



Starting a Nursery Business

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Introduction

The nursery business involves the production and marketing of various plants including trees, shrubs, grasses, perennial and annual flowers, and fruit trees. A landscaping service, garden center, or sod farm may also be associated with a nursery enterprise. A successful nursery operator must be knowledgeable about all phases of plant production and be willing to work long, hard days. Good marketing and management skills are essential. A passion for ornamental plants and an entrepreneurial spirit add greatly to the chances for success.

Marketing

Nursery crops are marketed in several different ways.

RETAILERS market directly to the end consumer, typically homeowners. This is most commonly done either through retail nurseries, which produce some or all of their own plant material, or garden centers, which purchase their inventory from a wholesale nursery. These businesses must be conveniently located for consumer access, ideally near urban or high-traffic areas. Retail nurseries additionally require adequate space and facilities for production, either on-site or at a nearby location.

MAIL-ORDER NURSERIES sell directly to the end consumer. Their plants are shipped directly to the customer rather than sold at a retail outlet. This is a great option for nurseries that produce specialty plants and whose customers are plant enthusiasts located across the country or globe. The vast majority of mail-order nurseries sell either bare root or small container-grown plants (1 gallon containers or smaller) due to high shipping costs and difficulties in packaging, but larger plants can be sold by mail-order nurseries if they are highly valuable.



WHOLESALERS produce plants that are typically sold in large batches at significantly lower prices to landscapers, retailers or other nurseries that grow and resell the material at a larger size. Wholesale production is usually most efficient when a limited number of plants are grown in large numbers.

RE-WHOLESALERS purchase large orders of various plants from wholesale producers and resell the plants to landscapers requiring diverse but smaller orders.

LANDSCAPE NURSERIES usually produce plants for their own in-house landscaping service, but some may sell plants at a retail outlet.

Licenses and Shipping Regulations

Any business that sells plants capable of overwintering outdoors must obtain a nursery or nursery dealer license. In addition, businesses that sell plants to out-of-state customers should obtain a license, regardless of the plants' ability to overwinter. In Kentucky, these licenses are obtained from the Office



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of the State Entomologist. Additionally, shipment of plants or plant parts across state lines can, in many cases, require a Phytosanitary Certificate. A Phytosanitary Certificate is required for most international shipments of plant material. Nurseries can contact the Office of the State Entomologist to determine if a certificate is needed and how it can be obtained.

Market Outlook

The nursery industry is driven by new home construction and healthy consumer spending. The trends of the broader economy challenged the nursery sector from 2006 to 2012. Some economic recovery since 2012, especially in housing starts during 2015-2016, increased demand for nursery products. Nursery industry consolidation has contributed to larger firms, which may be able to produce at lower costs than smaller firms. Smaller nurseries may find profitability in producing for niche and specialty markets, providing add-on services, and developing new business enterprises that complement nursery production.

Nurseries continued cautious capital investment after 2012, positioning themselves for the demand growth observed through 2016. About one-third of Kentucky nurseries indicated in 2012 that they planned some capital improvements, and many nurseries indicated beginning or continuing improvements in 2014. Nursery business plans and marketing strategies should account for broader economic cycles and the dynamics of the housing market within the nursery's territory.

Production considerations

Production methods

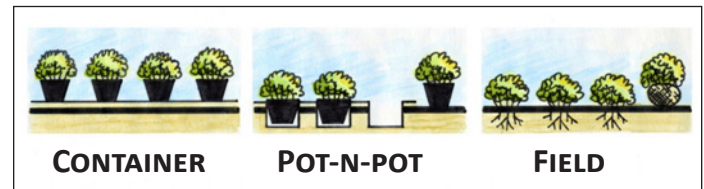
Nursery producers utilize one or more of the following production systems: field, container, and pot-in-pot.

FIELD PRODUCTION involves planting woody trees and shrubs directly in the ground and then harvesting them either as bareroot or balled-and-burlapped (B&B) material. In addition, perennial landscape plants can be field-grown, then dug and sold as bareroot material or transplanted and sold in containers.

CONTAINER PRODUCTION entails growing plants in containers filled with soilless growing media and placed in established production areas on the ground or on benches inside a greenhouse or similar protective structure.

POT-IN-POT production is a system that uses containers

(production pots) placed inside permanent in-ground containers (socket pots). Pot-in-pot is used for the production of caliper-sized shade trees, flowering trees, and large shrubs. The system combines many of the benefits of in-ground production with the marketing flexibility of container production.



A COMPARISON OF THE 3 NURSERY PRODUCTION SYSTEMS.

Site selection

Whether the prospective grower already owns property or is seeking a potential site, the land should be carefully evaluated to determine if it is suitable for a nursery business. The needs of the nursery site will depend on many factors, including production method, crops grown, and market. For example, containerized production entails the use of customized soilless growing media, so the type of native soil present is not nearly as important as it is with field-grown crops. Nevertheless, a well-drained, sunny site with good air circulation and a slightly sloping topography is generally best for most production systems. Avoid areas with hardpans and those that flood periodically. Sites where cold air accumulates (frost pockets) should only be planted with cold hardy species. A reliable, clean, pest-free water source must be readily available and adequate for the size and type of nursery being planned.

Potential growing sites for field production should be tested for soybean cyst nematode infestation, as the presence of this pest in the soil could severely limit out-of-state export. In addition, the history of pesticide use should be known as some crops may be sensitive to herbicide carryover. See Sustainable Production Systems: Efficient Wholesale Nursery Layout (below) for more information about establishing an efficient nursery layout.

Crop selection

A prospective grower who already owns property will need to select crops and production methods appropriate for that growing site. An alternative approach is to decide on the crops first and then purchase or rent land that is appropriate. Regardless of which approach is used, it is vital to the success of the nursery to match the crops with the production area.

There are countless plants and cultivars that can be mar-

keted by nurseries in Kentucky and surrounding states. These include ornamental trees and shrubs, grasses, vines and ground covers, tree fruits, woody small fruits, herbaceous perennials, and even aquatic plants. Defining the nursery's focus or mission helps determine which crops should be grown. Most nurseries produce a variety of plants with known high market demand, while other nurseries produce specialty crops, such as native plants or uncommon cultivated plants. Specialized production can serve niche markets and is especially well-suited for small production operations. Outdoor nurseries must produce species and cultivars that are adapted to local growing conditions. Greenhouse production allows for greater flexibility in crop selection and production schedules, but heating and cooling a greenhouse can be costly.

Nursery operators may choose to either produce their own planting stock or purchase liners from other growers. However, those new to the nursery business should not consider propagating their own material until production is well established.

Maintenance

Regardless of the production system, nursery crops will require supplementary irrigation. This can be accomplished with various micro-irrigation or overhead systems, depending on the production system. To maximize irrigation efficiency, plants with similar water requirements should be grouped together, and overhead watering systems should be avoided when plant spacing creates wide gaps between each container. Nutrients can be supplied using a controlled-release fertilizer, sidedressing, or fertigation.

Nursery-grown trees and shrubs are pruned to control size, thin canopy, and improve quality. Shade trees are often top-pruned in both winter and summer to ensure that a central leader is maintained and the shape of the tree canopy is in proper proportion to the trunk. Shrubs are pruned regularly to establish a height and density for the planned market. Trees may need to be staked to maintain a straight trunk. Winter protection for aboveground container-grown plants is needed in Kentucky.

Pest management

Insect and disease pests vary, depending on the plant species, cultivar, and production method. Management requires integrated pest management (IPM) strategies, such as planting resistant cultivars, scouting, appropriately timing irrigation, and practicing best management practices. Fungicides and insecticides are applied when

necessary to maintain plant quality.

Maintaining a weed-free area within plantings, in walkways, and along the planting perimeter is important. Techniques include hand weeding, mulching, ground cloth, cover cropping (most often with fescue or crimson clover), mowing, mechanical cultivation, and chemical methods.

Algae can be a serious problem in irrigation systems and in ponds serving as sources of water. Two major contributing factors are over-fertilization and over-irrigation, which increase nutrient run-off into ponds. Shallow, stagnant water increases algal growth in ponds, so shallow areas may need to be dredged and deepened.

Harvest

Plants may be sold as liners, whips or finished plants. The term **LINER** refers to any plant placed ('lined out') into a production system so it can be grown to a larger finished plant. **WHIPS** are plants consisting of a straight stem with little branching. **FINISHED PLANTS**, the final stage of production, have all the characteristics expected in the marketplace regarding form, size, branching and trunk size.

Easiest to harvest are container-grown and pot-in-pot plants. Crops grown in containers can be harvested any day of the year. Field-grown crops, on the other hand, are best dug when plants are dormant in the fall or spring. Digging can continue through winter as long as the weather remains relatively mild. In addition, harvesting field-grown nursery crops requires considerable skilled labor, whether plants are hand-dug or mechanically harvested. Field dug tree and shrub root balls are covered in burlap and may be further supported by wire baskets. Small trees can be harvested bare-root if the soil can be easily removed from the roots. Bare-root production is not common in Kentucky.

The time it takes for plants to reach a saleable size not only depends on the desired size for the market, but also on the type of plant, production system, and growing conditions. In general, field-grown finished trees can take three to five years to produce. Container-grown plants are generally in production for 30 to 36 months. Some cuttings produced in a propagation nursery can be ready to sell as liners in 10 to 12 weeks.

Labor requirements

Labor requirements vary depending on the production system used. Activities in the nursery typically include

(but are not limited to) planting or potting, pruning, irrigating, controlling weeds, staking trees, applying pesticides, and harvesting, among others. The level of management for container-grown plants is significantly higher than in field production, while pot-in-pot requires an intermediate level of management. A common rule of thumb is to employ one worker per actual acre of container production or one employee per 7 to 8 acres of field production.

Economic considerations

Beginning a nursery business requires a large capital investment, even if land does not need to be purchased. Expenses include equipment, buildings, cold storage, supplies, plant material, grading for drainage, and the installation of an irrigation system. A greenhouse or overwintering structure may be needed. Additional costs include labor, utilities, insurance, licenses, inspections and capital costs. Other system-specific costs may be incurred, such as socket containers, socket pot holes and drainage tile and its installation in the pot-in-pot system.

A grower must be prepared to make substantial investments for several years before realizing any positive returns. It can take two to four years of operation before significant returns can be expected and an additional three years before showing a profit. In addition, the nursery operator will need to be able to handle the cash flow ups and downs associated with seasonal sales.

Nursery growers should develop financial projections

based on the specific location, production system, and situation. Below are budget estimates updated in 2012 comparing 17 acres of each of the three different production systems. Capital requirement and fixed costs include purchase of irrigation system and equipment, including a 20- to 30-horsepower tractor for use in the nursery operation. This side-by-side comparison is only intended to illustrate approximate capital and production cost requirements for each system; each operation should develop budget estimates specific to its own production environment and real-time costs. A 2016 estimate for 1 acre of a pot-in-pot system estimated installation costs at \$32,000 and planting costs for 1,144 red maple trees at \$31,000. The production and harvest cost estimate was \$7,000 per acre.

Selected Resources

- Kentucky Office of the State Entomologist (University of Kentucky) <http://www.uky.edu/Ag/NurseryInspection/>
- UK Horticulture Nursery Crop Extension Research website <http://nursery-crop-extension.ca.uky.edu>
- Marketing Your Nursery (University of Kentucky, 2008) <http://www.ca.uky.edu/HLA/Dunwell/marketingournursery.html>
- Getting Started in the Nursery/Landscape Industry (University of Kentucky) <http://www.ca.uky.edu/HLA/Dunwell/Nlgetstart.html>
- Nursery Crops (Win Dunwell's web page) (University of Kentucky) <http://www.ca.uky.edu/HLA/Dunwell/win1.html>

UNIVERSITY OF KENTUCKY BUDGET ESTIMATES COMPARING THE THREE DIFFERENT PRODUCTION SYSTEMS.

Item	Production System (Total Costs, Useful Life of System)		
	Field (17-ACRE SYSTEM, 2012) (In Ground)	Container (17-ACRE SYSTEM, 2012) (Above Ground)	Pot in Pot (17 ACRES, 2012)
Capital requirement	\$255,550 to \$290,000	\$265,000 to \$300,000	±\$270,000
Machinery/equipment operation	\$32,960	\$19,560	\$23,375
Fixed costs	\$380,000 to \$420,000	\$380,000 to \$420,000	\$410,000 to \$450,000
Fixed costs per plant	\$20.00 to \$22.10	\$17.72 to \$19.60	\$17.57 to \$19.28
Variable costs	\$115,000 to \$140,000	\$178,000 to \$203,000	\$138,000 to \$158,000
Variable costs per plant	\$6.05 to \$7.38	\$8.30 to \$10.70	\$5.91 to \$6.77
Total cost	\$495,000 to \$560,000	\$558,000 to \$623,000	\$548,000 to \$608,000
Total cost per plant	\$26.09 to \$29.52	\$26.01 to \$29.04	\$23.48 to \$26.06

- Plant Material Shipments: Federal and State Plant Protection Regulations Relevant to Your Nursery Business (University of Kentucky, 2011) <http://www.ca.uky.edu/agc/pubs/ho/ho99/ho99.pdf>
- Soybean Cyst Nematode: A Potential Problem for Nurseries, ID-110 (University of Kentucky, 2011) <http://www.ca.uky.edu/agc/pubs/id/id110/id110.pdf>
- Sustainable Production Systems: Efficient Wholesale Nursery Layout (University of Kentucky, 2013) <http://www.ca.uky.edu/agc/pubs/HO/HO109/HO109.pdf>
- Trees, Shrubs, Ground Covers and Vines Suitable for Kentucky Landscapes, HO-61 (University of Kentucky, 1997) <http://www.ca.uky.edu/agc/pubs/ho/ho61/ho61.pdf>
- Best Management Practices: Guide for Producing Nursery Crops (Southern Nursery Association, 2013) <http://www.sna.org/Default.aspx?pageId=1140025>
- Commercial Nursery Production Handouts (University of Tennessee) <https://extension.tennessee.edu/mtnpi/Pages/handouts.aspx>
- Comparison of Field, Conventional Container, and Pot-n-pot Production (University of Tennessee, 2009) https://extension.tennessee.edu/mtnpi/Documents/handouts/Beginning_in_Nursery/Comparision_of_Production_Systems.pdf
- Getting Started in the Nursery Business: Nursery Production Options (Virginia Tech, 2014) <https://pubs.ext.vt.edu/430/430-050/430-050.html>
- The Southeastern US Pest Control Guide for Nursery Crops and Landscape Plantings. (Southern Nursery IPM Working Group, 2017). <https://content.ces.ncsu.edu/southeastern-us-pest-control-guide-for-nursery-crops-and-landscape-plantings/complete-southeastern-us-pest-control-guide.pdf>
- IPM for Select Deciduous Trees in Southeastern US Nursery Production (Southern Nursery IPM Working Group, 2014) https://wiki.bugwood.org/IPM_book
- IPM for Shrubs in Southeastern US Nursery Production: Vol I . (Southern Nursery IPM Working Group, 2014) http://wiki.bugwood.org/IPM_Shrub_Book
- IPM for Shrubs in Southeastern U.S. Nursery Production Volume II (Southern Nursery IPM Working Group, 2017). https://wiki.bugwood.org/IPM_Shrub_Book_II
- Nursery Crop Science Commercial Horticulture Information Portal (North Carolina State University) <http://www.ces.ncsu.edu/depts/hort/nursery/>
- Preparing Nursery Plants for Winter (North Carolina State University) <https://content.ces.ncsu.edu/preparing-nursery-plants-for-winter>
- So You Want to Start a Nursery? (Timber Press, 2003) <http://www.startanursery.com/>, or other book vendors
- Starting a Wholesale Nursery Business (University of Florida, 2000) <http://ufdc.ufl.edu/IR00005564/00001>
- Sustainable Small-scale Nursery Production (ATTRA, 2008) <https://attra.ncat.org/attra-pub/summaries/summary.php?pub=60>
- Nursery Budgets (Auburn University, 2000) <http://www.ag.auburn.edu/landscape/budgetguide.html>

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