

National Plant Germplasm System Ash Conservation Project

Jeffrey D. Carstens

USDA-ARS North Central Regional Plant
Introduction Station

Ames, Iowa



Photo credit: Jennifer Koch (USFS)



Photo credit: Jennifer Koch (USFS)

Photo credit: Lisa Hill (USDA)

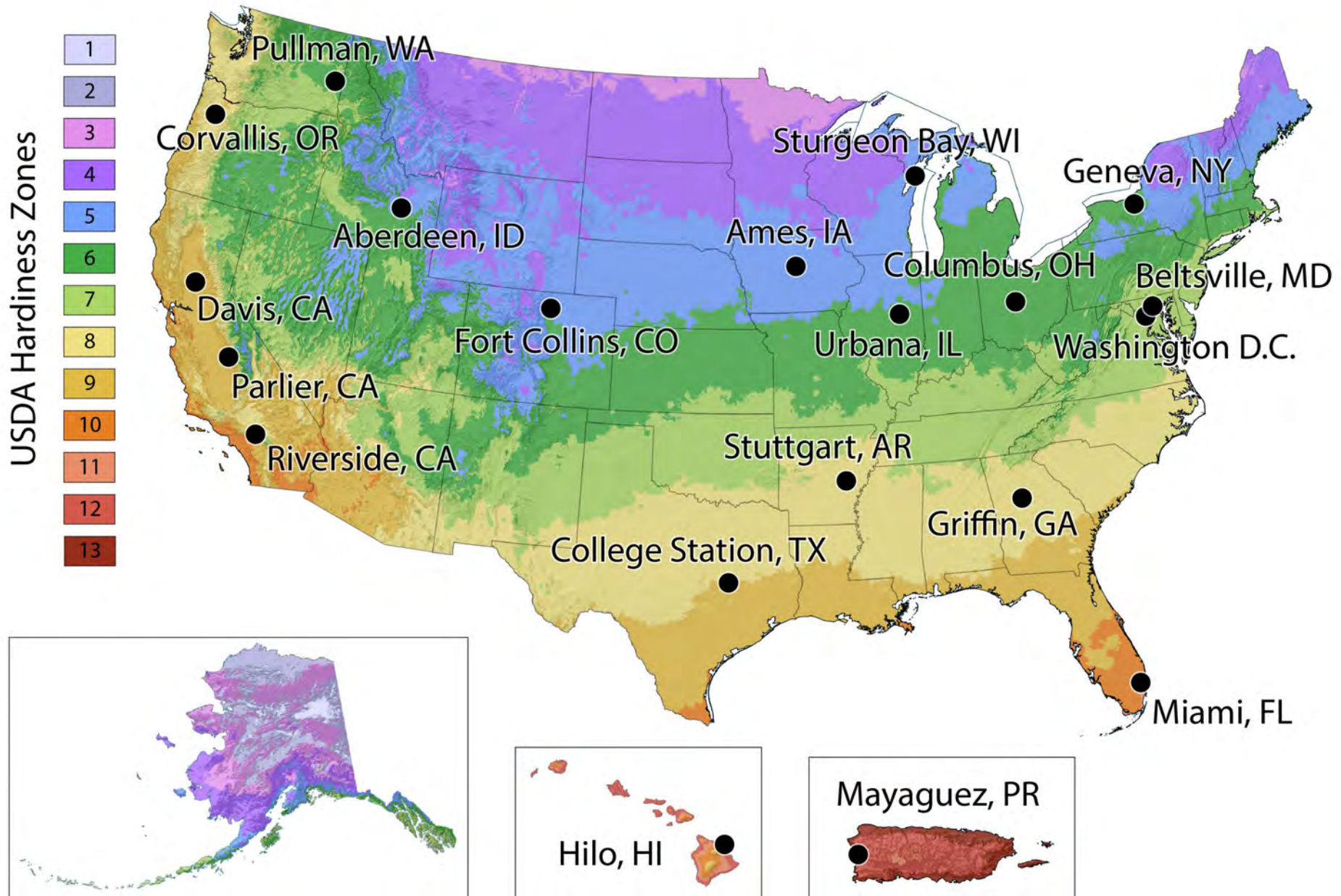


Photo credit: Jason Kilgore (USFS)

Photo credit: Lisa Hill (USDA)



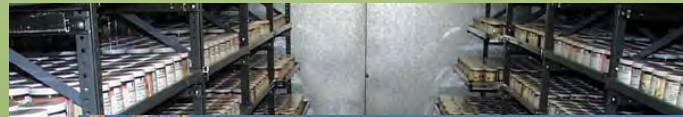
National Plant Germplasm System

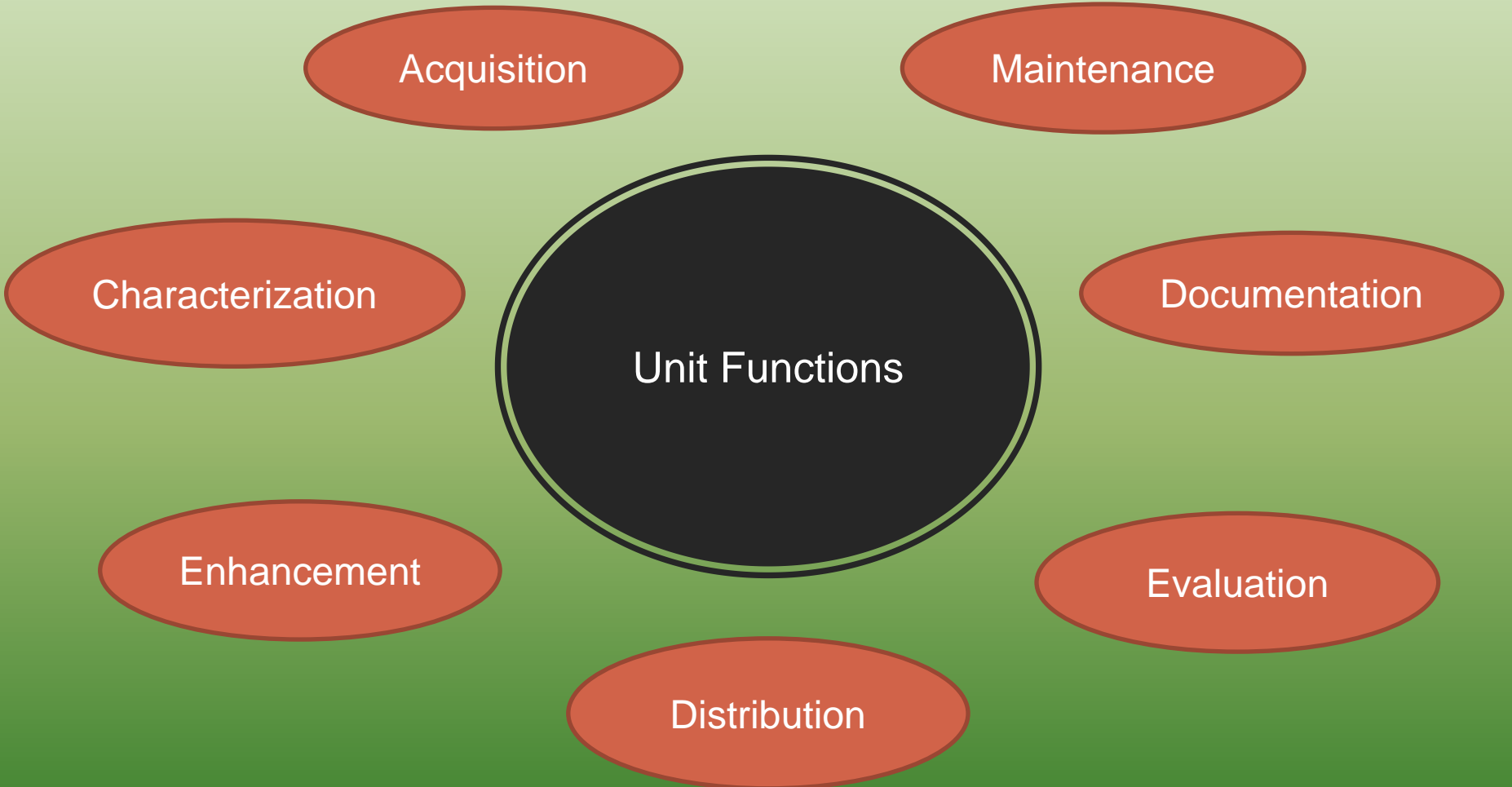


NPGS Mission

- Conserve genetically-diverse plant germplasm and associated information.

- Seeds
- Plants
- Dormant buds





Acquisition

Maintenance

Characterization

Documentation

Unit Functions

Enhancement

Evaluation

Distribution

The Ash Conservation Project

A cooperative process involving

- USDA-ARS
- Forest Service
- Natural Resources Conservation Service
- Seeds of Success
- Canadian Forest Service
- Tribal governments
- State agencies

Project Goals

- Assemble comprehensive collections
 - Taxonomic diversity
 - Ecoregions
- Obtain good passport data
- Herbarium specimens/images
- Verify seed quality
- Optimized sampling strategy
 - Substantial distance between sites
 - Stratified sampling
 - Population based sampling

Plant Collection Trips

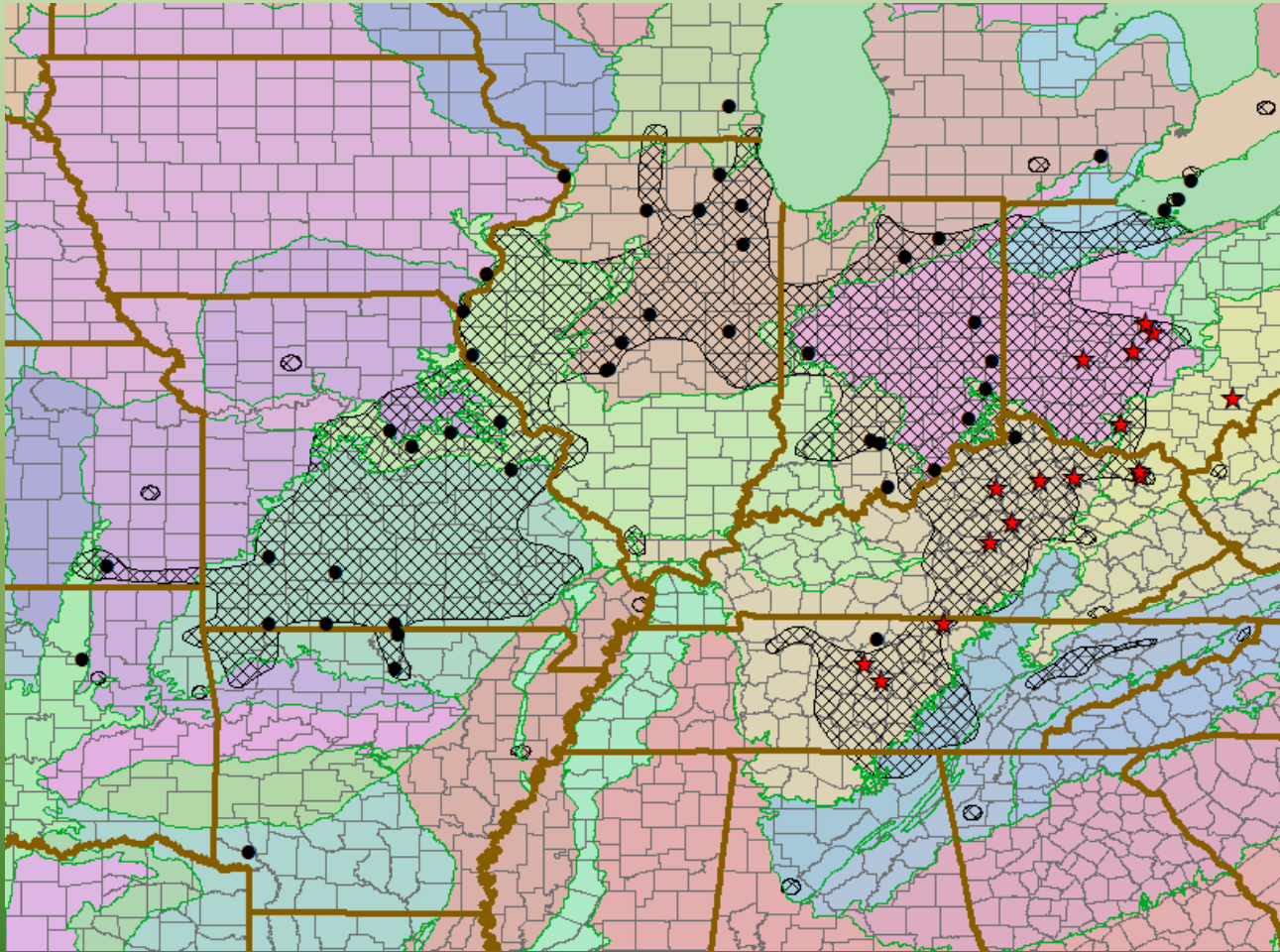
USDA-ARS Plant Exchange Office

- 13 trips
 - 23 US States
 - China
 - Ukraine
 - Japan

North America-China Plant Exploration Consortium

- 9 trips
 - China

F. quadrangulata



Fraxinus Holdings (GRIN)

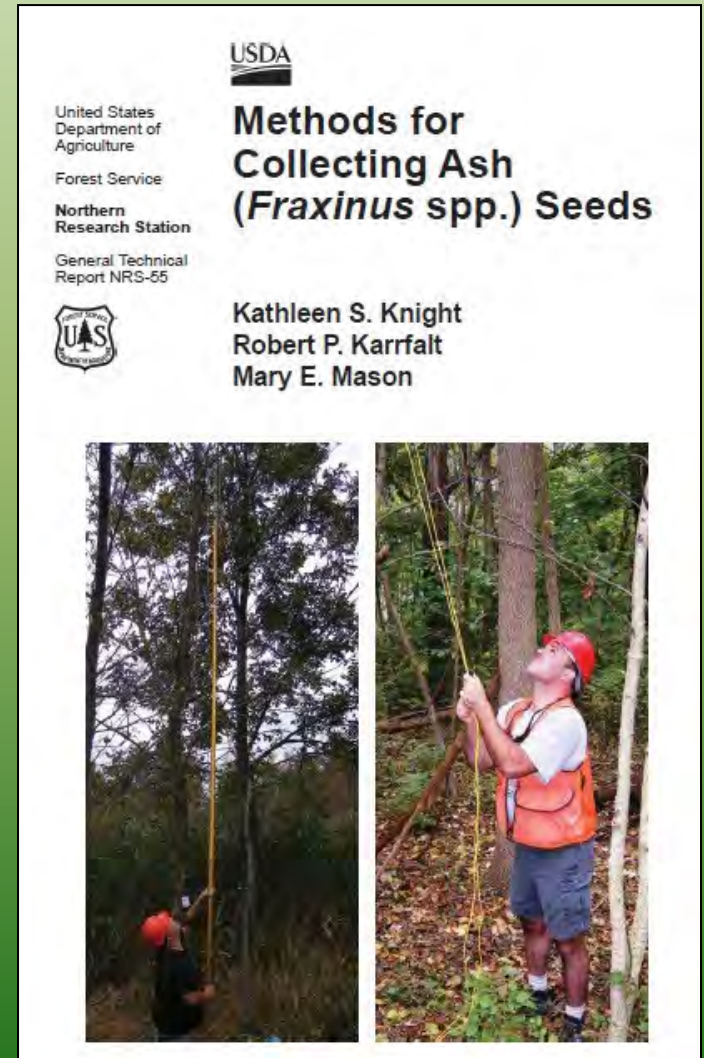
<u>Taxonomy</u>	<u>Accessions</u>	<u>Taxonomy</u>	<u>Accessions</u>
<i>Fraxinus angustifolia</i>	9	<i>Fraxinus mandshurica</i>	23
<i>Fraxinus apertisquamifera</i>	0	<i>Fraxinus micrantha</i>	0
<i>Fraxinus baroniana</i>	3	<i>Fraxinus odontocalyx</i>	0
<i>Fraxinus bungeana</i>	8	<i>Fraxinus ornus</i>	12
<i>Fraxinus chiisanensis</i>	0	<i>Fraxinus pallisiae</i>	0
<i>Fraxinus chinensis</i>	32	<i>Fraxinus paxiana</i>	10
<i>Fraxinus dimorpha</i>	0	<i>Fraxinus petenensis</i>	0
<i>Fraxinus excelsior</i>	17	<i>Fraxinus platypoda</i>	4
<i>Fraxinus ferruginea</i>	0	<i>Fraxinus purpusii</i>	0
<i>Fraxinus floribunda</i>	0	<i>Fraxinus raibocarpa</i>	1
<i>Fraxinus griffithii</i>	1	<i>Fraxinus rufescens</i>	0
<i>Fraxinus holotricha</i>	0	<i>Fraxinus sieboldiana</i>	7
<i>Fraxinus hubeiensis</i>	0	<i>Fraxinus sogdiana</i>	0
<i>Fraxinus insularis</i>	6	<i>Fraxinus spaethiana</i>	0
<i>Fraxinus lanuginosa</i>	3	<i>Fraxinus stylosa</i>	4
<i>Fraxinus longicuspis</i>	2	<i>Fraxinus trifoliolata</i>	0
<i>Fraxinus malacophylla</i>	0	<i>Fraxinus uhdei</i>	1
		<i>Fraxinus xanthoxyloides</i>	1

Fraxinus Holdings (GRIN)

<u>Taxonomy</u>	<u>Accessions</u>
<i>Fraxinus albicans</i>	1
<i>Fraxinus americana</i>	1230
<i>Fraxinus anomala</i>	15
<i>Fraxinus berlandieriana</i>	1
<i>Fraxinus biltmoreana</i>	5
<i>Fraxinus caroliniana</i>	6
<i>Fraxinus cuspidata</i>	8
<i>Fraxinus dipetala</i>	34
<i>Fraxinus gooddingii</i>	1
<i>Fraxinus greggii</i>	0
<i>Fraxinus latifolia</i>	93
<i>Fraxinus nigra</i>	375
<i>Fraxinus papillosa</i>	0
<i>Fraxinus pennsylvanica</i>	1025
<i>Fraxinus profunda</i>	108
<i>Fraxinus quadrangulata</i>	94
<i>Fraxinus velutina</i>	30

Lessons Learned

- Sampling techniques

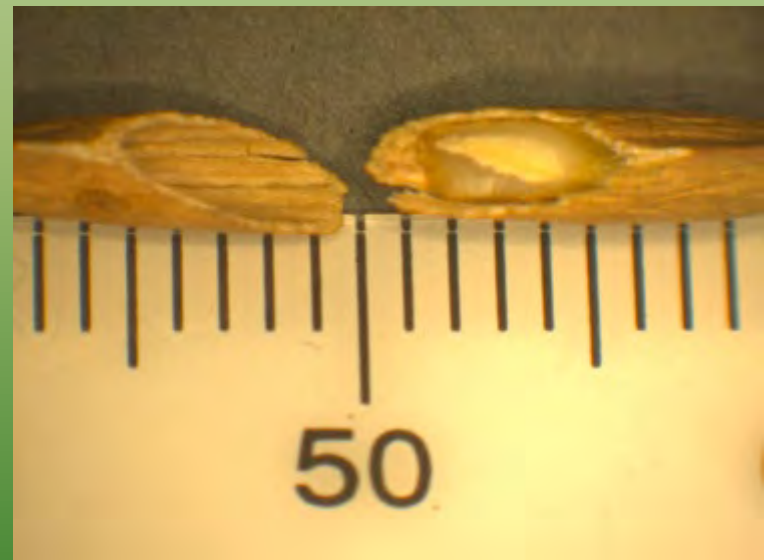


Lessons Learned

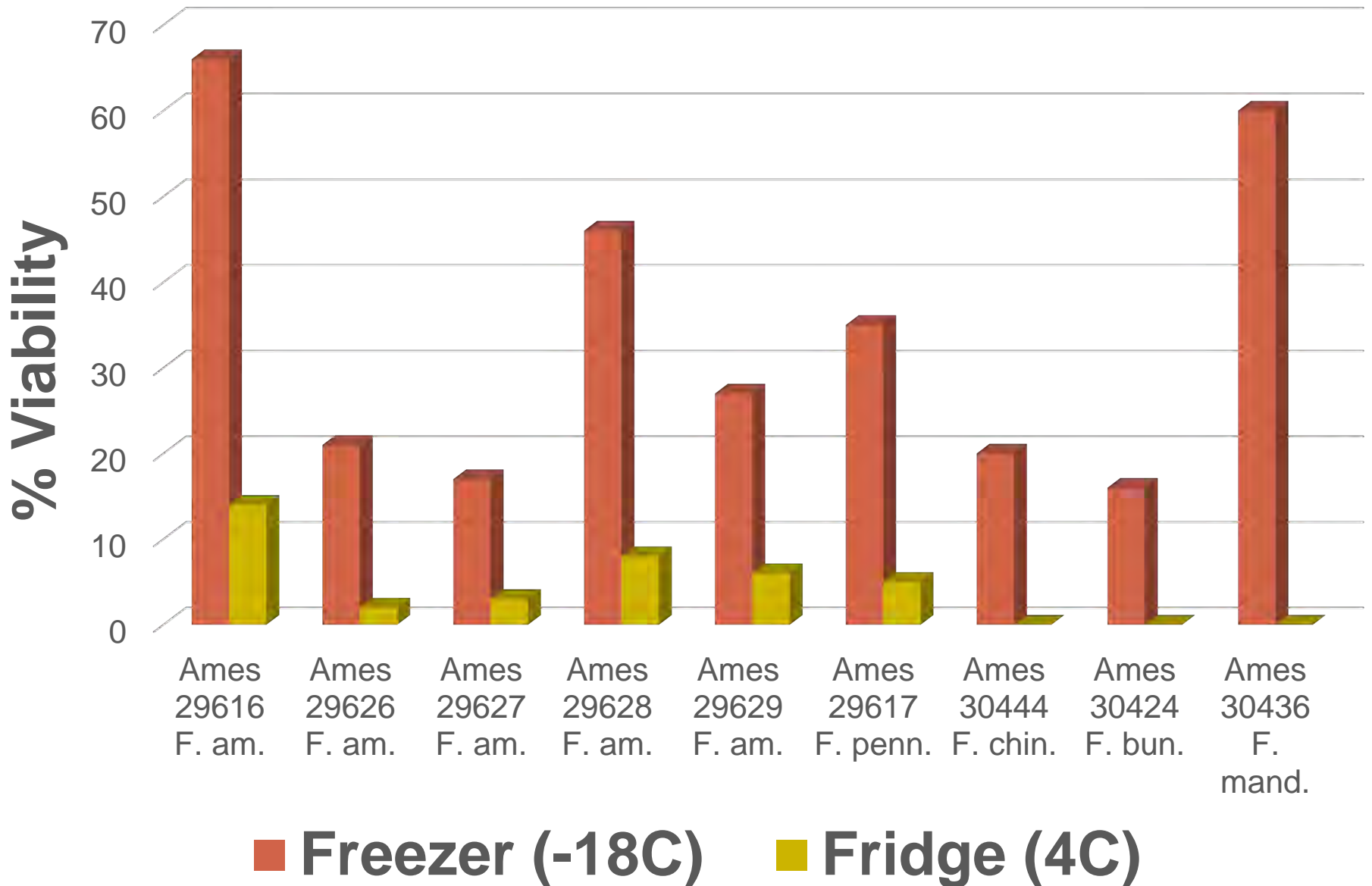
- Sampling techniques
- Value of local contacts
- Timing is everything

Lessons Learned

- Sampling techniques
- Value of local contacts
- Timing is everything
- Habitat preferences
- Seed quality checks
- Storage conditions



15 Years in Storage



Lessons Learned

- Sampling techniques
- Value of local contacts
- Timing is everything
- Seed quality checks
- Habitat preferences
- Storage conditions
- Database mgmt



Grin-Global Database



- Documents acquisitions
 - Maps of current/historical holdings
 - Passport data

U.S. National Plant Germplasm System

Accessions Descriptors Reports GRIN Taxonomy GRIN Help Contact Us Your Profile

USDA Introduces a Multi-Year Plan to Strengthen U.S. Genebank Management of Plant Germplasm

Accessions for *Betula populifolia* Marshall

Mapped accessions: 8
Total accessions: 16

Leaflet | © OpenStreetMap contributors

Source History

Collected

02 November 2023.

Porter County, Indiana, United States

Locality: Indiana Dunes State Park just 3.40 miles northeast of Chesterton, T37N R5W NE 1/4 SE 1/4 SW 1/4 Sec. 18

Coordinates: 41.6535, -87.0383 ([Map it](#))

Elevation: 186m.

Georeference protocol: Lat/lon determined by GPS

Habitat: Wild Habitat

Environment description: Low depressions with some standing water. Woodland edge.

Number of plants sampled: 10

Associated species: *Lindera benzoin*, *Quercus rubra*, *Acer saccharum*, *Nyssa sylvatica*, *Quercus* sp., *Liriodendron tulipifera*, *Cornus racemosa*, *Rosa multiflora*, *Betula papyrifera*, *Sassafras albidum*, *Ilex verticillata*, *Ilex opaca*, *Pinus strobus*, *Alnus incana* subsp. *rugosa*, *Acer rubrum*, *Smilax* sp., *Rubus* sp., *Symphytotrichum* sp., *Solidago altissima*, and *Vaccinium angustifolium*.

Comment: Localized population stretching approximately 75 yards. Noted approximately 20 mature and 20 juvenile specimens. Coordinates provided for specimen #286-1. Coordinates for all mother trees sampled may be provided upon request.

Collector(s):

- Carstens, Jeffrey D., USDA ARS NCRPIS
- Sherwood, Andrew P., USDA ARS NCRPIS

Grin-Global Database



- Documents acquisitions
- Taxonomy hub

U.S. National Plant Germplasm System

Accessions Descriptors Reports GRIN Taxonomy ▾ GRIN ▾ Help Contact Us Your Profile ▾

USDA Introduces a Multi-Year Plan to Strengthen U.S. Genebank Management of Plant Germplasm

Taxon: *Pediomelum argophyllum* (Pursh) J. W. Grimes

Nomenclature Common Names Distribution Economic Uses

Summary

Genus: *Pediomelum*
Family: *Fabaceae* (alt. Leguminosae)
Subfamily: *Faboideae*
Tribe: *Psoraleeae*

Nomen number: 312044
Place of publication: Mem. New York Bot. Gard. 61:69. 1990
Verified: 05/31/1991 ARS Systematic Botanists.
Accessions: 2 (1 active, 0 available) in National Plant Germplasm System. (Map it)

Autonyms (not in current use), synonyms and invalid designations

Basionym
Psoralea argophylla Pursh

Heterotypic Synonym(s)
Psoralidium argophyllum (Pursh) Rydb.

Other conspecific taxa

No images

Grin-Global Database



- Documents acquisitions
- Taxonomy hub
- Observation data

Distribution of Values for INFLORESCENCES PER STEM (INFLORESCENCES PER STEM)

Range	Number of Accessions
1.50000 - 3.07000	7
3.07000 - 4.64000	1
4.64000 - 6.21000	0
6.21000 - 7.78000	3
7.78000 - 9.35000	2
9.35000 - 10.92000	4
10.92000 - 12.49000	1
12.49000 - 14.06000	0
14.06000 - 15.63000	0
15.63000 - 17.20000	1



BRACT COLOR

Number of accessions (19)

Equal to

PINK/WHT=Pink and whitish midrib of bract with green background. ▲

PINK=Pink midrib of bract with green background.

RED=Red or reddish midrib of bract with green background.

WHT=White or silverish midrib of bract with green background. ▼

INFLORESCENCES PER STEM

Number of accessions (19)

Equal to

1.8 ▲

1.9 ▲

2.1 ●

2.2 ▼











2.5 ▼

Grin-Global Database



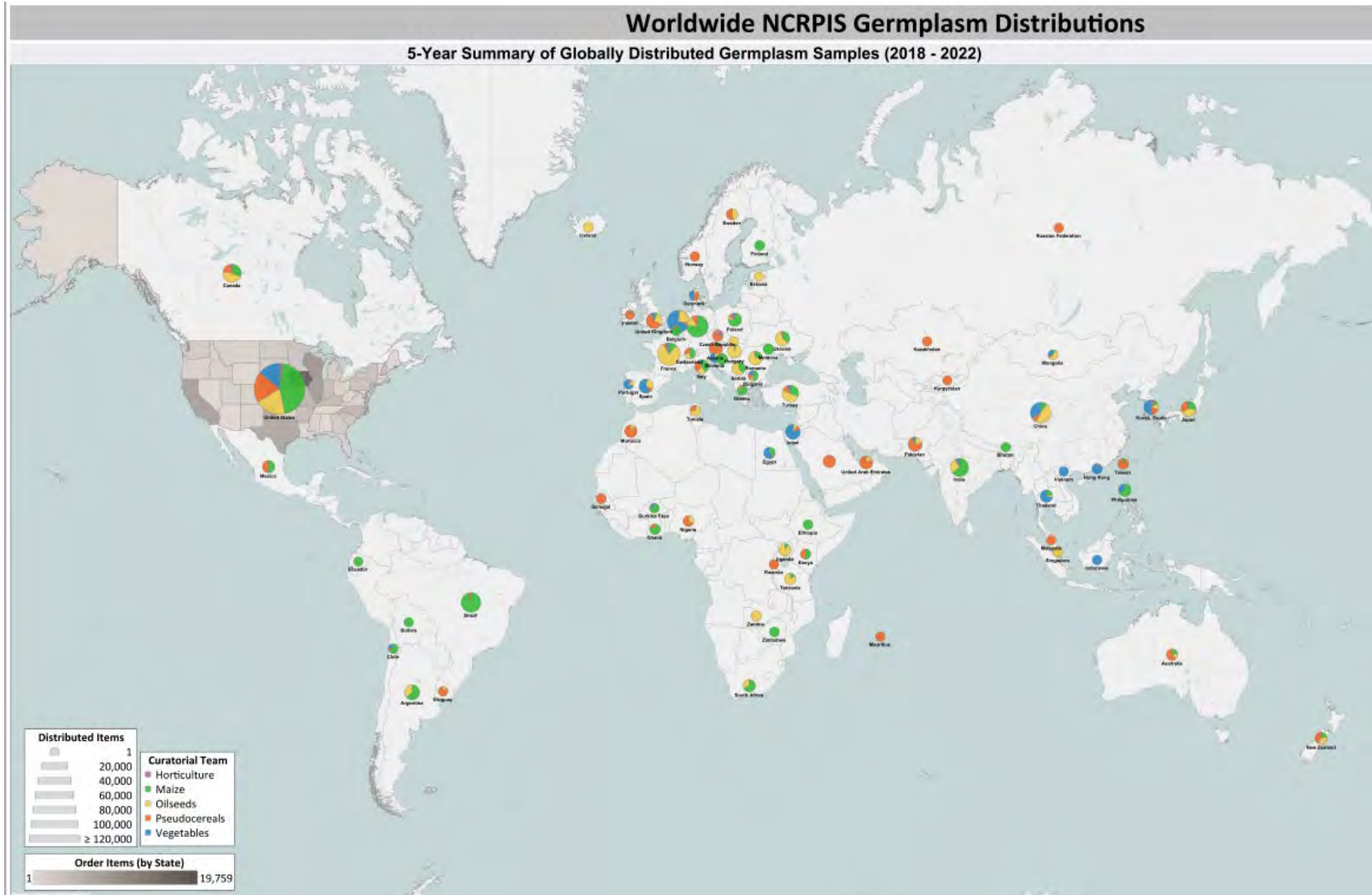
- Documents acquisitions
- Taxonomy hub
- Observation data
- Germplasm requests



<input type="checkbox"/>	Ames 35579	Holston Mountain	<i>Monarda xmedia</i> Wild.	Tennessee, United States	NC7		
<input type="checkbox"/>	Ames 35552	Ames 35552	<i>Monarda didyma</i> L.	Pennsylvania, United States	NC7		
<input type="checkbox"/>	Ames 35226	Ocoee Gorge	<i>Monarda austroappalachiana</i> Floden	Tennessee, United States	NC7		
<input type="checkbox"/>	Ames 34346	3237	<i>Monarda fistulosa</i> L.	Missouri, United States	NC7		
<input type="checkbox"/>	Ames 34321	JDC/MR/2018/061/874	<i>Monarda russeliana</i> Nutt. ex Sims	Oklahoma, United States	NC7		

Distributions

2018-2022 Distribution Summary





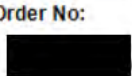



Data and graphics: Stacey Estrada (USDA-ARS)

Seed Packet Information

NPGS identifier →

Secondary identifier →

Quantity →

North Central Regional PI Station (NC7)		
Accession: Ames 35226 	Inventory:  21ncal01 SD	Order No:  Sort No: 5
For: 		
Taxonomy: Monarda austroappalachiana Accession Source: United States, Tennessee, Polk Plant Name: Ocoee Gorge		
Order Amt: 100 HSWT (grams): 0.038 Order Wt (grams): 0.038	Location: JAR PREPACKJ NC7-medicinals	Restrictions:
Item No: 6	Viability: % Viable: 98 % Normal: 85 Yr Tested: 2022 % Dormant: 23 Method: TB_Water_20-30C_12D_12L_7-21_1rep10 Website: https://npgsweb.ars-grin.gov/gringlobal/query/query.aspx?	
 U.S. National Plant Germplasm System		

← Source

← Viability data

Moving Forward

- Future targets (*Fraxinus*)
 - Southwestern and Southeastern U.S.
 - “Lingering” *Fraxinus* genotypes
 - Numerous taxonomic/geographic gaps

	<u>Taxonomy</u>	<u>Accessions</u>
→	<i>Fraxinus albicans</i>	1
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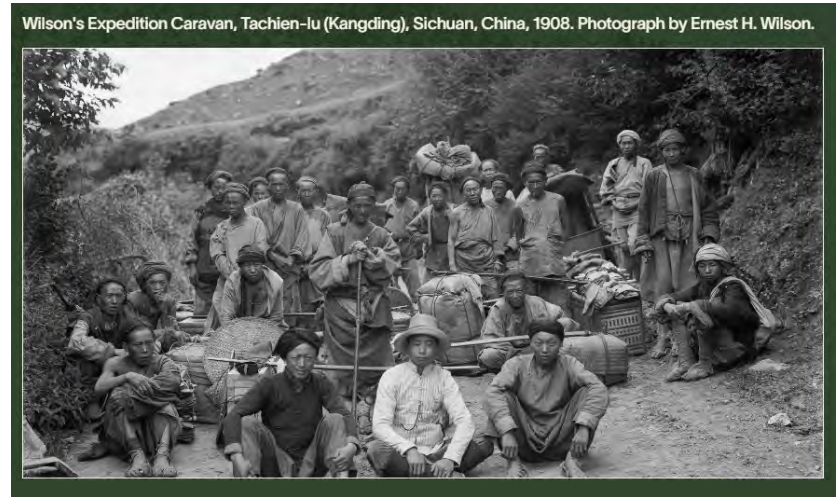
- Future targets (*Fraxinus*)
 - Southwestern and Southeastern U.S.
 - “Lingering” *Fraxinus* genotypes
 - Numerous taxonomic/geographic gaps
- Help always needed
 - Collection assistance
 - Insights on seed production
 - Knowledge of local flora



Collecting *Fraxinus quadrangulata*: Carstens and Ouellette

Plant Collecting

- Historical



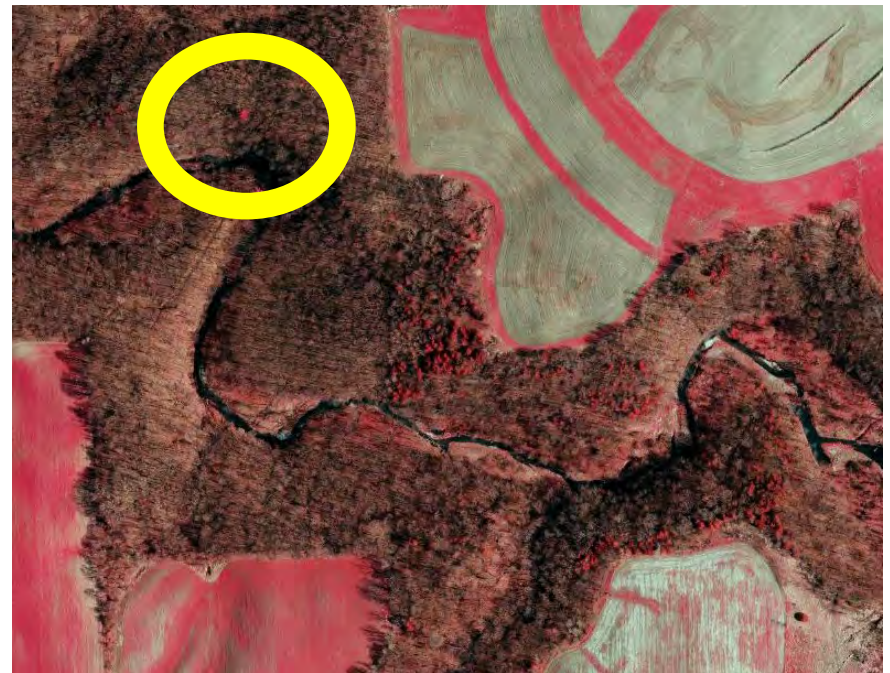
Collecting *Gymnocladus dioica*: Carstens & Schmitz (The Brenton Arboretum)

- Current



Plant Collecting

- Historical
- Current
- Future?



Plant Collecting

- Historical
- Current
- Future?
 - Emergency Response System?

Plant Collecting



- Historical
- Current
- Future?
 - Emergency Response System?
 - Data Warehouse?



Level III and IV Ecoregions of the Continental United States



Seed Information Database



Jeffrey.Carstens@usda.g