



Highbush Blueberries

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Introduction

The Northern 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.

Market Outlook

Blueberries continue to be popular with consumers, and acreage for local sales has increased in Kentucky and neighboring states. The identification of antioxidant properties in blueberry fruit, along with other health benefits, helped support consumer demand. More year-round supplies, because of imports, increased per capita blueberry consumption to record levels. The average U.S. fresh blueberry price declined somewhat from 2012 to 2017, but local Kentucky prices remained steady. 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. Markets with potential for added



value for local and regional production, especially direct markets, appear most promising for Kentucky blueberry growers.

Production Considerations

Cultivar selection

Blueberry cultivars differ as to when they mature; however, they will normally supply ripe berries for a two- to three-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 is 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 longer shelf life. Consult the University of Kentucky (UK) publication *Growing Highbush Blueberries in Kentucky and/*



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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.

Soil should be tested before purchasing plants to gauge whether the site would be appropriate for blueberry production. Soil sampling and testing should occur yearly to maintain the proper pH and fertility. 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. Recommended plant spacing is 10-12 feet between rows and 3-4 feet within the rows. It takes three to four years for plants to become fully established.

Apply organic mulch (such as sawdust or woodchips) after planting. Mulching keeps the soil cool in the summer and conserves moisture and helps protect the roots from the cold injury in the winter. It can also serve as an effective weed management strategy. Pine tree mulch is preferable to hardwood mulch since it contains less calcium and has minimal effect on the soil pH as it decomposes. Mulching should be done annually. Alleyways (the areas between the raised beds) can be maintained with perennial ryegrass or fescue and mowed periodically.

As previously mentioned, at least two cultivars should be planted for cross pollination. Honeybees must be relied upon to aid pollination, and a minimum of two



hives per acre is 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. During the first two years after planting, plants may require little pruning. However, after the third year 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. The main objectives of pruning are to encourage the growth of strong, new wood and maintain good fruit production. The best fruit is typically produced on 1-year-old wood that is 8 to 12 inches long. Promoting good air circulation and proper light penetration is essential to producing high quality fruit.

Blueberry plants have relatively shallow root systems that make them susceptible to drought injury. 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. Adequate and uniform irrigation is necessary from the period of blossoming to harvest. Drip irrigation will provide more uniformity compared to overhead sprinklers. Overhead irrigation may also encourage more disease pressure by keeping the leaves and fruit wet.

Pest management

Prior to 2013, few diseases or insect pests had been reported on blueberries in Kentucky. However, in 2013 the invasive insect spotted wing drosophila became established across Kentucky. Unfortunately, blueberries are one of the favorite crops that this insect in-

pests. 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 cultivars are expected to have less of a problem with this insect than later maturing cultivars. See [EntFact-229 Spotted Wing Drosophila, Biology, Identification & 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. Shiny streamers, large balloons and noise cannons can all be used, but birds can become accustomed to various scare tactics. 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 two weeks with proper refrigeration (32 to 34 degrees F).

Labor requirements

Production labor needs per acre for a mature planting are about 320 to 360 hours per year 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 per year, depending on how much management is involved while visitors are on the farm. In an Illinois study, it took

roughly 450 U-Pick customers to harvest an acre of blueberries over the course of the season, 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. A cooler for storing blueberries before delivery to retail or wholesale markets can also be a significant expense.

While the initial investment may be large, blueberry plants, with proper management, can 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 \$5,700 to \$9,300 (farm retail) and \$5,400 to \$8,300 (U-Pick) for 2017. The payback period is six years after planting for farm retail and five years after planting for U-Pick. Estimated annual returns to owner capital and management for an established planting are \$4,000 to \$7,000 per acre for farm retail and \$6,500 to \$9,800 per acre for U-Pick. These returns account for a \$12.50 per hour cost for hired labor and a \$15 per hour value of the farm operator's time.

Selected Resources

- Growing Highbush Blueberries in Kentucky, HO-60 (University of Kentucky, 2009) <http://www.ca.uky.edu/agc/pubs/ho/ho60/HO60.PDF>
- Blueberry Cost and Return Estimates Summary (University of Kentucky, 2019) http://www.uky.edu/ccd/sites/www.uky.edu/ccd/files/2019blueberry_cost&return.pdf
- Highbush Blueberry Production Budgets – Wholesale/Retail Marketing (University of Kentucky, 2019) http://www.uky.edu/ccd/sites/www.uky.edu/ccd/files/2019blueberrybudget_wholesale_retail.pdf
- Highbush Blueberry Production Budgets – Pick Your Own Marketing (University of Kentucky, 2019) http://www.uky.edu/ccd/sites/www.uky.edu/ccd/files/2019blueberrybudget_PYO.pdf
- Blueberry Diseases (University of Kentucky Plant Pathology Fact Sheet, 2008) <http://plantpathology.ca.uky.edu/files/ppfs-fr-s-10.pdf>
- Sample Fungicide Spray Schedule for Commercial Blueberry (University of Kentucky Plant Pathology

Fact Sheet, 2016) <http://plantpathology.ca.uky.edu/files/ppfs-fr-s-21.pdf>

- Bird Netting Pictures and Ideas for Bramble and Blueberry Plantings (University of Kentucky, 2018) http://www.uky.edu/hort/bird_netting_pics
- Highbush Blueberry Production (Penn State Extension) <https://extension.psu.edu/highbush-blueberry-production>
- Spotted Wing Drosophila, Biology, Identification & Monitoring, EntFact-229 (University of Kentucky) entomology.ca.uky.edu/ef229
- Spotted Wing Drosophila Management, EntFact-230 (University of Kentucky) entomology.ca.uky.edu/ef230
- Midwest Fruit Pest Management Guide (Midwest Fruit Workers Group, 2018) https://ag.purdue.edu/hla/hort/pages/sfg_sprayguide.aspx

- 2016 Organic Production and IPM Guide for Blueberries (Cornell University) <https://ecommons.cornell.edu/handle/1813/42887>
- Southern Region Small Fruit Consortium: Blueberries (Clemson University, North Carolina State University, Virginia Tech, University of Arkansas, University of Georgia, University of Tennessee) <http://smallfruits.org/crops/blueberries.html>

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