

APPLE GENETICS

IN
THE
21ST

CENTURY



WITH
TODD LITTLE SIEBOLD

JAMIE HANSON

JOHN BUNKER



Why it Matters (John)

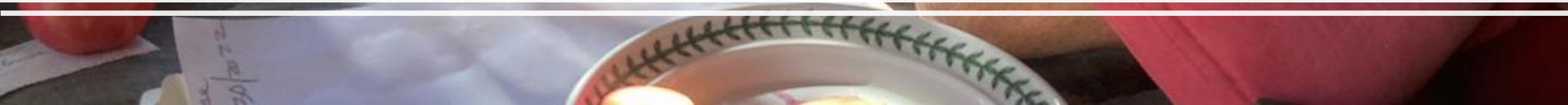




Tracking Down Old Apples – The OG Approach



Identifying
(aka Phenotyping)





THES

York
Lamb

Research



Tracking Down Apples w/ Genomics (Todd)



How We Came to Do Genetic Testing



A New Colleague

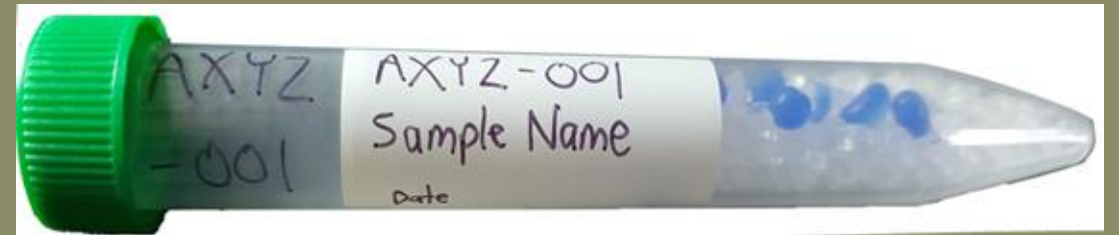
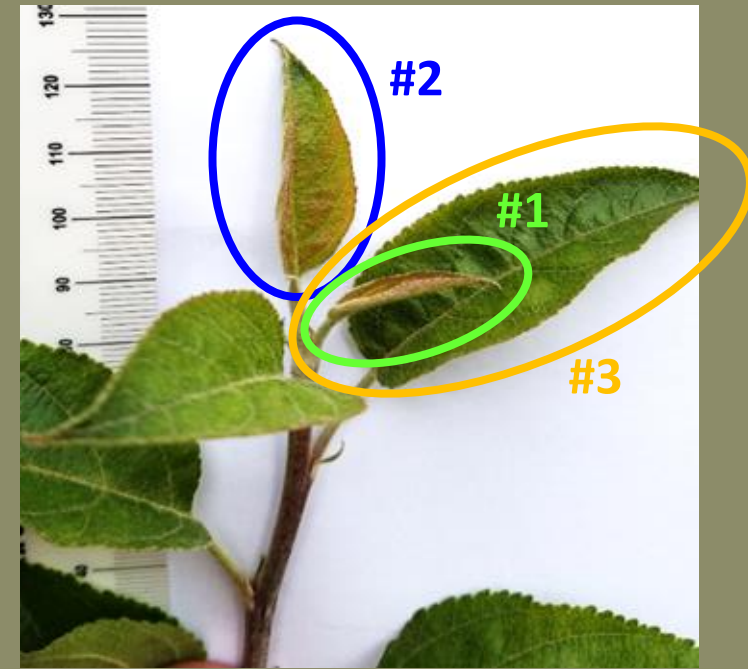
Geneticists need historians to:

- Reconstruct the family tree of apples and
- Verify identities based on historical research



How It Works

- Identify a significant tree
- Is it grafted/cultivated?
- Collect leaf samples
- Send it off to WSU
- DNA Extracted
- Genetic Fingerprint
- Compared to an Int'l Database
- Identity or Unique



Drap d'or

113

What We've Learned (Todd)

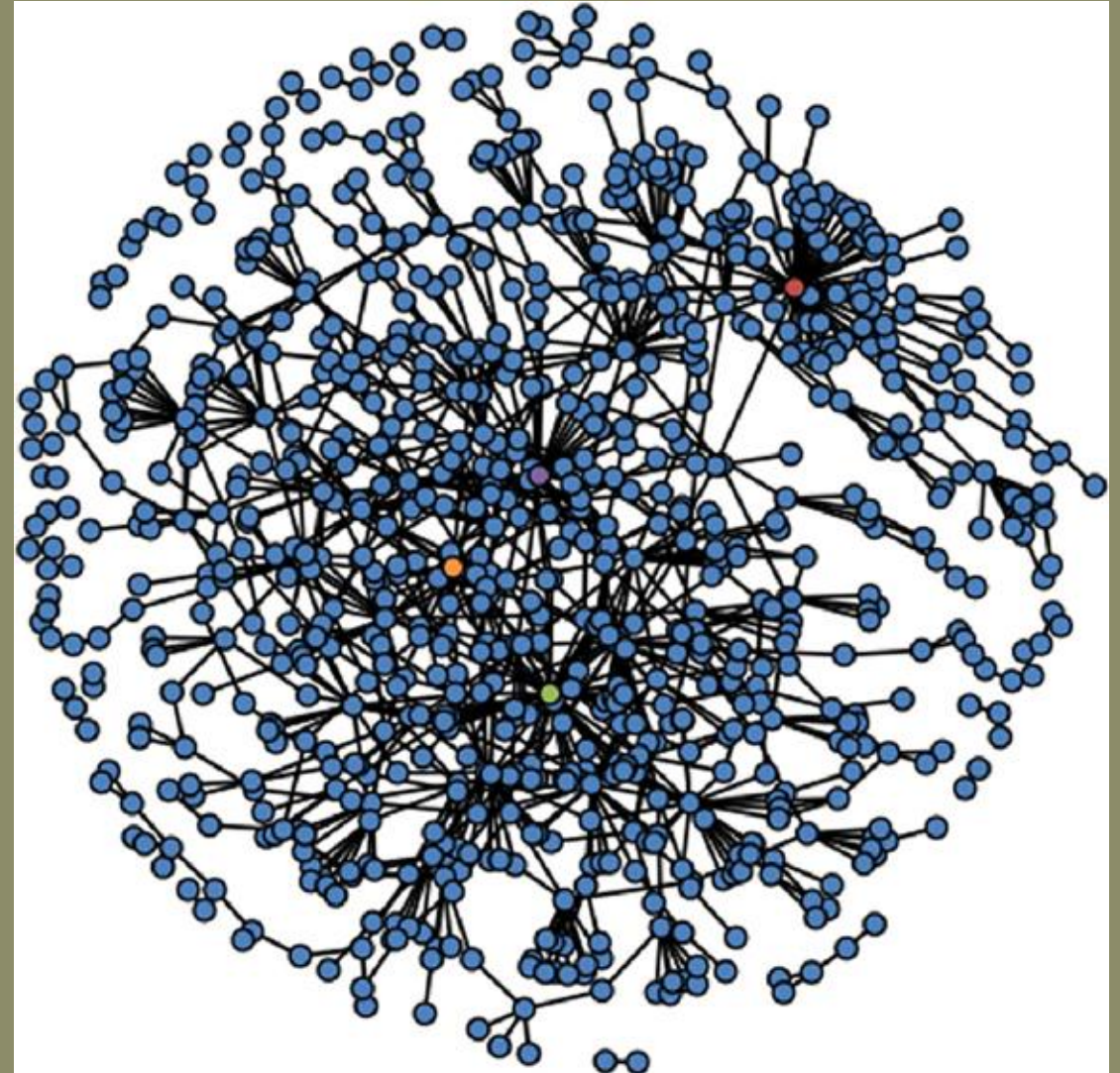
Les Grand-mères

- Reinette Franche
- Drap d'or De Bretagne
- Reinette de Hollande
- Reinette de Carmes
- Calville Rouge



Network of Relationships

- Muranty et al have done amazing work mapping the relationships among apples
- You can see the founders of major lineages
- Red is Reinette Frenche



Reinette Franche

Le gran-mere

She is in the lineage of *many* American apples.

Baldwin (c. 1740, MA)

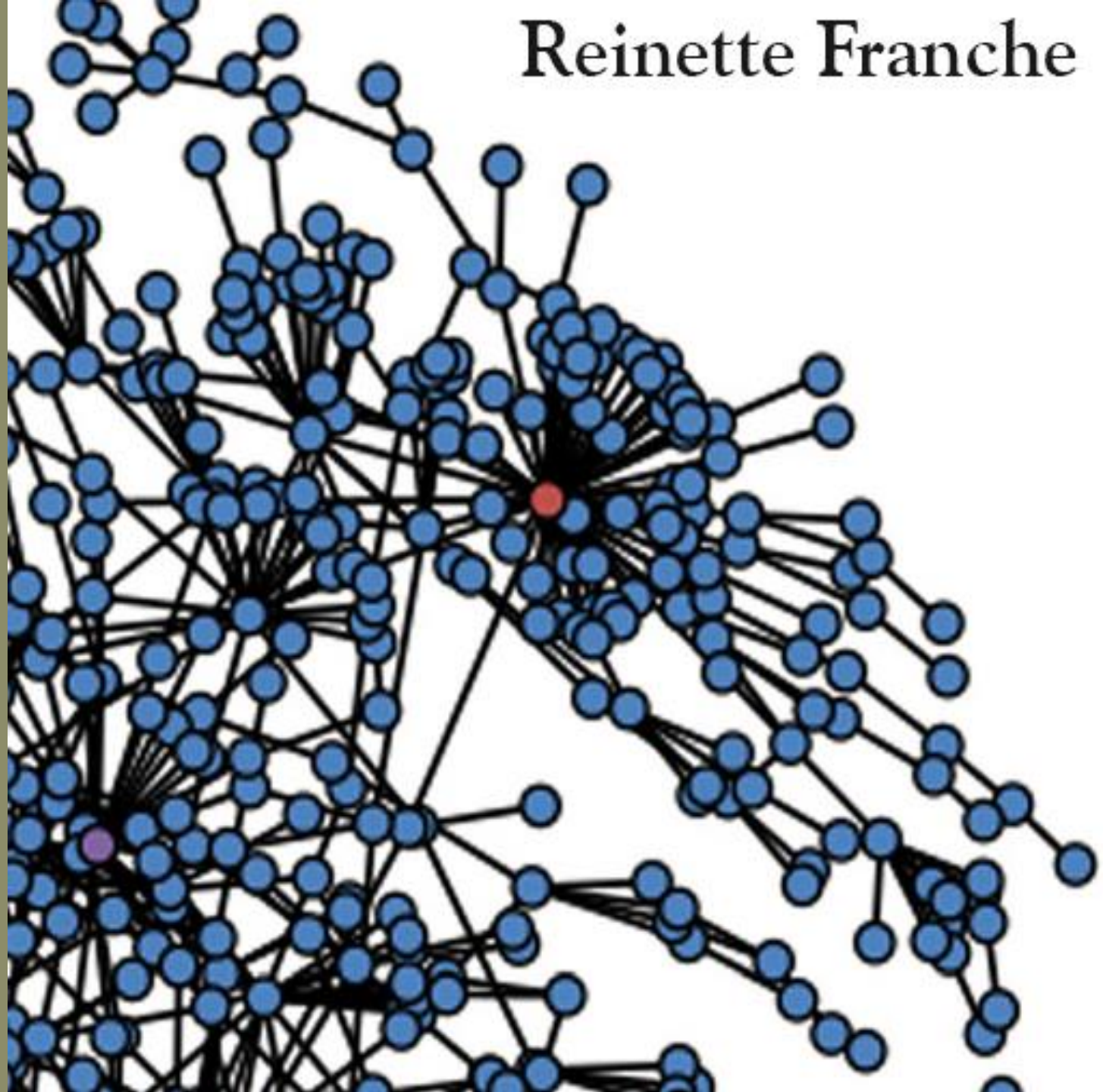
Rhode Island Greening

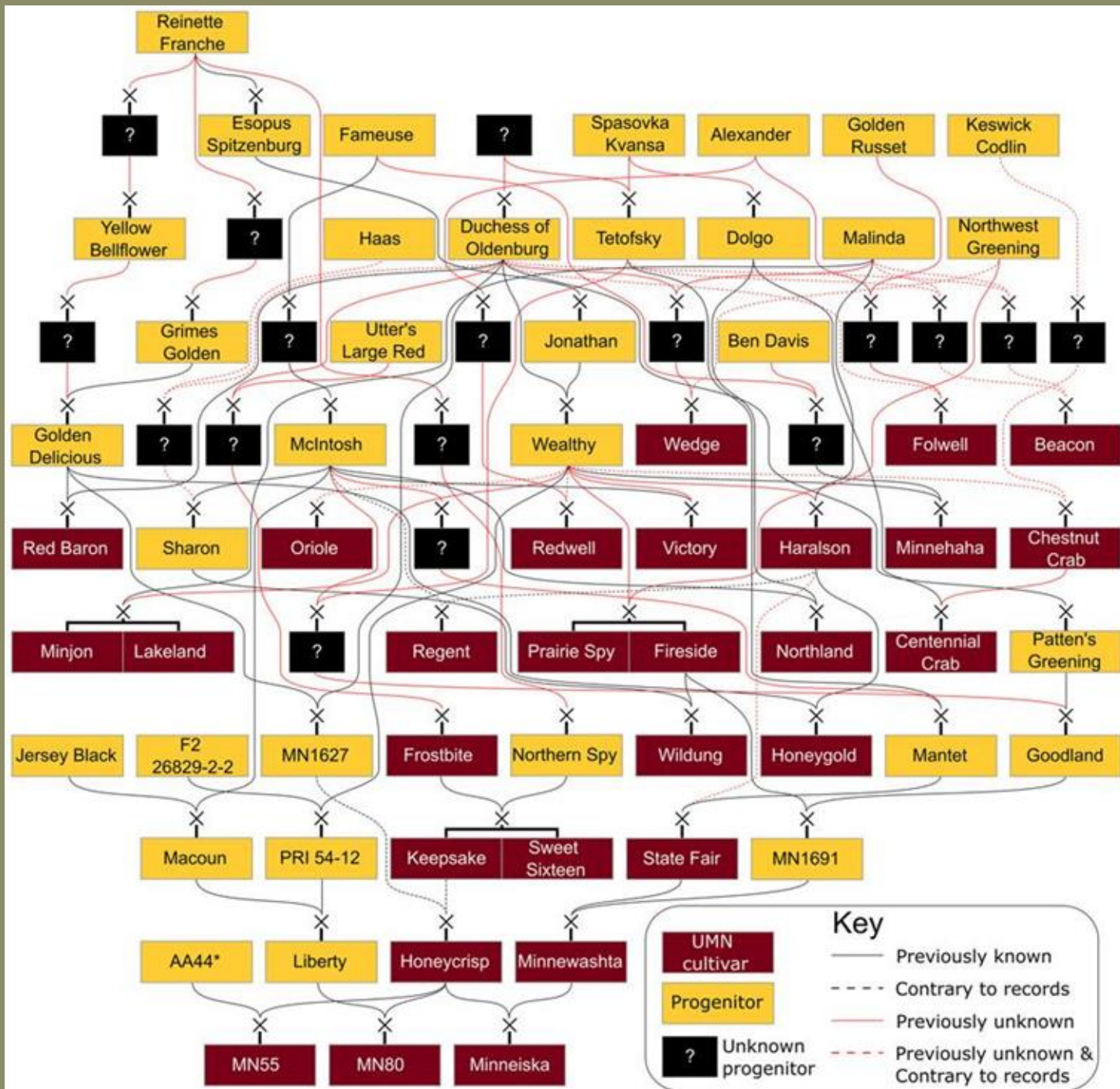
Roxbury Russet (c. 1640, MA)

Canada Reinette (Canada? Before 1770)

Esopus Spitzenberg (Before 1771, NY)

Blue Pearmain





Reinette Franche

?

Esopus Spitzenburg

Fameuse

?

Spasovka Kvansa

Alexander

Golden Russet

Keswick Codlin

Yellow Bellflower

?

Haas

Duchess of Oldenburg

Tetofsky

Dolgo

Malinda

Northwest Greening

?

Grimes Golden

?

Utter's Large Red

?

Jonathan

?

Ben Davis

?

?

?

?

Golden Delicious

?

?

McIntosh

?

Wealthy

Wedge

?

Folwell

Beacon

Red Baron

Sharon

Oriole

?

Redwell

Victory

Haralson

Minnehaha

Chestnut Crab

Minjon

Lakeland

?

Regent

Prairie Spy

Fireside

Northland

Centennial Crab

Patten's Greening

Jersey Black

F2 26829-2-2

MN1627

Frostbite

Northern Spy

Wildung

Honeygold

Mantet

Goodland

Macoun

PRI 54-12

Keepsake

Sweet Sixteen

State Fair

MN1691

AA44*

Liberty

Honeycrisp

Minnewashta

MN55

MN80

Minneiska

Nick



A man with a beard and a cap is looking up at a large tree trunk in a forest. The background shows other trees with some autumn-colored leaves.

Maine Apples of French Ancestry

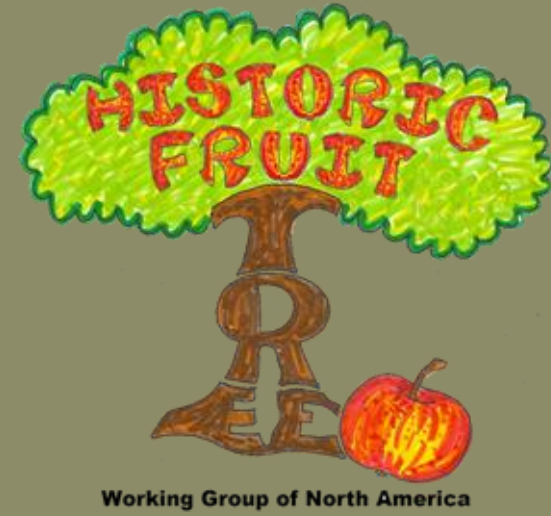
- Cape Jellison East - grandchild
- Cape Jellison West-grandchild
- Windham Russet-grandchild
- Lubec Red Point-grandchild
- Hunt Russet – Reinette de Carmes x UF13
- Golden Russet 2 – Child of UF13
- Twenty Ounce -- Child of UF13
- Bourassa of MHO – Child of UF13
- Golden Ball – Child of UF13
- Hendrick Sweet – Child of UF13
- Gray Pearmain – GC of UF 13

Some Franco-American Apples

- Golden Russet (#2)
- Roxbury Russet
- Esopus Spitzenberg
- Pumpkin Sweet
- Twenty Ounce
- Famuese
- Hunt Russet



Collaboration & Collections



The Preservation Orchards

@ Seed Savers Exchange

Historic Orchard:

- Planted in 1989
- 606 trees

Goldman Orchard:

- Planted in 2015
- 307 trees



****616 unique varieties by name, estimated to be closer to 400-500**



USDA in Geneva, NY

Where did our apples come from?



Public & Private Collections

Old & Abandoned Orchards

Winter Apples
Your choice of N. W. Greening, Malinda, Ben Davis, Gano, Tolman Sweet and Fameuse that are thrice sprayed, hand picked and graded for \$1.25 to \$1.50 per bushel basket.

ORCHARD HILL FARM
LOMEN BROS.

Call any time except Tue. and Thur. *1927* Four and one half miles south east of Decorah

HEALTH'S BEST WAY EAT APPLES EVERY DAY

Apples
We still have some good keepers on hand.

Lomen Bros.
Phone 414J Decorah, Ia.
Nov. 1927

Identifying a Mystery Tree



ASSE-025

Info from Initial DNA Testing in 2023:

- Child of two Unknown American Founders (UAF1 & UAF2)
 - Origin: United States
- Ancestor of trees found in Great Smoky Mountains National Park
 - Present in the North Carolina/Tennessee region prior to 1870 (when existing trees were planted)

Identifying a Mystery Tree



Royal Limbertwig from Horne Creek Farm



ASSE-025 from Seed Savers Exchange



“I tasted the sample John sent and think it is **highly likely to be the same Royal Limbertwig that we have here** and that came from Lee Calhoun's collection. The flavor and texture are similar enough that I could not distinguish it from my own.”

Identifying a Mystery Tree



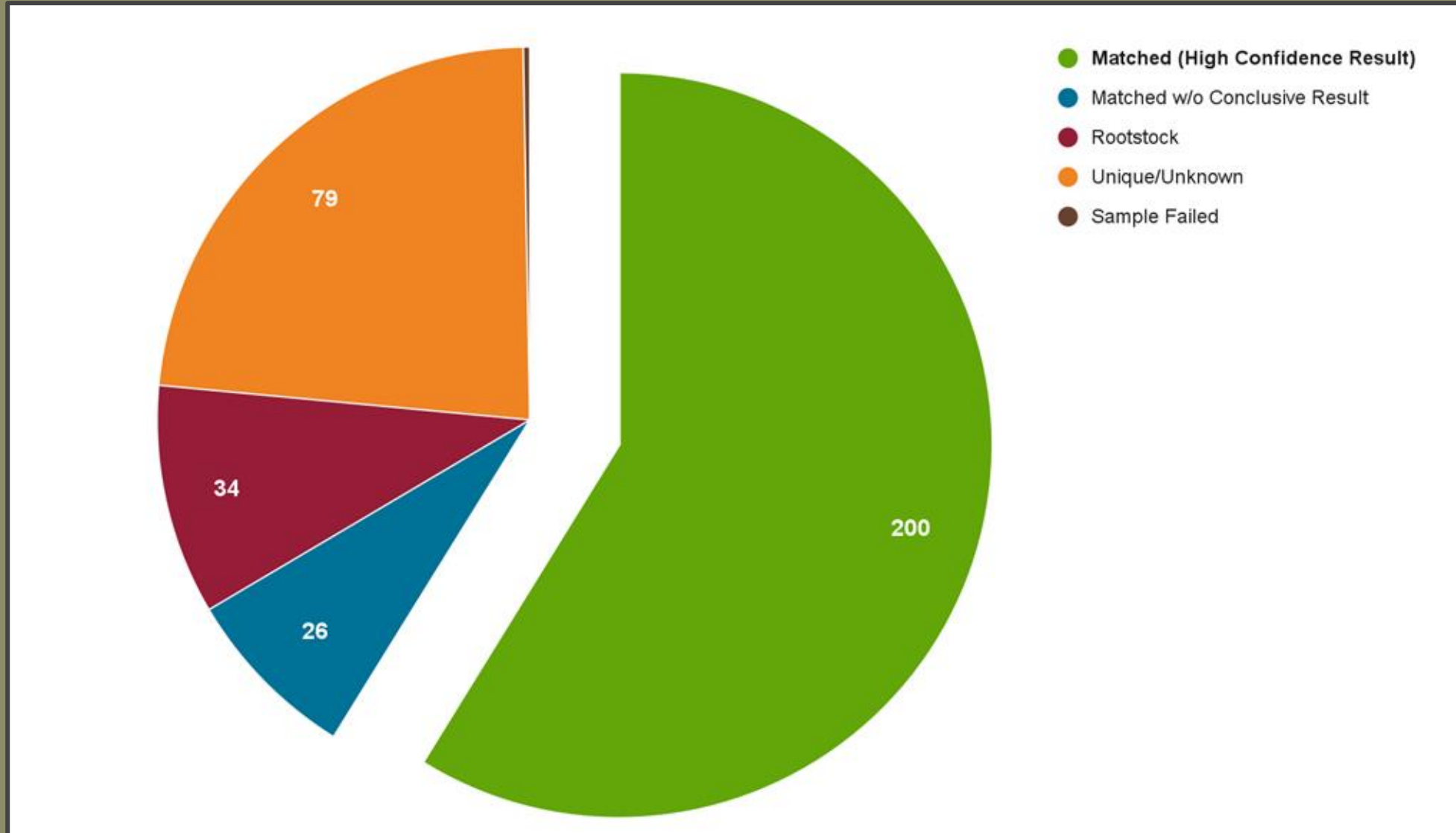
ASSE-025

New Info from DNA Testing in 2024/2025:

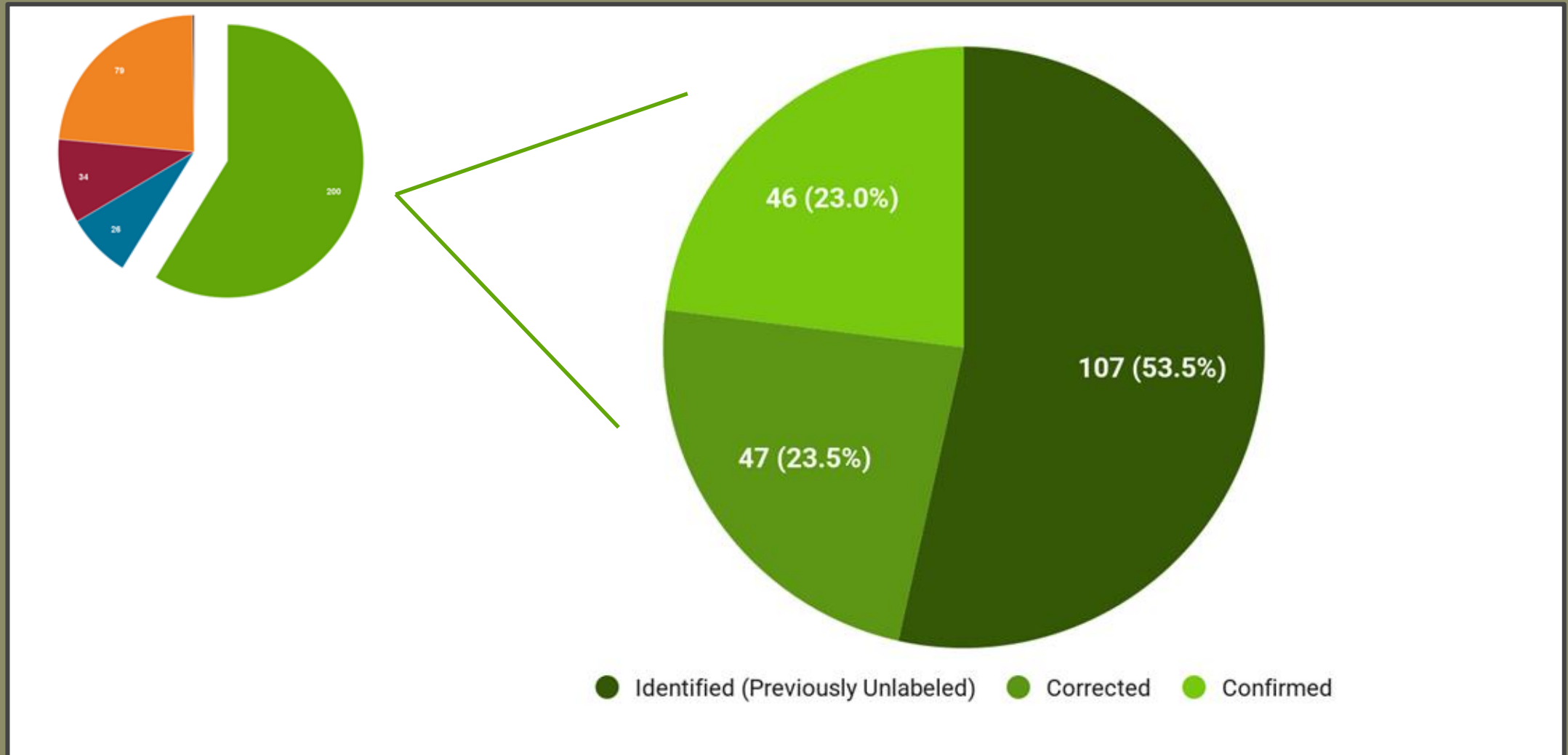
- **Does *not* match** 'Royal Limbertwig' (submitted by Horne Creek Farm)
- **Does match** 'Pittsburg' (submitted by Temperate Orchard Conservancy)

Working theory? ASSE-025 is **neither** 'Royal Limbertwig' nor the true 'Pittsburg'. The tree tested as 'Pittsburg' in 2024 is likely not true-to-type.

Results from 340 Tests



Results from 200 Matches





Cider Apple Mysteries

B2-12

Hewes Crab

8-26-22

Tremlett's and Geneva Tremlett's





Tom Tanner

Old Foxwhelp



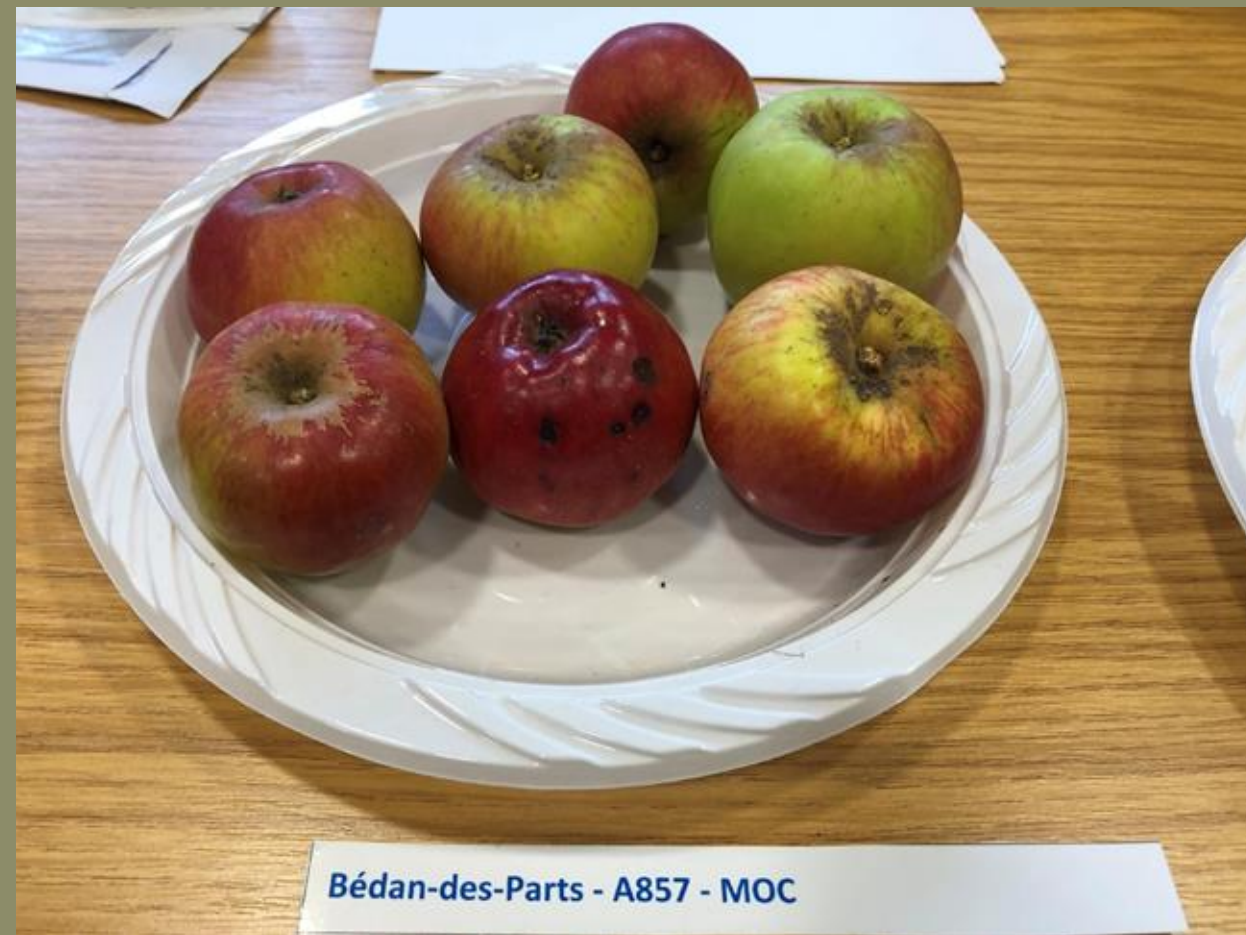
Fauxwhelp



Bedan



Bedan des partes



Bisquet..not Michelin



Bisquet Michelin



Margil



Pomme Gris



Hewes Virginia Crab



Beech Hill Bittersweet



BEECH HILL
BITTERSWEET