

honeyberries

HASKAPS

Honeyberries, also known as haskaps, are the recently domesticated fruit of the blue honeysuckle (*Lonicera caerulea*), a small shrub with light green leaves. The blue honeysuckle is considered a circumboreal species, with a native range from northern Norway to Labrador in Canada. The plant produces cream to light yellow, trumpet-shaped flowers that are borne in pairs (Figure 27). The fruit starts ripening in June, shortly before the earliest strawberries. Fruit are dark blue with light colored flesh. The berries form odd, irregular shapes that vary from hearts to purple caterpillars depending on cultivar (Figures 28-30). The largest fruit has the same weight as an average strawberry. The fruit is usually sour, with a taste that resembles a combination of blueberries and raspberries. Those that promote honeyberries as a crop have yet to agree on a common name. The word “honeyberry” is used because the plant is a close relative of the common honeysuckles. Most

domesticated cultivars come from the northern Japanese island of Hokkaido and the Kuril Islands north of Japan, where the indigenous Ainu people called them haskaps. Many people prefer “haskap” to denote the Japanese origin for the plants. Recently, haskaps have been touted as an alternative to blueberries because haskaps are hardier and tolerate a wider range of soils than blueberries. All haskap varieties are hardy to Zone 2, and haskap flowers have the unusual ability to survive temperatures as low as 17°F even in full bloom.

Like many emerging crops, the scientific classification of honeyberries is still being debated. While some nurseries have sold honeyberries under different scientific names, such as *Lonicera kamschatika* and *Lonicera emphylocalyx*, most scientists treat all honeyberries as the same species with distinct subspecies in different countries. The plant called *L. kamschatika* in some publications is



Figures 27 Haskap blossoms

usually written *L. caerulea* ssp. *kamschatika*, while the large-fruited plants from Hokkaido belong to the subspecies *L. caerulea* ssp. *emphyllocalyx*.

Haskaps are so closely related to the mountain fly honeysuckle *Lonicera villosa*, a native of the northeast U.S., that the two have hybridized. Haskaps are only distantly related to the invasive species Tartarian honeysuckle, a tall shrub common in windbreaks and homesteads throughout Minnesota. Like other honeysuckles, haskap seeds are small and unnoticeable when eaten with the fruit.

Figures 28–30. Diverse shapes of haskap fruit.

HISTORY

Although haskaps are circumboreal, most subspecies are marginally edible with berries that are bitter and small. In boreal areas, blue honeysuckles were not eaten as frequently as lowbush blueberries, lingonberries, or cloud berries by indigenous peoples. In East Asia the wild plants produced a larger and more consistently edible product, and they became important in both the Russian Far East and northern Japan.

Russians tried to develop haskaps as a crop as early as 1915, using plants from the Kuril Islands north of Japan, but breeding did not occur in earnest until 1950s in Russia and the 1960s in Japan. Both breeding programs only used fruit from their respective countries. By the 1990s, farmers on Hokkaido were growing haskaps for the commercial market, and gardeners throughout Russia were planting improved cultivars. Low yields and low harvest efficiency proved to be a problem on the Japanese island of Hokkaido. In spite of a good market, land devoted to haskap production sharply dropped after peaking in the mid 1990s, mainly because the farmers could not economically harvest the fruit.

In North America, new cultivars of haskaps are being released by groups in Oregon, Arkansas,

and the University of Saskatchewan. The Oregon group is led by Dr. Maxine Thompson, a retired horticulture professor from Oregon State University. Dr. Thompson has been breeding varieties from Hokkaido in collaboration with Dan Barney, a horticulturist in the Idaho panhandle, to develop cultivars suitable for mild climates. Although selected for mild climates, the Oregon cultivars appear to be hardy in Minnesota. The Arkansas group is led by Lidia Delafield who primarily uses material from the Russian Far East.⁴²

In the early 2000s, Dr. Robert Bors at the University of Saskatchewan began an extensive breeding program for haskaps using seeds from Dr. Thompson's program as well as the Kuril Islands, Russia, and Canada. One goal of the University of Saskatchewan breeding program was to develop varieties suitable for commercial production. Dr. Bors released his first cultivars in 2007, and the first commercial plots in the U.S. were planted a few years later.

The programs in Saskatchewan, Arkansas, and Oregon continue to release new cultivars of haskaps each year. Currently, there are dozens of cultivars, and most are so new that they have not been properly tested in Minnesota.

USES AND HEALTH BENEFITS

The earliest haskap cultivars ripen when no other fresh local fruit is available. A few people are promoting haskaps as a new crop that can be consumed fresh. Most varieties are too sour for fresh consumption and often contain bitter flavors, especially shortly after the berries turn blue. Many varieties have a long harvest window. Berries that are bitter when they first turn blue often develop a decent taste two weeks later. Not every cultivar

can be left on the plants because some will fall off shortly after turning blue, and because haskaps are susceptible to birds.

Haskaps are best used in processing. Haskaps can be used in any recipe that uses blueberries or raspberries, such as pies, jams, wines, and pastries. Because of the intense blue color and strong flavor, there is interest in using haskaps in dairy products

⁴² Berries Unlimited. <http://www.berriesunlimited.com>

like ice cream and smoothies. Since they have small seeds, haskaps can be dried and used in baking as a replacement for raisins or dried cranberries.

High demand for haskap products in Japan was partially driven by the perceived health benefits, beliefs that go back hundreds of years on Hokkaido.

Haskaps are high in vitamin C and antioxidants. Preliminary research shows that domesticated haskaps have antioxidant levels similar to other dark fruit like currants and elderberries. Further research on the specific health benefits of haskaps is being conducted.

PROPAGATION, PLANTING AND CARE

All haskap varieties available in the U.S. are patented, and vegetative propagation of those varieties is illegal. Haskap plants are widely available from a number of different nurseries and dealers in the United States.

Haskaps grow low to the ground, which makes them susceptible to competition from quackgrass and other perennial weeds. Always plant into soil that is free of quackgrass and Canada thistle. Haskaps grow well in mulch, which reduces pressure from most annual weeds, with the exception of quackgrass and Canada thistle. Mulch also keeps the soil cool during hot spells, which reduces stress on the plants.

The tallest haskaps grow to about six feet tall and spread to about the same distance. Therefore, they should be planted six to eight feet apart within the row. Some cultivars like 'Indigo Gem' are tall and narrow, while others are short and spreading, so some cultivars may require different spacing. Since the crop has been available for less than one

decade we don't know what their final size will be in the milder climate of Minnesota, and we don't know how old they will live to be.

Haskaps grow anywhere, but do best in a sandy loam soil with a neutral pH and soil organic matter above 5%. Haskaps also appear to grow well in soils with a slightly alkaline pH. Bark mulch will help to increase organic matter over the life of the planting. Haskaps have small root systems, and the plants will stop growing in early June if there is not enough water. Irrigation systems are advisable in areas with less than ten inches of rain between July and September. Guidelines for nitrogen fertilization are still being worked out, but the plants do appear to need less nitrogen than other fruiting shrubs, especially in fields with sufficient organic matter.

Pruning systems are still being worked out. Many haskap promoters claim that the plants never need to be pruned, while in Japan they are extensively trained to tall rows.

PRODUCTION PROBLEMS

As with many plants from extremely cold climates, haskaps will sprout during a warm spell in late winter. While sprouting early has been a serious problem in Oregon, it has not been a problem here in Minnesota, especially when the temperature stays below freezing most of the winter. During the mild winter of 2012 haskaps began to grow in March, but they still produced a crop.

Haskaps are such a new crop that we don't know which problems will arise as more acreages are planted each year. Although promoted as disease-resistant, growers have encountered several serious diseases. Botrytis has killed whole branches in wet areas of Oregon. Plants in Minnesota also have developed leaf diseases during wet summers, including powdery mildew. Some diseases have not been conclusively identified. Spotted Wing

Drosophila will probably not cause crop losses in haskaps because they ripen long before the fly population reaches threshold numbers.

Birds have caused serious losses in both Saskatchewan and Oregon, especially when cedar waxwings start to form large flocks around haskap fields. Bird netting is highly recommended.

Finding efficient ways to harvest haskaps is a high priority for everyone trying to grow this new crop. Minnesota producers who have tried to harvest the crop by hand quickly became discouraged. In Japan, the berries are picked by hand. In Europe and Canada, the fruit is shaken off either with machines or by hand. Growers who cannot afford an expensive machine to harvest fruit have had some success by developing manually powered picking machines. The picking machines have trays which can be moved below the plant canopy while the plants are shaken by hand. These manually powered harvesters are based on a blueberry harvester called the "Easy Harvester", and the first model was called the "Mark One." Five Hundred to 750 pounds of berries can be harvested per day with two people using the "Mark One." Other growers have placed tarps below the canopy and shaken the plants by hand.

Low yields have plagued a number of test plantings in Minnesota. Growers in Poland are finding yields between six and ten pounds per plant, but most growers in Minnesota have yet to see one pound per plant. The low yields are due to a combination of poor pollination and poor blossom production. Pollination is an issue because the tube-shaped white flowers can only be pollinated by insects, preferably bumble bees, and because every cultivar released so far is self-incompatible. Self-incompatible means that pollination and fruit set only can occur when a flower is pollinated with pollen from a different cultivar. Mixing different cultivars is critical in order to get maximum pollination. Even when there are multiple varieties side by side, the flowers often open before many bees have emerged, and different varieties don't always sprout at the same time. Poor blossom formation appears to be the larger problem, at least among cultivars tested in Minnesota. Flowers are formed in the nodes of the previous season's growth, and there just aren't enough blossoms to make a commercially viable crop. The low yields in Minnesota may be because the right cultivars have not been found.

EDIBLE LANDSCAPING

With its inconspicuous white flowers and plain green leaves, haskaps are neither especially striking nor particularly ugly. In landscapes, they could play a role similar to barberries as foundation shrubs planted near taller trees.

Some people worry that haskaps could become invasive like the closely related Tartarian honeysuckles or the vine honeysuckles. In many test plantings throughout the center of North America, there has not been any suggestion that they could be invasive.

COMMERCIAL POTENTIAL IN MINNESOTA

Haskaps are currently being promoted as the crop of the future. The crop has traits that justify a profitable future, including great flavor, easy processing and health benefits. Haskaps lack the disease susceptibility of saskatoons and are easier to process than Nanking cherries, both of which were promoted as the “crop of the future” at one time. Haskaps should become profitable for wholesale markets and local markets if growers can find varieties and develop cultural practices that can deliver yields of six pounds per plant. Haskaps that are planted on a six by ten-foot spacing that produces six pounds of fruit per plant would produce 4356 pounds per acre, which is lower than blueberries, and would require a farm gate price of \$3 per pound to be economically viable. Currently, wholesale prices vary from \$2.50 to \$5.00 a pound, depending on quality. Local markets have not been developed, and we don't know if a grower could sell 4000 pounds of haskaps as pick-your-own or at farmers' markets in most parts of the state. Demand should grow in upcoming years, but haskaps remain unknown for most people.

Minnesota does appear to have natural advantages for haskap production compared to other parts of the U.S. In southern states, the shrubs are often defoliated by leaf diseases shortly after harvest, while haskaps in Minnesota hold their leaves all summer. Plants do not bloom during warm spells in late winter here as they do in Oregon.

Haskaps exhibit huge differences among cultivars in fruit size, fruit shape, flavor, and productivity. New cultivars are being released each year, and growers interested in haskaps should test new cultivars. Of the cultivars that were available in 2011, 'Indigo Gem' appears to have the greatest potential for either large scale or small scale commercial production. Its large fruit and an upright growth habit facilitate hand picking or mechanical harvest. Anyone interested in growing haskaps should plant multiple cultivars in order to find a cultivar that can produce six or more pounds per plant and is easy to pick.