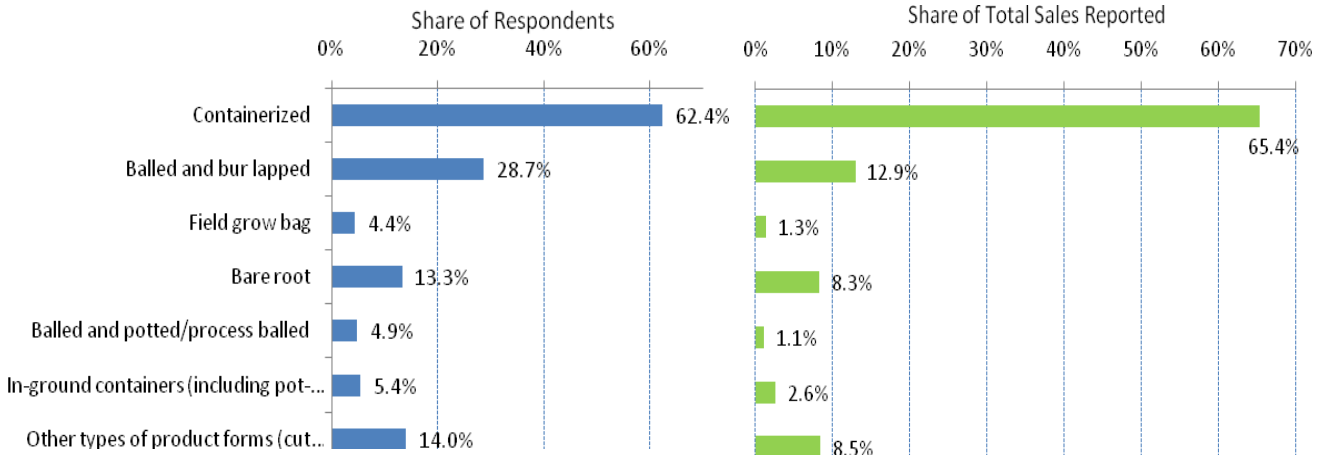


Table 9. Nursery product forms sold in U.S. states and regions, 2008.

Region / State	Containerized	Balled and bur lapped	Field grow bag	Bare root	Balled and potted/process balled	In-ground containers (including pot-in-pot)	Other types of product forms
	Percent of total sales in each region/state						
Appalachian	**68.7**	**12.7**	**0.1**	**12.8**	**0.9**	**3.2**	**1.6**
KY	57.1	12.8	1.0	24.7	4.1	-	0.3
NC	76.8	15.9	0.0	1.9	0.9	0.6	3.9
TN	44.0	15.9	0.2	36.1	0.4	2.1	1.2
VA	80.7	7.8	0.0	4.0	0.9	6.3	0.3
WV	67.5	30.3	-	-	-	-	2.1
Great Plains	**25.1**	**9.2**	**2.2**	**42.9**	**0.6**	**5.4**	**14.6**
KS	98.6	1.2	-	0.1	0.1	-	0.0
ND	92.2	-	-	0.5	-	-	7.4
NE	6.9	12.9	3.4	63.6	0.8	8.2	4.2
SD	18.7	3.6	-	7.3	0.0	0.1	70.2
Midwest	**52.7**	**27.2**	**0.2**	**9.2**	**1.0**	**2.5**	**7.2**
IA	95.8	1.8	0.1	0.7	0.1	0.2	1.3
IL	6.1	65.6	0.1	0.2	0.8	0.1	27.1
IN	62.8	20.2	-	4.8	0.2	9.3	2.7
MI	38.1	51.9	0.0	2.5	1.6	0.1	6.0
MN	66.4	3.3	-	24.0	1.2	0.0	5.1
MO	10.1	82.8	-	5.6	0.2	0.0	1.3
OH	63.3	12.9	0.5	13.0	1.7	5.2	3.4
WI	92.6	1.8	0.0	3.5	0.0	0.1	1.9
Mountain	**83.4**	**12.0**	**1.0**	**0.3**	**0.9**	**0.9**	**1.6**
AZ	97.6	-	1.9	0.5	-	-	-
CO	77.3	18.5	0.1	0.2	0.1	1.9	1.8
CT	61.5	26.5	-	10.5	-	1.5	-
ID	54.5	28.6	5.3	0.2	7.4	0.1	4.0
MT	99.9	-	-	-	-	0.1	-
NV	87.7	12.1	-	0.2	-	-	-
UT	63.6	6.7	17.5	3.5	-	8.7	-
WY	76.2	7.8	0.2	3.5	1.1	0.1	11.1
Northeast	**55.3**	**28.2**	**0.9**	**4.0**	**1.0**	**1.7**	**8.8**
CT	61.5	26.5	-	10.5	-	1.5	-
DE	57.7	0.5	0.5	10.8	26.5	-	4.1
MA	45.2	44.7	2.6	1.2	1.1	5.1	0.1
MD	51.9	38.9	2.6	0.8	3.8	1.3	0.7
ME	59.4	32.0	2.4	0.5	0.3	1.9	3.5
NH	94.9	5.0	-	0.1	-	-	-
NJ	51.9	36.5	1.8	0.0	1.1	7.0	1.7
NY	45.6	32.6	0.2	15.6	1.5	0.1	4.5
PA	53.9	23.7	0.1	1.0	0.4	0.3	20.8
RI	41.6	43.6	11.7	1.8	0.1	0.7	0.4
VT	94.6	3.6	-	0.0	0.2	1.0	0.6
Pacific	**68.5**	**1.7**	**2.7**	**7.5**	**2.0**	**2.0**	**15.6**
AK	99.9	-	-	0.0	-	0.0	0.1
CA	68.0	0.6	3.5	9.6	2.5	2.5	13.3
HI	99.7	-	-	0.0	0.1	-	0.2
OR	75.7	7.0	-	4.0	1.4	0.4	11.5
WA	18.9	9.6	1.7	1.1	-	1.0	67.8
Southcentral	**60.4**	**2.1**	**0.2**	**16.6**	**0.2**	**11.3**	**9.4**
AR	21.7	2.9	0.2	2.6	-	-	72.6
LA	90.0	4.5	0.6	0.7	0.9	-	3.4
NM	93.4	4.6	-	0.4	1.5	-	0.2
OK	70.1	28.1	-	1.2	-	0.5	-
TX	58.8	0.1	0.1	23.9	0.0	16.7	0.4
Southeast	**76.6**	**11.3**	**1.7**	**5.1**	**0.6**	**0.7**	**4.1**
AL	39.7	11.1	8.5	31.9	8.6	0.0	0.1
FL	85.6	3.8	1.6	3.4	0.0	0.7	4.9
GA	53.4	39.6	0.0	3.3	0.0	0.6	3.0
MS	92.5	2.4	0.2	4.1	0.6	-	0.2
SC	39.8	57.1	0.0	1.0	0.5	0.3	1.3
United States	**65.4**	**12.9**	**1.3**	**8.3**	**1.1**	**2.6**	**8.5**

Wholesale and Retail Sales Outlets

The share of total sales made at wholesale and retail levels are shown by region and state in Table 10. Overall 76.8 percent of sales went to wholesale, and 23.2 percent to retail. There were 10 states with over 90 percent of sales at wholesale, and the highest were Oregon (98.9%), Alabama (93.3%), and Florida (93.0%). States with nearly all of their sales as retail included New Hampshire (99.9%), Montana (99.3%), Idaho (99.3%), Vermont (95.3%), Wyoming (93.8%), and New Mexico (85.3%).

Table 10. Wholesale and retail sales in U.S. states and regions, 2008.

Region / State	Wholesale sales	Retail sales
	Percent of total sales in each region/state	
Appalachian	**80.1**	**19.9**
KY	34.7	65.3
NC	87.4	12.6
TN	88.0	12.0
VA	71.4	28.6
WV	29.0	71.0
Great Plains	**36.6**	**63.4**
KS	47.9	52.1
ND	69.0	31.0
NE	24.3	75.7
SD	70.6	29.4
Midwest	**72.0**	**28.0**
IA	85.8	14.2
IL	71.7	28.3
IN	90.1	9.9
MI	56.9	43.1
MN	91.7	8.3
MO	80.1	19.9
OH	55.1	44.9
WI	85.7	14.3
Mountain	**79.9**	**20.1**
AZ	77.7	22.3
CO	90.8	9.2
ID	69.0	31.0
MT	0.7	99.3
NV	79.7	20.3
UT	44.3	55.7
WY	6.2	93.8
Northeast	**58.0**	**42.0**
CT	29.0	71.0
DE	82.3	17.7
MA	76.1	23.9
MD	72.0	28.0
ME	50.5	49.5
NH	0.1	99.9
NJ	92.8	7.2
NY	40.9	59.1
PA	62.1	37.9
RI	76.3	23.7
VT	4.7	95.3
Pacific	**78.8**	**21.2**
AK	71.7	28.3
CA	78.0	22.0
HI	80.0	20.0
OR	98.9	1.1
WA	70.9	29.1
Southcentral	**69.9**	**30.1**
AR	40.4	59.6
LA	90.0	10.0
NM	14.7	85.3
OK	91.7	8.3
TX	80.1	19.9
Southeast	**91.2**	**8.8**
AL	93.3	6.7
FL	93.0	7.0
GA	87.4	12.6
MS	71.0	29.0
SC	92.4	7.6
United States	**76.8**	**23.2**

Market Channels

Respondents were asked to specify the percentage of total sales to different wholesale market outlets, including mass merchandisers, home centers, single location garden centers, multiple location garden centers, landscape firms, re-wholesalers, and others. The most popular outlet as a share of total wholesale sales was landscape firms with 30.8 percent of sales nationally, followed by single location retail garden centers (21.9%), and re-wholesalers (21.3%), then mass merchandisers (9.3%), home centers (7.5%) and multiple location garden centers (7.5%), as shown in Figure 5.

Results for market channel sales for individual states and regions are shown in Table 11. Landscape market sales were highest in Missouri (94.6%), Oklahoma (94.5%), Utah (92.5%), Maine (82.9%), Massachusetts (82.7%) and Connecticut (80.5%). Sales to single location garden centers were highest in Montana (99.9%), Arkansas (86.4%), and South Dakota (80.3%). Sales to re-wholesalers were highest in Tennessee (57.8%) and Alabama (51.0%). Sales to mass merchandisers were highest in Kansas (70.1%), Wisconsin (55.9%) and New Mexico (47.1%), and sales to home centers were highest in Iowa (32.6%). Sales to multiple location garden centers were highest in Alaska (74.4%) and Louisiana (31.3%).

Figure 5. Market channel sales of nursery products in the U.S., 2008.

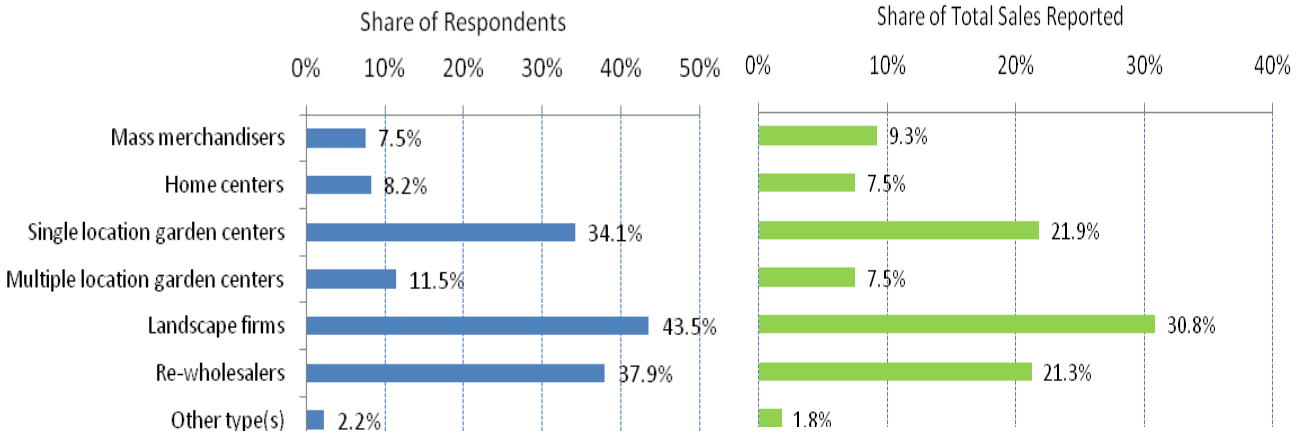


Table 11. Market channel sales of nursery products in U.S. states and regions, 2008

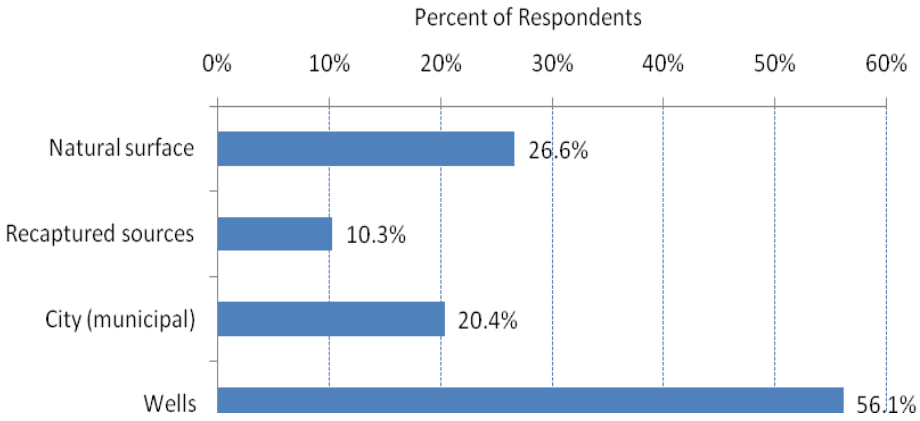
Region / State	Mass merchandisers	Home centers	Single location garden centers	Multiple location garden centers	Landscape firms	Re-wholesalers	Other type(s)
	Percent of total sales in each region/state						
Appalachian	**4.2**	**9.3**	**17.2**	**5.1**	**41.3**	**21.1**	**1.7**
KY	8.2	0.4	2.2	0.4	77.1	10.9	0.9
NC	2.6	6.7	4.8	5.3	70.2	10.3	0.0
TN	2.4	3.6	8.7	5.3	21.5	57.8	0.8
VA	6.9	16.8	38.5	5.2	17.2	11.2	4.3
WV	-	0.6	4.0	-	56.9	38.5	-
Great Plains	**11.1**	**0.5**	**17.3**	**1.9**	**10.7**	**2.0**	**56.5**
KS	70.1	1.3	10.1	4.7	13.2	0.7	-
ND	-	-	25.8	-	68.4	5.8	-
NE	-	0.5	3.5	1.8	8.1	0.9	85.3
SD	-	-	80.3	-	12.5	7.2	-
Midwest	**12.5**	**7.3**	**24.5**	**4.9**	**34.8**	**14.8**	**1.1**
IA	30.3	32.6	8.0	-	11.9	8.0	9.2
IL	-	0.3	38.3	0.7	49.0	11.7	0.0
IN	5.7	6.9	8.9	0.3	72.5	5.7	0.1
MI	0.8	7.6	41.5	2.8	31.6	15.8	-
MN	29.2	1.7	30.4	8.4	17.6	12.7	-
MO	-	-	2.5	-	94.6	2.8	0.2
OH	5.0	14.4	20.9	12.9	17.5	27.1	2.2
WI	55.9	1.5	8.8	4.3	1.5	26.8	1.2
Mountain	**2.2**	**2.4**	**40.7**	**1.0**	**46.0**	**7.4**	**0.1**
AZ	-	3.2	4.1	-	79.4	13.2	-
CO	1.9	2.7	20.0	1.4	66.4	7.5	-
ID	8.4	7.4	34.5	3.3	25.3	20.0	1.2
MT	-	-	99.9	-	0.1	-	-
NV	6.6	3.3	8.0	-	71.3	10.8	-
UT	2.4	1.4	2.2	-	92.5	1.1	0.5
WY	8.8	-	14.9	-	74.1	2.2	-
Northeast	**1.6**	**0.4**	**23.2**	**7.7**	**42.8**	**22.4**	**1.9**
CT	-	-	14.7	1.4	80.5	3.4	-
DE	-	-	13.9	-	68.7	17.4	-
MA	-	-	2.7	2.4	82.7	12.2	-
MD	0.2	0.2	30.6	1.5	40.4	27.1	-
ME	0.9	-	8.8	0.2	82.9	7.1	0.2
NH	-	-	75.0	-	25.0	-	-
NJ	1.4	0.1	21.6	11.7	33.7	27.9	3.6
NY	4.7	0.9	11.1	2.3	64.8	11.5	4.7
PA	0.4	0.5	36.4	13.6	16.4	32.4	0.3
RI	1.1	0.0	28.9	8.6	43.5	17.8	-
VT	12.1	2.9	39.7	6.0	38.6	0.7	-
Pacific	**13.7**	**6.8**	**23.7**	**16.0**	**17.2**	**21.7**	**0.8**
AK	-	-	10.1	74.4	14.9	0.6	-
CA	19.1	6.2	20.1	11.8	16.6	25.0	1.2
HI	0.1	0.0	49.3	19.6	9.9	21.2	-
OR	0.2	7.3	46.1	12.5	10.3	23.6	0.0
WA	0.5	20.7	21.6	14.5	36.3	6.2	0.2
Southcentral	**18.7**	**7.8**	**36.8**	**9.6**	**14.0**	**13.1**	**0.0**
AR	3.0	1.1	86.4	1.0	4.7	3.8	-
LA	8.8	1.8	11.0	31.3	11.0	36.1	-
NM	47.1	0.2	20.3	0.2	29.8	2.4	0.1
OK	0.8	-	3.7	-	94.5	0.9	-
TX	18.8	13.6	44.7	5.2	8.9	8.7	0.1
Southeast	**6.2**	**11.3**	**12.6**	**2.4**	**37.3**	**29.8**	**0.4**
AL	9.4	9.5	15.5	0.1	14.5	51.0	-
FL	7.5	12.1	11.7	2.8	31.4	34.0	0.5
GA	1.6	10.6	14.3	2.0	59.2	12.3	0.0
MS	4.2	2.4	23.0	2.3	43.4	20.4	4.4
SC	0.0	0.1	2.2	0.3	76.9	20.5	-
United States	**9.3**	**7.5**	**21.9**	**7.5**	**30.8**	**21.3**	**1.8**

Irrigation Water Sources and Application Methods

Respondents were asked to indicate the percentage of water for nursery irrigation that was obtained from the following sources: natural surface, recaptured sources, city (municipal), and wells. Overall, 56.1 percent of respondents indicated that wells were a source of water for their irrigation, followed by natural surface water (26.6%), city (municipal) water (20.4%) and recaptured sources (10.3%), as shown in Figure 6. Note that the sum of these sources exceeds 100 percent because respondents were allowed to indicate multiple sources.

The States with the highest percentage of respondents using wells were Alaska (86.7%), Oregon (80.4%), Louisiana (79.5%), and Florida (77.9%), while more than two thirds of respondents from Minnesota, Maine, New Hampshire, New Jersey, Vermont, and Georgia noted wells as water source (Table 12). Less than half of respondents in the Appalachian, Great Plains, and Mountain regions mentioned wells as a source of water, including only 16.7 percent of respondents in Kentucky and North Dakota, and 14.3 percent in West Virginia. In Hawaii, 10.5 percent of respondent said they use wells for irrigation. States with the highest use of natural surface water were Colorado (60.9%), North Dakota (50.0%), North Carolina (47.0%), Connecticut (44.4%), Tennessee (42.6%), and Idaho (41.5%). States with the highest percentage using city (municipal) water for irrigation were Kansas (75%) and Nebraska (72.7%). States with high use of recaptured water were Louisiana (25.0%), Virginia 23.3%) and Maryland (22.9%).

Figure 6. Irrigation water sources used by nursery producers in the U.S., 2008.



Respondents were also asked about their irrigation application methods used, which included overhead, drip, sub-irrigation (ebb/flood), and other methods. A majority (59.6 %) reported using overhead irrigation, followed by drip irrigation method (37.5%), other unspecified methods (18.7%) and sub-irrigation or ebb/flood (4.5%), as shown in Figure 7.

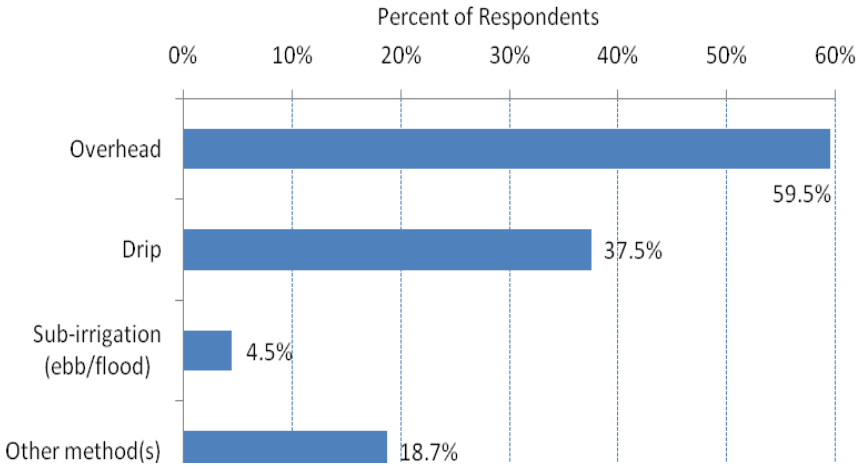
The States with the highest share of overhead water irrigation were Oregon (93.5%), Kansas (83.3%), and Rhode Island (82.4%) as shown in Table 12. States with the highest use of drip irrigation were New Hampshire (66.7%), Arizona 57.1%), Idaho (53.7%), and Kansas (50.0%). Sub-irrigation was used prominently in Utah (33.3%) and Colorado (30.4%).

Table 12. Irrigation water sources and application methods used by nursery producers in U.S. states and regions, 2008.

Region / State	Water Sources				Application Methods			
	Natural surface	Recaptured sources	City (municipal)	Wells	Overhead	Drip	Sub-irrigation (ebb/flood)	Other method(s)
	Percent of respondents in each region/state							
Appalachian	**43.4**	**12.7**	**25.6**	**46.4**	**67.8**	**33.7**	**3.3**	**13.6**
KY	33.3	3.3	63.3	16.7	60.0	33.3	6.7	6.7
NC	47.0	13.2	18.5	51.0	70.2	31.1	4.6	16.6
TN	42.6	10.9	30.7	44.6	64.4	36.6	0.0	9.9
VA	37.2	23.3	11.6	60.5	72.1	39.5	2.3	16.3
WV	57.1	0.0	28.6	14.3	71.4	14.3	14.3	14.3
Great Plains	**20.0**	**4.4**	**48.9**	**44.4**	**57.8**	**42.2**	**6.7**	**24.4**
KS	0.0	0.0	75.0	33.3	83.3	50.0	0.0	16.7
ND	50.0	0.0	16.7	16.7	33.3	33.3	0.0	16.7
NE	27.3	9.1	72.7	27.3	72.7	27.3	9.1	9.1
SD	18.8	6.3	25.0	75.0	37.5	50.0	12.5	43.8
Midwest	**30.8**	**10.4**	**15.4**	**50.1**	**50.1**	**30.4**	**3.7**	**17.9**
IA	33.3	0.0	26.7	40.0	40.0	26.7	3.3	23.3
IL	38.7	9.3	8.0	45.3	36.0	21.3	2.7	20.0
IN	25.9	11.1	11.1	51.9	55.6	37.0	0.0	7.4
MI	16.9	4.8	16.9	54.2	53.0	30.1	0.0	18.1
MN	29.2	12.5	8.3	66.7	56.3	29.2	8.3	20.8
MO	21.1	13.2	15.8	57.9	55.3	34.2	7.9	21.1
OH	41.1	16.3	21.3	41.1	49.6	34.8	2.8	17.0
WI	20.5	5.1	7.7	61.5	64.1	28.2	10.3	12.8
Mountain	**36.5**	**3.5**	**22.6**	**49.6**	**47.0**	**44.3**	**13.0**	**21.7**
AZ	14.3	0.0	28.6	57.1	71.4	57.1	0.0	0.0
CO	60.9	4.3	30.4	39.1	56.5	47.8	30.4	17.4
ID	41.5	2.4	4.9	53.7	46.3	53.7	7.3	19.5
MT	12.5	0.0	37.5	50.0	37.5	25.0	0.0	37.5
NV	14.3	0.0	28.6	57.1	28.6	42.9	0.0	42.9
UT	55.6	11.1	33.3	33.3	77.8	33.3	33.3	0.0
WY	15.0	5.0	35.0	55.0	25.0	30.0	10.0	35.0
Northeast	**31.4**	**7.3**	**11.5**	**53.4**	**51.9**	**33.2**	**3.9**	**20.5**
CT	44.4	5.6	16.7	44.4	61.1	38.9	0.0	27.8
DE	23.8	4.8	4.8	47.6	52.4	19.0	0.0	23.8
MA	43.8	6.3	31.3	50.0	75.0	43.8	6.3	6.3
MD	37.1	22.9	5.7	57.1	65.7	42.9	5.7	17.1
ME	32.4	8.8	2.9	67.6	47.1	14.7	2.9	32.4
NH	0.0	0.0	0.0	66.7	33.3	66.7	0.0	33.3
NJ	30.8	0.0	1.9	73.1	69.2	34.6	3.8	13.5
NY	34.0	4.8	17.7	43.5	49.0	32.0	3.4	19.7
PA	28.7	8.4	10.2	51.6	45.1	33.8	4.7	20.4
RI	29.4	17.6	41.2	52.9	82.4	41.2	5.9	17.6
VT	30.8	0.0	0.0	76.9	53.8	34.6	0.0	30.8
Pacific	**14.3**	**10.1**	**41.0**	**50.5**	**61.1**	**46.1**	**5.5**	**25.1**
AK	33.3	6.7	0.0	86.7	46.7	33.3	6.7	60.0
CA	10.8	10.1	48.6	44.6	55.4	49.0	5.4	28.7
HI	26.3	10.5	42.1	10.5	57.9	26.3	0.0	5.3
OR	21.7	17.4	19.6	80.4	93.5	56.5	6.5	2.2
WA	17.2	5.2	29.3	60.3	69.0	32.8	6.9	22.4
Southcentral	**14.4**	**16.7**	**32.9**	**52.8**	**53.7**	**36.6**	**4.2**	**27.8**
AR	31.8	13.6	45.5	36.4	59.1	31.8	0.0	31.8
LA	15.9	25.0	13.6	79.5	75.0	40.9	2.3	22.7
NM	17.6	5.9	47.1	47.1	35.3	23.5	11.8	35.3
OK	15.8	10.5	26.3	47.4	31.6	26.3	10.5	31.6
TX	9.6	16.7	36.8	47.4	50.9	39.5	3.5	27.2
Southeast	**22.2**	**11.4**	**11.6**	**72.4**	**71.2**	**41.5**	**4.0**	**13.0**
AL	18.4	10.2	30.6	57.1	71.4	32.7	4.1	10.2
FL	20.9	10.6	8.3	77.9	72.8	42.1	4.9	14.7
GA	31.6	15.8	13.7	66.3	72.6	48.4	1.1	5.3
MS	17.9	14.3	21.4	53.6	53.6	39.3	0.0	14.3
SC	26.1	10.9	21.7	45.7	58.7	30.4	2.2	10.9
United States	**26.6**	**10.3**	**20.4**	**56.2**	**59.6**	**37.6**	**4.5**	**18.7**

Note: Sum of sources and methods may exceed 100% because respondents were allowed to indicate multiple types.

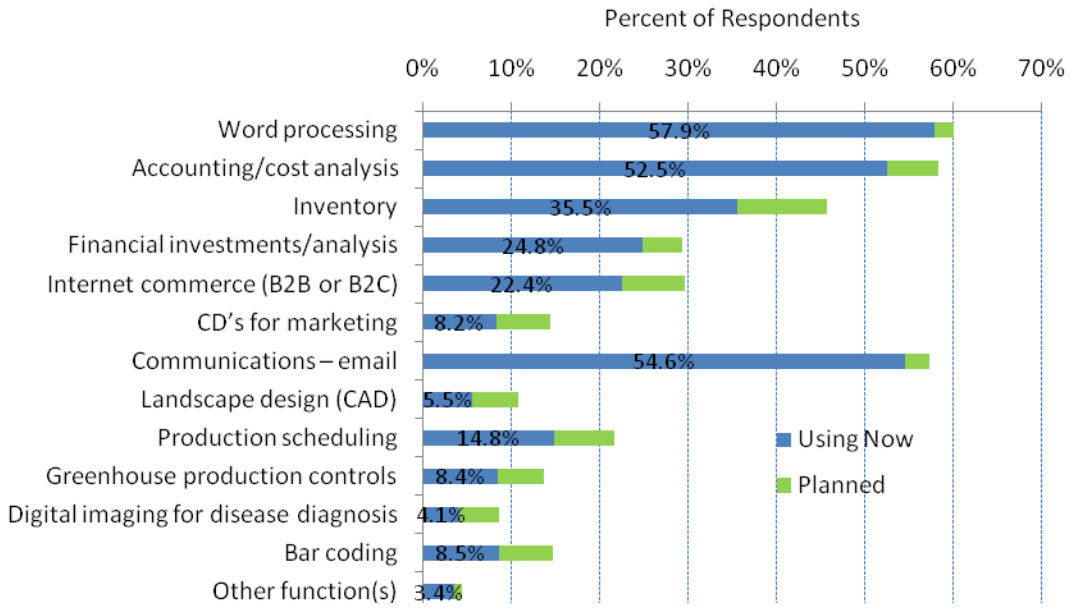
Figure 7. Irrigation application methods used by nursery producers in the U.S., 2008.



Computer Use

Respondents were asked to indicate whether they currently use, or plan to use within the next five years the following computer functions: word processing, accounting/cost analysis, inventory, financial investment/analysis, internet commerce, CDs for marketing, communications (email), landscape design (CAD), production scheduling, greenhouse production controls, digital imaging for disease diagnosis, bar coding and other functions. These results are summarized in Figure 8 and detailed by region and state in Table 13.

Figure 8. Use of computers for nursery business functions, now and planned within 5 years, by nursery producers in the U.S., 2008.



Word processing was the most popular computer function currently being used by 57.9 % of nursery firms in the US. In addition, 3.1 percent of survey respondents reported they were planning to adopt the use of word processing in the next five years. The states with the highest word processing use were Colorado and Alaska with

87.0 and 86.7 percent respectively. The lowest word processing use was found in Wyoming and Montana with 30.0 and 37.5 percent, respectively.

Over half of US nursery firms (55.3%) currently use a computer to do **accounting/cost analysis**. The leading states with computer use for accounting/cost analysis are North Dakota (83.3%) and Colorado (82.6%). The top states with nursery professionals planning to use computers for accounting/cost analysis in the next five years are New Hampshire (33.3%), Vermont (15.4%), West Virginia (14.3%), and Iowa (13.3%).

Currently, 36.2 percent of all respondents use computer to manage **inventory**. The states with the highest percentage use of computer software to manage inventory were Utah (66.7%), Massachusetts (62.5%), Oregon (60.9%), and Alaska (60.0%). Several states reported low percentages of adoption of computer use to manage inventory, including New Hampshire (0%), Montana (12.5%), Delaware (14.3%), Kentucky (16.7%), and Florida (20.5%). States with a high relatively high percentage planning to adopt computer inventory systems in the next five years were New Hampshire (33.3%), Vermont (26.9%), and Rhode Island (23.5%).

Computer use for **financial investments/analysis** is used by about 1 of every 4 nursery firms in the US. The most frequent computer use currently for financial investment/analysis was reported by nursery respondents from Arizona (57.1%), Nebraska (54.5%), and Oregon (50%). The top states with nursery professionals planning to use computers in the next five years for financial investment/analysis are Vermont (23.1%), West Virginia (14.3%), and Wisconsin (10.3%).

Computer use for **internet commerce** was reported by 23.4 percent of survey respondents. There are several states with a reported use of computers for internet commerce that was almost twice the national average or more, including Oregon (41.3%), Virginia (46.5%), Colorado (47.8%), and Nevada (57.1%). Respondents from Arizona (28.6%), Nebraska (18.2%), and Vermont (15.4) reported the highest rate of planned use of internet commerce in the next five years.

Only 10.2 percent of all survey respondents are currently using computers for **making CDs** to use as a marketing tool. The most frequent computer use to create CDs for marketing was reported by respondents from Arizona and Nevada (28.6%), Colorado (26.1%), and Kansas (25.0%). The top states with nursery professionals planning to use CDs for marketing were Nebraska (18.2%), New Mexico (11.8), Vermont (11.5%), and Louisiana (11.4%).

The use of a computer for **communications (e-mail)** was the second most popular computer function currently being used by 55.7 percent of respondents. There were ten states with 70 percent or more of nursery firms using a computer for email or communications, including Alabama, Arkansas, Arizona, Colorado, Indiana, North Dakota, Nevada, Oregon, Rhode Island, Virginia, and Vermont. Respondents from New Hampshire (33.3%), West Virginia (14.3%), and Montana (12.5%) reported the highest future use planned for communications and email.

Only 5.0 percent of respondents reported to be currently using a computer for **landscaping design**, with 6.7 percent of nursery professionals planning to use landscaping design software in the next five years. The states with the highest current use of a computer for landscaping design are Nevada (27.3%), Minnesota (18.8%), Kansas (16.7%), and Virginia (14.0%). The top states with nursery professionals planning to use a computer for

landscaping design are North Dakota (16.7%), West Virginia (14.3%), and New Mexico and Rhode Island (11.8%).

Overall current use of a computer for **production scheduling** was reported by 15.2 percent of respondents. The highest production scheduling rate of use among respondents was reported by Alaska (40.0%) and North Dakota (33.3%). The top states with nursery professionals planning to use a computer for production scheduling were New Hampshire (33.3%), Nebraska (18.2%), and West Virginia (14.3%).

The use of a computer for **greenhouse production controls** was relatively low with only 8.4 percent of survey respondents currently using, and 7.4 percent planning to use in the next five years. The only state with a percentage use higher than 20 percent was Hawaii (21.1%). However, there were several states with a relatively high percentage of firms planning to use greenhouse production controls, including New Hampshire (33.3%), Alaska (20.0%), Vermont (15.4%), and Arizona and West Virginia (14.3%).

The decrease in the cost of digital cameras and storage and processing of images has given way to a new application of computers to utilize **digital images** for disease diagnosis and marketing purposes. Only a very small portion of nursery professionals are currently using a computer for these purposes, about one out of every twenty. The use of a computer for processing digital images will probably continue to grow and gain popularity in years to come. About 5.7 percent of nursery professionals are already planning to use this tool in the next five years, with respondents in several states reporting much higher rates. Vermont (19.2%), Nebraska (18.2%), Kansas (16.7%) and West Virginia (14.3%) are among those whose respondents are planning to substantially increase the use of digital imaging in their nursery operations.

Bar coding is also a relatively new computer function used by nursery operations. Only 8.3 percent of respondents reported to be currently using bar coding in their operations with 6.5 percent of firms planning to adopt this computer function in the next five years. Utah (22.2%) and Colorado (21.7%) were the ranked first and second for computer use for bar coding. The top states with nursery professionals planning to use a computer for bar coding were Rhode Island (23.5%) and Nebraska (18.2%).

Table 13. Computer use for nursery business functions, currently and planned next five years, in U.S. states and regions, 2008.

Region / State	Word processing		Accounting/cost analysis		Inventory		Financial investments/analysis		Internet commerce	
	Current	Planned	Current	Planned	Current	Planned	Current	Planned	Current	Planned
	Percent of respondents in each region/state									
Appalachian	**61.4**	**2.1**	**48.5**	**8.7**	**33.4**	**14.5**	**25.0**	**6.9**	**28.3**	**6.9**
KY	60.0	-	36.7	10.0	16.7	23.3	20.0	3.3	20.0	10.0
NC	62.9	3.3	46.4	9.3	31.8	16.6	25.2	9.9	26.5	11.3
TN	52.5	1.0	47.5	6.9	34.7	9.9	19.8	3.0	25.7	1.0
VA	79.1	2.3	67.4	9.3	48.8	11.6	39.5	7.0	46.5	4.7
WV	57.1	-	42.9	14.3	28.6	14.3	28.6	14.3	28.6	-
Great Plains	**68.9**	**6.7**	**62.2**	**4.4**	**37.8**	**13.3**	**28.9**	**2.2**	**24.4**	**11.1**
KS	58.3	16.7	50.0	8.3	33.3	16.7	25.0	8.3	33.3	8.3
ND	83.3	-	83.3	-	50.0	-	33.3	-	33.3	-
NE	72.7	-	54.5	-	45.5	9.1	54.5	-	18.2	18.2
SD	68.8	6.3	68.8	6.3	31.3	18.8	12.5	-	18.8	12.5
Midwest	**55.1**	**1.9**	**47.4**	**6.2**	**35.6**	**8.5**	**21.2**	**2.7**	**14.8**	**5.6**
IA	50.0	6.7	43.3	13.3	30.0	20.0	23.3	3.3	16.7	-
IL	52.0	1.3	45.3	4.0	38.7	1.3	21.3	2.7	13.3	8.0
IN	63.0	-	66.7	-	40.7	3.7	33.3	-	14.8	-
MI	47.0	-	41.0	4.8	27.7	7.2	15.7	2.4	13.3	7.2
MN	68.8	2.1	62.5	4.2	43.8	10.4	33.3	2.1	18.8	4.2
MO	63.2	2.6	55.3	7.9	36.8	7.9	13.2	5.3	13.2	10.5
OH	53.2	2.8	47.5	6.4	36.9	8.5	21.3	0.7	15.6	4.3
WI	59.0	-	28.2	12.8	30.8	17.9	15.4	10.3	12.8	7.7
Mountain	**62.6**	**0.9**	**57.9**	**1.7**	**42.6**	**4.3**	**27.5**	**1.7**	**25.2**	**4.3**
AZ	57.1	-	71.4	-	42.9	-	57.1	-	28.6	28.6
CO	87.0	-	82.6	-	52.2	4.3	34.8	4.3	47.8	-
ID	65.9	-	58.5	2.4	46.3	4.9	26.8	2.4	14.6	7.3
MT	37.5	12.5	12.5	12.5	12.5	-	12.5	-	12.5	-
NV	71.4	-	71.4	-	42.9	-	28.6	-	57.1	-
UT	77.8	-	66.7	-	66.7	11.1	22.2	-	33.3	-
WY	30.0	-	30.0	-	25.0	5.0	20.0	-	10.0	-
Northeast	**49.5**	**1.6**	**45.8**	**5.4**	**28.0**	**9.9**	**19.1**	**3.9**	**18.6**	**5.9**
CT	61.1	-	61.1	-	44.4	-	11.1	-	22.2	5.6
DE	38.1	-	23.8	4.8	14.3	-	0.0	4.8	14.3	4.8
MA	56.3	-	62.5	-	62.5	6.3	43.8	-	37.5	6.3
MD	65.7	-	57.1	-	42.9	8.6	31.4	5.7	34.3	-
ME	64.7	2.9	41.2	5.9	32.4	17.6	14.7	2.9	20.6	8.8
NH	0.0	33.3	0.0	33.3	0.0	33.3	0.0	-	0.0	-
NJ	53.8	1.9	48.1	7.7	30.8	11.5	21.2	1.9	15.4	3.8
NY	53.1	2.0	45.6	6.1	30.6	10.2	23.8	5.4	18.4	10.2
PA	40.0	0.7	43.3	4.4	20.4	7.6	14.9	2.2	15.3	3.3
RI	64.7	11.8	64.7	11.8	52.9	23.5	29.4	-	29.4	11.8
VT	73.1	-	50.0	15.4	26.9	26.9	23.1	23.1	23.1	15.4
Pacific	**69.6**	**1.4**	**66.6**	**4.1**	**47.2**	**9.2**	**34.3**	**4.1**	**29.3**	**8.3**
AK	86.7	-	73.3	-	60.0	-	20.0	6.7	33.3	13.3
CA	68.6	2.0	66.2	4.1	43.6	9.5	34.1	5.1	26.7	9.8
HI	57.9	-	47.4	5.3	42.1	10.5	5.3	5.3	26.3	5.3
OR	78.3	-	71.7	6.5	60.9	15.2	50.0	2.2	41.3	4.3
WA	67.2	-	69.0	3.4	53.4	5.2	36.2	-	32.8	3.4
Southcentral	**56.9**	**1.4**	**47.7**	**4.1**	**31.9**	**11.6**	**25.5**	**3.7**	**23.1**	**5.6**
AR	72.7	-	54.5	-	54.5	4.5	31.8	4.5	31.8	9.1
LA	50.0	2.0	45.5	4.1	20.5	11.4	18.2	4.5	18.2	2.3
NM	58.8	-	52.9	5.3	29.4	17.6	35.3	5.9	23.5	11.8
OK	42.1	-	36.8	6.5	31.6	10.5	21.1	-	26.3	5.3
TX	58.8	-	48.2	3.4	32.5	12.3	26.3	3.5	22.8	5.3
Southeast	**56.9**	**1.4**	**47.7**	**4.6**	**31.9**	**11.6**	**25.5**	**3.7**	**23.1**	**5.6**
AL	72.7	4.5	54.5	-	54.5	4.5	31.8	4.5	31.8	9.1
FL	50.0	2.3	45.5	9.1	20.5	11.4	18.2	4.5	18.2	2.3
GA	58.8	-	52.9	5.9	29.4	17.6	35.3	5.9	23.5	11.8
MS	42.1	-	36.8	5.3	31.6	10.5	21.1	-	26.3	5.3
SC	58.8	0.9	48.2	3.5	32.5	12.3	26.3	3.5	22.8	5.3
United States	**57.6**	**3.1**	**55.3**	**6.6**	**36.2**	**10.3**	**25.6**	**5.9**	**23.4**	**9.2**

Table 13 (continued). Computer use for nursery functions, currently and planned next five years, in U.S. states and regions, 2008.

Region / State	CD's for marketing		Communications – email		Landscape design		Production scheduling	
	Current	Planned	Current	Planned	Current	Planned	Current	Planned
	Percent of respondents in each region/state							
Appalachian	**8.1**	**6.0**	**56.3**	**1.8**	**6.0**	**6.0**	**15.7**	**7.8**
KY	0.0	10.0	56.7	-	10.0	-	3.3	10.0
NC	7.9	8.6	53.6	3.3	4.6	9.9	17.2	9.9
TN	5.9	4.0	52.5	-	4.0	2.0	13.9	4.0
VA	20.9	-	76.7	-	14.0	4.7	23.3	7.0
WV	0.0	-	42.9	14.3	0.0	14.3	14.3	14.3
Great Plains	**13.3**	**8.9**	**57.8**	**-**	**13.3**	**2.2**	**15.6**	**8.9**
KS	25.0	8.3	50.0	-	16.7	-	16.7	16.7
ND	16.7	-	83.3	-	0.0	16.7	33.3	-
NE	9.1	18.2	54.5	-	27.3	-	18.2	18.2
SD	6.3	6.3	56.3	-	6.3	-	6.3	-
Midwest	**5.8**	**3.7**	**51.6**	**3.5**	**7.3**	**5.0**	**12.9**	**4.4**
IA	0.0	6.7	53.3	6.7	13.3	6.7	16.7	-
IL	6.7	4.0	42.7	5.3	5.3	4.0	9.3	5.3
IN	3.7	-	70.4	-	11.1	-	22.2	-
MI	3.6	3.6	43.4	2.4	3.6	3.6	8.4	3.6
MN	6.3	2.1	58.3	2.1	18.8	6.3	18.8	6.3
MO	7.9	2.6	47.4	10.5	5.3	7.9	10.5	10.5
OH	7.8	4.3	56.0	2.1	4.3	5.0	13.5	3.5
WI	5.1	5.1	51.3	2.6	10.3	7.7	12.8	5.1
Mountain	**13.0**	**4.5**	**58.3**	**1.7**	**5.2**	**2.6**	**16.5**	**4.3**
AZ	28.6	-	71.4	-	0.0	-	14.3	14.3
CO	26.1	4.3	73.9	-	0.0	4.3	26.1	4.3
ID	9.8	-	63.4	2.4	7.3	4.9	12.2	-
MT	0.0	-	37.5	12.5	0.0	-	12.5	12.5
NV	28.6	-	71.4	-	0.0	-	28.6	-
UT	11.1	-	44.4	-	11.1	-	22.2	11.1
WY	0.0	-	35.0	-	10.0	-	10.0	5.0
Northeast	**5.9**	**4.5**	**47.0**	**2.3**	**5.7**	**4.0**	**5.1**	**5.3**
CT	11.1	-	50.0	-	0.0	-	5.6	-
DE	4.8	-	38.1	-	4.8	-	0.0	-
MA	0.0	6.3	56.3	-	0.0	-	6.3	6.3
MD	17.1	8.6	65.7	-	14.3	5.7	14.3	8.6
ME	5.9	2.9	64.7	-	0.0	8.8	2.9	8.8
NH	0.0	-	0.0	33.3	0.0	-	0.0	33.3
NJ	5.8	5.8	40.4	3.8	7.7	3.8	7.7	7.7
NY	6.1	8.2	53.1	4.8	7.5	5.4	11.6	7.5
PA	4.7	1.8	37.1	1.1	4.7	2.5	7.3	2.5
RI	11.8	5.9	70.6	5.9	11.8	11.8	23.5	5.9
VT	0.0	11.5	73.1	3.8	3.8	7.7	23.1	11.5
Pacific	**11.1**	**6.7**	**65.4**	**2.8**	**3.7**	**6.0**	**21.7**	**7.8**
AK	6.7	6.7	66.7	6.7	6.7	-	40.0	6.7
CA	11.1	7.4	63.9	2.7	4.7	7.4	21.6	10.1
HI	0.0	-	57.9	5.3	0.0	5.3	10.5	5.3
OR	21.7	2.2	73.9	4.3	0.0	-	21.7	2.2
WA	6.9	8.6	69.0	-	1.7	5.2	20.7	1.7
Southcentral	**4.2**	**6.5**	**53.2**	**1.9**	**3.7**	**3.2**	**17.6**	**5.1**
AR	4.5	9.1	72.7	-	4.5	-	27.3	-
LA	2.3	11.4	50.0	-	4.5	-	13.6	4.5
NM	11.8	11.8	58.8	-	0.0	11.8	23.5	5.9
OK	5.3	-	47.4	5.3	0.0	5.3	10.5	-
TX	3.5	4.4	50.9	2.6	4.4	3.5	17.5	7.0
Southeast	**4.2**	**6.5**	**53.2**	**1.9**	**3.7**	**3.2**	**17.6**	**5.1**
AL	4.5	9.1	72.7	-	4.5	-	27.3	-
FL	2.3	11.4	50.0	-	4.5	-	13.6	4.5
GA	11.8	11.8	58.8	-	0.0	11.8	23.5	5.9
MS	5.3	-	47.4	5.3	0.0	5.3	10.5	-
SC	3.5	4.4	50.9	2.6	4.4	3.5	17.5	7.0
United States	**10.2**	**9.2**	**55.7**	**3.4**	**5.0**	**6.7**	**15.2**	**9.4**

Table 13 (continued). Computer use for nursery business functions, currently and planned next five years, in U.S. states and regions, 2008.

Region / State	Greenhouse production controls		Digital imaging		Bar coding		Other	
	Current	Planned	Current	Planned	Current	Planned	Current	Planned
	Percent of respondents in each region/state							
Appalachian	**6.9**	**5.7**	**3.9**	**5.1**	**8.4**	**6.6**	**2.4**	**1.2**
KY	0.0	6.7	0.0	-	3.3	-	3.3	-
NC	7.3	5.3	5.3	6.6	4.6	9.3	2.6	2.6
TN	6.9	4.0	3.0	5.0	13.9	5.0	2.0	-
VA	11.6	9.3	4.7	2.3	14.0	4.7	2.3	-
WV	0.0	14.3	0.0	14.3	0.0	14.3	0.0	-
Great Plains	**8.9**	**4.4**	**2.2**	**11.1**	**2.2**	**11.1**	**2.2**	**-**
KS	16.7	8.3	0.0	16.7	8.3	16.7	0.0	-
ND	16.7	-	16.7	-	0.0	16.7	0.0	-
NE	9.1	9.1	0.0	18.2	0.0	18.2	0.0	-
SD	0.0	-	0.0	6.3	0.0	-	6.3	-
Midwest	**7.9**	**2.9**	**1.7**	**2.9**	**7.7**	**5.2**	**2.3**	**0.4**
IA	13.3	-	3.3	-	13.3	3.3	6.7	-
IL	5.3	2.7	1.3	1.3	2.7	8.0	4.0	-
IN	7.4	-	0.0	-	7.4	7.4	0.0	-
MI	7.2	2.4	1.2	2.4	4.8	3.6	1.2	-
MN	14.6	4.2	4.2	4.2	10.4	8.3	0.0	-
MO	5.3	7.9	0.0	5.3	5.3	-	0.0	-
OH	7.1	2.8	1.4	4.3	10.6	4.3	3.5	1.4
WI	7.7	2.6	2.6	2.6	7.7	7.7	0.0	-
Mountain	**11.3**	**2.6**	**4.3**	**0.9**	**10.4**	**2.6**	**3.5**	**-**
AZ	0.0	14.3	0.0	-	14.3	-	0.0	-
CO	17.4	-	4.3	4.3	21.7	4.3	4.3	-
ID	12.2	-	2.4	-	7.3	2.4	4.9	-
MT	12.5	12.5	0.0	-	0.0	-	0.0	-
NV	14.3	-	14.3	-	0.0	-	14.3	-
UT	11.1	11.1	11.1	-	22.2	-	0.0	-
WY	5.0	-	5.0	-	5.0	5.0	0.0	-
Northeast	**5.1**	**4.0**	**2.8**	**3.0**	**5.9**	**5.3**	**3.3**	**0.5**
CT	11.1	-	0.0	-	11.1	5.6	0.0	-
DE	0.0	-	4.8	-	0.0	-	0.0	-
MA	0.0	6.3	0.0	-	12.5	12.5	6.3	-
MD	8.6	2.9	8.6	5.7	11.4	5.7	2.9	-
ME	0.0	5.9	2.9	2.9	11.8	2.9	5.9	-
NH	0.0	33.3	0.0	-	0.0	-	0.0	-
NJ	5.8	3.8	0.0	5.8	7.7	11.5	3.8	-
NY	7.5	6.1	4.8	4.1	8.8	6.8	5.4	0.7
PA	2.9	1.5	1.8	0.4	2.2	2.5	2.2	0.7
RI	17.6	11.8	0.0	5.9	5.9	23.5	0.0	-
VT	11.5	15.4	3.8	19.2	7.7	3.8	3.8	-
Pacific	**13.4**	**7.1**	**6.5**	**4.6**	**15.4**	**8.5**	**5.3**	**1.2**
AK	13.3	20.0	13.3	-	13.3	-	6.7	-
CA	14.5	8.1	6.8	5.7	16.9	11.1	5.4	1.4
HI	21.1	-	10.5	-	5.3	10.5	10.5	-
OR	13.0	4.3	4.3	4.3	17.4	4.3	2.2	-
WA	5.2	3.4	3.4	1.7	10.3	-	5.2	1.7
Southcentral	**10.2**	**2.8**	**3.7**	**2.3**	**6.0**	**4.2**	**5.6**	**0.9**
AR	9.1	-	0.0	4.5	9.1	-	22.7	-
LA	4.5	2.3	2.3	2.3	4.5	2.3	2.3	-
NM	11.8	5.9	0.0	11.8	0.0	11.8	0.0	-
OK	10.5	10.5	0.0	-	5.3	5.3	5.3	-
TX	12.3	1.8	6.1	0.9	7.0	4.4	4.4	1.8
Southeast	**10.2**	**2.8**	**3.7**	**2.3**	**6.0**	**4.2**	**5.6**	**0.9**
AL	9.1	-	0.0	4.5	9.1	-	22.7	-
FL	4.5	2.3	2.3	2.3	4.5	2.3	2.3	-
GA	11.8	5.9	0.0	11.8	0.0	11.8	0.0	-
MS	10.5	10.5	0.0	-	5.3	5.3	5.3	-
SC	12.3	1.8	6.1	0.9	7.0	4.4	4.4	1.8
United States	**8.4**	**7.4**	**5.7**	**7.0**	**8.3**	**6.5**	**3.2**	**1.4**

Integrated Pest Management Practices

Respondents were asked to indicate which of 22 IPM practices they follow, including removing infested plants, 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 beneficial, use mulches to suppress weeds, beneficial insect identification, inspect incoming stock, manage irrigation to reduce pests, spot treatment with pesticides, ventilate green houses, use of beneficial insects, keep pest activity records, adjust fertilization rates, use screening/barriers to exclude pests, use bio pesticides/lower toxicity, treat retention pond water, and use pest resistant varieties. The most common IPM practices performed by nursery professionals were to remove infested plants (74.1%), use cultivation/hand weeding (66.0%), apply spot treatment with pesticides (62.5%), alternate pesticides to avoid chemical resistance (51.5%), inspect incoming stock (49.5%), and elevate or space plants for air circulation (48.2%), as shown in Figure 9. The least common IPM practices were to use sanitized water foot baths (2.2%), treat retention pond water (3.8%), using screening or barriers to exclude pests (8.3%), soil solarization/sterilization (8.7%).

Table 14 presents the detailed results for percent of respondent using various pest management practices by region and state. The extent of pest management practices used by respondents was quite different in various states. While 100 percent of Nebraska and nearly 89 percent of Ohio respondents removed infested plants, only 43 percent of Nevada respondents and 33 percent of New Hampshire respondents used this practice. The same variations among state respondents using other pest management practices were also prevalent.

Figure 9. Integrated pest management (IPM) practices used by U.S. nursery producers, 2008.

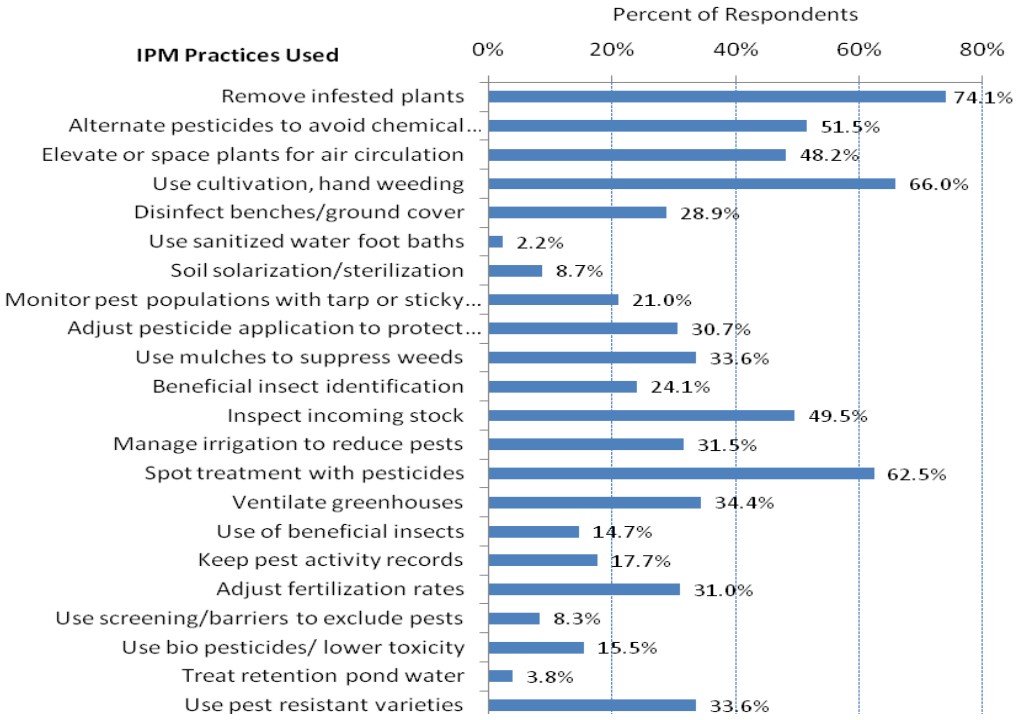


Table 14. Integrated pest management practices followed by nursery producers in U.S. states and regions, 2008.

Region / State	Remove infested plants	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
	Percent of respondents in each region/state						
Appalachian	**71.1**	**58.7**	**42.8**	**67.2**	**26.8**	**2.1**	**6.0**
KY	73.3	36.7	40.0	66.7	16.7	0.0	0.0
NC	71.5	60.3	41.1	61.6	27.2	2.0	8.6
TN	64.4	62.4	40.6	76.2	26.7	1.0	5.0
VA	83.7	60.5	53.5	62.8	32.6	7.0	4.7
WV	71.4	57.1	57.1	85.7	28.6	0.0	0.0
Great Plains	**86.7**	**51.1**	**53.3**	**68.9**	**40.0**	**0.0**	**17.8**
KS	83.3	50.0	66.7	66.7	75.0	0.0	41.7
ND	66.7	50.0	66.7	100.0	33.3	0.0	16.7
NE	100.0	54.5	63.6	54.5	36.4	0.0	9.1
SD	87.5	50.0	31.3	68.8	18.8	0.0	6.3
Midwest	**80.2**	**46.8**	**43.7**	**64.0**	**19.5**	**1.7**	**5.4**
IA	76.7	50.0	46.7	46.7	16.7	0.0	3.3
IL	81.3	36.0	37.3	61.3	8.0	1.3	2.7
IN	59.3	55.6	33.3	59.3	11.1	3.7	7.4
MI	75.9	43.4	48.2	60.2	21.7	0.0	4.8
MN	83.3	39.6	37.5	81.3	20.8	2.1	6.3
MO	71.1	55.3	31.6	63.2	28.9	2.6	5.3
OH	88.7	50.4	46.8	63.8	22.0	2.1	6.4
WI	79.5	53.8	59.0	74.4	25.6	2.6	7.7
Mountain	**73.0**	**48.7**	**42.5**	**67.8**	**36.5**	**1.7**	**11.3**
AZ	85.7	71.4	28.6	85.7	57.1	0.0	14.3
CO	78.3	60.9	52.2	65.2	43.5	4.3	13.0
ID	73.2	46.3	39.0	70.7	22.0	2.4	7.3
MT	87.5	50.0	50.0	62.5	62.5	0.0	12.5
NV	42.9	42.9	28.6	71.4	14.3	0.0	0.0
UT	55.6	33.3	33.3	66.7	33.3	0.0	22.2
WY	75.0	40.0	50.0	60.0	50.0	0.0	15.0
Northeast	**76.1**	**50.3**	**49.8**	**58.7**	**28.0**	**1.2**	**7.0**
CT	72.2	55.6	61.1	50.0	27.8	0.0	0.0
DE	61.9	19.0	33.3	42.9	14.3	0.0	4.8
MA	62.5	43.8	37.5	62.5	31.3	0.0	6.3
MD	68.6	60.0	57.1	65.7	34.3	5.7	2.9
ME	88.2	26.5	47.1	67.6	32.4	0.0	5.9
NH	33.3	0.0	33.3	66.7	33.3	0.0	0.0
NJ	73.1	51.9	50.0	71.2	23.1	1.9	7.7
NY	78.2	43.5	47.6	63.3	29.3	1.4	10.2
PA	77.1	58.2	50.5	51.3	26.2	1.1	6.5
RI	76.5	58.8	47.1	64.7	29.4	0.0	5.9
VT	80.8	46.2	65.4	76.9	42.3	0.0	7.7
Pacific	**73.3**	**49.1**	**49.5**	**71.7**	**31.6**	**2.5**	**12.9**
AK	86.7	40.0	53.3	86.7	60.0	0.0	13.3
CA	72.3	47.0	49.0	69.9	27.7	2.7	13.2
HI	73.7	68.4	52.6	52.6	52.6	10.5	5.3
OR	78.3	58.7	56.5	84.8	41.3	0.0	8.7
WA	70.7	48.3	44.8	72.4	29.3	1.7	17.2
Southcentral	**69.4**	**50.5**	**46.8**	**68.1**	**30.1**	**3.7**	**11.1**
AR	81.8	68.2	63.6	86.4	22.7	4.5	13.6
LA	65.9	70.5	52.3	70.5	34.1	2.3	4.5
NM	76.5	29.4	52.9	76.5	35.3	0.0	23.5
OK	52.6	15.8	26.3	52.6	26.3	0.0	5.3
TX	70.2	48.2	43.9	64.9	29.8	5.3	12.3
Southeast	**71.3**	**54.4**	**52.2**	**68.7**	**32.9**	**3.1**	**9.4**
AL	67.3	53.1	51.0	65.3	26.5	4.1	10.2
FL	72.5	55.8	54.1	71.2	33.8	2.9	9.9
GA	69.5	54.7	46.3	61.1	30.5	4.2	7.4
MS	71.4	46.4	50.0	64.3	39.3	0.0	7.1
SC	65.2	43.5	43.5	60.9	30.4	4.3	8.7
United States	**74.2**	**51.5**	**48.2**	**66.0**	**28.9**	**2.2**	**8.7**

Table 14 (continued). Integrated pest management practices followed by nursery producers in U.S. states and regions, 2008.

Region / State	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
	Percent of respondents in each region/state						
Appalachian	**16.3**	**34.3**	**29.2**	**23.5**	**49.1**	**31.9**	**66.6**
KY	13.3	40.0	40.0	20.0	46.7	33.3	66.7
NC	15.2	33.1	29.8	26.5	46.4	33.8	67.5
TN	7.9	31.7	19.8	15.8	46.5	25.7	62.4
VA	37.2	44.2	41.9	27.9	65.1	41.9	72.1
WV	42.9	14.3	28.6	57.1	57.1	14.3	71.4
Great Plains	**20.0**	**26.7**	**44.4**	**24.4**	**57.8**	**33.3**	**66.7**
KS	33.3	0.0	25.0	16.7	75.0	33.3	83.3
ND	16.7	33.3	16.7	33.3	50.0	33.3	66.7
NE	18.2	54.5	45.5	45.5	45.5	36.4	72.7
SD	12.5	25.0	68.8	12.5	56.3	31.3	50.0
Midwest	**18.3**	**26.4**	**39.7**	**21.0**	**47.2**	**21.8**	**61.7**
IA	20.0	26.7	56.7	6.7	50.0	16.7	70.0
IL	8.0	24.0	33.3	21.3	40.0	6.7	48.0
IN	14.8	33.3	33.3	14.8	40.7	18.5	66.7
MI	24.1	28.9	36.1	25.3	47.0	31.3	57.8
MN	25.0	18.8	31.3	16.7	50.0	22.9	45.8
MO	13.2	15.8	44.7	10.5	50.0	13.2	68.4
OH	19.1	29.1	37.6	24.8	50.4	25.5	71.6
WI	20.5	30.8	64.1	28.2	46.2	30.8	64.1
Mountain	**31.3**	**28.7**	**32.2**	**24.3**	**47.0**	**26.1**	**60.0**
AZ	14.3	28.6	42.9	57.1	42.9	42.9	71.4
CO	34.8	34.8	26.1	30.4	52.2	30.4	69.6
ID	31.7	34.1	36.6	19.5	39.0	24.4	63.4
MT	37.5	25.0	37.5	25.0	75.0	25.0	62.5
NV	28.6	28.6	42.9	28.6	42.9	14.3	57.1
UT	11.1	33.3	33.3	22.2	33.3	33.3	44.4
WY	40.0	10.0	20.0	15.0	55.0	20.0	45.0
Northeast	**22.7**	**29.5**	**37.6**	**23.8**	**49.2**	**22.7**	**58.7**
CT	44.4	44.4	44.4	27.8	66.7	27.8	61.1
DE	4.8	4.8	19.0	9.5	19.0	19.0	33.3
MA	31.3	37.5	62.5	6.3	50.0	18.8	81.3
MD	20.0	40.0	42.9	22.9	51.4	31.4	65.7
ME	14.7	32.4	58.8	35.3	61.8	26.5	41.2
NH	0.0	0.0	33.3	0.0	66.7	33.3	33.3
NJ	19.2	23.1	28.8	17.3	48.1	28.8	59.6
NY	22.4	23.8	37.4	23.1	53.1	24.5	56.5
PA	22.5	33.1	31.3	23.6	44.4	16.7	61.8
RI	29.4	23.5	58.8	23.5	41.2	23.5	58.8
VT	38.5	30.8	69.2	50.0	76.9	46.2	57.7
Pacific	**30.9**	**30.0**	**36.6**	**25.1**	**53.5**	**38.7**	**60.4**
AK	66.7	13.3	66.7	33.3	80.0	26.7	46.7
CA	31.4	30.1	35.8	26.0	54.1	39.5	59.1
HI	10.5	15.8	26.3	15.8	52.6	26.3	73.7
OR	32.6	39.1	37.0	28.3	58.7	54.3	63.0
WA	24.1	31.0	36.2	19.0	39.7	29.3	63.8
Southcentral	**17.1**	**29.6**	**31.9**	**23.1**	**49.1**	**30.1**	**63.0**
AR	22.7	31.8	31.8	18.2	54.5	18.2	81.8
LA	15.9	31.8	18.2	11.4	59.1	31.8	72.7
NM	41.2	17.6	41.2	35.3	52.9	35.3	70.6
OK	10.5	21.1	26.3	15.8	26.3	10.5	26.3
TX	14.0	31.6	36.8	28.1	47.4	34.2	60.5
Southeast	**17.3**	**34.0**	**26.7**	**26.4**	**49.4**	**42.0**	**65.6**
AL	12.2	20.4	18.4	8.2	36.7	38.8	69.4
FL	17.1	36.9	26.6	29.7	52.0	44.2	65.3
GA	20.0	31.6	21.1	20.0	45.3	42.1	66.3
MS	14.3	21.4	35.7	14.3	39.3	32.1	60.7
SC	21.7	26.1	43.5	26.1	45.7	23.9	67.4
United States	**16.3**	**34.3**	**29.2**	**23.5**	**49.1**	**31.9**	**66.6**

Table 14 (continued). Integrated pest management practices followed by nursery producers in U.S. states and regions, 2008.

Region / State	Ventilate greenhouses	Use of beneficial insects	Keep pest activity records	Adjust fertilization rates	Use screening, barriers to exclude pests	Use bio pesticides, lower toxicity	Treat retention pond water	Use pest resistant varieties
	Percent of respondents in each region/state							
Appalachian	**31.0**	**8.4**	**22.9**	**35.2**	**6.9**	**13.0**	**5.7**	**33.1**
KY	30.0	10.0	6.7	30.0	6.7	16.7	6.7	33.3
NC	27.8	11.9	23.8	32.5	6.6	13.2	5.3	35.1
TN	28.7	3.0	26.7	34.7	5.9	6.9	2.0	22.8
VA	46.5	7.0	23.3	53.5	9.3	20.9	16.3	46.5
WV	42.9	14.3	14.3	14.3	14.3	28.6	0.0	57.1
Great Plains	**42.2**	**13.3**	**17.8**	**26.7**	**13.3**	**11.1**	**2.2**	**40.0**
KS	75.0	16.7	33.3	33.3	8.3	8.3	8.3	41.7
ND	33.3	16.7	16.7	33.3	0.0	16.7	0.0	16.7
NE	45.5	27.3	18.2	18.2	18.2	18.2	0.0	54.5
SD	18.8	0.0	6.3	25.0	18.8	6.3	0.0	37.5
Midwest	**26.6**	**10.2**	**14.8**	**26.0**	**5.8**	**11.2**	**2.5**	**32.2**
IA	30.0	6.7	13.3	30.0	13.3	10.0	3.3	46.7
IL	12.0	9.3	14.7	20.0	4.0	9.3	5.3	32.0
IN	29.6	11.1	11.1	22.2	7.4	11.1	3.7	29.6
MI	28.9	9.6	19.3	30.1	3.6	13.3	1.2	30.1
MN	31.3	12.5	14.6	20.8	6.3	12.5	0.0	33.3
MO	28.9	2.6	2.6	21.1	5.3	13.2	0.0	26.3
OH	27.0	12.8	17.0	28.4	5.7	8.5	2.8	34.0
WI	35.9	10.3	12.8	30.8	7.7	17.9	2.6	25.6
Mountain	**43.5**	**24.3**	**16.5**	**29.6**	**14.8**	**20.9**	**2.6**	**27.8**
AZ	57.1	28.6	28.6	14.3	0.0	28.6	0.0	28.6
CO	34.8	17.4	13.0	34.8	13.0	30.4	0.0	34.8
ID	34.1	19.5	12.2	31.7	17.1	19.5	4.9	22.0
MT	75.0	37.5	25.0	25.0	0.0	25.0	0.0	12.5
NV	14.3	28.6	28.6	14.3	28.6	28.6	0.0	42.9
UT	33.3	22.2	11.1	44.4	11.1	22.2	11.1	22.2
WY	70.0	35.0	20.0	25.0	20.0	5.0	0.0	35.0
Northeast	**36.3**	**15.5**	**18.0**	**27.2**	**4.8**	**11.5**	**1.9**	**49.8**
CT	44.4	22.2	22.2	38.9	5.6	16.7	0.0	33.3
DE	14.3	14.3	9.5	14.3	0.0	0.0	0.0	14.3
MA	37.5	0.0	18.8	31.3	0.0	12.5	0.0	37.5
MD	40.0	20.0	31.4	40.0	5.7	11.4	11.4	37.1
ME	26.5	20.6	14.7	38.2	11.8	14.7	2.9	41.2
NH	66.7	33.3	0.0	0.0	0.0	0.0	0.0	0.0
NJ	32.7	9.6	17.3	23.1	3.8	5.8	1.9	32.7
NY	36.1	15.6	19.0	25.2	4.8	13.6	0.7	111.6
PA	36.7	13.5	17.1	26.9	4.4	9.5	1.8	28.0
RI	41.2	17.6	5.9	17.6	5.9	5.9	0.0	29.4
VT	53.8	38.5	23.1	26.9	7.7	38.5	0.0	34.6
Pacific	**39.9**	**21.7**	**17.7**	**31.6**	**9.7**	**22.1**	**4.6**	**28.3**
AK	80.0	46.7	13.3	26.7	13.3	6.7	13.3	46.7
CA	34.8	23.3	18.9	31.4	10.5	23.6	4.7	26.4
HI	42.1	5.3	5.3	26.3	26.3	15.8	0.0	10.5
OR	60.9	21.7	21.7	39.1	2.2	21.7	6.5	30.4
WA	37.9	12.1	13.8	29.3	5.2	20.7	1.7	37.9
Southcentral	**39.8**	**18.1**	**8.8**	**21.8**	**11.6**	**21.8**	**3.7**	**30.1**
AR	31.8	13.6	9.1	27.3	9.1	18.2	4.5	40.9
LA	40.9	9.1	11.4	22.7	6.8	20.5	2.3	29.5
NM	64.7	23.5	5.9	23.5	35.3	11.8	11.8	41.2
OK	26.3	15.8	10.5	5.3	10.5	15.8	0.0	10.5
TX	39.5	21.9	7.9	22.8	10.5	25.4	3.5	29.8
Southeast	**32.7**	**13.3**	**19.9**	**38.5**	**10.5**	**16.8**	**5.4**	**26.7**
AL	28.6	6.1	16.3	32.7	4.1	6.1	0.0	20.4
FL	33.1	15.3	21.2	41.2	12.8	20.9	5.0	27.7
GA	31.6	7.4	22.1	33.7	4.2	9.5	7.4	27.4
MS	39.3	3.6	3.6	32.1	3.6	3.6	14.3	28.6
SC	30.4	15.2	13.0	26.1	6.5	2.2	6.5	19.6
United States	**34.4**	**14.7**	**17.8**	**31.1**	**8.3**	**15.6**	**3.8**	**33.7**

Sources of Seedlings, Whips, Grafts, and Liners Purchased for Propagation

Respondents were asked to indicate the percentage of total purchase sources of seedlings, whips, grafts and liners that they obtained from the top five states/countries including their own home state. Overall, most propagation materials were purchased within the home region rather than from other regions. The results matrix by state is presented in Table 15, with purchasing state/region shown row-wise and regions of origin in the columns. A total of 28 states reported purchasing over 90 percent of their seedlings, whips, grafts, and liner materials from their own home region including Montana (100%), Connecticut (100%), Delaware (100%), Massachusetts (100%), Maine (100%), New Hampshire (100%), Vermont (99.9%), Oklahoma (99.7%), Missouri (99.6%), Michigan (99.1%), Utah (99.1%), New Mexico (98.2%), Nebraska (96.8%) and South Dakota (96.0%). The Northeast and Midwest regions purchased 95 percent and 94 percent of the propagation materials from within their respective regions. Some states purchased more than half of their propagation materials from other regions, including North Dakota (59.4% from Appalachian), Alabama (52.1% from Appalachian). In addition, respondents reported purchasing an overall average of 0.3 percent of source materials from foreign countries/regions including Europe, Bahamas, Belgium, Canada, Caribbean, China, Germany, India, Japan, Mexico, and the Netherlands.

Table 15. Purchases of propagation materials by nursery producers in U.S. states and regions, 2008.

Purchasing Region / State	Source Region								
	Appalachian	Great Plains	Midwest	Mountain	Northeast	Pacific	Southcentral	Southeast	Foreign
	Percentage of total purchases in each state or region								
Appalachian	**76.0**	**0.4**	**2.7**	**0.1**	**12.8**	**0.1**	**4.2**	**3.4**	**0.2**
KY	80.8	0.0	19.2	0.0	0.0	0.0	0.0	0.0	0.0
NC	86.2	0.0	0.5	0.4	6.2	0.2	0.1	6.4	0.0
TN	72.3	1.4	2.9	0.0	4.3	0.0	14.0	4.4	0.7
VA	68.0	0.0	1.8	0.0	30.1	0.0	0.0	0.0	0.0
WV	83.4	0.0	1.1	0.0	15.5	0.0	0.0	0.0	0.0
Great Plains	**1.1**	**89.2**	**7.6**	**0.0**	**0.0**	**0.0**	**2.0**	**0.1**	**0.0**
KS	0.0	59.5	28.5	0.0	0.0	0.0	11.9	0.0	0.0
ND	59.4	34.7	2.8	0.0	0.0	0.0	0.0	3.1	0.0
NE	0.0	96.8	3.2	0.0	0.0	0.0	0.0	0.0	0.0
SD	0.0	96.4	3.6	0.0	0.0	0.0	0.0	0.0	0.0
Midwest	**0.4**	**1.7**	**94.4**	**0.1**	**3.0**	**0.0**	**0.0**	**0.3**	**0.0**
IA	0.0	17.6	82.0	0.0	0.5	0.0	0.0	0.0	0.0
IL	0.0	0.9	98.7	0.4	0.0	0.0	0.0	0.0	0.0
IN	1.3	0.0	96.5	0.0	0.0	0.0	0.0	2.2	0.0
MI	0.9	0.0	99.1	0.0	0.0	0.0	0.0	0.0	0.0
MN	0.0	2.7	97.3	0.0	0.0	0.0	0.0	0.0	0.0
MO	0.0	0.4	99.6	0.0	0.0	0.0	0.0	0.0	0.0
OH	0.5	0.0	85.7	0.0	13.8	0.0	0.0	0.0	0.0
WI	0.0	11.1	86.8	0.0	1.7	0.3	0.0	0.1	0.0
Mountain	**0.0**	**0.7**	**0.1**	**87.1**	**0.5**	**1.1**	**10.3**	**0.0**	**0.2**
AZ	0.0	0.0	0.0	67.2	0.0	6.0	26.7	0.1	0.0
CO	0.0	1.4	0.2	80.6	0.0	0.0	17.8	0.0	0.0
ID	0.0	0.0	0.3	93.0	0.0	5.0	0.0	0.0	1.7
MT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0
NV	0.0	0.0	0.0	80.1	17.3	0.5	2.1	0.0	0.0
UT	0.0	0.0	0.0	99.1	0.0	0.9	0.0	0.0	0.0
WY	0.0	1.9	0.0	98.0	0.2	0.0	0.0	0.0	0.0
Northeast	**0.7**	**0.0**	**4.2**	**0.0**	**94.5**	**0.0**	**0.0**	**0.0**	**0.2**
CT	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0
DE	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0
MA	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0
MD	6.3	0.0	0.0	0.0	93.6	0.1	0.0	0.0	0.0
ME	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0
NH	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0
NJ	0.2	0.0	10.8	0.0	89.0	0.0	0.0	0.0	0.0
NY	0.8	0.0	2.9	0.0	96.1	0.0	0.0	0.0	0.2
PA	0.0	0.0	4.4	0.0	95.0	0.0	0.0	0.1	0.5
RI	0.0	0.0	5.5	0.0	94.5	0.0	0.0	0.0	0.0
VT	0.0	0.0	0.1	0.0	99.9	0.0	0.0	0.0	0.0
Pacific	**1.0**	**0.2**	**2.1**	**3.6**	**1.5**	**88.9**	**1.4**	**0.6**	**0.5**
AK	0.0	0.0	0.3	0.0	0.3	98.6	0.0	0.7	0.0
CA	0.9	0.2	0.6	2.8	1.5	91.9	1.4	0.4	0.2
HI	0.0	0.0	4.9	0.6	0.5	90.9	1.4	1.7	0.0
OR	3.1	0.0	21.5	11.3	3.1	52.0	1.5	2.9	4.7
WA	0.1	0.6	0.1	6.9	0.0	92.0	0.0	0.1	0.2
Southcentral	**0.6**	**0.2**	**2.8**	**0.4**	**0.1**	**4.5**	**87.9**	**3.5**	**0.0**
AR	0.0	1.6	1.8	0.0	0.2	0.0	94.9	1.5	0.0
LA	2.0	0.0	0.3	0.0	0.0	0.1	92.6	5.1	0.0
NM	0.0	0.0	0.0	1.7	0.0	0.0	98.2	0.0	0.0
OK	0.0	0.3	0.0	0.0	0.0	0.0	99.7	0.0	0.0
TX	0.1	0.0	6.7	0.1	0.2	11.8	76.2	4.9	0.0
Southeast	**14.6**	**0.0**	**1.8**	**0.2**	**6.2**	**0.6**	**2.3**	**73.9**	**0.4**
AL	52.1	0.0	1.4	0.0	0.3	0.0	1.2	45.1	0.0
FL	12.6	0.0	2.5	0.3	8.3	0.9	2.8	72.1	0.5
GA	11.7	0.0	0.2	0.0	0.8	0.0	0.6	86.7	0.0
MS	12.9	0.0	1.0	0.0	4.0	0.0	11.2	70.9	0.0
SC	29.9	0.1	0.4	0.0	15.4	0.0	0.0	54.1	0.0
United States	**11.4**	**2.1**	**17.8**	**4.1**	**18.3**	**18.6**	**9.9**	**17.5**	**0.3**

Interregional Trade of Nursery Products

The interregional trade of nursery products was also one of the surveyed subjects. The flow of products sold from regions and states to other regions is shown in Table 16. The home state of the nursery was listed as the first option for a destination state since this was the dominant practice of all states in previous surveys. In most cases, the weighted percentages of sales to buyers within the nursery's home state were by far the largest. The states with the largest share of products sold to their own home region were Montana (100%), Oklahoma (99.3%), Utah (98.5%), Missouri (98.2%), New Mexico (97.3%), Nebraska (96.7%), Indiana (93.8%), Arkansas (93.6%), Michigan (93.2%), and Wyoming (92.8). The state of Hawaii sold more products to buyers in California (47.5%) than buyers in Hawaii. Interregional trade of nursery products from the states in a region to the same region dominated the trade flows, from 73 percent in the Southeast to more than 95 percent in the Northeast. A few individual states had a high share of sales outside their region, including North Dakota (59.4%) and Alabama (52.1%).

Trade Show Participation

Survey respondents were asked to indicate the number of trade shows attended annually with and without an exhibit. The average number of trade shows attended was 2.3 with an exhibit, and 1.8 trade shows without an exhibit, as shown in Table 17. The states with the highest average number of trade shows attended with an exhibit were New York (4.1), Minnesota (4.1), and Wisconsin (4.0), while the highest average number without an exhibit were Colorado (15.9) and New Jersey (7.4).

Table 16. Interregional trade in nursery products by U.S. states and regions, 2008.

Selling Region / State	Purchasing Region								
	Appalachian	Great Plains	Midwest	Mountain	Northeast	Pacific	Southcentral	Southeast	Foreign
	Percentage of total sales in each state or region								
Appalachian	**75.7**	**0.4**	**2.9**	**1.2**	**11.9**	**0.1**	**4.2**	**3.4**	**0.2**
KY	80.8	0.0	19.2	0.0	0.0	0.0	0.0	0.0	0.0
NC	86.2	0.0	0.5	1.7	4.9	0.2	0.1	6.4	0.0
TN	71.5	1.4	3.5	0.0	4.7	0.0	13.9	4.4	0.7
VA	67.8	0.0	1.8	2.1	28.2	0.0	0.0	0.0	0.0
WV	83.4	0.0	1.1	0.0	15.5	0.0	0.0	0.0	0.0
Great Plains	**1.1**	**89.2**	**7.6**	**0.0**	**0.0**	**0.0**	**2.0**	**0.1**	**0.0**
KS	0.0	59.5	28.5	0.0	0.0	0.0	11.9	0.0	0.0
ND	59.4	34.7	2.8	0.0	0.0	0.0	0.0	3.1	0.0
NE	0.0	96.8	3.2	0.0	0.0	0.0	0.0	0.0	0.0
SD	0.0	96.4	3.6	0.0	0.0	0.0	0.0	0.0	0.0
Midwest	**0.4**	**1.7**	**94.4**	**0.6**	**2.6**	**0.0**	**0.0**	**0.3**	**0.0**
IA	0.0	17.6	82.0	0.0	0.5	0.0	0.0	0.0	0.0
IL	0.0	0.9	98.7	0.4	0.0	0.0	0.0	0.0	0.0
IN	1.3	0.0	96.5	0.0	0.0	0.0	0.0	2.2	0.0
MI	0.9	0.0	99.1	0.0	0.0	0.0	0.0	0.0	0.0
MN	0.0	2.6	97.3	0.0	0.0	0.0	0.0	0.0	0.0
MO	0.0	0.4	99.6	0.0	0.0	0.0	0.0	0.0	0.0
OH	0.5	0.0	85.7	2.3	11.5	0.0	0.0	0.0	0.0
WI	0.0	11.1	86.8	0.0	1.7	0.3	0.0	0.1	0.0
Mountain	**0.0**	**0.7**	**0.1**	**87.1**	**0.5**	**1.1**	**10.34**	**0.0**	**0.2**
AZ	0.0	0.0	0.0	67.2	0.0	6.0	26.7	0.1	0.0
CO	0.0	1.4	0.2	80.6	0.0	0.0	17.8	0.0	0.0
ID	0.0	0.0	0.3	93.0	0.0	5.0	0.0	0.0	1.7
MT	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0
NV	0.0	0.0	0.0	87.5	9.9	0.5	2.1	0.0	0.0
UT	0.0	0.0	0.0	99.1	0.0	0.9	0.0	0.0	0.0
WY	0.0	1.9	0.0	98.0	0.2	0.0	0.0	0.0	0.0
Northeast	**0.7**	**0.0**	**4.2**	**0.0**	**94.5**	**0.0**	**0.2**	**0.2**	**0.2**
CT	0.0	0.0	0.0	86.4	13.6	0.0	0.0	0.0	0.0
DE	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0
MA	0.0	0.0	0.0	3.3	96.7	0.0	0.0	0.0	0.0
MD	6.3	0.0	0.0	2.0	91.6	0.1	0.0	0.0	0.0
ME	0.0	0.0	0.0	3.2	96.8	0.0	0.0	0.0	0.0
NH	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0
NJ	0.2	0.0	10.8	1.0	88.0	0.0	0.0	0.0	0.0
NY	0.8	0.0	2.9	3.2	91.3	0.0	0.9	0.8	0.2
PA	0.0	0.0	4.4	5.6	89.4	0.0	0.0	0.1	0.5
RI	0.0	0.0	5.5	9.0	85.4	0.0	0.0	0.0	0.0
VT	0.0	0.0	0.1	7.1	92.9	0.0	0.0	0.0	0.0
Pacific	**1.1**	**0.3**	**2.1**	**3.6**	**1.5**	**88.8**	**1.4**	**0.6**	**0.5**
AK	0.0	0.0	0.3	0.0	0.3	98.6	0.0	0.7	0.0
CA	1.0	0.3	0.6	2.8	1.5	91.8	1.5	0.4	0.2
HI	0.0	0.0	4.9	0.6	0.5	90.9	1.4	1.7	0.0
OR	3.1	0.0	21.5	11.4	3.1	52.0	1.5	2.9	4.7
WA	0.1	0.6	0.1	6.9	0.0	92.0	0.0	0.1	0.2
Southcentral	**0.6**	**0.2**	**2.8**	**0.4**	**0.1**	**4.5**	**87.9**	**3.5**	**0.0**
AR	0.0	1.6	1.8	0.0	0.2	0.0	94.9	1.5	0.0
LA	2.0	0.0	0.3	0.0	0.0	0.1	92.6	5.1	0.0
NM	0.0	0.0	0.0	1.7	0.0	0.0	98.2	0.0	0.0
OK	0.0	0.3	0.0	0.0	0.0	0.0	99.7	0.0	0.0
TX	0.1	0.0	6.7	0.1	0.2	11.8	76.2	4.9	0.0
Southeast	**14.5**	**0.2**	**2.4**	**3.4**	**2.9**	**0.8**	**2.3**	**73.1**	**0.4**
AL	52.1	0.0	1.4	0.0	0.3	0.0	1.2	45.1	0.0
FL	12.5	0.1	3.4	5.0	3.5	1.2	2.7	71.1	0.5
GA	11.7	0.4	0.4	0.0	0.8	0.0	0.6	86.1	0.0
MS	12.9	0.0	1.0	0.0	4.0	0.0	11.2	70.9	0.0
SC	29.9	0.1	0.4	0.0	15.4	0.0	0.0	54.1	0.0
United States	**11.4**	**2.1**	**17.9**	**6.2**	**16.2**	**18.6**	**9.8**	**17.5**	**0.2**

Table 17. Average number of trade shows attended by nursery producers in U.S. states and regions, 2008.

Region / State	With Exhibit	Without Exhibit
Appalachian	**2.3**	**2.2**
KY	1.4	1.4
NC	2.1	2.9
TN	2.8	1.7
VA	2.8	1.6
WV	0.0	0.4
Great Plains	**1.6**	**1.5**
KS	2.0	2.5
ND	2.0	3.0
NE	2.0	1.0
SD	0.5	1.0
Midwest	**2.8**	**1.8**
IA	2.7	3.0
IL	3.0	1.5
IN	1.8	1.9
MI	1.7	1.6
MN	4.1	2.5
MO	1.1	1.0
OH	3.0	1.6
WI	4.0	2.4
Mountain	**1.7**	**4.9**
AZ	1.3	0.0
CO	1.8	15.9
CT	2.7	1.9
ID	2.3	1.3
MT		1.0
NV	0.0	0.3
UT	3.0	1.5
WY	0.5	1.3
Northeast	**2.1**	**2.1**
CT	2.7	1.9
DE	1.5	1.3
MA	2.5	2.8
MD	1.4	1.0
ME	1.0	1.4
NH	-	-
NJ	1.9	7.4
NY	4.1	2.0
PA	2.0	1.3
RI	1.3	3.0
VT	0.8	0.7
Pacific	**2.1**	**1.3**
AK	1.0	0.5
CA	2.2	1.3
HI	0.2	0.2
OR	3.1	1.7
WA	1.9	1.7
Southcentral	**2.6**	**1.6**
AR	3.7	1.0
LA	2.0	3.2
NM	2.0	1.5
OK	0.8	0.7
TX	3.3	1.3
Southeast	**2.3**	**1.4**
AL	3.6	1.8
FL	1.9	1.4
GA	3.3	1.5
MS	2.6	1.2
SC	2.9	1.3
United States	**2.3**	**1.8**

Sales Transaction Methods

Respondents were asked to indicate their percentage of sales using the following sales methods: trade show orders, telephone orders, in-person orders, mail orders, internet, and other. The most common sales methods for the whole sample were in-person orders, used by 73.5 percent of firms, and telephone orders (55.8%), which represented 43.7 and 43.3 percent of sales, respectively. Trade show orders represented 5.8% of sales, followed by internet sales (4.4%), and mail orders (2.6%).

Table 18 presents information on sales transaction methods used by region and state. In-person orders were the highest sales transaction method in New Hampshire (100%), Montana (100%), New Mexico (95.4%), Vermont (95.3%), and Missouri (93.2%). Hawaii (99.5%) and Alaska (77.6%) were the states with the highest percentage of sales through telephone orders. While trade show orders accounted for 5.8 percent of total transactions in all states, Tennessee, Michigan, and Pennsylvania used this method for nearly one fourth of their transactions. Internet transactions represented 34 percent of sales in New York and 26 percent in Connecticut.

Figure 10. Sales transaction methods for nursery products in the U.S., 2008.

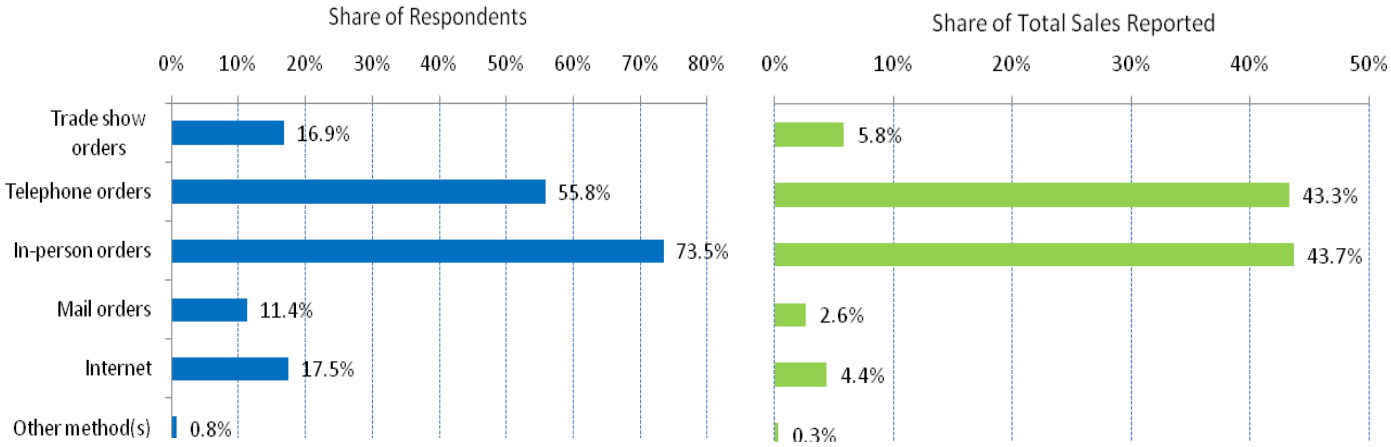


Table 18. Sales transaction methods for nursery products in U.S. states and regions, 2008.

Region / State	Trade show orders	Telephone orders	In-person orders	Mail orders	Internet	Other
	Percent of total sales in each region/state					
Appalachian	**8.1**	**39.7**	**46.7**	**1.9**	**3.7**	**0.0**
KY	5.9	9.7	81.6	2.4	0.3	-
NC	2.4	61.6	32.6	0.7	2.7	-
TN	24.9	19.7	42.2	5.3	7.8	0.0
VA	3.2	30.6	63.1	0.8	2.2	-
WV	-	18.4	79.8	0.9	0.9	-
Great Plains	**0.0**	**32.5**	**67.4**	**-**	**0.1**	**-**
KS	-	14.3	85.0	-	0.7	-
ND	-	63.3	36.7	-	-	-
NE	-	33.7	66.3	-	-	-
SD	0.3	41.8	58.0	-	-	-
Midwest	**7.3**	**25.7**	**56.5**	**5.7**	**4.7**	**0.0**
IA	7.0	9.4	79.7	0.1	3.9	-
IL	11.4	39.3	43.3	0.3	5.6	-
IN	0.3	26.5	72.4	0.7	0.1	-
MI	24.4	18.3	53.4	0.5	3.4	0.1
MN	5.6	26.7	64.4	3.3	0.1	-
MO	0.7	5.7	93.2	0.1	0.3	-
OH	2.7	31.5	36.5	18.1	11.2	0.1
WI	0.0	8.6	90.1	0.5	0.8	-
Mountain	**2.6**	**47.9**	**43.4**	**0.8**	**5.4**	**0.0**
AZ	-	54.1	43.5	0.2	2.1	-
CO	4.7	73.9	10.3	0.5	10.5	-
ID	4.9	49.0	40.8	0.7	4.6	0.0
MT	-	0.0	100.0	-	-	-
NV	-	71.5	14.5	13.9	0.1	-
UT	-	74.4	24.9	0.2	0.5	-
WY	-	10.0	90.0	-	-	-
Northeast	**9.3**	**29.8**	**45.0**	**5.1**	**10.2**	**0.6**
CT	0.3	17.1	48.2	8.2	26.2	-
DE	1.6	55.6	40.0	2.2	0.7	-
MA	3.3	53.2	42.1	0.7	0.7	-
MD	3.1	62.0	33.1	0.8	1.0	-
ME	-	25.2	71.4	0.6	2.8	-
NH	-	-	100.0	-	-	-
NJ	1.0	50.5	43.3	0.8	1.3	3.0
NY	1.7	20.8	41.9	1.5	34.1	0.0
PA	23.2	20.9	42.5	10.1	3.3	0.1
RI	4.5	17.1	62.6	15.8	0.1	-
VT	0.1	3.5	95.3	0.2	0.9	-
Pacific	**4.5**	**47.9**	**40.9**	**1.5**	**4.6**	**0.5**
AK	0.0	77.6	22.3	0.1	0.0	-
CA	5.9	42.2	45.0	1.7	4.6	0.6
HI	0.0	99.5	0.5	0.0	0.0	-
OR	2.7	31.8	61.1	3.0	1.4	-
WA	1.0	58.8	24.6	0.4	15.1	0.1
Southcentral	**6.4**	**38.6**	**51.8**	**1.0**	**2.1**	**0.0**
AR	0.8	11.9	84.5	1.4	1.4	-
LA	0.2	67.9	29.5	1.5	0.9	-
NM	0.2	2.0	95.4	-	2.4	-
OK	0.1	19.3	80.5	0.0	0.0	-
TX	13.6	42.4	39.9	1.1	3.0	0.0
Southeast	**3.6**	**60.3**	**31.7**	**1.6**	**2.3**	**0.5**
AL	5.8	49.7	25.0	16.9	0.6	1.9
FL	4.0	57.2	35.5	0.5	2.3	0.5
GA	2.0	73.5	20.8	1.0	2.5	0.1
MS	1.8	48.2	49.8	0.1	-	-
SC	2.4	69.8	22.6	0.4	4.8	-
United States	**5.8**	**43.3**	**43.7**	**2.6**	**4.4**	**0.3**

Marketing Practices

Marketing practices examined included sales to repeat customers, negotiated sales, brokerage sales, contract sales, and export sales. More than 80 percent of overall nursery sales were to repeat customers, as shown in Figure 11. Negotiated sales, defined as transactions where various terms of sales such as price, quantity, and delivery were discussed, were practiced by 68.9 percent of firms, and represented 36.6 percent of total sales. Brokerage or resale of finished products was practiced by 53.4 percent of respondents and represented 10.4 percent of total sales. Forward contract sales were used by 28 percent of respondents and accounted for 15.5 percent of total sales. Exporting to foreign markets was done by 33.3 percent of respondents, but this represented only 3.7 percent of total sales.

Table 19 shows percent of total sales under selected marketing practices by region and state. Repeat customer sales were highest in Alaska (95.1%), Indiana (94.4%), Oregon (93.1%), Montana (92.3%), and Missouri (90.9%). Negotiated sales were highest in Hawaii (98.2%), Wisconsin (75.3%) and Iowa (72.9%). Brokerage sales were highest in Oklahoma (88.9%), New Hampshire (84.8%) and Nebraska (78.6%). Forward contract sales were highest in Alaska (67.7 %), Iowa (67.6%) and North Dakota (58.7%). Foreign exports were highest in Arizona (67.4%) and Alabama (42.1%).

Figure 11. Marketing practices used by nursery producers in the U.S., 2008.

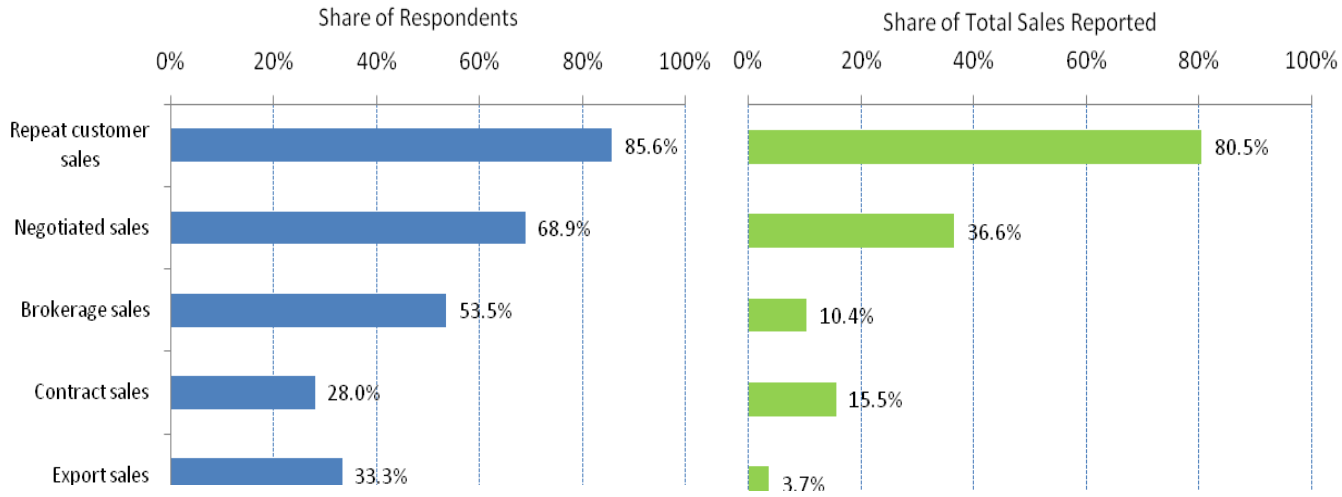


Table 19. Marketing practices used by nursery producers in U.S. states and regions, 2008.

Region / State	Repeat customer sales	Negotiated sales	Brokerage	Forward Contracting	Exports
	Percent of total sales in each region/state				
Appalachian	**79.8**	**24.7**	**6.9**	**19.6**	**0.5**
KY	61.9	22.9	16.3	6.0	-
NC	84.3	36.6	6.8	5.3	0.5
TN	77.5	23.2	8.8	5.6	1.2
VA	77.8	11.6	4.5	48.9	-
WV	84.6	5.1	29.9	1.7	-
Great Plains	**81.5**	**29.9**	**54.4**	**15.3**	**0.1**
KS	82.3	35.9	15.9	2.6	0.5
ND	85.4	19.3	8.3	58.7	-
NE	87.6	35.4	78.6	21.2	-
SD	56.7	3.4	1.9	0.1	-
Midwest	**78.3**	**33.6**	**9.0**	**12.4**	**0.5**
IA	81.0	72.9	7.2	67.6	-
IL	84.8	52.2	1.5	0.9	0.1
IN	94.4	15.7	47.0	14.0	0.0
MI	61.2	48.9	2.6	4.6	0.0
MN	76.8	28.7	3.2	14.7	0.0
MO	90.9	4.5	3.1	2.3	-
OH	76.4	16.3	7.9	5.4	1.7
WI	74.4	75.3	4.2	46.3	0.1
Mountain	**80.3**	**12.6**	**22.1**	**17.8**	**7.5**
AZ	89.4	36.1	4.0	7.2	67.4
CO	74.5	5.6	15.7	21.7	0.0
ID	82.6	15.8	11.2	16.4	0.8
MT	92.3	9.6	47.8	19.1	-
NV	60.9	14.0	-	18.3	-
UT	50.6	53.4	4.5	0.7	-
WY	42.5	10.5	22.6	1.9	-
Northeast	**75.4**	**22.3**	**13.3**	**5.1**	**0.4**
CT	63.3	12.7	45.4	2.4	-
DE	89.6	18.8	12.4	6.4	-
MA	81.9	55.7	24.5	1.9	-
MD	78.9	14.9	3.0	6.6	0.0
ME	78.0	9.0	28.5	4.4	1.2
NH	50.0	-	84.8	-	-
NJ	82.9	28.8	8.5	7.8	-
NY	83.3	25.7	7.8	4.3	0.7
PA	71.8	23.6	2.6	5.4	0.6
RI	83.0	12.3	15.6	11.0	-
VT	75.8	1.9	7.8	1.1	-
Pacific	**80.0**	**40.6**	**5.6**	**21.7**	**4.1**
AK	95.1	2.0	0.8	67.7	-
CA	79.8	42.5	5.4	22.0	4.5
HI	75.1	98.2	9.9	0.3	0.2
OR	93.1	11.3	1.2	6.7	10.1
WA	58.3	44.9	14.1	9.8	0.4
Southcentral	**82.4**	**33.5**	**15.7**	**17.4**	**0.2**
AR	76.2	6.1	2.9	27.4	0.0
LA	83.7	34.0	3.3	8.2	-
NM	85.4	9.7	0.4	28.2	-
OK	85.2	33.2	88.9	1.3	-
TX	82.1	44.1	23.3	17.5	0.3
Southeast	**84.8**	**51.4**	**10.3**	**13.9**	**9.5**
AL	73.6	49.9	4.8	29.0	42.1
FL	86.0	51.4	11.1	16.8	10.8
GA	84.4	55.3	8.0	3.6	0.3
MS	84.6	8.7	21.5	17.2	-
SC	78.1	44.5	18.8	0.8	-
United States	**80.5**	**36.6**	**10.4**	**15.5**	**3.7**

Note: Practices were measured independently and do not sum to 100%.

Forward Contracting

As indicated above, forward contracting is an important marketing practice that many nursery producers use as a risk management tool. The most common buyer for forward contracting was other producers, used by 12.1 percent of respondents, followed by retail garden centers (7.6%), mass merchandisers (4.4%), cooperatives (<1%), and others (7.9%), as shown in Figure 12.

Table 20 shows the percentage of producers using forward contracting by type of buyer and region and state. The Appalachian region had the highest percentage of producers using forward contracting to other producers (36.1%), while the Midwest had the lowest (2.7%). North Carolina reported the highest rate of forward contracting to other producers (69.5%). Some states did not engage in any forwarding practices.

Figure 12. Customers for forward contracting by nursery producers in the U.S., 2008.

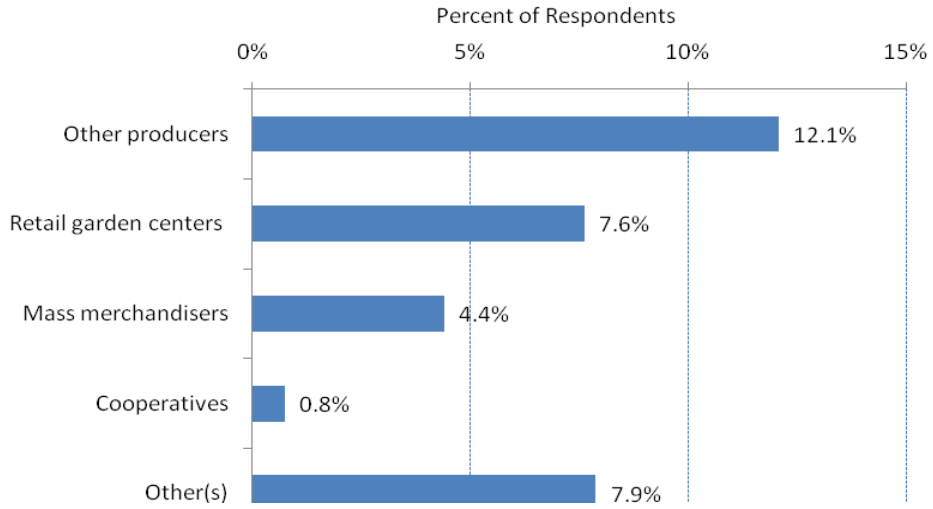


Table 20. Customers for forward contracting by nursery producers in U.S. states and regions, 2008.

Region / State	Other producers	Retail garden centers	Mass merchandisers	Cooperatives	Other(s)
	Percent of producers in each region/state				
Appalachian	**36.1**	**4.2**	**2.1**	**0.6**	**6.9**
KY	6.7	0.0	0.0	3.3	0.0
NC	69.5	3.3	2.0	0.7	6.6
TN	9.9	6.9	2.0	0.0	8.9
VA	7.0	4.7	4.7	0.0	9.3
WV	0.0	0.0	0.0	0.0	0.0
Great Plains	**4.4**	**6.7**	**2.2**	**0.0**	**6.7**
KS	0.0	8.3	0.0	0.0	0.0
ND	16.7	16.7	0.0	0.0	16.7
NE	9.1	9.1	9.1	0.0	9.1
SD	0.0	0.0	0.0	0.0	6.3
Midwest	**2.7**	**4.6**	**1.9**	**0.4**	**6.7**
IA	0.0	6.7	3.3	0.0	6.7
IL	2.7	1.3	1.3	0.0	9.3
IN	3.7	11.1	7.4	0.0	7.4
MI	4.8	3.6	1.2	1.2	4.8
MN	2.1	6.3	4.2	0.0	6.3
MO	0.0	5.3	0.0	0.0	5.3
OH	2.8	3.5	1.4	0.7	7.1
WI	2.6	7.7	0.0	0.0	5.1
Mountain	**5.2**	**7.8**	**2.6**	**0.0**	**12.2**
AZ	14.3	0.0	0.0	0.0	28.6
CO	8.7	17.4	4.3	0.0	13.0
ID	4.9	9.8	4.9	0.0	9.8
MT	0.0	0.0	0.0	0.0	12.5
NV	0.0	0.0	0.0	0.0	14.3
UT	11.1	11.1	0.0	0.0	11.1
WY	0.0	0.0	0.0	0.0	10.0
Northeast	**4.2**	**5.0**	**0.8**	**0.5**	**4.2**
CT	5.6	0.0	0.0	0.0	5.6
DE	4.8	4.8	0.0	0.0	0.0
MA	0.0	0.0	0.0	0.0	0.0
MD	5.7	11.4	0.0	0.0	8.6
ME	2.9	0.0	2.9	0.0	8.8
NH	0.0	0.0	0.0	0.0	0.0
NJ	5.8	1.9	0.0	0.0	1.9
NY	5.4	6.8	2.0	0.0	4.8
PA	3.3	4.0	0.4	0.4	2.5
RI	5.9	0.0	0.0	0.0	0.0
VT	3.8	19.2	0.0	7.7	19.2
Pacific	**10.1**	**12.7**	**19.6**	**1.4**	**15.2**
AK	0.0	0.0	6.7	0.0	33.3
CA	10.1	15.2	27.7	1.4	13.9
HI	10.5	0.0	5.3	0.0	15.8
OR	17.4	8.7	0.0	0.0	15.2
WA	6.9	10.3	1.7	3.4	17.2
Southcentral	**5.1**	**5.1**	**1.9**	**0.9**	**7.4**
AR	4.5	4.5	4.5	0.0	4.5
LA	0.0	6.8	0.0	2.3	18.2
NM	0.0	0.0	0.0	0.0	11.8
OK	10.5	10.5	5.3	0.0	0.0
TX	7.0	4.4	1.8	0.9	4.4
Southeast	**18.7**	**11.1**	**2.6**	**1.0**	**7.6**
AL	16.3	10.2	6.1	4.1	10.2
FL	22.7	13.5	2.7	0.9	6.8
GA	9.5	3.2	2.1	1.1	13.7
MS	0.0	7.1	0.0	0.0	7.1
SC	4.3	2.2	0.0	0.0	2.2
United States	**12.1**	**7.6**	**4.4**	**0.8**	**7.9**

Advertising Expenditures

Respondents were asked to indicate the percentage of their total sales allocated to advertising and the percentage of their advertising budget spent on the following media forms: internet, yellow pages, radio/TV, billboards, gardening publications, catalogs, trade journals, newsletters, trade shows, and others. Advertising expenditures represented 4.6 percent of total sales on average. The most popular advertising media was catalogs, accounting for 23.2 percent of the total advertising budget, followed by trade shows (20.9%), other unspecified media (14.6%), and the internet (12.5%), as shown in Figure 13.

The results are presented by region and state in Table 21. There were several states with a substantially higher than average portion of their sales spent on advertising, including Alabama (14.5%), Connecticut (13.2%), North Carolina (13.1%), and Wyoming (12.5%). The highest advertising shares for internet media were reported in Washington (73.8%), Hawaii (53.9%), Virginia (37.3%), Nevada (25.0%), Texas (24.0%) and North Carolina (22.3%).

Figure 13. Advertising media used by nursery producers in the U.S., 2008.

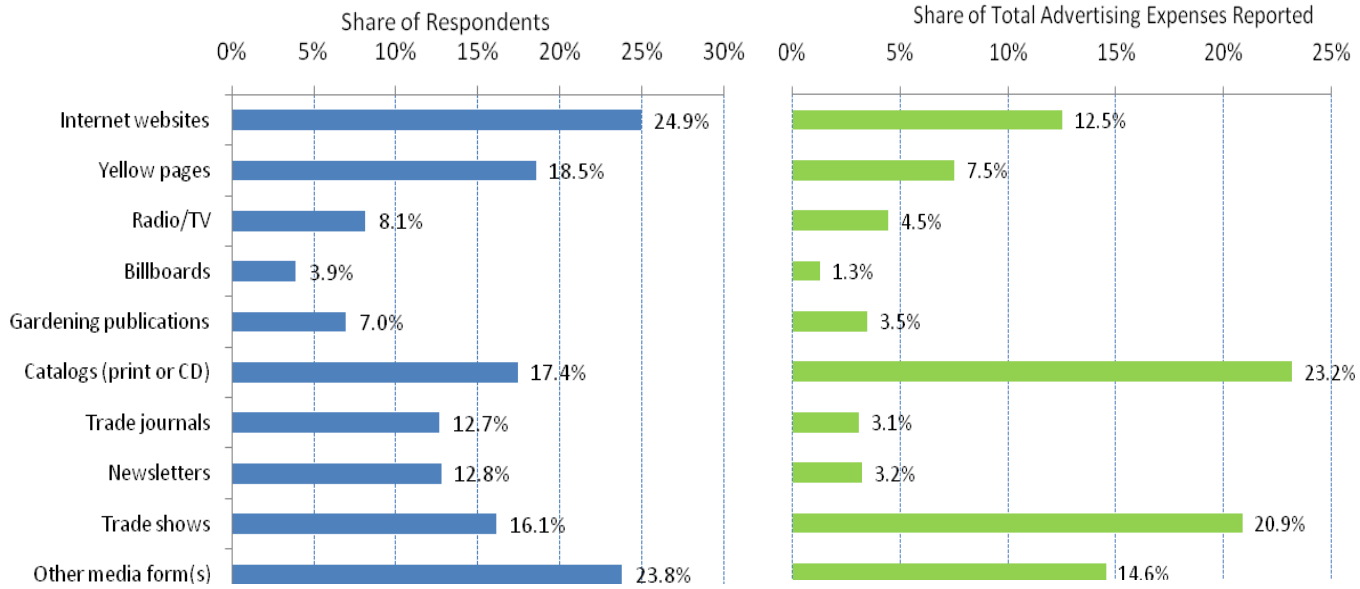


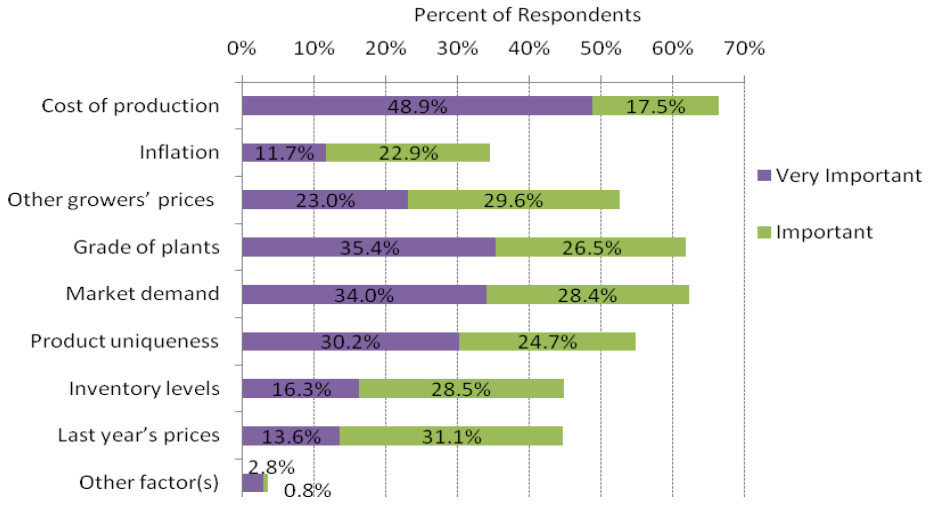
Table 21. Advertising expenditures by nursery producers in U.S. states and regions, 2008.

Region / State	Internet websites	Yellow pages	Radio /TV	Billboards	Gardening publications	Catalogs (print or CD)	Trade journals	Newsl etters	Trade shows	Other media	Total Advertising Expenses of Total Sales
	Percent of advertising expenses in each region/state										
Appalachian	**20.6**	**20.9**	**15.3**	**0.1**	**3.0**	**13.5**	**1.4**	**0.4**	**19.6**	**3.6**	**7.8**
KY	2.3	9.2	23.6	-	1.8	49.7	-	0.7	11.8	0.2	6.2
NC	22.3	27.7	21.2	0.0	4.3	11.1	1.2	0.3	9.9	2.0	13.1
TN	8.6	2.5	1.3	0.4	0.1	12.1	0.8	0.8	60.8	4.6	6.4
VA	37.3	13.8	0.7	-	0.0	22.5	3.9	0.5	7.3	13.9	2.4
WV	-	8.3	66.7	-	-	-	-	-	-	25.0	2.2
Great Plains	**17.6**	**2.9**	**2.1**	**-**	**0.1**	**0.2**	**0.3**	**4.2**	**2.2**	**70.4**	**6.6**
KS	10.8	2.8	23.4	-	-	-	-	6.9	27.0	28.8	2.5
ND	3.3	8.2	19.1	-	-	-	-	23.9	45.6	-	1.4
NE	18.3	2.6	0.3	-	0.1	0.2	0.3	3.9	0.3	74.1	9.3
SD	4.9	25.4	28.9	-	1.3	0.0	-	5.4	6.1	28.0	0.5
Midwest	**10.6**	**2.5**	**2.6**	**6.2**	**0.4**	**23.7**	**5.3**	**10.9**	**20.2**	**13.4**	**4.7**
IA	7.4	12.9	37.0	-	0.1	1.4	-	7.9	2.9	24.6	0.8
IL	10.5	0.7	0.2	0.2	0.2	27.0	11.6	5.2	41.3	3.0	8.7
IN	18.9	18.7	3.9	0.3	-	47.4	5.4	0.1	1.1	4.0	2.8
MI	16.3	1.5	5.5	0.0	0.1	9.5	7.1	9.4	3.0	41.7	7.7
MN	1.2	0.4	1.8	34.3	0.0	9.9	0.2	36.8	2.3	2.4	5.1
MO	5.0	24.7	15.1	-	0.1	1.6	-	12.3	17.4	23.7	0.5
OH	10.1	1.6	1.1	0.1	1.1	39.6	0.4	2.1	32.4	7.1	3.8
WI	14.2	10.1	14.7	-	3.1	15.8	3.8	4.2	0.2	33.6	0.4
Mountain	**9.1**	**8.2**	**26.2**	**0.0**	**3.9**	**5.1**	**1.4**	**6.9**	**5.5**	**33.2**	**3.1**
AZ	6.7	2.3	30.0	-	-	12.3	8.5	15.6	24.5	-	1.3
CO	20.8	10.3	6.5	0.0	0.2	13.1	2.5	19.7	6.6	20.1	2.2
ID	13.7	6.4	11.8	0.2	0.3	6.9	2.8	2.0	29.4	25.6	2.2
MT	0.1	0.2	50.5	-	-	-	-	-	-	49.3	4.9
NV	25.0	74.9	-	0.1	-	-	-	-	-	-	3.3
UT	15.5	80.9	-	-	-	-	-	-	-	3.6	3.6
WY	2.3	0.6	5.0	-	41.7	-	-	-	-	44.7	12.5
Northeast	**7.9**	**2.7**	**1.3**	**1.2**	**2.0**	**34.1**	**2.5**	**1.4**	**6.7**	**17.9**	**3.8**
CT	7.3	1.2	0.3	-	2.2	85.7	0.4	1.4	0.9	0.0	13.2
DE	30.5	5.1	8.7	-	0.0	10.6	-	27.8	2.5	13.7	2.5
MA	17.1	14.4	7.2	18.5	1.7	16.3	1.7	0.0	20.2	2.9	2.5
MD	15.4	5.1	4.3	0.2	1.8	20.9	6.5	5.7	9.6	30.5	1.6
ME	8.0	2.0	0.7	0.1	0.5	24.1	21.0	1.3	20.7	20.6	2.3
NH	-	-	-	-	-	-	-	-	-	-	0.0
NJ	9.5	1.3	-	-	0.2	37.7	2.6	2.1	9.9	2.2	1.1
NY	1.4	2.4	1.5	0.0	0.4	7.7	0.9	0.8	0.7	15.8	6.5
PA	12.6	2.7	1.0	0.8	3.7	23.6	4.6	1.2	14.0	34.6	3.5
RI	7.9	4.4	6.6	-	-	3.0	-	1.3	23.9	53.0	1.2
VT	2.9	16.0	0.5	58.1	2.7	-	-	0.3	1.3	18.1	1.3
Pacific	**12.1**	**7.3**	**1.3**	**0.5**	**1.2**	**34.8**	**1.8**	**2.4**	**29.4**	**5.0**	**6.0**
AK	3.3	1.8	8.0	0.0	-	-	-	0.0	-	87.0	0.2
CA	8.5	6.8	1.0	0.5	0.6	37.7	1.7	2.2	31.3	5.2	7.2
HI	53.9	7.8	-	-	30.0	-	3.9	-	-	-	0.0
OR	7.8	0.2	11.2	0.0	18.1	19.1	6.3	10.3	26.2	0.9	3.1
WA	73.8	20.7	0.3	-	0.3	1.4	0.4	0.7	1.9	0.4	5.0
Southcentral	**15.6**	**2.0**	**0.4**	**0.4**	**1.2**	**19.8**	**4.5**	**2.7**	**14.0**	**23.6**	**2.0**
AR	0.8	0.1	0.4	0.1	0.1	0.3	0.3	4.6	47.3	46.2	4.4
LA	11.8	6.9	-	1.8	0.7	19.4	2.9	5.0	45.8	5.6	0.4
NM	2.3	0.0	-	1.9	-	0.1	-	1.6	0.5	93.6	1.9
OK	5.7	17.6	2.1	0.9	0.6	-	33.7	36.1	-	3.2	1.7
TX	24.0	2.1	0.5	0.1	1.9	31.2	6.0	1.0	4.0	3.3	2.3
Southeast	**7.8**	**2.2**	**1.0**	**0.4**	**14.2**	**7.5**	**6.4**	**1.6**	**21.0**	**35.0**	**2.9**
AL	0.3	0.4	0.2	0.0	1.3	1.0	0.1	0.0	0.8	95.8	14.5
FL	6.5	3.6	0.7	0.3	23.5	9.8	6.3	2.9	29.1	12.3	2.4
GA	25.0	0.3	2.9	1.3	6.5	10.5	17.4	0.5	26.2	8.8	1.9
MS	2.1	3.8	3.8	0.2	-	3.1	3.4	0.3	39.0	39.5	1.5
SC	7.6	4.1	2.4	0.1	0.5	23.2	12.6	0.8	40.6	8.0	1.3
United States	**12.5**	**7.5**	**4.5**	**1.3**	**3.5**	**23.2**	**3.1**	**3.2**	**20.9**	**14.5**	**4.6**

Factors Affecting Price Determination, Geographic Expansion and Impacting the Nursery Business

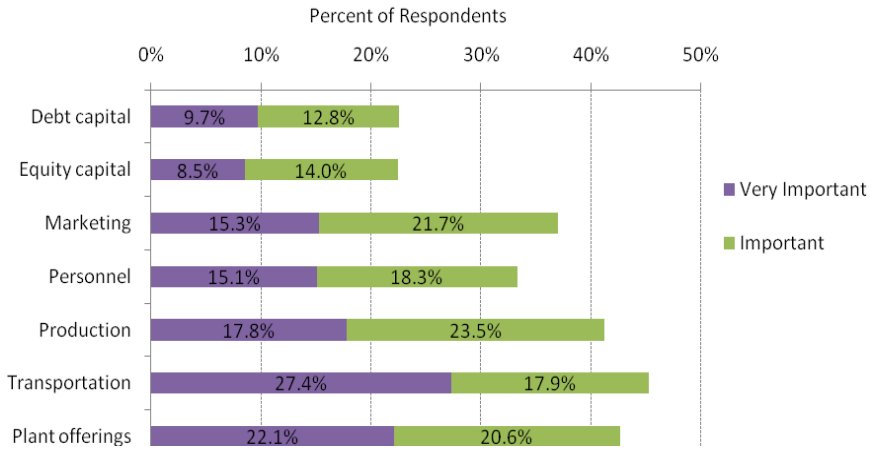
Survey respondents were asked to indicate the importance of factors affecting price determination, geographic expansion and issues affecting the nursery business by rating each on a scale of 1 to 4 with 4 representing "most important" and 1 representing "not important". The eight factors affecting product prices were cost of production, inflation, other grower prices, grade of plants, market demand, product uniqueness, inventory levels, and last year's prices. Cost of production was the factor with the highest important or very important rating with 66 percent of respondents, followed by market demand (62%), grade of plants (62%)., product uniqueness (55%), other grower's prices (53%), inventory levels (45%), last year's prices (45%), and inflation (35%), as shown in Figure 14.

Figure 14. Factors affecting product pricing for U.S. nursery producers, 2008.



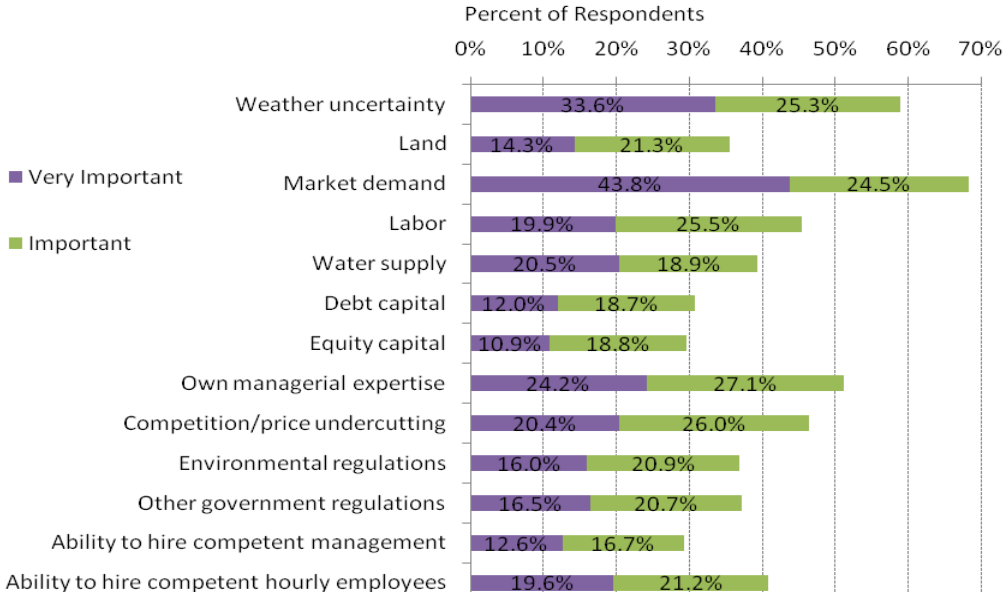
Respondents were asked to rate factors that might limit the expansion of the geographic scope of their trading area, including debt capital, equity capital, marketing, personnel, production, transportation, and plant offerings. The most important factor was transportation, rated either important or very important by 45 percent of respondents, followed by plant offerings (43%), production (41%), marketing (37%), debt capital (23%) and equity capital (22%), as shown in Figure 15.

Figure 15. Factors affecting geographic expansion for U.S. nursery producers, 2008.



Finally, the survey asked respondents to rate the importance of thirteen general factors or issues that might impact their nursery business, including 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, and ability to hire competent hourly employees. Market demand was the factor rated either important or very important by the most respondents (68%), followed by weather uncertainty (59%), own managerial expertise (51%), competition/price undercutting (46%), labor (45%), ability to hire competent hourly employees (41%), water supply (39%), other government regulations (37%), land availability (36%), debt capital (31%), equity capital (30%), and ability to hire competent management (29%), as shown in Figure 16.

Figure 16. Factors impacting the business for U.S. nursery producers, 2008.



The regional results of these questions are presented in Table 22. There were some differences in percentage of respondents rating a particular factor among regions, however, overall ratings for any factor were rather consistent. As such, cost of production, grade of plants, and market demand factors had higher percentages for importance rating in all regions, and factors such as inflation, inventory levels, and other factors received lower percentages in all regions.

Table 22. Factors affecting product pricing, geographic area and general business for nursery producers in U.S. regions, 2008.

Factor	Appalachian	Great Plains	Midwest	Mountain	Northeast	Pacific	South-central	Southeast	U.S.
	Percentage of Respondents Rating Important or Very Important								
Factors Determining Product Prices									
Cost of production	68.7	80.0	74.2	70.4	67.5	59.7	71.3	60.7	66.4
Inflation	39.5	35.6	32.6	32.6	36.5	33.2	33.8	34.0	34.6
Other growers' prices	55.1	64.4	59.0	48.7	50.8	48.8	49.1	52.2	52.6
Grade of plants	65.4	77.8	70.7	61.7	66.5	51.6	64.4	55.6	62.0
Market demand	66.9	66.7	69.4	65.2	63.4	52.5	59.3	60.9	62.3
Product uniqueness	56.6	66.7	58.2	65.2	55.6	52.8	60.6	49.0	54.9
Inventory levels	47.0	42.2	46.4	44.3	46.7	42.2	42.6	43.7	44.8
Last year's prices	44.9	53.3	52.8	51.3	48.9	40.6	41.7	38.0	44.8
Other factor(s)	3.9	-	2.5	2.6	2.3	5.8	3.2	4.4	3.6
Factors Affecting Geographic Range of Trading Area									
Debt capital	29.8	42.2	22.0	20.0	19.9	25.3	18.1	20.9	22.6
Equity capital	29.5	33.3	22.2	22.6	20.0	24.2	19.0	21.1	22.5
Marketing	69.6	62.2	26.0	46.1	37.0	40.1	52.8	23.1	38.5
Personnel	36.7	40.0	34.9	40.0	32.6	36.4	33.3	28.4	33.3
Production	30.1	24.4	27.2	26.1	22.2	23.7	25.0	19.1	23.7
Transportation	49.4	48.9	46.2	54.8	42.5	50.5	47.7	40.1	45.3
Plant offerings	43.7	42.2	45.5	51.3	41.1	43.3	45.8	39.4	42.7
Factors Impacting the Business									
Weather uncertainty	63.3	75.6	69.9	60.0	61.8	50.2	59.3	51.7	59.0
Land	38.9	31.1	36.6	42.6	36.5	38.7	30.6	31.5	35.5
Market demand	69.9	82.2	76.3	60.9	69.7	63.1	68.1	64.9	68.3
Labor	47.0	46.7	44.3	47.0	43.9	49.5	49.1	43.0	45.4
Water supply	47.3	24.4	32.0	45.2	30.1	44.2	46.8	43.4	39.4
Debt capital	34.0	35.6	30.8	34.8	26.7	34.1	22.7	32.0	30.7
Equity capital	35.2	35.6	27.4	33.0	25.5	33.2	25.0	30.6	29.7
Own managerial expertise	50.3	68.9	57.8	53.9	51.4	50.0	49.1	47.5	51.3
Competition/price undercutting	51.2	62.2	46.8	47.0	42.7	44.7	39.8	48.8	46.4
Environmental regulations	42.8	28.9	34.7	27.8	34.8	41.5	31.9	38.4	37.0
Other government regulations	41.0	33.3	34.7	27.8	35.9	43.1	30.1	38.6	37.2
Ability to hire competent management	35.5	42.2	25.4	26.1	27.8	34.1	25.0	28.8	29.4
Ability to hire competent hourly employees	46.4	48.9	41.8	44.3	40.1	42.6	42.6	36.2	40.9

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Appendix—Survey Questionnaire

2009 National Nursery Industry Survey

Conducted by the *Green Industry Research Consortium* of University horticulturists and economists.

Funded by the Horticultural Research Institute (HRI)

Dear Nursery Owner or Manager:

This survey is being conducted by the *Green Industry Research Consortium*, a group of University-based horticulturists and agricultural economists, with funding by the Horticultural Research Institute (HRI). This represents the fifth time that this survey has been conducted by our group since 1989. The purpose of the survey is to document trends in production and marketing practices in the U.S. nursery and greenhouse industry. The survey is being sent to randomly selected nursery firms throughout the U.S. Information collected in this survey will be invaluable to researchers, educators, and allied professionals, as well as owners and managers in the nursery industry. Much of this information is not available from any other source. To see examples of the results provided by this project, please visit our website at http://www.s1021.org/publications.html.

It is important that you respond to this survey so that your type of business is represented in the study. Of course, your participation is voluntary, and you do not have to answer any question that you do not wish to. All information provided is ***anonymous and strictly confidential***, and results will only be disclosed in summary form. Unfortunately, we cannot provide any compensation for your participation, however, your time in this matter is gratefully appreciated.

When you have completed the questionnaire, please return it in the postage-paid envelope provided.

If you have questions or concerns about the survey, please contact one of the principal investigators:

Dr. Alan W. Hodges	Dr. Charles R. Hall	Dr. Marco Palma
University of Florida	Texas A & M University	Texas A & M University
352-392-1881 x312	979-458-3277	979-845-5284
awhodges@ufl.edu	chall@ag.tamu.edu	mapalma@tamu.edu

Thank you very much for you cooperation!

This project is dedicated to the memory of our colleague John Brooker, an Agricultural Economist at the University of Tennessee, who had a long and distinguished career in service to the environmental horticulture industry, and was instrumental in developing and conducting the National Nursery Survey.

General Company Information

1. In what **state** is your business primarily located? _____ (may use two letter abbreviation)
2. What is the **ZIP code** for this location? _____
3. Does your business **operate a nursery in another state**? ___Yes ___No
   If yes, please list the state(s): _____
4. What **year** was your firm established? _____

Employment

5. How many **employees** did your firm have last year (2008)?
   _____ Permanent employees
   _____ Temporary or seasonal employees (average number during peak season)
   How has the **number of employees changed** over the last five years? (check which applies)
   Permanent: ____increased _____stayed the same ____decreased
   Temporary: ____increased _____stayed the same ____decreased
   If employment has changed, indicate by what percent: Permanent _____% Temporary _____%

Nursery Product Types

6. What percentage of your sales last year (2008) were for the following **plant types**? (answers should sum to 100%)

_____% Deciduous shade and flowering trees
_____% Deciduous shrubs
_____% Broad-leaved evergreen shrubs (excl.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
_____% Sod
_____% Propagated material (liners, cuttings, plugs, etc.)
_____% Other (list)

7. What percentage of your total plant sales are **native plants,** i.e. plants present in your state before European settlement? _____%

8. What percentage of your plant sales were in the following **product forms** last year? (answers should sum to 100%)

_____% Containerized
_____% Balled and burlapped
_____% Field grow bag
_____% Bare root
_____% Balled and potted / process balled
_____% In-ground containers (including pot-in-pot)
_____% Other types: e.g. cut trees, budwood, scions, seeds, tissue cultured plantlets, unrooted cuttings

Production and Management Practices

9. What percentage of your irrigation water is obtained from the following source(s)? (answers should sum to 100%)

_____% Natural surface
_____% Recaptured
_____% City
_____% Well

10. What percentage of your irrigation water is applied by the following methods? (answers should sum to 100%)

_____% Overhead
_____% Drip
_____% Subirrigation (ebb/flood)
_____% Other types (list)

11. How has your **irrigation water use on a per acre** basis changed over the past five years? (check answer that applies)

_____increased
_____remained the same
_____decreased

If irrigation water use has changed, indicate by what percent? _____%

12. What functions of your firm are currently **computerized**, or will be in the next five years?

Function	Using currently (check if yes)	Planned for next 5 years (check if yes)
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)		

13. Which of the following **Integrated Pest Management (IPM) practices** do you follow? (check any that apply)

_____ Remove infested plants or plant parts
_____ Elevate or space plants for air circulation
_____ Disinfect benches/ground cover
_____ Soil solarization/sterilization
_____ Adjust pesticide appl. to protect beneficial
_____ Beneficial insect identification
_____ Manage irrigation to reduce pests
_____ Ventilate greenhouses
_____ Keep pest activity records
_____ Use screening/barriers to exclude pests
_____ Treat retention pond water
_____ Alternate pesticides to avoid chemical resistance
_____ Use cultivation, hand weeding
_____ Use sanitized water foot baths
_____ Monitor pest populations with tarp/sticky boards
_____ Use mulches to suppress weeds
_____ Inspect incoming stock
_____ Spot treatment with pesticides
_____ Use of beneficial insects
_____ Adjust fertilization rates
_____ Use biopesticides/lower toxicity
_____ Use pest resistant varieties

Marketing Practices

14. At how many **trade shows** was your firm represented last year, with or without an exhibit?

_____With an exhibit _____Without an exhibit

15. What percentage of your sales are to **repeat customers**? _____%
16. Do you publish discount (price) information for large-volume purchases?

_____Yes _____No

17. What percentage of your sales are **negotiated,** i.e. there was discussion over price, quality or other terms of sale?

___%

18. What percentage of your sales were made last year using the following **sales methods**? (answers should sum to 100%)

_____% Trade show orders _____% Telephone orders _____% In-person orders
_____% Mail orders _____% Internet sales

19. What percentage of your sales last year were **wholesale vs. retail**? (answers should sum to 100%)

_____% Wholesale _____% Retail

20. If you sell wholesale, what percentage of your wholesale sales were to the following type(s) of **market outlets**? (answers should sum to 100%)

_____% Mass merchandisers (general merchandise stores, etc.)
_____% Home Centers (home improvement, building supply, hardware, etc.)
_____% Single location garden centers
_____% Multiple location garden centers (chain stores)
_____% Landscape firms (in-house or external)
_____% Re-wholesalers (brokers, other growers, etc.)

21. Do you **resell or broker** plants from other growers? _____Yes _____No

If yes, what percent of your total sales does this account for? _____%

22. What percentage of your total sales are **on contract**, i.e. sold or committed before being produced? ____%
23. If you do **forward contracting**, which of the following types of buyers contract for production with your firm? (check any that apply)

_____ Other producers _____ Retail garden centers _____ Mass merchandisers
_____ Cooperatives _____ Other (please specify)

24. What percentage of total sales did your firm spend on **advertising** last year (2008)? _____%
25. What percentage of your **advertising budget** is spent on the following media forms? (answers should sum to 100%)

_____% Internet websites _____% Yellow pages

_____% Radio / TV _____% Billboards

_____% Gardening publications _____% Catalogs (print or CD)

_____% Trade journals _____% Newsletters

_____% Trade shows _____% Other (please specify)

Regional Trade in Nursery Products

26. What are the top five **states or countries**, including your own state, that you **purchase from** to obtain seedlings, liners, whips, grafted material, tissue culture plantlets, cuttings, or plugs, and the percentage of total purchases represented by each?

Top five States or Countries	Percent of Purchases
1)	_____%
2)	_____%
3)	_____%
4)	_____%
5)	_____%

27. Do you **export** nursery products out of the U.S.? _____Yes _____No

If yes, what percentage of total sales are for exports? _____%

If you export, please list the countries: _____

28. What are the top five **states or countries**, including your own state, that you **sell to**, and what percentage of total sales does each represent?

Top Five States or Countries	Percent of Total Sales
1) Home state	_____%
2)	_____%
3)	_____%
4)	_____%
5)	_____%

Factors Affecting Management and Planning

29. Rate the importance of each of the following **factors for determining prices for your products**, using a scale of 1 to 4, with 1= not important; 2= minor importance; 3= important; and 4= very important (check in appropriate column).

	1	2	3	4
Cost of production	_____	_____	_____	_____
Inflation	_____	_____	_____	_____
Other growers' prices	_____	_____	_____	_____
Grade of plants	_____	_____	_____	_____
Market demand	_____	_____	_____	_____
Product uniqueness	_____	_____	_____	_____
Inventory levels	_____	_____	_____	_____
Last year's price	_____	_____	_____	_____
Other	_____	_____	_____	_____

Please specify other _____

30. Rate each of the following **factors affecting the geographic range of your trading area**, using a scale of 1 to 4, with 1= not important; 2= minor importance; 3= important; and 4= very important (check in appropriate column).

	1	2	3	4
Debt capital	____	____	____	____
Equity capital	____	____	____	____
Marketing	____	____	____	____
Personnel	____	____	____	____
Production	____	____	____	____
Transportation	____	____	____	____
Plant offerings	____	____	____	____

31. Rate each of the following **factors impacting your business**, using a scale of 1 to 4 scale, with 1= not important; 2= minor importance; 3= important; and 4= very important (check in appropriate column).

	1	2	3	4
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	____	____	____	____

Annual Sales

32. What was the **gross value of product sales** from your nursery last year (2008) or most recent completed fiscal year? Please enter the value here (rounded to nearest $1000): $_____

Alternatively, check the appropriate range below:

____ Less than $249,999	____ $250,000 to $499,999
____ $500,000 to $999,999	____ $1,000,000 to $1,999,999
____ $2,000,000 to $2,999,999	____ $3,000,000 to $3,999,999
____ $4,000,000 to $4,999,999	____ $5,000,000 to $9,999,999
____ $10,000,000 to $14,999,999	____ $15,000,000 to $19,999,999
____ $20,000,000 to $29,999,999	____ $30,000,000 to $39,999,999
____ $40,000,000 to $49,999,999	____ $50,000,000 or more