

Bamboo

Introduction

Bamboo is the general name used for a number of perennial, woody-stemmed grasses. Native cane (*Arundinaria gigantea*), which is commonly referred to as river cane, grows naturally in Kentucky and throughout much of the Southeast. It is one of three bamboo species native to North America. There are more than a hundred introduced species that can be grown in the U.S., with growth habits ranging from low-growing groundcovers to full-sized trees that reach a height of more than 30 feet at maturity.

Bamboos are well known for their vigorous growth and variety of uses. They are a popular landscape plant because they grow rapidly, are evergreens, and create a tropical or exotic atmosphere. They are often marketed as alternative, fast-growing privacy screens.

Edible young bamboo shoots are used in cooking, while mature canes (or culms) are harvested for timber uses that include fences, stakes, fishing poles, crafts, flooring, and furniture. Because they are capable of removing high levels of carbon dioxide from the atmosphere, bamboos are being promoted for their environmental benefits. Some species are used for various soil and wildlife conservation purposes; however, only native species are recommended for such uses, since several of the introduced species have become locally invasive. Native cane has received considerable interest in recent years for its use in habitat restoration. In addition, bamboo foliage is reportedly nutritious forage for grazing cattle.



Marketing and Market Outlook

Potential growers should thoroughly investigate all aspects of growing and marketing this crop before considering production. While bamboo has become the focus of increased attention as a potential alternative crop, there are a number of serious limitations to commercial production. A major concern is its reputation for being invasive and difficult to eliminate. There have already been cases of introduced bamboo species escaping from Kentucky plantings and spreading into nearby woods and fields. In some situations several acres of land have been affected.

Although widely recognized by many as a problematic plant, bamboo also has many enthusiasts. However, only growers willing to install appropriate barriers to prevent unwanted spread or who produce containerized plants should consider pursuing any enterprise involving bamboo.

Bamboo is best suited for production in Kentucky as an ornamental nursery crop for wholesale and retail sale. Potted



or balled-and-burlapped bamboo can be marketed wholesale to garden centers, nurseries, and landscape contractors. Bamboo plants are also sold for retail prices at local farmers markets. Mail order and Internet markets will involve nationwide sales and shipping. Producers will need to be prepared to advise buyers regarding the importance of a containment plan. Locally adapted bamboo should have a marketing advantage over less hardy plants from out-of-state sources. Contact the Kentucky Office of the State Entomologist regarding the specific requirements for shipping plant material within the Commonwealth or across state lines.

Fresh bamboo shoots are considered a tasty alternative to the more readily available canned import. However, many U.S. consumers are unfamiliar with preparing and cooking bamboo. Providing instructions, along with recipes, will be an important aspect of promoting fresh shoots. Health food stores, farmers markets, and ethnic markets are potential marketing avenues. Restaurants, particularly those specializing in Asian or vegetarian dishes, may also be interested in purchasing fresh bamboo. Bamboo shoots could also be added to the product mix for a farmers market or community supported agriculture (CSA) grower.

Bamboo canes are hard and durable, but lightweight, making them suitable for a number of on-farm uses (trellises, fences, stakes, etc.). Marketing green or cured culms will require competing with imports. Direct sales to farmers, craftsmen, furniture makers, etc. may be possible. Identifying a niche market with repeat buyers will be crucial to success.

Production Considerations

Plant selection

It is essential to select bamboo species that are both hardy to Kentucky and suitable for the intended end-use(s). Nurseries selling bamboo for home or commercial landscapes need to select cultivars with growth habits that make them appropriate for transplanting to those locations. While a number of bamboos can be harvested for multiple purposes (e.g. both shoots and poles), other species are only suitable for very specific uses. Producers

should only purchase their plant material from a reputable dealer selling bamboo that has been correctly identified to species and cultivar. To obtain commercial quantities of planting material it may be necessary to make arrangements with one or more wholesale nurseries well in advance of the intended planting date.

Bamboos are typically classified as “runners,” which spread aggressively several feet per year, or “clumpers,” which only spread a few inches per year. Many of the bamboos hardy to Kentucky are runners and, therefore, potentially invasive.

Running bamboos are useful for ground stabilization and erosion control, as well as bamboo groves for commercial uses. Herbicides, rhizome pruning, and mowing, which may be effective in restricting the growth of the less invasive bamboos, are often unsuccessful in confining aggressive species. Larger species have been known to send up shoots 20 to 30 feet from the main plant. Limiting rhizome growth of these runners will require container production or installing a root barrier 2 to 3 feet deep around the grove. Fiberglass sheets or high-density polypropylene will make the most effective, long-lasting barriers in groves. Natural barriers, such as streams and ponds, can also help to contain bamboo. In addition, a well-traveled gravel road may deter spread in that direction. Planning groves for future growth potential is essential since individual plants may spread to cover as much as 50 square feet after 5 to 10 years.

Clumpers are further grouped according to whether their habit is “open clumping” or “tight clumping.” Because clumpers spread slowly and do not have an invasive growth habit, they generally do not need a strong containment system. Hardy clumpers are more suitable than runners for landscapes where space is limited or where installing an underground barrier is not feasible.

Site selection, planting, and maintenance

Bamboo does best in well-drained, moist, fertile soils. It will not, however, tolerate continuously swampy or waterlogged sites. Lands unsuitable for row crops, such as hillsides, are potential sites

for bamboo production. Under no circumstances should any non-native running bamboo species be planted without an adequate root barrier. Mature commercial groves should be thinned regularly to aid in ease of harvest and to maximize yields.

Bamboo plantings can be started from container-grown or balled-and-burlapped plants. Tissue culture plantlets are available from some wholesalers. Bamboo can also be vegetatively propagated by division or rhizome cuttings taken from established plantings. Planting rhizome cuttings without attached leafy shoots is risky unless they are watered frequently for the first few months. Because of the infrequency of flowering and the scarcity of available seed, bamboo is generally not started from seed. Transplants or rhizome cuttings should be planted in the spring in Kentucky.

Established bamboo is divided by digging up the young plants that emerge in the planting. Retaining a portion of the rhizome, along with the surrounding soil, improves the success rate of transplanting. Expanding a grove or nursery operation can also be accomplished using 2- to 3-year-old rhizomes that include healthy buds. Once rhizomes have been cut into suitable lengths, they are planted in a trench. After two seasons, plants are dug and either potted or planted in a permanent field site.

Young plants need to be protected with a sunscreen that provides shade in the heat of the day, as well as a windbreak. Transplants must be watered well for at least the first 2 years. Irrigating an established planting is not as critical; however, watering does result in increased productivity. Container-grown plants will require more frequent irrigation than field-grown material.

Pest management

Only a few diseases or insect pests have been reported on U.S.-grown bamboo. These include spider mites, scale insects, and rust disease. It is important to keep groves weed-free from planting to establishment. Controlling weeds in nurseries is also important. Methods of weed control include mowing, hand weeding, mulches, and herbicides. Vole damage to rhizomes could pose a problem in some plantings.

Harvest and storage

Bamboo for nursery sales are sold either as balled-and-burlapped or container-grown plants. Field-grown bamboos are dug in early spring before plants send out shoots. While bamboo can be dug by hand, the rhizomes are very tough and will need to be cut before the plant can be lifted from the ground. The use of a mechanized tree spade will make this job easier. The length of time a plant can be grown in a container is especially limiting for fast-growing bamboo. Once unsold plants outgrow their containers, they will have to be repotted to larger containers or planted in-ground.

Harvesting a grove for both poles and shoots requires careful management to maintain the productivity of the planting. The largest and straightest shoots should be left to mature into culms, which will replace the ones that will be harvested. Shoot harvest should be limited to those that are small or mid-sized, especially in the early years of the grove. It can take a grove 7 years or more to mature and reach full production.

Culms must be at least 3 to 5 years old before harvesting for wood uses. Canes are cut by hand close to the ground either in late winter prior to shoot emergence or in summer after shoot harvest. The branched tops, which are not profitable for timber use, are removed. Tops can be disposed of by feeding them as green chop to livestock or shredding them for mulch. The lower, unbranched culms are either sold “green” or cured for several months in a well-ventilated shed or barn.

Edible shoots are harvested at the first indication that tips are emerging from the soil. They are cut by hand below ground at the point of rhizome attachment. Timeliness is critical since shoots grow rapidly and can quickly become tough. Shoot emergence occurs over a period of several weeks. Harvested shoots are washed and weighed prior to packaging in crushed ice. Shoots can also be frozen and sold off-season.

Labor requirements

Bamboo production is highly labor-intensive and management-intensive, particularly during the initial years of establishment and production. The level of management for container-grown

nursery plants can be significantly higher than field production. Hand labor is required for all aspects of production and harvest.

Economic Considerations

Initial investments include land preparation, material for the root barrier, purchase of plant material, plant establishment, and installation of an irrigation system. The level of investment required, combined with the absence of clear market channels for farm-grown bamboo in the region, makes large-scale, “open field” bamboo plantings a risky source of potential farm income in Kentucky.

There appears to be much greater potential in the production of bamboo as an ornamental nursery crop. Nurseries growing commercial quantities of locally adapted species and varieties should be able to profit from bamboo.

There is also high, but limited, profitability potential in Kentucky for bamboo shoots marketed to the niche food market (e.g. farmers markets and upscale restaurants). Bamboo has good potential as part of a well-planned mix of specialty food crops or grown as part of a well-designed and managed agroforestry production program.

Selected Resources

On the Internet

- Growth of Cane (*Arundinaria* sensu stricto), the Mysterious Native Bamboo of North America (Bluegrass Woodland Restoration Center, 2012) http://bluegrasswoodland.com/uploads/Growth_of_Cane.pdf
- Office of the Kentucky State Entomologist (University of Kentucky) <http://www.uky.edu/Ag/NurseryInspection/>

- American Bamboo Society <http://americanbamboo.org>
- Bamboo Australia <http://www.bamboo-oz.com.au/>
- Bamboo Catalog and Selection Guide (Booshoot Gardens, 2013) 2.64 MB <http://www.booshoot.com/wp-content/uploads/2012/03/BooCatalog2013-catalog-web1.pdf>
- Bamboo Farming USA <http://bamboofarmingusa.com/>
- Bamboo Shoots (Washington State University, 2001) <http://agsyst.wsu.edu/bambroc.pdf>
- BambooWeb <http://www.bambooweb.info/>
- Extension Bamboo Research (Washington State University, 2004) <http://agsyst.wsu.edu/bamboo.html>
- Growing Bamboo in Georgia (University of Georgia, 2012) http://www.caes.uga.edu/Publications/displayHTML.cfm?pk_id=7830

In print

- *Farming Bamboo*. Daphne Lewis, Carol Miles, and Heiko Miles. 2008. Lulu.com Publishers: Raleigh, NC. 220 pp. <http://www.lulu.com/shop/daphne-lewis-and-dr-carol-miles-and-heiko-miles/farming-bamboo/paperback/product-3529186.html>

Commercial Web sites listed in the resources are provided for information purposes only and their inclusion does not represent an endorsement of the company or its products by the University of Kentucky.

Reviewed by Tim Phillips, Associate Professor, Forage Grass Breeding, University of Kentucky (Issued 2005, Revised 2009); Reviewed by Julian Campbell, Bluegrass Woodland Restoration Center (Revised 2009; Revised 2013)

Photo by Cheryl Kaiser, University of Kentucky

April 2013

For additional information, contact your local [County Extension](#) agent