The Morton Arboretum Quarterly

VOLUME 30, NUMBER 3 Autumn 1994

AMERICAN HAZELNUT

An Overlooked Native Shrub in Northeastern Illinois

By

Marlin Bowles, *Research Associate*
and Michael Spravka, *Research Assistant*

ECOSYSTEM RESTORATION
IN NORTHEASTERN ILLINOIS

In northeastern Illinois there is a burgeoning effort to restore portions of our landscapes to something approaching the healthier ecosytems that existed here before the first European settlers arrived. For example, the Arboretum's 25-year-old Schulenberg Prairie restoration has served as a guide for prairie restoration and as a benchmark against which new restorations can be measured. The success of many prairie restorations throughout Illinois has led to an awakening interest in restoring woodland and savanna ecosystems as well. Recent research at the Arboretum has helped us to understand the structure and function of these ecosystems. This article examines the ecology, recovery needs, and landscaping utility of American hazlenut, *Corylus americana*, a formerly widespread component of natural woodlands and savannas.

FORMER ABUNDANCE OF HAZEL

At the time of settlement, oak savannas and woodlands in northeastern Illinois were apparently different from those found today. One striking ex-

Artist's conception of the occurrence of hazel along a continuum of vegetation extending from prairie (left) through savanna (center) to light gaps in oak woodlands (right).

ample comes from historic descriptions and information collected by the original Public Land Survey in the early 1800s, which indicate that American hazelnut (*Corylus americana*) was the most abundant woody understory shrub. In addition to its importance as an understory plant, this species occurred in a poorly understood habitat known as barrens, formed thickets or copses on open prairie, and comprised "roughs" bordering the edges of timber.

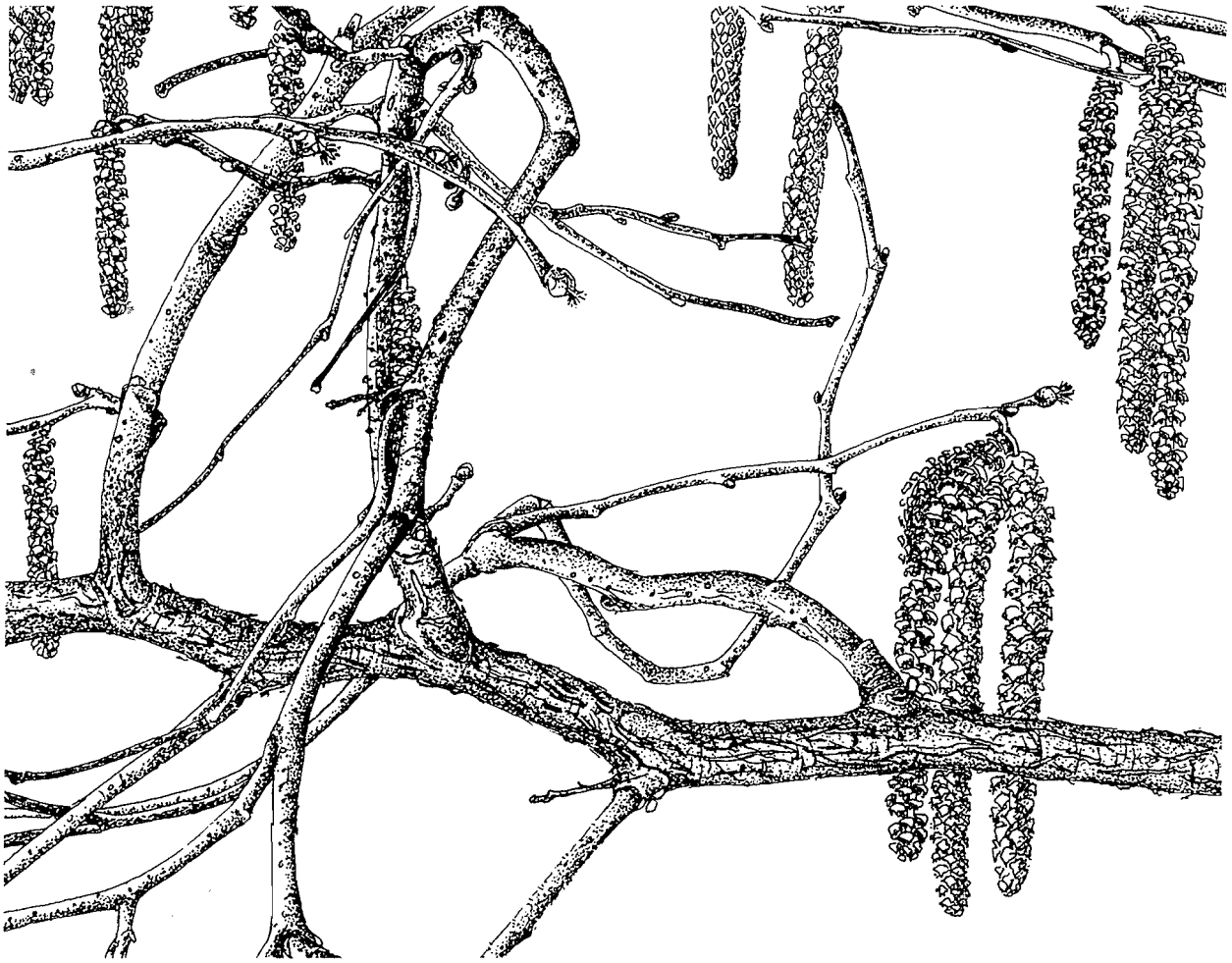
Hazel, which requires high light levels, apparently prospered in the open-canopied woodlands described by early settlers. With settlement, naturally occurring fires or those purposely set by native American Indians were eliminated. As a result, the woodlands began to change as tree growth closed canopy gaps and shaded out hazel from the shrub layer. Clearing of woodland for pasture and subsequent overgrazing by cattle and pigs may have also contributed to the decline of hazel.

Today the most abundant shrubs in many northeastern Illinois woodlands are often the grazing-resistant gray dogwood (*Cornus racemosa*) and the introduced buckthorns *Rhamnus frangula* and *R. cathartica*. These exotic shrubs provide nesting habitat for native woodland birds, but can be replaced by native shrubs such as hazel during restoration efforts.

DESCRIPTION OF HAZEL

American hazelnut, or hazel, is a small-branched shrub generally reaching 3 to 5 feet (.9 to 1.5m) high in woodland environments. It can spread by root sprouts, producing large clones in light gaps or full sun, where it may reach almost 10 feet (3m) in height. Hazel, one of the earliest flowering native plants, belongs to the birch family (Betulaceae). Its two-inch long catkins turn golden yellow when dispersing wind-blown pollen in late March. Hazel canes have zig-zag branches with alternate, simple, two-ranked ovate leaves up to 6 inches (15cm) long. The shell-covered nuts mature in the fall, and are enclosed by an involucre of two enlarged leaf-like bracts. Large crops of nuts can be produced, but are highly sought after by animals such as squirrels and blue jays, and often disappear before full maturity. In fall, the leaves turn a range of colors from brick red to yellow-orange, and quickly drop from the branches.

The thin-barked canes of hazel are very sensitive to disturbance, and usually die back after stem-



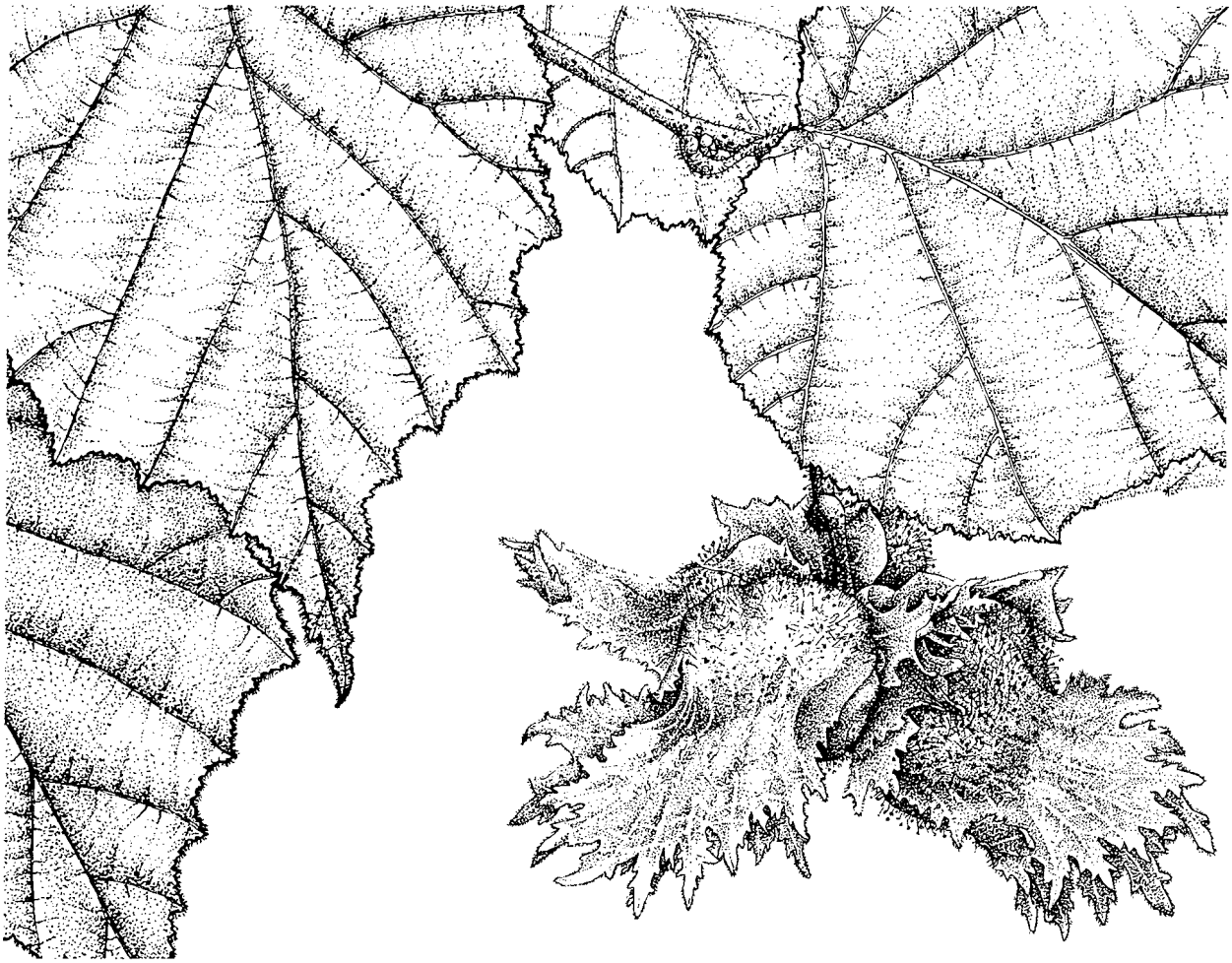
Hazel is one of the earliest flowering plants, dispersing pollen from 2-inch (5cm) catkins in late March.

browsing or fire. They can resprout from the plant's root system, but require three to five years to reach reproductive size.

PROPAGATION OF HAZEL

Hazelnuts can still be collected from naturally occurring plants found in railroad rights-of-way, ungrazed open woods, woodland edges, and in prairie remnants. Nuts should be collected in late August or early September, after they have matured, but before they have been harvested by animals. This is a very narrow window of time, and requires some field evaluation. Hazel growing in areas isolated from woodlands may not be found by squirrels, and thus may retain their nuts longer. To avoid collecting immature nuts, they should be taken after the leafy involucre begins to brown. If feasible, sort the nuts into different size classes and cull out any that have been deformed, damaged, or have weevil exit holes.

Once collected, nuts should be husked of their involucre, air dried in thin layers for about one week to prevent mold, and then stratified with fine grade moist peat moss in small plastic bags at about 35-40°



Hazel matures large quantities of nuts, each of which is enclosed in a pair of leafy bracts or involucre.

F for two or more months. During stratification, periodically check the nuts for mold. If mold is present, discard the infected nuts. Then thoroughly rinse the viable nuts and dry them for several days before continuing the stratification in new bags. Hazelnuts can be germinated under warm conditions either in a greenhouse or outside after threat of frost. They should be planted about one inch deep in humus-rich soil in 4- to 6-inch-deep flats or pots. Keep the soil moist but well-drained. Seedlings will grow in partial shade but will develop best in full sun. Transfer them to full sun gradually if they are started under greenhouse or shaded conditions. For the first year, seedlings can be grown in original pots or flats, but should be transferred to deeper pots or set out the following spring.

ESTABLISHING HAZEL

Habitat selection

Hazel can be established in areas that range from the full sun of open prairie through partial shade of oak savanna to light gaps in oak woodland. Hazel can be established readily in most soils, but requires conditions that are not subject to flooding.

Savanna restorations with adequate soil moisture and light are good areas for initiating hazel restorations. Based on the first year of restoration experiments, predictions can be made about hazel growth in open bur oak savanna. Differences in ground layer vegetation appear to affect hazel growth more than canopy cover. For example, hazel planted in Hungarian brome sod can be expected to have comparatively high mortality and poor growth. However, pre-planting herbicide treatment of brome grass can reduce these negative effects. Brome covered sites appear to have more negative effects on plantings than do sites dominated by other shrubs or vines such as blackberry (*Rubus*), or by native herbs. However, we recommend clearing of buckthorns from hazel plantings.

Planting hazel

Because seed mortality can be high due to a wide range of environmental factors, one-year-old or older nursery stock should be planted to supplement restorations. This approach is labor intensive, but helps insure establishment of hazels. For each plant, excavate a hole to the depth of the root, and loosen the soil before placing it around the root system. Immerse the root of each seedling in water before planting. Water immediately after planting, and periodically to avoid excessive drying of the soil during the first year of growth. A mulch of wood chips or other organic material should be placed over the exposed soil to prevent soil moisture loss.

MANAGING HAZEL RESTORATIONS

Because it requires relatively high amounts of sunlight, hazel occurs where natural disturbance processes such as fire and forest tree-fall gaps increase light, or persists along forest edges where light is more available. Fire appears to be important for maintenance of hazel habitat, and is essential for savanna restoration. However, as noted earlier, the thin-barked canes of hazel are very sensitive to disturbance and usually die back after stem-browsing or fire. Delay burns of planted hazel until they reach a size that allows regeneration after fire. Also, the longer a burn is delayed, the greater the chances of hazel reaching reproductive size. When

burning, protect hazel plots by backfiring and using a backpack sprayer to prevent the fire from entering the plots. The Morton Arboretum is conducting research to determine the role of fire and herbivory by animals in the growth and reproduction of hazel.

Our experimental results with hazel plantings are limited, but suggest that seedling establishment and initial growth is not sensitive to shade from the relatively high, open canopies of mature bur oaks. Nevertheless, their shade may have long-term effects on growth, development, and reproduction of hazel. Subcanopy shade from understory trees, however, appears to reduce hazel growth.

LANDSCAPING WITH HAZEL

As with natural landscapes, hazel can be used in a variety of cultivated landscape plantings. It is perhaps best reserved for naturalizing in wooded settings in the light shade of oaks or in larger landscapes in openings between heavier shade trees such as maples or basswoods. In open areas it can be planted as a hedge along walkways. Plantings should always be mulched to preserve soil moisture. An exotic cousin, the Turkish hazel, *C. colurna*, is a good tree for formal landscapes. A medium-sized tree (40 to 50 feet), it can be used effectively in lawns and as a street tree. Its short trunk and branching pattern,

American hazelnut makes an extremely attractive landscape plant. This handsome specimen is growing along a brick path outside the Arboretum's Sterling Morton Library.

with bottom branches touching the ground, give it the appearance of a very large shrub.

Sources of hazel

Groups or organizations interested in planting hazels can purchase seedlings or older plants from local tree nurseries. Until now some nurseries have not grown hazel to any great extent because of low demand due to lack of recognition and popularity. The Illinois Department of Conservation tree nursery in Mason County, Illinois propagates and sells native Illinois hazel. American hazelnut will be one of the featured plants available through the Members' Cooperative Research program at the Arboretum in spring, 1995.

SUGGESTED READING LIST

Axelród, A.N. and F.D. Irving. 1978. Some effects of prescribed fire at Cedar Creek Natural History Area. *Journal of the Minnesota Academy of Science*. 44(2):9-11.

Bebb, M.S. 1860. The flora of Ogle and Winnebago Counties., Ill. *The Prairie Farmer*. 22(6):182-183.

Bowles, M.. and J. McBride. 1993. Preliminary report on the reintroduction of hazel (Corylus americana) to Fermilab and The Morton Arboretum. Unpublished report by The Morton Arboretum.

Gerhard, F. 1857. *Illinois as it is*. Chicago: Keen and Lee. Philadelphia: Charles Desilver.

Gleason, H.A. 1922. The vegetational history of the Middle West. *Annals of the Association of American Geographers* 12:39-85.

Mitchell, S.A. 1837. *Illinois in 1837; a sketch...together with a letter on cultivation of the prairies by the Hon. H.L. Ellsworth....* Philadelphia: S. Augustus Miller and Griggs & Elliot.

Short, C.W. 1845. Observations on the botany of Illinois, more especially in reference to the autumnal flora of the prairies. *The Western Journal of Botany.*

Stearns, F.W. 1974. Hazels *in* J.D. Gill and W.M. Healy, eds. *Shrubs and vines for northeastern wildlife.* USDA Forest Service Northeastern Experiment Station General Technical Report, NE-9, pp. 65-70.

Tehon, L.R. 1942. Fieldbook of native Illinois shrubs. Illinois Natural History Survey *Manual No. 3*. Urbana.

Whelan, C.J. and M.L. Dilger. 1992 Invasive, exotic shrubs: a paradox for natural area managers. *Natural Areas Journal*. 129(12):109-110.