

STATUS OF CLONING AMERICAN HAZELNUTS FOR COMMERCIAL PRODUCTION

-Focus on micropropagation-

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Emeritus Professor**

- **Research advisor with Knight Hollow Nursery, Inc. (KHN)**
 - **Concentrate on new products**

BACKGROUND

- **KHN has been in woody crop cloning business for 4 decades**
 - **The experience with many other woody perennial crops has helped guide how to propagate American and hybrid hazelnut**



‘MICROCULTURE’

- **Generally 4 major steps needed**
 - **Isolation- plant to sterile culture**
 - **Stabilization- continuous shoot growth**
 - **Production- multiplication of vigorous shoots**
 - **Propagule establishment- rooting and acclimation**

KHN CULTURE ROOM



KHN microplants rooting and acclimating



HAZELNUT CLONING AT KHN

-Focus on micropropagation-

Outline:

-How easy is hazelnut to micropropagate?

-Where are we now?

-The present and future availability of selected Midwest consortium clones

HAZELNUT CLONING AT KHN

-Focus on micropropagation-

-How easy is hazelnut to micropropagate?

-It has NOT been easy

-Obstacles

- Getting responsive material to put into microculture
- Long stabilization times
- Keeping growth continuous and vigorous
- Consistent rooting/acclimation

Another issue:

-Working with many *diverse* selections

SPECIES (10)

SPR 774

SPR 778

MDR 688

CAS 665

CAS 669

PAL 708

MDR 677

PAR 739

NAM 553

NAM 255

HYBRIDS (18)

Arb4-3

Arb7-1

Arb7-21

Cuddy2-28

Eric4-21

Eric5-13

Gibs5-15

Gibs6-23

GunthPC

HeasB

Minar342

PriceW41

Rose9-2

Rose18-10

SPC 2D5

StapN2-7

StapN7-6

ShepRosy

HAZELNUT CLONING AT KHN

-Focus on micropropagation-

-Where are we now?

-Obstacles

- Getting responsive material to put into microculture
 - Difficult but **solved**
- Long stabilization times
 - Have to **tolerate**
- Keeping growth continuous and vigorous
 - Difficult but **solved**
- Consistent rooting/acclimation
 - **Solved**

-Conclusion:

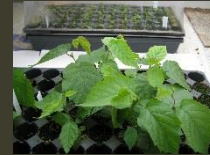
-Micropropagation successful, but **SLOW**

HOW WOULD YOU USE THIS PROCESS?

Micropropagation (cloning) of selected plants



Rooted/acclimated microplants



HOW USE THIS PROCESS?

Micropropagation (cloning) of selected plants



Rooted/acclimated microplants



Plugs

(via layers?)

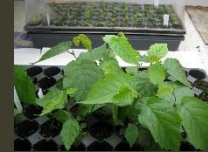


Field planting

HOW USE THIS PROCESS?

Micropropagation (cloning) of selected plants

↓
Rooted/acclimated microplants



↓
Plugs

↓
Liners



↙ (via layers?)

↓ (via layers?)

Field planting

Field planting

Micropropagation (cloning) of selected plants

Rooted/acclimated microplants



Plugs

Liners



Plugs or liners

(via layers?)

(via layers?)

Field planting

Field planting

Field-grown plant

(via layers?)

Field planting





Pros/cons of each propagule type



'Plugs'

- Cheapest
- Needs most initial field care
- Greatest numbers early



Liners

- Easiest field planting/care
- Moderate initial cost



Bareroot plants

- Most complex field planting
- Most costly initially
- Assured survival
- Earliest harvest

JASON'S AND LOIS'S DIRTY DOZEN

<u>Selection</u>	IN MICRO	2019 PLUGS	2020 LINERS
Rose9-2	X	FALL	
PriceW41	X	FALL (few)	
Minar342	X	FALL	
Rose18-10	X	FALL (few)	
SpC-2D5	X	FALL (few)	
StapN2-7	X	-----	
ShepRosy	(2020)	-----	
Cuddy2-28	X	FALL	
Arb4-3	-----	-----	
Gibs5-15	X	FALL	
Eric4-21	X	FALL	
HandFats	X	FALL	

- **TO BE DETERMINED**
 - COSTS
 - NUMBERS

QUIZ QUESTION

**WHICH U.S. STATE HAS THE
SMALLEST SOFT DRINKS?**



**WHICH U.S. STATE HAS THE
SMALLEST SOFT DRINKS?**



MINISODA.

- Comments/questions