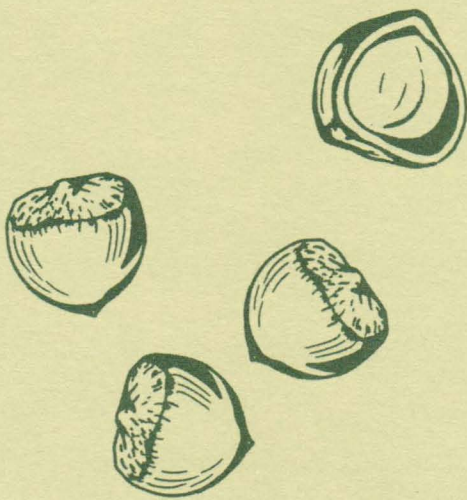


Since the 1920s, hazelnut breeders in the eastern and central United States have crossed native and European hazels, attempting to combine the superior qualities of the European hazel with the disease resistance and cold hardiness of the American species.



Commercial Hazelnuts in Minnesota

by Scott J. Josiah

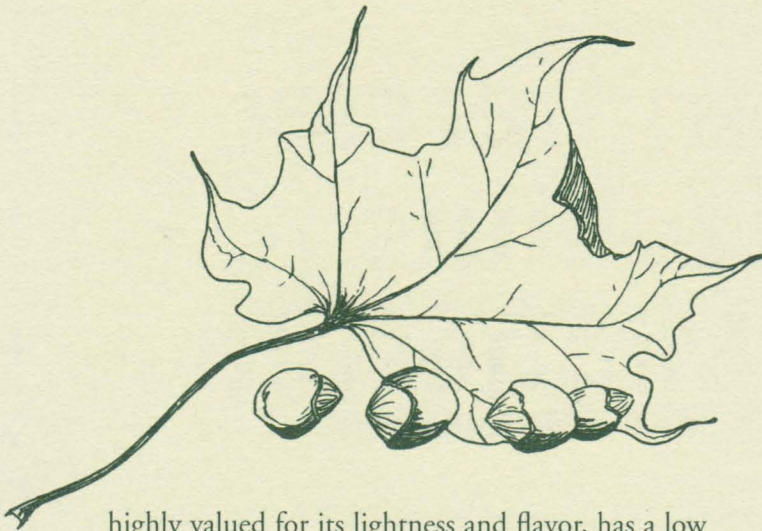
Can hazelnuts be grown as a commercial crop in Minnesota? This publication provides detailed information about growing hazels as an agricultural crop so that people can form educated opinions about this crop's potential. As with most "alternative crops," there has not been large-scale production and marketing of commercial hazels in the Midwest in general, and in Minnesota in particular. On the other hand, a number of factors indicate that hazels could be grown commercially in the state. This publication summarizes the status of the research on hazels in Minnesota and elsewhere so that farmers, landowners, and gardeners can decide for themselves the level of interest and/or financial commitment they want to invest. The author hopes this information will encourage interest in this emerging crop without creating false expectations.

Hazelnuts: An Overview

Hazelnuts (*Corylus* spp.), also known as filberts, have many species and are found throughout the world. The most commercially valuable species, the European hazel (*C. avellana*), is produced in Turkey, Italy, Spain, France, and the United States. In the United States, hazels are grown almost exclusively in Oregon's Willamette Valley, which produces three percent of the world's commercial production of hazelnuts (Thompson et al. 1996). Hazelnuts are marketed both unshelled and shelled in raw, roasted, or salted forms. They are used in the confectionery industry and in a wide range of food products.

Markets

Hazelnuts have significant national and international markets. Most commercial hazelnuts (from *C. avellana*) are used in chocolate confections; added to foods such as cereals, cookies, breads, and other staples; put into roasted nut mixes; and made into flavorings for products ranging from hazelnut oils, coffees, syrups, and even beer. Hazelnuts are nutritious with 19 percent protein content and are an excellent source of vitamins E and B6. Hazelnut oil can be used for cooking, is



highly valued for its lightness and flavor, has a low linolenic acid content (which translates into a longer shelf life), and is 70 percent monounsaturated (similar to olive oil). The meal that is left after oil is extracted has been used as a nutritious livestock feed. In Italy, Turkey, France, and Croatia, truffles (an edible mycorrhizal fungus) often grow with hazelnut plants and are commercially valuable.

There are no commercial hazelnut plantings growing east of the Rocky Mountains, thus there is no price history for the crop in Minnesota. However, in 1998, an average U.S. wholesale price for unshelled hazelnuts (produced in Oregon) ranged between \$.35 to \$1/lb. Oregon hazelnuts marketed in-shell (among the world's largest) retailed for about \$1/lb. Shelled hazels sold for \$3/lb, and roasted or chocolate-coated hazelnuts packaged in decorative tins sold for around \$12/lb (Rutter, 1998).

Minnesota's Native Hazelnuts






There are two native hazel species in Minnesota: the American hazelnut (*C. americana*) and beaked hazelnut (*C. cornuta*). Both are cold-tolerant and grow well in the Upper Midwest and well into Canada. Native hazelnuts tolerate shade and can form dense understories in the maple-basswood, jack pine, paper birch, aspen, and pin oak forests of Wisconsin and Minnesota. Native hazels also grow along streams, in hedgerows, meadows, woodlands, roadsides, forest edges, and in remnants of oak savanna. Although tolerant of a wide range of growing conditions, these

wind-pollinated plants grow best on rich, moist, well-drained soils. Hazelnuts can reproduce from root or stump sprouts, allowing them to survive periodic fires and other disturbances. However, they are not invasive. Nuts from these native species are small with thick shells, and have little commercial value.

Planting Commercial Hazelnuts in Minnesota

Currently all commercial hazelnut varieties come from selections of the European Hazel. These varieties produce nuts of higher quality, larger size, and thinner shells than Minnesota's native hazels. However, European hazel varieties are best adapted to a mild, temperate climate moderated by a nearby body of water. They cannot tolerate the harsh winters of the Upper Midwest, nor are they resistant to Eastern filbert blight, a disease that is caused by the endemic fungus *Anisogramma anomala*.

Since the 1920s, hazelnut breeders in the eastern and central United States have crossed native and European hazels, attempting to combine the superior qualities of the European hazel with the disease resistance and cold hardiness of the American species. Over the years, several hybrid hazel varieties that may be suitable for Minnesota conditions have been released. These include cultivars such as:

-  "Grand Traverse," "89-Lisa," "G-22," "88-BS," "G-14," and "G-17" developed by Cecil Farris (Lansing, Michigan);
-  "Rush" and "Winkler" (Lancaster, Pennsylvania);
-  "Carlola," "Delores," and "Magdalene" by Carl Weschcke (Minnesota);
-  "Laroka," "Eastoka," "Faroka," and "Morrisoka" by J. U. Gellatly (Westbank, British Columbia);
-  and several open-pollinated unnamed varieties from Badgersett Research Farms in southeastern Minnesota.

These cultivars and varieties may be more cold hardy and disease resistant than *C. avellana*. Compared to wild hazels, they may produce heavier crops of larger nuts at more regular intervals. However, none of these cultivars have been extensively and rigorously tested for performance in Minnesota, and some may no longer be available. Many cultivars have not been extensively evaluated for the characteristics that make hazels commercially valuable (yield, size, shape, kernal percentage, shell thickness, attractiveness, ease of pelticle removal, flavor, nuts per cluster, husk type, oil content, post-harvest storability, and timing of nut maturity). Rigorous larger-scale testing is needed to determine the long-term performance of these hybrid cultivars throughout the region and the suitability and value of their nuts for commercial use.

Nut Production

With good care (proper planting timing, vigorous seedling stock, adequate weed control, and supplemental watering during the first few years) hybrid hazels currently grown in Minnesota produce a small nut crop within three years of establishment, with larger crops produced after four to five years. Preliminary data from Badgersett Farm's highest producing plants growing on test plots in southeastern Minnesota indicate that (when extrapolated to a per/acre dry in-shell yield) an average acre may produce between 800 to 2,000 pounds of nuts per year, depending on the variety, weather, and other factors (Pellett et al. 1998). Percent kernal, a more accurate gage of commercial production potential, varies from 25–40 percent (averaging around 30–37 percent for Badgersett's higher producing varieties), which is lower than commercial *C. avellana* varieties. Nut production can be cyclical, with heavy production one year and lighter production the next. Full sun is needed to maximize nut production.

Hazelnuts and the Rural Landscape

Hybrid-derived hazels can be planted in orchards in rows alternately 10 and 15 feet apart to maximize

production while leaving room for farm equipment. Hazels also can be planted in agroforestry applications such as living snow fences, field or farmstead windbreaks, and as streamside buffer strips. These applications help control blowing snow, prevent soil erosion, protect crops from wind damage, improve water quality, and increase adjacent crop yields—while at the same time producing a nut crop. Deer and other wildlife use hazelnuts for browse and shelter, and the nuts and buds are important food sources for bear, small mammals, and many species of birds.

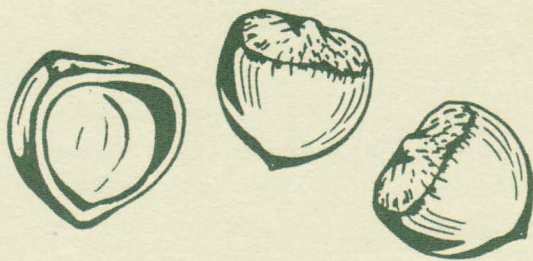
Challenges

Successfully growing hybrid hazels for commercial nut production in Minnesota requires weed control, supplemental water during dry periods for several years after establishment, and protection from wildlife (particularly rodents, rabbits, and deer). Weed control around seedlings is critical, as herbaceous plant and grass competition can seriously stunt growth and decrease seedling survival. Dense grass around hazel seedlings encourages rodents by providing cover from predators, and increases the chance of stem girdling. Woodpeckers, blue jays, crows, turkeys, squirrels, bears, chipmunks, raccoons, and other animals can consume considerable quantities of the nut crop. Insect pests such as nut weevils and filbert bud mite may also reduce nut production.

Finally, harvesting hazelnuts may require high labor costs since harvesting machinery specific to bush type hazelnuts has not yet been developed.

Summary

The development of hazelnuts as a commercial crop is in its infancy in Minnesota, and for that matter across the central and eastern United States. Long-term research and testing is needed to identify cultivars that can survive Minnesota conditions while consistently producing adequate quantities of nuts with commercial value.



For More Information and Hazelnut Plant Material

Badgersett Research Farm

RR 1, Box 141
Canton, MN 55922
(507) 743-8570
www.badgersett.com

Bedford Nursery

2845 Cortland Rd.
New Paris, PA 15554-7656
(814) 733-4533

Campberry Farm

RR 1
Niagara-On-The-Lake
Ontario, Canada
L0S 1J0
(905) 262-4927

Grimo Nut Nursery

979 Lakeshore Rd. RR3
Niagara-On-The-Lake
Ontario, Canada
L0S 1J0
(905) 934-6887
nuttrees@grimonut.com
www.grimonut.com

Grinnell Nursery

14495 Morrice Road
Perry, MI 48872
(517) 625-7176

Other Internet Resources:




Oregon Hazelnut Industry website:

www.teleport.com/~hazelnut/

Oregon Hazelnut retailers:

www.hazelnut.com/store/order.html

References

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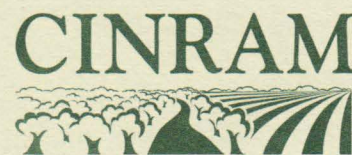
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