Highbush blueberries and grower discussion with Dr. David Handley

Highbush blueberries are more of a pick-your-own, dessert crop, not ideal for canning, caters to the fresh market. There are two growers in Maine now that are mechanically harvesting.

The species is vaccinium corymbosum
There are specialists starting to mix highbush with wild.

Chile and Mexico are major players at the moment. The market has been able to absorb it so far. But it is good to take a good look at the market, because some producers are keeping their product longer than expected. It is a health-promoting crop and this is a good way to market this product.

The local demand for highbush has not been met yet, road-side stands are still popular and doing quite well.

Highbush blueberries are from the same family as rhododendrons, so they like the same types of soils. They have winter hardiness issues.

Some bushes have been in production for more than 50 years and are still going strong.

They have a shallow fibrous root system and have a slow-growing root. They don't like clay soils. The plants fruit on one-year old shoots.

Pre-plant preparation is essential for weed control, make sure the area is free of weeds before planting. Roots extend it to the drip-line of the bush. The roots can't penetrate heavy soils, the soil has to hold water and nutrients well.

Question of fungi that is necessary to the plant? Most nursery plants come pre-infected.

Canes can be 6 to 8 feet tall when mature, you need to prune them, most growers keep the canes at 5 feet. The canes will start from the crown of the plant. You can see up to 3 feet of cane growth in one year. On the second flush of growth, you can see berries appearing. Watch out for winter injury. Small vegetative buds will give you shoots the next year; this is where the next year's crop is born.

The buds go dormant in the fall. Here in the North, we meet chilling requirements for the plant by the end of January. By the end of February, the shoots are ready to go, but if there's another low drop in temperature, you will lose them.

You will get 5 to 12 flowers per bud. The buds open from the tip and work downwards. Early flowering varieties take a longer period to ripen. Most varieties require cross-pollination. The fruit is many-seeded, with clusters of 5 to 8. The blue color ripens with the fruit. The size can increase 35% after they are truly blue. Give them 3 to 4 more days after they turn true blue before harvesting, it will give them more sugar.

Actual breeding of blueberries started only in the 1920s. Only a handful of varieties are suitable for our cold climates. Avoid early varieties and late varieties.

The best types for our climate

Patriot	early	large, high-quality fruit	very hardy
Northland	early-mid	small dark, good quality	very hardy
Blueray	mid-early	large high-quality fruit	hardy
Bluecrop	midseason	large fruit, attractive	hardy, MB res.
Nelson	mid-late	large good quality fruit	very hardy
Jersey	late-mid	med-small, good quality	hardy, MB res.

(Jersey takes longer, but does better in poor soils)

Newer varieties that are less popular but good

Duke	early	fruit is medium-sized	hardy
Tora	midseason	large high-quality fruit	hardy?

Herbert	midseason	pick-your-own crop, large, soft	hardy, variable
Draper	midseason	large, good quality	hardy?
Elizabeth	mid-late	large, good quality	hardy, variable
Blue gold	mid-late	med., good quality fruit	hardy

Half-high blueberries: Highbush and low-bush crosses
They have a short stature for better winter survival
St. Cloud 48": best commercial potential
Northblue 30": home garden quality
Friendship 24": good fruit quality
North Country 24" good ornamental
These last two are good ornamental plants

What to order?
Dormant 1 to 2 year-old plants 12 to 18" tall
Older bigger plants are more expensive to ship

You can typically plant 650 to 800 plants per acre
Plant in early spring. Know when your soil is ready to time the shipping. Take a soil test the previous fall, and work the soil then. The best pH is around 4.8 to 5.2. The phosphorous level is critical when the plant is getting started. If you have weed issues, plant a cover crop one season before planting your berries.

Plant them10 to 12 inches deep and spread out the roots. Add mature compost or pre-moistened peat moss and blend with the natural soil. Put no fertilizer in the trench, they'll be sensitive to the salts. Leave a little depression around for water collection. Don't prune at planting time. Space the plants 5 feet apart in the row (2 to 4 feet for the half-highs) and 8 to 12 feet between rows.

Flower clusters are to be removed by hand the first few weeks after planting, the plant needs to concentrate on setting roots. Do this the first three years. Fertilize very lightly, if at all, 4 to 6 weeks after planting (fish emulsion).

For the first season, have clean cultivation. Some growers prefer to put sod or a cover crop. To water, use trickle or drip irrigation systems. You don't want to wet the foliage in the summer, it creates disease problems. Put mulch of wood chips or shavings 4 to 8 inches deep. Do not recommend landscape fabric, the root system will suffer. With straw, there is a possibility of disease.

Establish ground cover between the plants in the fall of planting year or the spring of the second year. Stay away from conservation or contractor mix, grasses will be a problem with these. You still want a wide area of mulch around the blueberries, about 3 to 4 feet wide. Maintain the soil pH at 4.5-5.2. They may require applications of ground sulphur.

There is a high demand for nitrogen, 100 to 120 lbs per acre per year. An ammonium form of nitrogen is preferred. Source? Organic matter, ammonium sulfate (21% N) and others. Some products can be incorporated into the irrigation system.

There is a low demand for phosphorous: 0 to 30 lbs per acre per year. There is a medium demand for potassium. Decaying mulch will provide enough potassium. Iron deficiency is common, usually caused by high pH. Take soil tests to check. A magnesium deficiency is common as well, the outer parts of the leaves turn maroon in colour. It signifies that the pH is too low. Epsom salts can help with this.

Frontload the fertilizer as much as you can. Apply the fertilizer at bud break. Sidedress once after 6 weeks on 1 to 2 year old plants, and twice at 6 week intervals on older plants. Don't forget to fertilize both sides of the rows to have even growth.

Not much pruning is needed in years 1 to 3. Remove broken branches and weak growth, you want it to be upright. Start pruning in March. Prune it to 6 to 12 canes. Any cane more than 6 years old should go (the bigger canes). You can do this in two steps: First, remove 1 to 4 of the oldest canes, then remove the

weak one year shoots that are less than 6 inches long with few buds. Remove the winter injured ones (turned a chocolate brown).

The bushes will overfruit, by pruning you will get a better fruit. Shouldn't take longer than 5 to 10 minutes per bush. Only plant what you can prune, and prune every year.

To renovate neglected bushes, cut all canes to the ground, or remove 1/3 to _ of the oldest each year.

Harvest blueberries when it's cool and dry; early morning after the dew is gone is best. Refrigerate them immediately. Use shallow containers so the bottom fruit won't be crushed. Store them at 32 degrees Fahrenheit or 0 degrees Celsius.

For marketing blueberries, pick-your-own is difficult because of timing, labor (having someone there to check) and price issues. Pre-picked is a problem because of labor issues. Retail could have problems with demand as well as price-resistance (because of the low price of low-bush berries). Whole sale can have problems with demand also, but also has storage and transportation issues.

The price for establishment costs (year 2000 prices) are $4,000 to $6,000 per acre for years 1 and 2. The maintenance costs for years 4 and later can be expected to be between $6,000 and $7,000 and are mostly due to labor. The net returns (above costs) are expected to be around $2,000 to $6,000 (depending on course on yield and price).

A major problem for blueberries is birds. Netting is the best method to deter them. Put posts 8 ft tall. Make sure to anchor at the bottom so that birds don't crawl underneath. Just put the nets as the berries are turning blue and remove right after, or else the UV rays will break down the netting. Other deterrents are scare-eyes, owls, sounds accompanied by mylar, but move them 2 to 3 times daily.

Another problem is insects, specifically the blueberry maggot. The fly will lay eggs in the fruit when it's blue, and the fruit will then cave in on itself. You can use traps, or some applications are also allowed.

There are a few fungi that affect the blueberry as well. The first is "mummy berry". It overwinters in mummified fruit and starts as shoot blight. The berries will turn a salmon color then white. No fungicides are acceptable organically. That the fruits that are mummified and remove them to prevent spreading, you need to break the cycle.

Another fungi is "witches broom". This fungi has two hosts, the blueberry and balsam fir (it can't spread from blueberry to blueberry). Spores can travel over 1000 ft. Witches broom is seen a lot in Patriot and St. Cloud varieties. It creates a rubbery blue-like growth that creates spores. You need to remove entire canes that have brooms, and if the brooms come from the base of the plant, the entire plant must be removed. Make sure to sterilize the pruners afterwards when cutting these.

One thing that kills buds is cold and desiccation. Desiccation is caused by the wind, so it's a good idea to put evergreen to protect them.

For more information, order the Highbush blueberry production guide at www.nraes.org or download Blueberries: Organic Production at www.attra.org/attra-pub/PDF/blueberry.pdf.