

Horticultural Practices of Growing Highbush Blueberries in the Ever-Expanding U.S. and Global Scene

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Abstract

Blueberries have become a major crop worldwide. Strong markets for processed and fresh fruit have resulted in good returns for growers and an increase in planted area. New cultivars, better adapted to “non-traditional” growing areas, have expanded production worldwide. Common cultivars and production systems are described.

Blueberries have become a major crop worldwide with 43,765 hectares (ha) grown in 2005 (1). Highbush blueberries are presently grown on six continents. The number of production regions has increased and the production systems used would be considered “non-traditional” compared to what was common 15 years ago (4). New cultivars, better adapted to “non-traditional” growing areas, have expanded production worldwide. Fresh blueberries are now available throughout the year in North America, for example, due to a combination of types of blueberries grown, production region (region within the U.S. and other countries in the northern and southern hemispheres), and production methods used.

Cultivars

Northern highbush (*Vaccinium corymbosum* L.) blueberries accounted for 75% of the planted area in North America in 2003 (8). The most common cultivars are ‘Bluecrop’, ‘Jersey’, ‘Duke’, ‘Blueray’, ‘Rubel’, ‘Elliott’, ‘Brigitta’, ‘Berkeley’, ‘Bluejay’, ‘Reka’, ‘Nelson’, ‘Elliott’, and the new releases ‘Draper’, ‘Liberty’, and ‘Aurora’.

Southern highbush blueberries accounted for 10% of the planted area in North America in 2003 (8). This type of blueberry is grown in the southeastern U.S. and in California. The most common cultivars are ‘O’Neal’, ‘Bluecrisp’, ‘Reveille’, ‘Southern Belle’,

‘Star’, ‘Bladen’, ‘Emerald’, ‘Jewel’, ‘Sharpblue’, ‘Misty’, ‘Millenia’, and ‘Santa Fe’. The northern and southern hybrids, ‘Ozarkblue’ and ‘Legacy’ are being commonly planted in the more temperate areas of the U.S. and Chile, for example.

In 2003, rabbiteye blueberries (*V. virgatum* Ait.) were predominantly grown in the southern and southwestern regions, accounting for 15% of the planted area in North America (8). The cultivars ‘Powderblue’, ‘Climax’, ‘Tifblue’, ‘Brightwell’, ‘Premier’, ‘Centurion’, and ‘Rahi’ are planted. Newer cultivars such as ‘Ochlockonee’, ‘Alapaha’, ‘Onslow’ and ‘Vernon’ show promise. Rabbiteyes are most commonly grown in the U.S., but are also planted to a limited extent in Chile.

Production systems

Strik and Yarborough (8) provide a review of the major changes in production systems in North America from 1993 to 2003. In general, plantings established prior to the early 1990s have an in-row spacing of 1.2 m with 3 m between rows. Overhead irrigation is common, although many plantings in New Jersey, Michigan, and North Carolina are un-irrigated.

Blueberries, in most production regions worldwide, are planted in soils that are naturally acidic (pH 4.2 to 5.5) with no modification of pH required before or after planting. Blueberries are now commonly established at

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an in-row spacing of 0.9 m with 3 m between rows. Sawdust mulch or compost is often incorporated into the soil prior to planting two-year-old blueberry plants. A mulch, often sawdust, is usually applied to the soil surface after planting. Blueberries are now typically established on raised beds that are about 0.3 m high and often a simple, two-wire trellis is used to improve harvest efficiency. Overhead or drip irrigation systems are installed with some plantings having both so that plants may be protected from spring frost using overhead systems and can be irrigated more efficiently and fertigated, if desired. In some production regions, such as areas in Argentina, an expensive, permanent structure is required to support a net for protection against hail damage.

There is generally no fruit crop produced in the planting year. Although removal of fruit buds is recommended to prevent cropping in the second year (6), many growers will prune plants to allow a low yield in the second year. This allows some income to offset some of the high cost of planting establishment (2). Plantings are considered mature in year seven and are long-lived.

Pruning is done annually during the dormant season to balance vegetative growth and yield in most production regions (7). Summer pruning is done commonly on rabbiteye blueberries to tip vegetative shoots during the growing season and encourage branching and fruit bud set. This is done by machine, after harvest, in some regions. Southern highbush blueberries are also summer pruned in a similar manner, by hand or machine, depending on production region.

Plants are fertilized with fertilizers containing ammonium-nitrogen (N) in the spring of each year with N fertilization rate depending on planting age and canopy size. Sawdust or other organic mulches may immobilize nitrogen, thus requiring higher N fertilization rates (3).

In some regions, including eastern Washington, California, northern Chile, and regions of Argentina, Australia, southwestern

Europe, and South Africa, blueberries are being grown on soil with a high pH (above pH 6). Sulfur is often incorporated prior to planting to help lower soil pH. However, in most of these regions, especially if the irrigation water has a high pH, plantings are drip-irrigated with water acidified with phosphoric or sulfuric acid. In this case, plantings are also fertilized through the drip irrigation system.

In California and eastern Washington, grow tubes are used in the establishment year by some growers to protect young plants from contact herbicides and wind and to hasten top growth. The impact of grow tubes is being studied in western Oregon (Strik, unpublished).

There were about 220 ha of highbush blueberries produced organically in North America in 2003 (8). Interest in organic blueberry production has grown worldwide as there is a strong market for organic blueberries.

Harvest

Average yield varies with production region. In North America, the typical yield of a well-maintained, mature field ranges from 6.7 MT/ha in the northeast to 20 mT/ha in the northwest. Yield per hectare is considered to be higher in the northwestern region of the U.S. than in any other production region worldwide.

In North America, most highbush blueberry fruit destined for the processed market is harvested by machine. In many production regions, blueberries that may be harvested by machine are now trellised to keep the bushes more narrow and better fit the throat of the over-the-row machine harvester and thus reduce fruit loss on the ground (5). A large change in the last 10 years has been the increased use of machine harvest for fresh market fruit; this trend is expected to continue in most production regions of North America due to the high cost and poor availability of labor. In other areas of the world, production systems are similar to those in North America. However in Europe and South America, most fruit are hand picked for the dominant

fresh market. Fruit is either packed into its final container in the field, or is picked into larger containers (often buckets) and then is transported quickly to a cleaning, sorting, packing, and storage facility.

Blueberry production worldwide is expected to increase as existing fields become mature and new plantings are established. Production systems that focus on producing a quality fruit, economically, for targeted markets will increase.

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