

Background on Cultivated Hazelnuts in the Upper Midwest



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UNIVERSITY OF MINNESOTA

Driven to DiscoverSM

Hybrid Hazelnuts

Corylus avellana

European hazelnut

- Basis of nut industry
- Bred for high yield
- Not hardy in MN & WI
- Highly susceptible to Eastern Filbert Blight

x

Corylus americana* and/or *Corylus cornuta

American
hazelnut

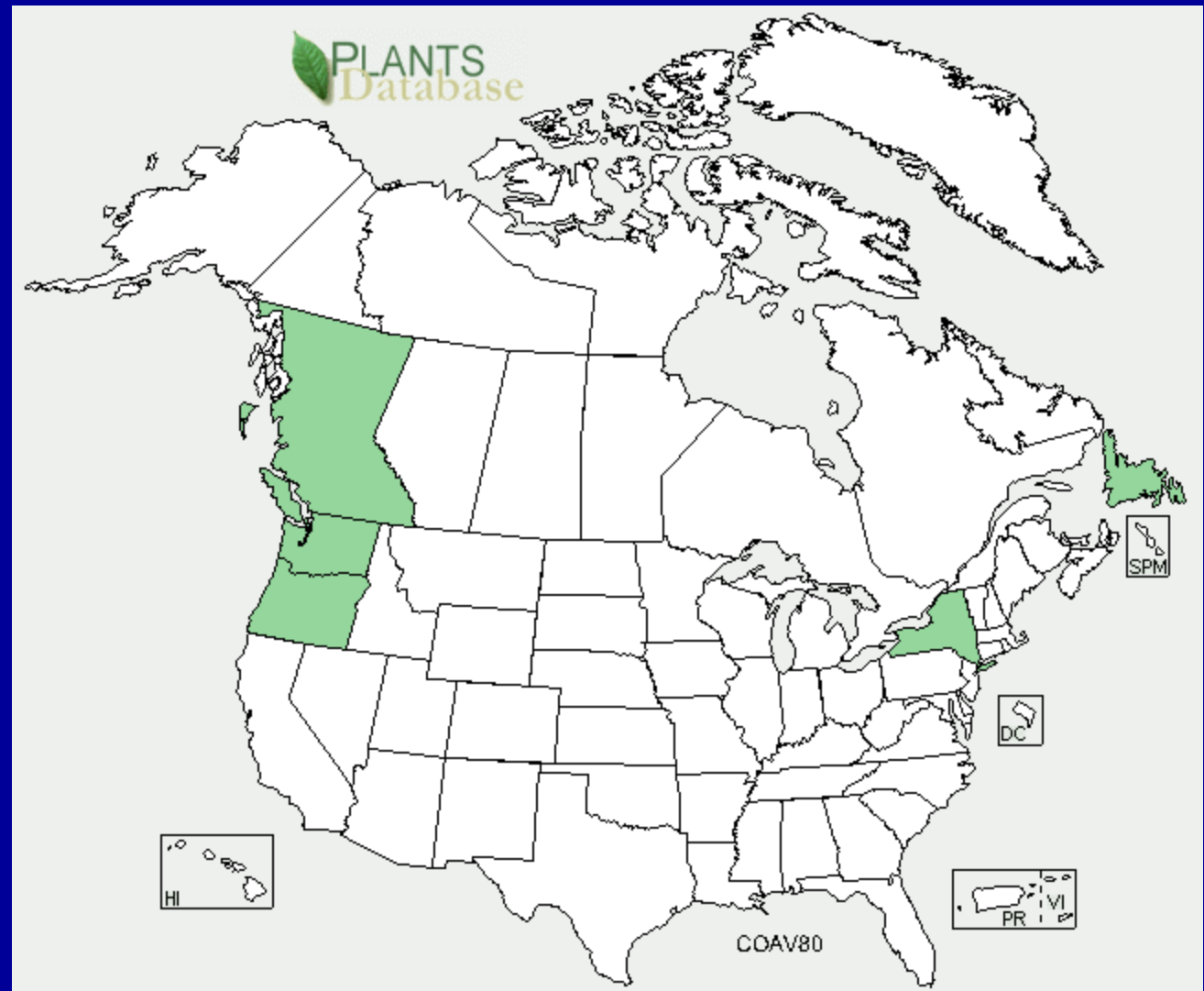
beaked
hazelnut

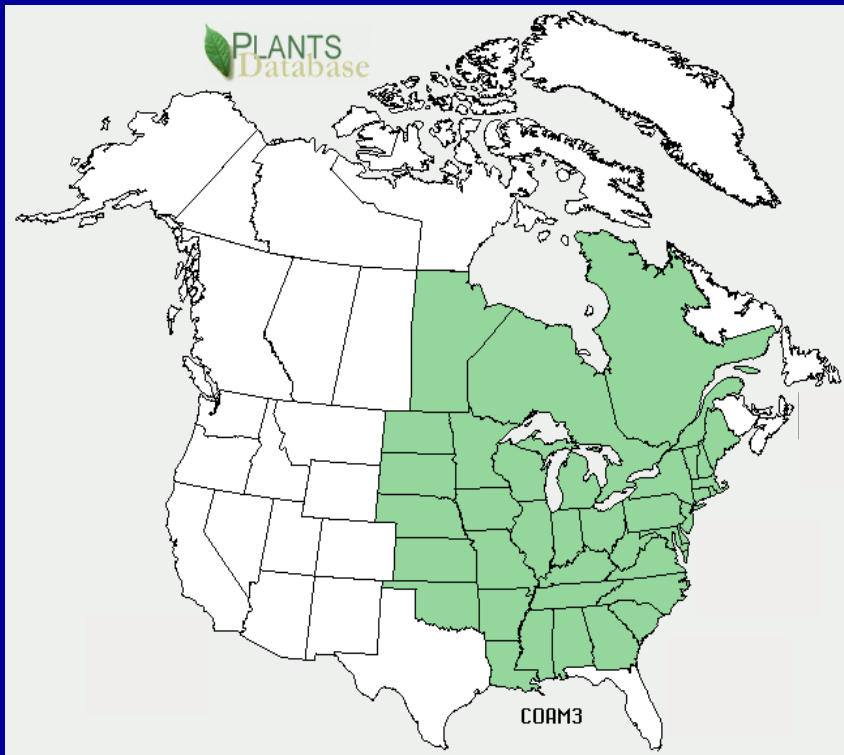
- Widely distributed in wild
- Inconsistent nut yield
- Hardy in MN & WI
- Resistant to Eastern Filbert Blight

Farris, 2000

Distribution of *Corylus avellana* in North America

European hazelnut, called “filbert” in the older literature.

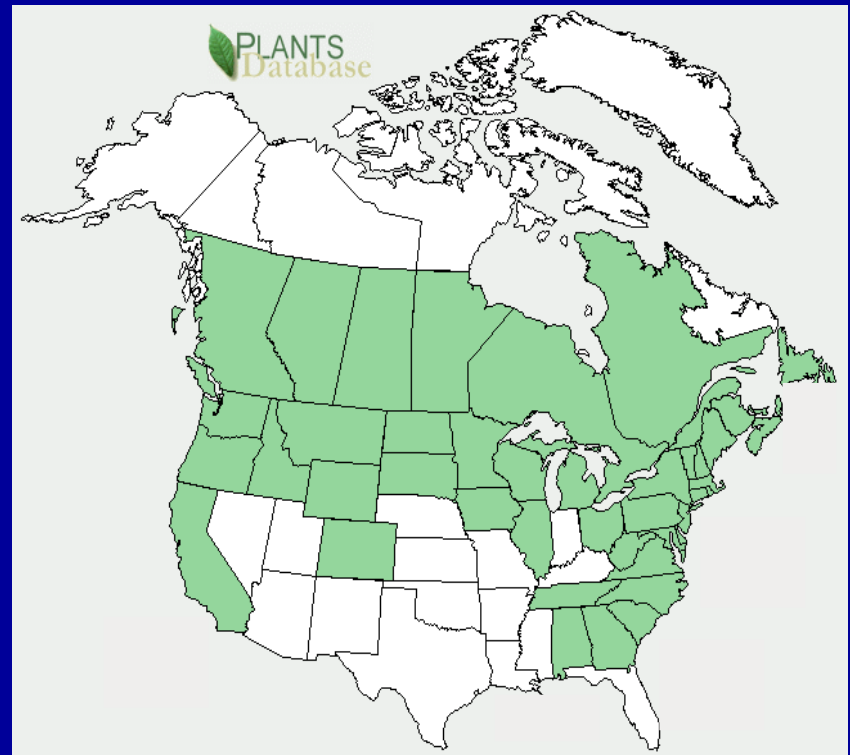




Corylus americana

American hazelnut

Found in more open woods, such as oak savannah.



Corylus cornuta

Beaked hazelnut

Found in denser woodlands, associated with aspen and pine.



American,
C. americana

UGA0008207



European
C. avellana



American,
C. americana



Beaked,
C. cornuta

USFS

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Initial Crosses in 1910s and '20s

- J.F. Jones (Lancaster, PA)
- S.H. Graham (Ithaca, NY)
- William Bixby (New York City)
- C.A. Reed (USDA in Beltsville, MD)
- G. Slate (NY State Ag Expt Stn, in Geneva, NY)
 - *C. avellana* x *C. americana* hybrids.
 - Several varieties of *C. avellana* were used as pollen parent.
 - *C. americana* parent was “Rush”, reputedly a seedling variety of *C. americana*, but some think it was itself a hybrid.
 - Rush is highly susceptible to Big Bud Mite (BBM).

1920's

J.U. Gellatly
(Westbank, British Columbia)

C. avellana x *C. cornuta* hybrids called "Filazels".

- Extremely cold hardy
- Ripened much earlier than *C. avellana*.
- Highly resistant to EFB.
- Highly susceptible to BBM.

Carl Weschcke, River Falls, WI

“Growing Nuts in the North”, 1953

1921-1932: Purchased a total of 226 seedlings of various European, American, and hybrid hazelnuts from these other breeders. Almost all were eventually either winter-killed or killed by EFB. Even some pure *C. americana* “Winkler” from Iowa were winter-killed.

But before they died...

Carl Weschcke

- 1934:** Pollinated an “unusually fine” (large nuts) wild hazel growing in the woods on his farm with pollen from a Gellatly “filbert” (implies pure *C. avellana*). Got 4 seedlings he called “Hazilberts”.
- 1940:** Pollinated the Hazilberts with a mix of pollen from surviving Winklers, European hazels and Jones hybrids.
- 1942-1945:** Pollinated another 4 wild hazels from his woods, chosen for early maturity and thin shells.

Carl Weschcke

1945: Had 2000 hazels on farm, of which he kept detailed records on 650 for five years.

- Best yields equivalent to 2 tons/acre (shelled or in-shell?)

Characteristics of Hazilberts were highly variable, but in general:

- Bush growth form, like *C. americana*.
- Involucre covers the nut, like *C. americana*.
- Smaller nuts with thicker shells than Europeans.
- Kernels mostly free of pellicles, with good flavor.
- Trade-off between thin shells and nut yield.

1960's

Cecil Farris (Perry Michigan)

Crossed Faroka (from Gellatly) with Royal
(a European) → Grand Traverse

- Selected for large nut size
- Grand Traverse was initially EFB resistant, but no longer is so.
- Farris wrote the book “The Hazel Tree”, (2000) which is available from the Northern Nut Growers Association.

Phil and Mary Rutter

Badgersett Research Corporation

1981: Collected seeds from Weschcke's farm and planted them at Badgersett Farm, in SE Minnesota.

Also plants from Slate, Gellatly, and Farris.

1991: Mary Rutter reported to NNGA:

Compared to Rush hazels, the progeny of these Weschcke hybrids had:

- Much lower incidence of EFB
- Much smaller EFB pustules
- Much lower mortality due to EFB.

Eastern Filbert Blight (EFB)

Anisogramma anomala



Photo: Tom Molnar

Opinions Regarding EFB Resistance in *C. americana*

- Fuller (1910): “from a very careful search, I have not been able to find any clumps of these bushes of any considerable size that was entirely free of pustulous stems.”
- Weschcke (1954): “One salient feature which definitely separates the species *C. americana* from others of its genus is its resistance to hazel blight, a native fungus disease of which it is the host. *C. americana*, through long association, has become comparatively immune to its effects and quickly walls off infected areas while filbert plants (*C. avellana*) are soon killed by contact with it. Hybrids between filberts and hazels will usually be found to retain some of the resistance of the hazel parent.”

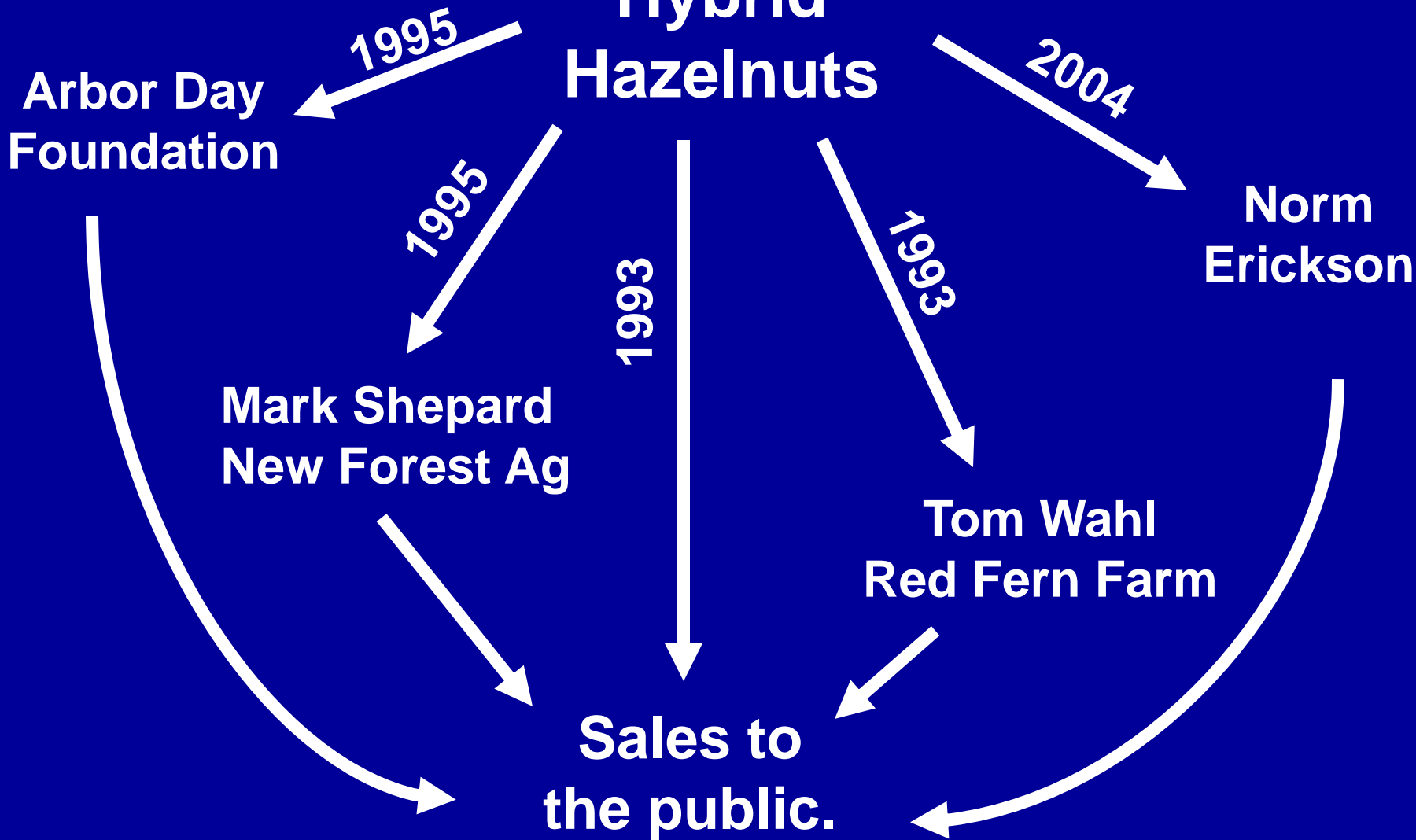
Mary Rutter attributed high EFB resistance in Weschcke hazels to:

1. More *C. americana* in genetic mix, deduced from their morphological traits.
2. Extremely stringent selection for resistance: “Be resistant or die!”
3. Better adaptation to winter conditions
→ less winter injury less likely to leave the vulnerable to springtime infection by EFB. (I question this one.)

Weschcke/Badgersett

Hybrid

Hazelnuts



Other Sources of Hybrid Hazelnuts

	Nut Quality	Yields	Winter Hardiness <u>here</u>	EFB Resistance
Grimo Nut Nurseries, Niagara on the Lake, ON	Beautiful large nuts	?	Appear to be.	Skidders, Winklers, Heterophylla are not. Slate appears to be.
St. Lawrence Nurseries, Potsdam, NY	Beautiful large nuts	?	Appear to be.	?
Grinnell Nut Nurseries, Perry, MI (retired)	?	?	?	Grafted Grand Traverse was initially but no longer.