UNIVERSITY OF KENTUCKY College of Agriculture, Food and Environment

COOPERATIVE EXTENSION SERVICE
UNIVERSITY OF KENTUCKY COLLEGE OF AGRICULTURE, FOOD AND ENVIRONMENT
Center for Crop Diversification Crop Profile

Highbush Blueberries

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Introduction

The highbush blueberry (*Vaccinium corymbosum*) is a perennial shrub that will do well in most areas of Kentucky as long as the soil is properly adjusted. With proper care, blueberry plants may remain productive for 40 years or more.

Marketing

Blueberries have been great sellers when offered at Kentucky's farmers markets or other direct markets. U-Pick is one of the most desirable ways to market blueberries in Kentucky because it eliminates considerable harvest labor expense. Other options include roadside stands, community supported agriculture (CSA) subscriptions, and local groceries. Produce auctions present an additional marketing opportunity, especially for well-packaged berries. Blueberry growers in south central Kentucky were developing some freezing and other value-added possibilities beginning in 2014.

Market Outlook

Blueberries are increasing in popularity and are one of Kentucky's emerging small fruit crops. The identification of antioxidant properties in blueberry fruit, along with other health benefits, has helped increase consumer demand. Nationally, fresh blueberry prices remain strong. Kentucky producers can realize well over the national average price by marketing fresh, high quality blueberries locally. Wholesale market prices may also be favorable for producers willing to invest in the equipment needed to safely package, cool, and ship blueberries within the state. Blueberry consumption has been boosted by year-round availability of frozen blueberries, and the frozen market is very price-competitive. Markets with potential for added value for local and regional production, especially direct markets, appear most promising for Kentucky blueberry growers.

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Production considerations

Cultivar selection

Blueberry cultivars differ as to when

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they mature; however, they will normally supply ripe berries for a 2- to 3-week harvest period. By careful cultivar selection, a continuous supply of fresh berries can be produced throughout the fruiting season. Regardless, a minimum of two varieties are needed to assure cross pollination. Select cultivars that produce large, firm, light blue berries with good aroma and flavor. Other desirable characteristics include resistance to cracking and good keeping quality. Consult the University of Kentucky (UK) publication Growing Highbush Blueberries in Kentucky and/or your county Extension agent for recommended cultivars.

Site selection and planting

Commercial blueberry production should be considered only if large amounts of organic mulching material are available. Blueberries thrive in a highly organic, well-drained soil with a pH of 4.5 to 5.2. While most Kentucky soils do not meet these requirements, sites that have less than 2,500 pounds of calcium per acre can be amended to provide an environment suitable for planting. All blueberry plants should be planted on a raised bed to improve soil drainage and reduce phytophthora root rot.

Two-year-old virus-free plants, either bare-rooted or potted, should be planted in late fall once plants are dormant, or early in spring before growth starts. Planting rows in a north-south orientation is preferred. Apply organic mulch (such as sawdust or woodchips) after planting. It takes three to four years for plants to become fully established.

As previously mentioned, at least two cultivars should be planted for cross pollination. Honeybees must be relied upon to aid pollination, and two hives per acre are recommended. No cultivar should be separated by more than two rows from a cultivar with similar bloom or fruit maturity period.

Pruning and maintenance

On sites where plants are growing well, commercial growers will maintain bushes at a maximum height of 6 feet for ease of harvest. Annual pruning, which may be done from February to bud break in the spring, is necessary to help establish and develop vigorous plants, increase fruit size and assure good production the following season. Pruning is also essential for removing dead and diseased canes.

While blueberries can be grown without irrigation, UK tests show that irrigation more than doubles blueberry yields. Consequently, commercial production is not recommended without irrigation. Soil moisture needs to be closely monitored when trickle irrigation is used so that the soil is kept damp, but not wet.

Pest Management

Prior to 2013, few diseases or insect pests have been reported on blueberries in Kentucky. However, in 2013 the spotted wing drosophila, an invasive insect, became established across Kentucky. Unfortunately, blueberries are one of the favorite crops that this insect infests. Female flies lay eggs beneath the fruit skin when fruit begin to color. Under ideal conditions eggs hatch and become larvae within the fruit in eight days. Once this pest is trapped in a planting a spray program is initiated on a weekly schedule. Earlier maturing varieties are expected to have less of a problem with this insect than later maturing varieties. See EntFact-229, Spotted Wing Drosophila, Biology, Identification and Monitoring, and EntFact-230, Spotted Wing Drosophila Management. Twig blights and stem cankers can cause some losses, especially if allowed to spread into larger branches and the crown. Phytophthora root rot has been a serious problem for many growers. Berry diseases include anthracnose and mummy berry. Iron chlorosis commonly occurs on sites with a pH level above 5.2. Additional insect pests include Japanese beetles, bagworms, and plum curculio.

The most serious blueberry pest is birds, particularly in small plantings. Visual and auditory repellents have been used with varying

success. The most effective method of protecting plants from birds is to cover bushes with netting just before berries begin to color, and then removing it after harvest is complete. Other wildlife pests can include voles, rabbits, and deer.

Harvest and Storage

Blueberries should be allowed to ripen to a uniform blue color on the plant before handpicking. Fruit flavor and sugar content will not improve after harvest. Berries need to be picked at least once per week during the harvest period, beginning in early to mid-June and ending in early August. Blueberries can remain on the plant for up to 10 days without a loss in quality. Freshly harvested berries may be stored for up to 2 weeks with proper refrigeration.

Labor requirements

Production labor needs per acre for a mature planting are about 320 to 360 hours for a farm retail operation. Ten to 15 pickers are needed per acre for hand harvesting. U-Pick farms will require approximately 20 to 100 hours per acre in labor, depending on how much management is involved while visitors are on the farm. Illinois data indicates that it takes roughly 450 U-Pick customers to harvest an acre of blueberries, with the average customer picking 11.7 pounds of berries (about 15 pints).

Economic considerations

The major investments in establishing blueberries include the cost of plants, labor required for plant establishment, and installation of an irrigation system. Producers who choose to sell their blueberries at retail or wholesale markets will also incur a significant expense in purchasing a cooler.

While the initial investment may be large, blueberry plants, with proper care, will remain productive for as long as 40 to 50 years. Because it takes three years for plants to become established, blueberries will not begin to generate economic returns toward their establishment cost until the fourth season. Five-year establishment costs per acre are estimated at $5,300 to $8,800 (farm retail) and $5,000 to $8,000 (U-Pick) for 2013. The payback period is 6 years after planting for farm retail and 5 years after planting for U-Pick. Estimated annual returns to owner capital and management for an established planting are $4,200 to $7,200 per acre for farm retail and $7,100 to $10,000 per acre for U-Pick.

Selected Resources

- Crop Budgets: Berries (University of Kentucky, 2014) *Three blueberry budget files:* http://www.uky.edu/Ag/CCD/budgets.html
- Blueberry Cost and Return Estimates Summary (University of Kentucky, 2014) http://www.uky.edu/Ag/CCD/2014blueberrysummary.pdf
- Highbush Blueberry Production Budgets – Wholesale/Retail Marketing (University of Kentucky, 2014) http://www.uky.edu/Ag/CCD/2014blueberrywhole_retail_budget.pdf
- Highbush Blueberry Production Budgets – Pick Your Own Marketing (University of Kentucky, 2014) http://www.uky.edu/Ag/CCD/2014blueberry_pyobudget.pdf
- Highbush Blueberry Production (Penn State Extension) http://extension.psu.edu/business/ag-alternatives/horticulture/fruits/highbush-blueberry-production
- Spotted Wing Drosophila, Biology, Identification and Monitoring, EntFact-229 (University of Kentucky) http://www2.ca.uky.edu/entomology/entfacts/entfactpdf/ef229.pdf
- Spotted Wing Drosophila Management, EntFact-230 (University of Kentucky) http://www2.ca.uky.edu/entomology/entfacts/entfactpdf/ef230.pdf
- Midwest Small Fruit and Grape Spray Guide, ID-94 (Midwest Fruit Workers Group, 2015) https://ag.purdue.edu/hla/Hort/Pages/sfg_sprayguide.aspx
- Blueberries: Organic Production (ATTRA, 2004) https://attra.ncat.org/attra-pub/summaries/summary.php?pub=14
- Blueberry Production (Cornell University) http://www.fruit.cornell.edu/berry/production/blueberryproduction.htm

• Growing Blueberries (Michigan State University) http://blueberries.msu.edu/growing_blueberries
• Midwest Small Fruit Pest Management Handbook, B-861 (Ohio State University, 2004) http://ohioline.osu.edu/b861/index.html
• Production Guide for Organic Blueberries (Cornell University, 2010) 1.32 MB file; 39 pp. http://nysipm.cornell.edu/organic_guide/blueberry.pdf
• Southern Region Small Fruit Consortium: Blueberries (Clemson University, North Carolina State University, Virginia Tech, University of Arkansas, University of Georgia, University of Tennessee) http://www.smallfruits.org/Blueberries/index.htm

Podcast

Larry Martin of the Kentucky Blueberry Growers Association discusses blueberry production and marketing.
http://www.uky.edu/Ag/CCD/podcasts/blueberries.mp3

Reviewed by John Strang, Extension Specialist (Revised 2014)
Photos by Mark Ehlenfeldt, USDA (blueberry fruit) and Scott Bauer, USDA (blueberry blossoms) **March 2014**

For additional information, contact your local County Extension agent