

# chokecherries

Chokecherries are trees and shrubs of the species *Prunus virginiana*, which is one of the most widespread tree or shrub species in North America. Chokecherries produce fruit on long cylindrical clusters called racemes (Figure 6). Flowers are white and showy, but have a musky odor that differs greatly from the floral smell typical of fruit blossoms. The leaves are simple and oval. In Minnesota and points to the south and east, the range of chokecherries overlaps with the wild black cherry (*Prunus serotina*). Chokecherries and black cherries have leaves and fruit that are very similar. Black cherries grow into large trees valued for their wood, while chokecherries range anywhere from a small shrub to a small tree. Black cherry fruit is often bitter, while chokecherries are astringent, causing the mouth to feel dry when eaten fresh (see Astringency sidebar, p. 22). Ripe chokecherry fruit varies from bright red to almost black. In some parts of the U.S., red-fruited forms dominate; while in Minnesota, the fruit is most often black.

Some chokecherry cultivars have been selected to form trees, while others are shrubs that spread via underground rootsuckers. In harsh climates such as the high plains, chokecherries rarely grow over 3 feet tall, but in mild climates they usually grow into small trees.



**Figure 6.** Chokecherry fruit of the cultivar ‘Garrington’

Chokecherries have one of the widest ranges of any woody plant native to North America. They grow in the rich deciduous forests of the Northeast, on rocky hillsides on the Great Plains, and on the slopes of dry mountains in Nevada. In the Great Plains and Rocky Mountain regions, chokecherries were extensively used by Native Americans, who made pastes and dried the fruit. Dried chokecherries were commonly mixed with bison fat and dried meat to form pemmican. Some scientists have speculated that Native Americans scattered seed along trails for future food. European settlers in the High Plains and Intermountain West quickly learned how to use chokecherries in a variety of products.

In spite of high local demand, there has been little interest in domesticating the crop or selecting

varieties suitable for local conditions. The most common cultivar on the market is 'Schubert', also known as 'Canada Red', which was selected as an ornamental rather than for fruit quality. 'Canada Red' forms a small tree with leaves that turn red shortly after the leaves expand, and it does produce small amounts of black fruit. In the 1990s, 'Canada Red' was planted as a common landscaping tree, but the cultivar was extremely susceptible to the disease black knot, and many have been removed.

The Canadians have selected several varieties for fruit quality, including the black 'Garrington', the red fruited 'Lee Red', the yellow 'Boughen's Golden', and the red-leaved varieties 'Robert' and 'Goertz'. All these varieties are difficult to find in Canada and almost impossible to find in the US.

## USES AND HEALTH BENEFITS

Chokecherries are used for wine, jelly, sauces, and syrups. When processing chokecherries, the extremely high ratio of seed to pulp in the fruit causes problems. Generally, the fruit is mixed with water and heated and simmered until the water is infused with juice. Chokecherries don't jell well, and sometimes extra acid or pectin needs to be added in order for the fruit to jell.

Chokecherries have a strong, unique flavor that many people find agreeable. Chokecherries are rarely mixed with other fruit, because people who like chokecherries want that unique flavor. People who grew up eating chokecherries tend to show a great deal of devotion to the fruit, which is why several towns throughout the Intermountain West have annual chokecherry festivals.

Chokecherry bark and leaves were believed to have medicinal properties. The bark was frequently used by Native Americans as a tea to cure digestive ailments. European settlers in the 19th and early 20th century likewise used chokecherry leaves and bark to help with fevers and colds. While Native

Americans extensively used chokecherry juice to cure a variety of ailments, such as diarrhea, post-partum hemorrhaging, and sore throats, these health benefits have not been demonstrated by modern science.

Tests have shown chokecherry fruit contains about half the antioxidants of aronia, elderberries and other blue fruit.

Like most stone fruit, the pits of chokecherries are poisonous if eaten raw. Both pits and bark contain cyanogenic glycosides, which release poisonous hydrogen cyanide when the pits are crushed (see elderberry), and chokecherry pits are easier to crush than plums, cherries or apricots. The cyanogenic glycosides are only found in pits and bark and are unrelated to the fruits' astringency. Most of the cyanogenic compounds are destroyed during drying or cooking, so tea made from chokecherry leaves or bark has no harmful effects. The few cyanide-producing compounds that leach into jelly and wine are at levels too low to harm humans while giving the final product an almond-like flavor.

# PROPAGATION

Chokecherries are primarily propagated using seeds. Seeds work well for large nurseries that supply plants for conservation projects, but do not work for growers who want to harvest chokecherry fruit. There is little consistency in fruit quality and ripening times in plants grown from seed.



**Figure 7.** Chokecherries grown from seed, showing the variability in bloom time and flower production.

Chokecherries are fairly easy to propagate by digging up and transplanting rootsuckers that sprout near desirable plants. Chokecherry roots don't spread widely, and most daughter plants from rootsuckers are within five feet of the mother plant. Digging up chokecherry rootsuckers is different than plums and many other shrubs, because most daughter plants often have few roots. Therefore, it is recommended to cut the lateral root that connects the mother and daughter plants, with a sharp shovel, the summer before transplanting. This forces the daughter plants to form more roots. Rootsuckers should be dug in spring before sprouting. Chokecherries sprout extremely early in the spring, and can sprout before the ground thaws, creating a very narrow window for digging plants out.

Chokecherries are occasionally propagated through grafting. Some desirable varieties do not form rootsuckers readily, and some nurseries find grafting to be more cost effective than digging rootsuckers. Landscapers prefer grafted trees on rootstocks that have few rootsuckers. There has been little public research on different rootstocks, and currently most are grafted onto seedling chokecherry rootstocks. The 'Canada Red' cultivar sold by ornamental nurseries is usually grafted onto a cultivar that does not send up suckers.

# PLANTING AND CARE

Chokecherries should be spaced three to four feet apart in the row to form a hedge. In heavier soils and milder climates, they can be spaced further

apart. Weed control is only critical for the first four years. They respond well to a wood chip or bark mulch, especially the first two years.



## PRODUCTION PROBLEMS

In central and northern Minnesota, chokecherries have few pests and can be grown organically. The two worst problems in the northern half of Minnesota are black knot and eastern tent caterpillars, and both problems are best controlled through scouting and pruning.

Throughout Minnesota, the biggest problem with chokecherries is black knot, an unusual fungal disease that grows into the bark, slowly girdling branches. When black knot grows into the main trunk, the whole tree can be killed. Black knot is a bigger problem in Minnesota than in Western States, because rains in early summer help the fungus start new infections. The best way to control black knot is to remove sources of inoculum. Wild chokecherries near the planting should be killed. Branches with the disease should be pruned and removed as soon as the disease becomes visible. Black knot first shows up as a large swelling in July, but becomes most visible during the winter, when it should always be pruned out. Some varieties are more resistant

to black knot than others. 'Garrington' is fairly resistant. The widely planted ornamental cultivar 'Canada Red' is exceptionally susceptible.

Chokecherries are a major host for the eastern tent caterpillar or bag worm, which forms large, visible silk nests in the branches. The caterpillars leave the nests to feed on the leaves and can easily defoliate an entire tree. Adult moths lay eggs on branches in late summer. Caterpillars hatch in early spring. The best way to control the eastern tent caterpillars is to remove the nests as soon as they become visible. When the leaves first emerge, nests are often the size of a quarter and can be easily plucked off the plant by hand or scorched with a hand-held propane torch. Insecticides are marginally effective, because the silk protects the caterpillars from insecticides.

In southern Minnesota, chokecherry production appears to be limited by the cherry fruit gall. This insect lays its eggs in the developing fruit, causing large, deformed fruit.



**Figure 8.** *Black knot on chokecherry branch.*



**Figure 9.** *Eastern tent caterpillar nests in a chokecherry bush*

## HARVESTING

Almost all chokecherries in the U.S. and Canada are harvested by hand from wild plants. Wild plants can be challenging to harvest, because most wild plants in Minnesota are over ten feet tall and most of the fruit is just out of reach from the ground. Wild chokecherries often grow next to roads, where the ground is too uneven to place ladders and where pickers are in danger of being hit by vehicles and farm machinery. With regular pruning, chokecherries can be kept at heights where all the fruit can be harvested from the ground. If the plants are kept short, chokecherries can be picked

faster than many other semi-wild fruit. Several people have reported picking over five gallons of chokecherries per hour.

With their short height, chokecherries show a potential for mechanical harvesting, and raspberry or blueberry harvesters could be adapted to harvest chokecherries. Mechanical harvesters will only work if a row only has one cultivar, and if the plants are pruned and trained to be small enough for a mechanical harvester.

## COMMERCIAL POTENTIAL

Cost projections in Canada show that chokecherries could be extremely lucrative. Wineries report rarely having enough fruit for their needs. High picking costs means that fruit should be sold at about \$3 per pound in order to make a profit for the grower.

Currently, the market for chokecherry products in the Midwest is declining. The people who grew up making chokecherry jelly are not being replaced with children who know the crop.

## EDIBLE LANDSCAPING

‘Canada Red’ was popular with commercial landscapers in the late 1990s due to its red leaves and extreme hardiness, but in the Midwest, the trees proved too susceptible to black knot. Other varieties with resistance to black knot have flowers in the

spring, good fall color and provide edible fruit. Most chokecherries have the undesirable trait of sending out too many rootsuckers, so they work best in a lawn or in a hedgerow or windbreak where root suckers are easily controlled by mowing.

## MINNESOTA EXPERIENCES

In spite of there being several chokecherry cultivars that were selected for fruit quality, most chokecherries harvested in Canada and the United States are from wild plants. The Minnesota Department of Agriculture funded an on-farm trial to look at the feasibility of chokecherry production through their sustainable agriculture grant program

in 2008.<sup>17</sup> Seedlings were purchased from northwest Montana and from Minnesota. A small number of plants of the cultivar ‘Garrington’ were purchased from a nursery in New York. Both Minnesota and Montana seedlings grew and produced fruit, but the Montana seedlings were more susceptible to black knot.

<sup>17</sup> Andresen, Todd and Michelle. 2008. Chokecherry (*Prunus virginiana*) Production in Western Minnesota. *Greenbook*, Minnesota Department of Agriculture. <http://www.mda.state.mn.us/Global/MDADocs/protecting/sustainable/greenbook2008/fv-chokecherry.aspx>

The project showed that seedlings are not feasible for a commercial orchard. Some seedlings did not flower, while others were loaded with blossoms in the spring, giving large nonproductive areas to the orchard. Any grower interested in chokecherries must find suitable cultivar and a way to propagate

plants vegetatively. Gurnington does appear to be suitable for commercial production, but the plants are no longer being sold by any nurseries in the United States. Several Minnesota producers have selected unique cultivars of chokecherries, but those cultivars are not being sold at this time.

Note from Thaddeus:

*Does a chokecherry by another name taste just as astringent?*

*Shortly after 2000, a few Canadian horticulturists recommended changing the name "chokecherry" to "wild black cherry." Although the proposed name change would have caused confusion in Minnesota, which does have native wild black cherries (*Prunus serotina*), I decided to gather information. In 2008 and 2009, I conducted taste tests at a farmers' market. I told the consumers that we were testing 4 new fruit jellies. Two of the samples were chokecherry from the same jar, with one labeled "chokecherry" and the other labeled "wild black cherry". The other two jellies were also new crops like red currant and aronia. Two people noticed the trick. One woman refused to do the taste test because she heard that chokecherries were poisonous. Everybody else rated the two chokecherry jellies with different names roughly the same, including a large group of teenagers who had never eaten chokecherry jelly. Chokecherry jelly was rated quite high by both new and old consumers.*

*In the past thirty years, chokeberries have become aronia berries and Oregon filberts have become hazelnuts, but there doesn't appear to be a need to change the name of chokecherries. Changing the name would attract few new consumers while turning off many people from the Great Plains and Intermountain West who grew up eating chokecherry products. Lewistown, Montana is unlikely to change the name of their annual "Chokecherry Festival," for instance.*