



Hybrid Hazelnut Consortium Update

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Hybrid Hazelnut Consortium

- Arbor Day Foundation
- Oregon State University (OSU)
- Rutgers University
- Nebraska Forest Service (NFS)
- Started in 2008
- Develop EFB resistant, cold hardy plants

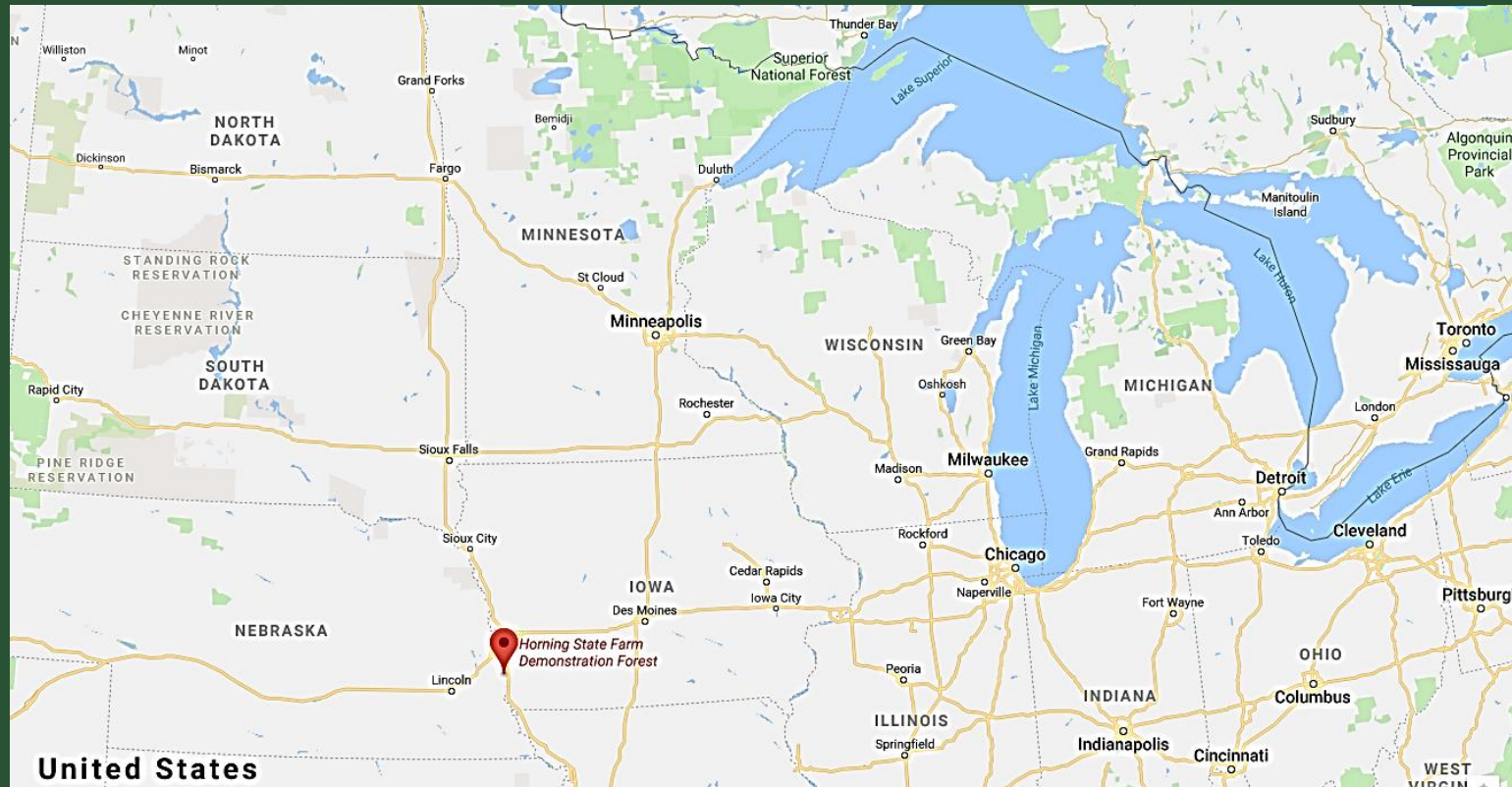


Hybrid Hazelnut Consortium

- Crosses made at OSU and Rutgers
- NFS propagates and screens in our test plots
- EFB resistance
- Cold hardiness
- Insect pests
- Yield and quality
- Flowering and other phenotypic data



Horning State Farm in Plattsmouth, NE



Horning State Farm Demonstration Forest

Seedling Screening and Planting

Fall 2019

- Evaluated 896 plants for EFB, yield and nut characteristics
- Selected 54 plants for further evaluation

- Planted 1,635 new seedlings
- These represent 10 new F2 hybrid progenies from OSU



15.035

- 1.0g avg kernel wt.
- 46% kernel



81.054

- 1.0g avg kernel wt.
- 41% kernel



A2.035

- 0.7g avg kernel wt.
- 48% kernel
- Thin Shell



Other Testing

- Identifying good pollenizer plants
 - 'Potomac' and 'Gassaway' may have potential
- New layers from Rutgers
 - 30 selections
 - F1 hybrid progenies from 2012
 - Plant in Spring 2020
 - Testing cold hardiness, yield and flowering timing



Other Testing

- Joint Performance Trial at Horning Farm
 - Four selections from UMHDI in 2019: Price W41, SpC-2D5, Rose 9-2 & Arb 7-1
 - Observed dieback, but most survived
 - Alongside 'Grand Traverse' and OSU541.147 'The Beast'
 - Additional plants for 2020 – Arb 4-3, GunthGF, ShepRosy



Regional Cultivar Trials

- Distributed 'Grand Traverse' and 'The Beast' to 7 states in Spring of 2017 and Spring 2018
- NE, IA, MO, MN, WI, SD and KS
- The IA, MN and WI sites are being looked after by members of the Upper Midwest Hazelnut Development Initiative
- Both Genotypes survived the severe cold in MN & WI in 2019 with some minor dieback in Bayfield, WI
- NE sites are mostly people from NE Nut Growers Association



Even More Regional Trials!

- Awarded USDA Specialty Cop Block Grant for 2019-22
- \$10,997 to set up more tests in NE, KS, CO, MO, OK, TN, AL, WV, & NY
- Brings total states involved to 13
- Study parameters
 - Survival, Yield, and Flowering timing
- Provide further testing for production system utilizing expertise of cooperating farmers.



Current Clonal Plant Material

- 'Grand Traverse'
- OSU 541.147 'The Beast'
- NADF 10-50 – Eventually?



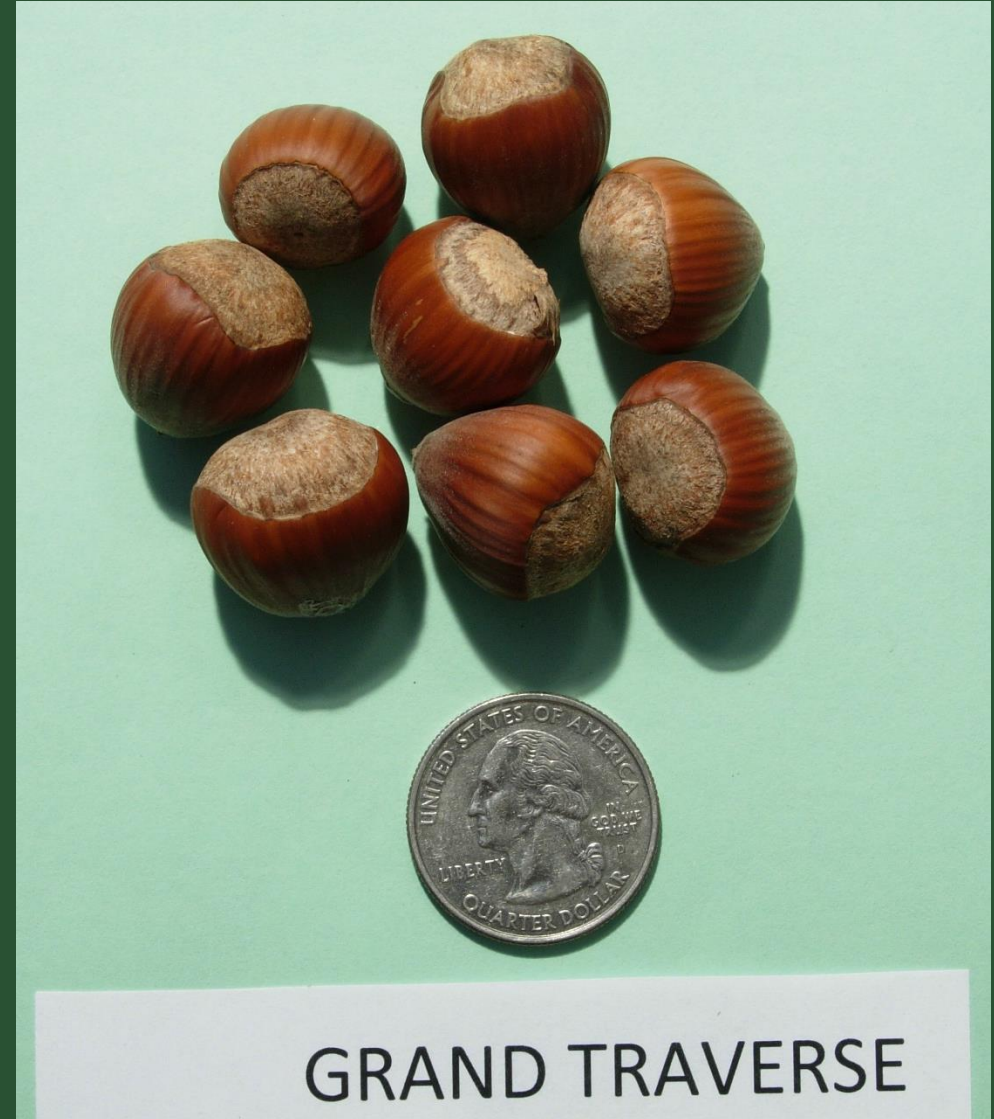
'Grand Traverse'

- Developed by Cecil Farris
- 75% *C. avellana*, 25% *C. colurna*
- EFB resistant and cold hardy in Nebraska which is Zone 5
- Already in public domain, so no patent protection needed



'Grand Traverse'

- 11lbs per tree avg.
- Avg. kernel wt. of 1.3g
- 40% kernel
- Arbor Day Foundation and Great Plains Nursery in fall 2020



OSU 541.147 'The Beast'

- 75% *C. avellana*, 25% *C. americana*
- EFB resistance from *C. americana* 'Rush'
 - OSU 541.147 = NY 110 x Avellana Mix 1990, and S-alleles tell us the pollen parent is OSU 226.118
 - NY 110 = *C. americana* Rush x DuChilly (Sathuvalli et al. 2012)
 - NY 110 is from George Slate's work in Geneva, NY.
 - OSU 226.118 = Tombul Ghiaghli x OSU 42.103
 - OSU 42.103 = Montebello x Compton



OSU 541.147 'The Beast'

- At 6 years old it was producing around 17lbs of nuts
- 43% kernel
- Plant patent in works
- Available from Arbor Day and Great Plains Nursery fall 2020





NADF 10-50

- *C. americana* x *C. avellana* hybrid from Arbor Day plot in Nebraska City.
- Seedling purchased from Badgersett Research Corp.
- Avg. kernel wt. of 1.0g
- 39% kernel
- 10-year avg. yield was 5.71lbs



NADF 10-50

- Tissue cultures in lab at UNL, but they are growing very slowly
- Sent to a propagator in Oregon to increase numbers
- Goal is expanded yield testing and eventual patent.



Plan for Nebraska Growers

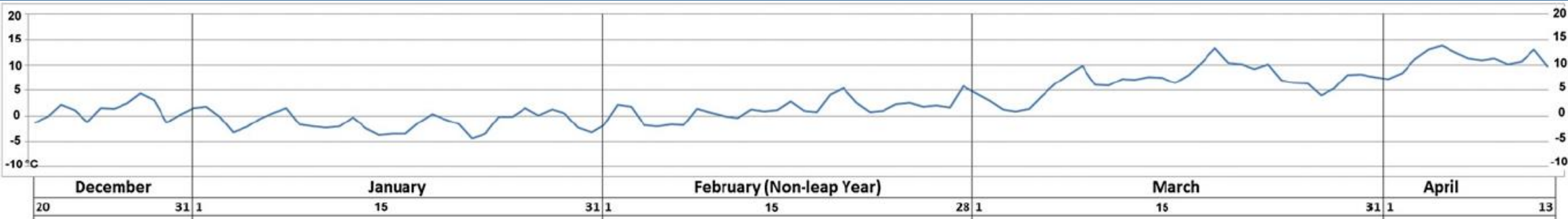
- Target acreage owners and small farm families for farmer's market
- Start with smaller plots at acreages and marginal areas of crop lands
- Selling nuts at local farmer's markets and grocery stores
- Potential for use in biodiesel and feed



Plan for Nebraska Growers

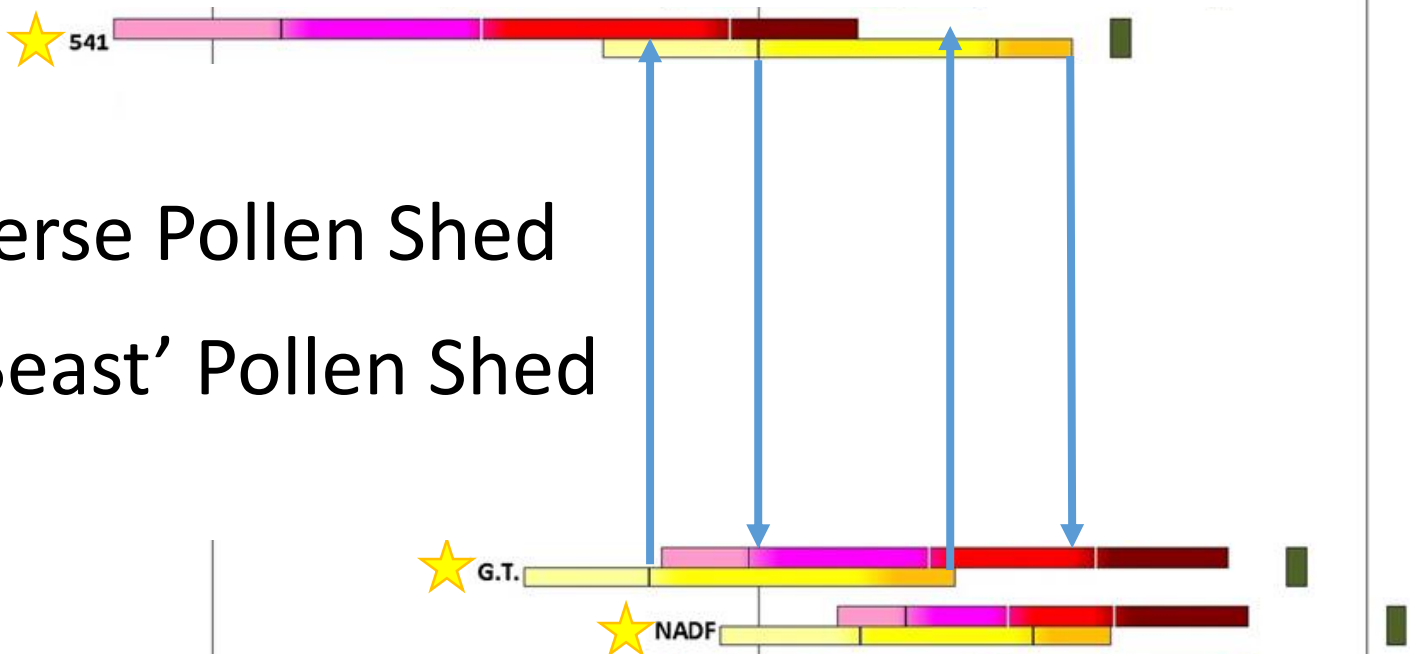
- Combine 'Grand Traverse', 'The Beast' and in an orchard to provide pollen for each other
- Will need to include some seedlings to improve pollen spread until better pollenizers identified
- Farmers plant larger plots (>1 acre) as production methods and processing infrastructure develops

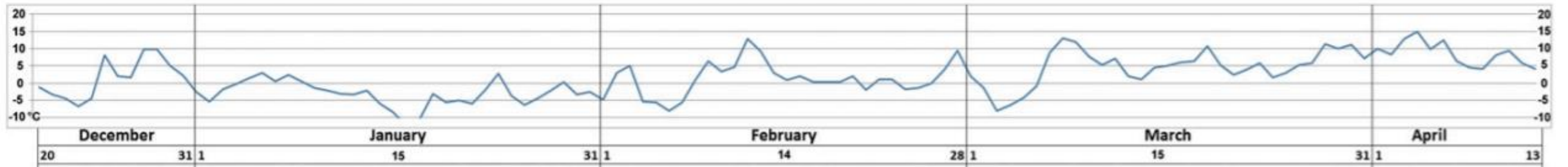




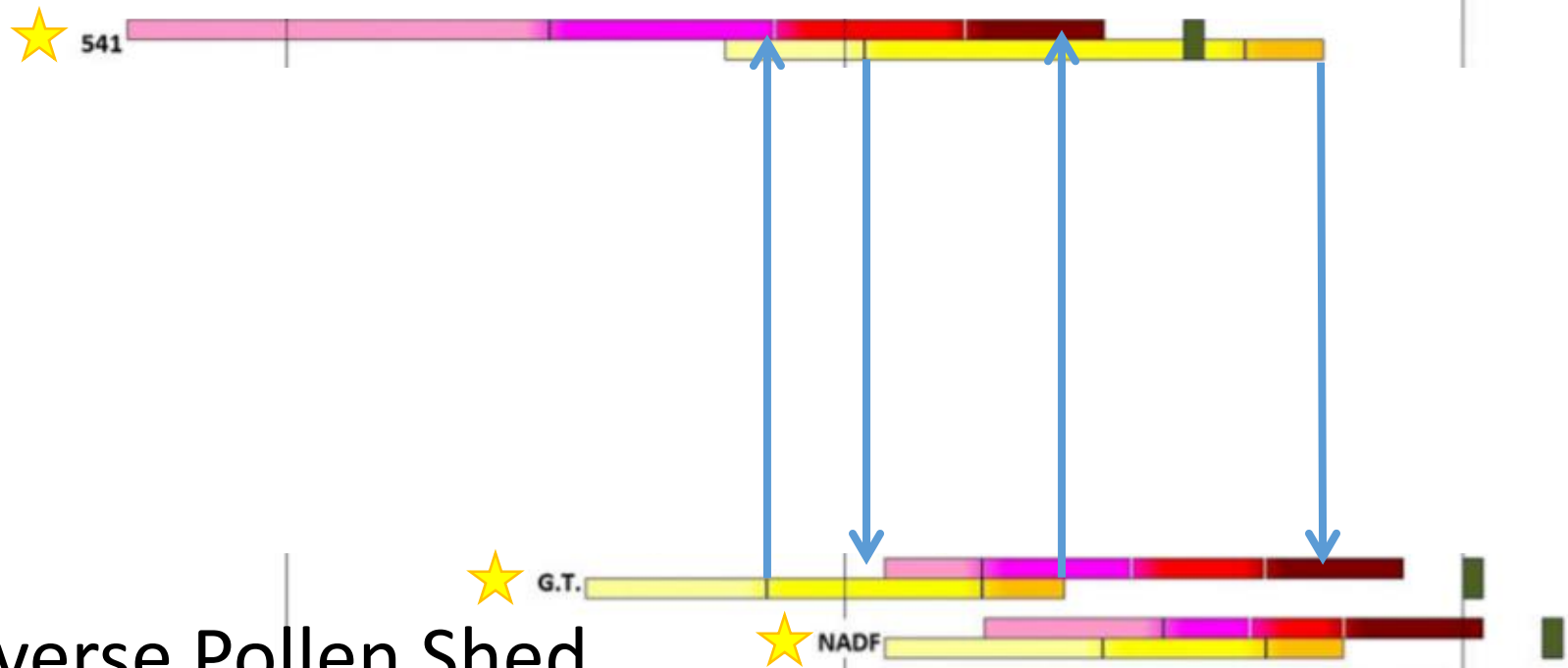
Gran Traverse Pollen Shed

541 'The Beast' Pollen Shed





541 'The Beast' Pollen Shed



Gran Traverse Pollen Shed

1/2 Acre Test Plot Design

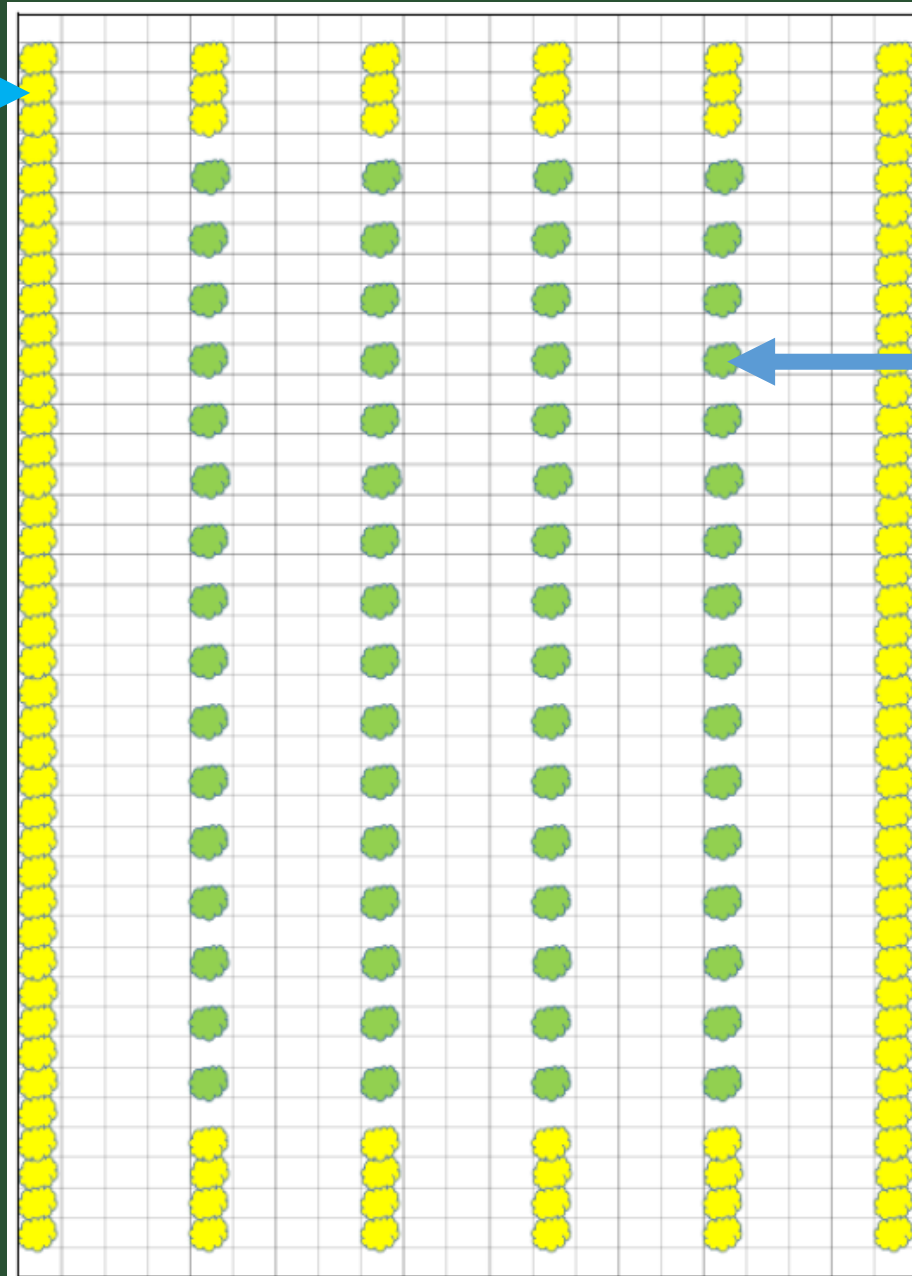
100 seedling
pollenizers in
border rows 5'
apart.



Provide plenty of
pollen.

20' between rows.

Image Courtesy Thomas J. Molnar,
Ph.D., Rutgers University

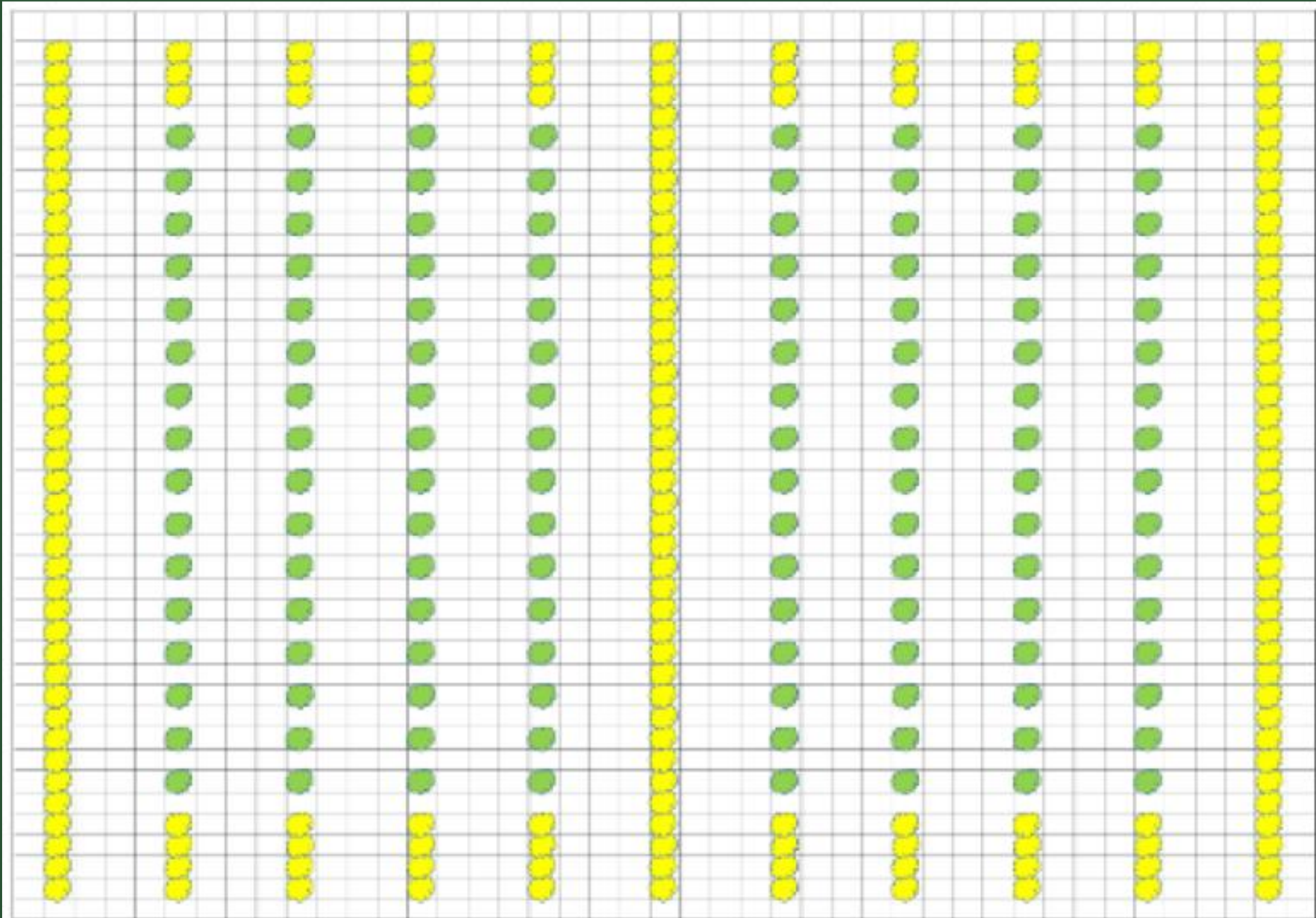


64 Clonal nut-
producing cultivars in
alternating rows.

16 plants per row,
spaced 10' apart.

In our case, this will be
'Grand Traverse' and
OSU 541.147 'The
Beast'.

1 Acre Test Plot Design



Expansion to Prairie Pines



Expansion to Prairie Pines



More Information:

- **Hybrid Hazelnut Consortium**

<https://www.arborday.org/programs/hazelnuts/consortium/>

<https://www.facebook.com/hybridhazelnutconsortium/>

- **Nebraska Forest Service**

<https://nfs.unl.edu/hybrid-hazelnut-consortium>

<https://www.facebook.com/nebraskaforest/>



Questions?

