

# **The Great Basin Native Plant Selection and Increase Project**



**Nancy Shaw**

**USDA Forest Service, Rocky Mountain  
Research Station, Boise, Idaho**



**Mike Pellant**

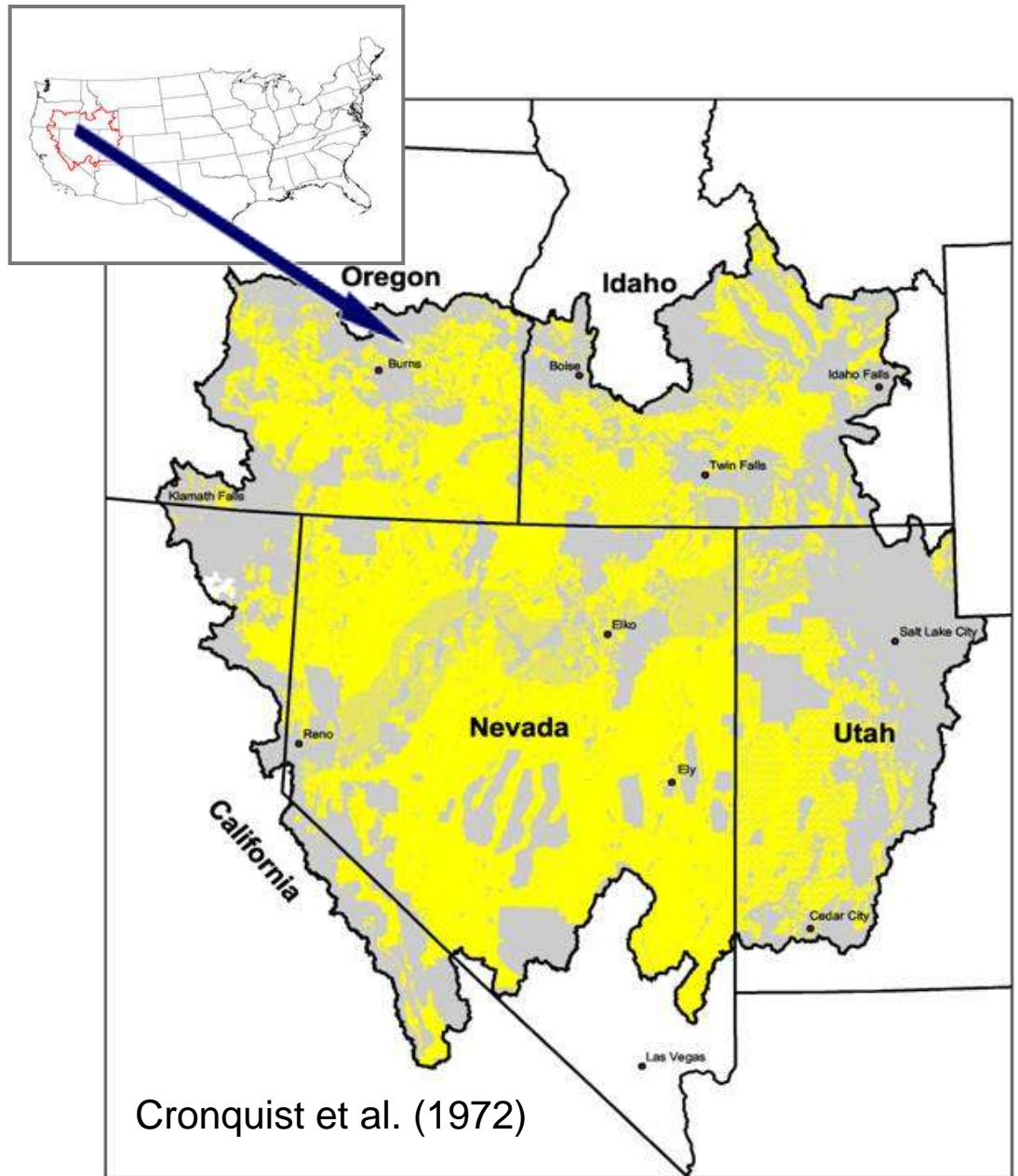
**USDI Bureau of Land Management  
Boise, Idaho**



# The Great Basin

 BLM: 30 million ha

 Total: 55 million ha



**Grazing**



**Perennial  
invasives**



**Wildland Urban  
Interface issues**



**Cheatgrass invasion,  
sagebrush loss**



**SO  
WHAT'S  
THE ISSUE?**

**Roads, mining,  
energy development**



**Altered fire regimes**



**Climate  
change**

**TES species  
loss**



# GBNPSIP ORIGINS

## Federal Interagency Native Plant Materials Development Program

USDI and USDA strategy for  
addressing short and long-term  
native plant needs

### USDI BLM Great Basin Restoration Initiative

Proactive, landscape-scale  
restoration program

### USDI and USDA Great Basin Native Plant Selection and Increase Project

Collaborative public/private  
plant materials program



# PROGRESS FROM PARTNERSHIPS...

## Goals

- Increase the availability of native plant materials, particularly native forbs
- Develop techniques for repairing disturbed plant communities to create diverse, functional ecosystems



# Native Plant Materials

- Species selection to seed supplies  
*Which, from where and how much?*
- Cultural practices  
*For agricultural and wildland seed production*
- Wildland seedings  
*Multiple species – multiple issues*
- Science delivery  
*Where's the info?*

# Species Selection to Seed Supplies

## Partners:

### **Species Selection, Seed Collection**

BLM, SOS, Cooperators

### **Seed Zones and Plant Materials**

Forestry (FS PNW, RMRS, GEL Lab, NF)

Agriculture (ARS, NRCS), Universities

### **Initial Increase**

NRCS Plant Material Centers

FS LPN Nursery, Private Industry

### **Seed Regulatory Agencies**

Crop Improvement Associations

Foundation Seed Programs

AOSCA, AOSA

### **Seed Production and Cultural Practices**

Universities, Agencies

Private Seed Growers



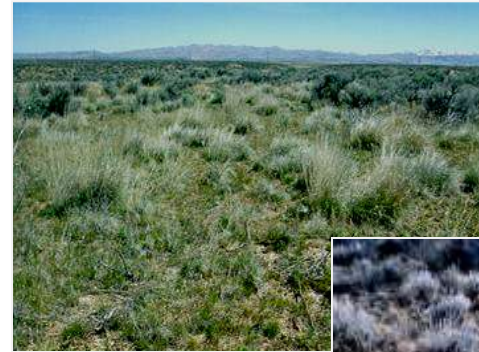
Sulfur-flower buckwheat  
common garden



Tour – seed production  
farm, Washington

# Species Selection, Locations, Needs.....

Seed zones,  
ecoregions,  
MLRAs, ES,  
Communities



Site  
condition

Species selection,  
locations, and quantities

Specific  
objectives



# Seed Collection



**Cooperator  
Projects**



**Seed growers**

## **Collectors:**

- ✓ **Cooperators**
- ✓ **SOS**
- ✓ **BLM and other agencies**
- ✓ **Volunteers**

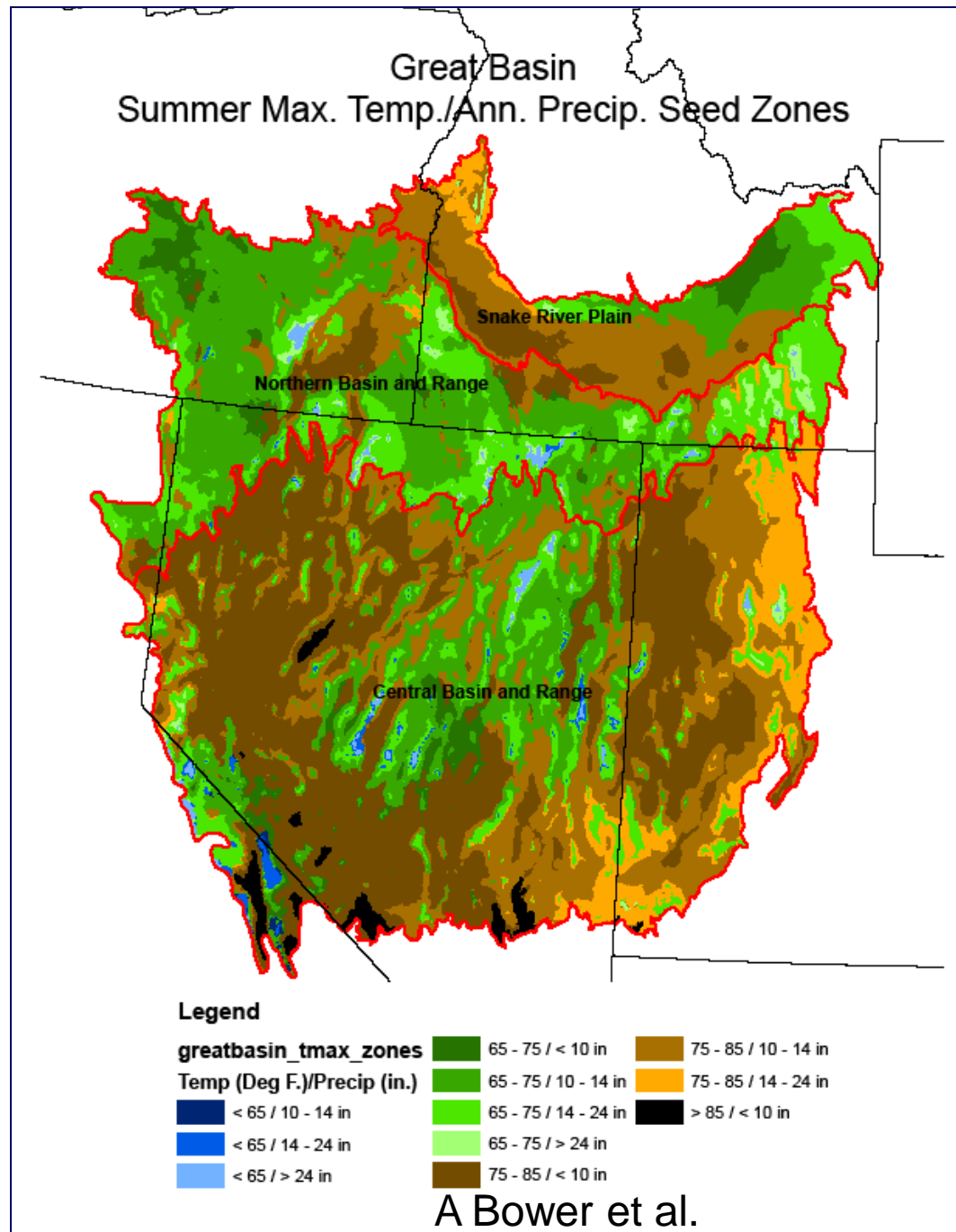


**Germplasm  
conservation**



# Provisional Seed Zones

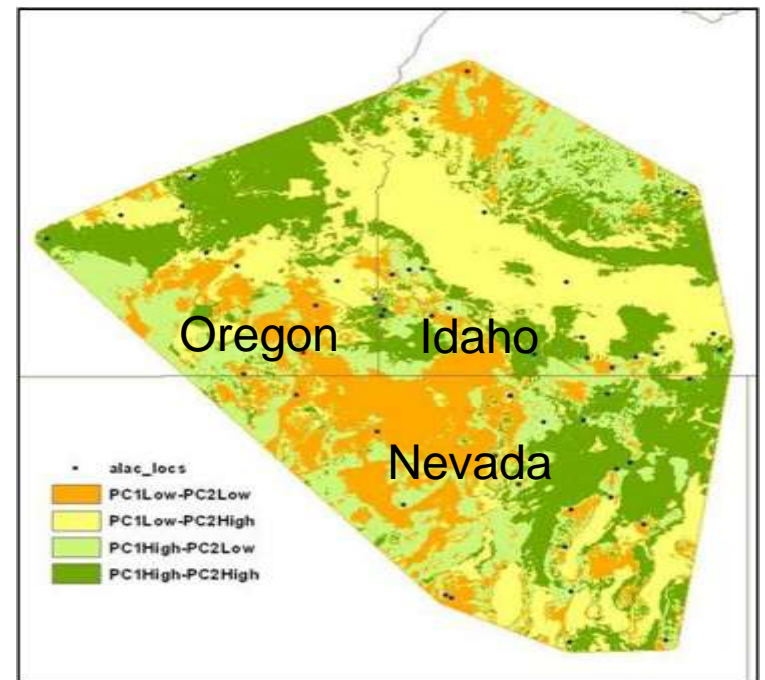
Andy Bower,  
Vicky Erickson  
Brad St. Clair



# Preliminary seed zones for *Allium acuminatum* for the Great Basin in Oregon, Idaho and Nevada

## Progress:

- ✓ Germplasm collection
- ✓ Common gardens established
- ✓ Evaluation of morphological and phenological diversity
- ✓ Analysis of diversity
- ✓ Determine seed adaptation zones

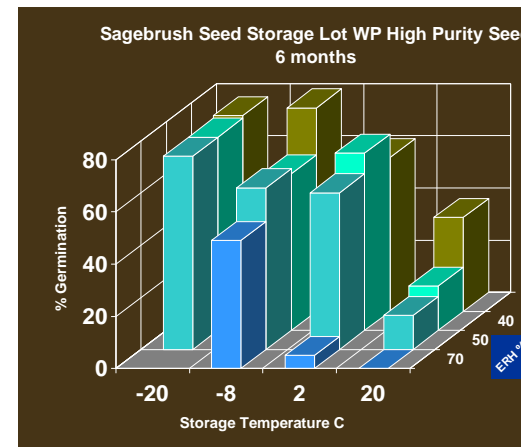
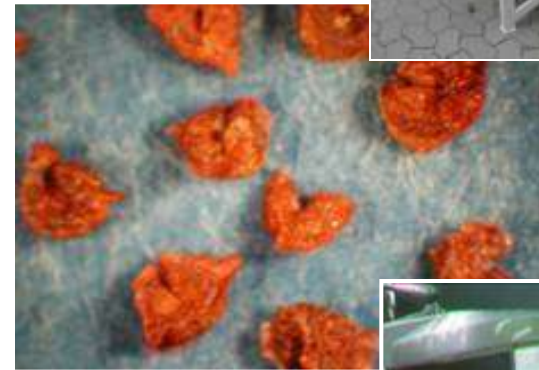


(RC Johnson et al.)

# Cultural Practices for Seed Production

## Seed Technology

- ✓ Harvesting methods, equipment
- ✓ Seed cleaning techniques and equipment
- ✓ Storage regimes, seed longevity
- ✓ Nature of dormancy
- ✓ Germination requirements
- ✓ Testing protocols



# Cultural Practices for Agricultural Seed Production

## Stand Establishment

- ✓ Soil requirements
- ✓ Seed pretreatments
- ✓ Seeding equipment
- ✓ Seeding date, rate, depth
- ✓ Row spacing
- ✓ Seeding strategies
- ✓ Nursery propagation and transplanting



# Cultural Practices for Agricultural Seed Production

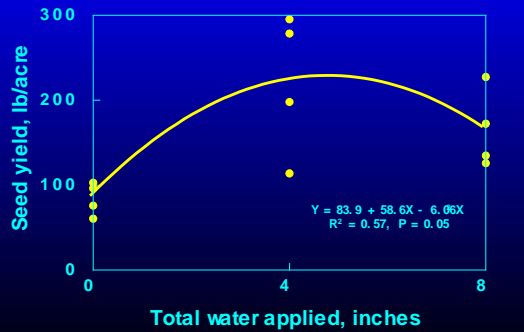


## Stand Maintenance

- ✓ Weed control
- ✓ Irrigation
- ✓ Seed predators
- ✓ Diseases
- ✓ Pollinators
- ✓ Harvesting



Royal penstemon average seed yields over three years in response to subsurface drip irrigation.



J Cane

# Cultural Practices for Agricultural Seed Production

## Equipment and Equipment Modifications

- ✓ Site preparation
- ✓ Seeding
- ✓ Harvesting
- ✓ Conditioning
- ✓ Weed Control



# Initial Seed Increase

Forest Service  
Lucky Peak Nursery



Private Growers

NRCS  
Aberdeen  
Plant  
Materials  
Center



# Commercial Production



S Young

# Buy-Back Program

Scientific name	Common name	Gen	Origin	Region
<b>FORBS</b>				
<i>Achillea millefolium</i>	Yarrow	G0	Eagle	SRP
<i>Astragalus filipes</i>	Basalt milkvetch	G1	Brothers, Succor Cr	NBR
<i>Chaenactis douglasii</i>	Dusty maiden	G0	Pooled	NBR, SRP
<i>Dalea ornata</i>	Western prairie clover	G0	UT, NV	NBR, CBR
<i>Dalea searlsiae</i>	Searl's prairie clover	G1	NV	CBR
<i>Eriogonum heracleoides</i>	Wyeth buckwheat	G0	Pooled	NBR, SRP
<i>Eriogonum umbellatum</i>	Sulfur-flower buckwheat	G0	Pooled	NBR
<i>Eriogonum umbellatum</i>	Sulfur-flower buckwheat	G0	Pooled	SRP
<i>Lomatium triternatum</i>	Nineleaf biscuitroot	G1	Pooled	NBR
<i>Machaeranthera canescens</i>	Hoary aster	G0	Pooled	NBR, SRP
<i>Penstemon acuminatus</i>	Sand penstemon	G1	Pooled	NBR, SRP
<i>Penstemon cyaneus</i>	Blue penstemon	G0	Richfield	Upper SRP
<i>Penstemon deustus</i>	Hotrock penstemon	G1	Pooled	NBR
<i>Penstemon deustus</i>	Hotrock penstemon	G1	Huntington	NBR, SRP

# Source-Identified

## Scientific name

## Common name

### Central Basin and Range

*Amsinckia menziesii*

Menzies' fiddleneck

*Cleome lutea*

Yellow spiderflower

*Lithospermum ruderale*

Western stoneseed

*Lupinus arbustus*

Longspur lupine

*Lupinus argenteus*

Silvery lupine

*Sphaeralcea grossulariifolia*

Gooseberryleaf globemallow

*Thelypodium milleflorum*

Manyflower thelypody

### Wasatch Front

*Argemone munita*

Flatbud pricklypoppy

*Lupinus sericeus*

Silky lupine

### Northern Basin and Range

*Potentilla gracilis*

Slender cinquefoil

### Snake River Plain

*Penstemon acuminatus*

Sharpleaf penstemon

*Lomatium dissectum*

Fernleaf biscuitroot

*Eriogonum heracleoides*

Parsnipflower buckwheat

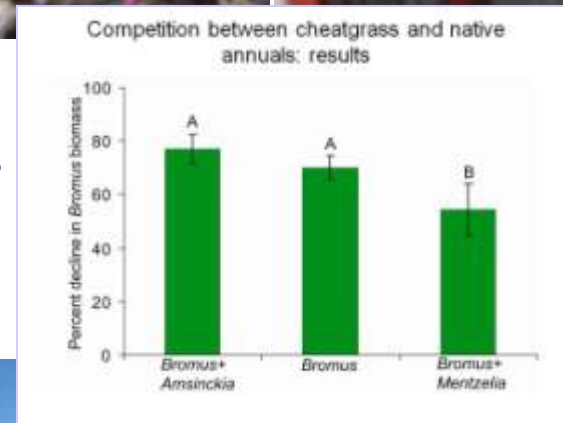
# Wildland Seedings

## Greenhouse, laboratory and small plot studies

- ✓ Seed ecology
- ✓ Seedbed/microsite requirements
- ✓ Autecology
- ✓ Species interactions
- ✓ Response to environmental variables

## Large plot seedings

- ✓ Operational equipment
- ✓ Multi-species seedings





# Drill Seeding Studies



Rangeland drill



Minimum till drill

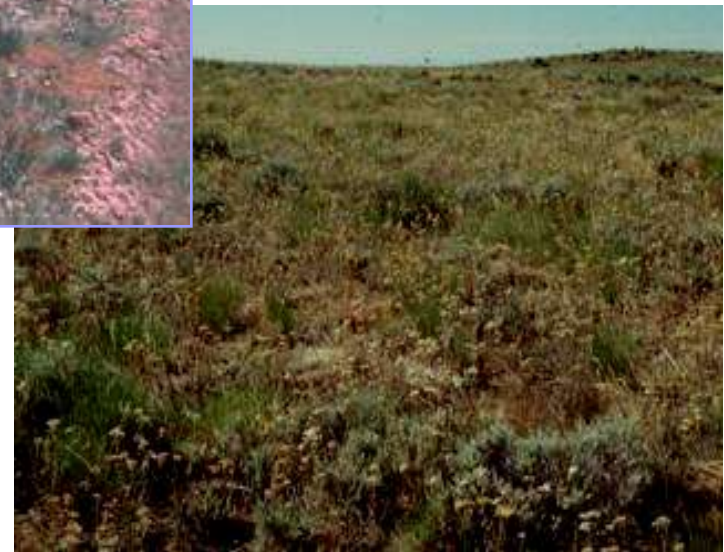
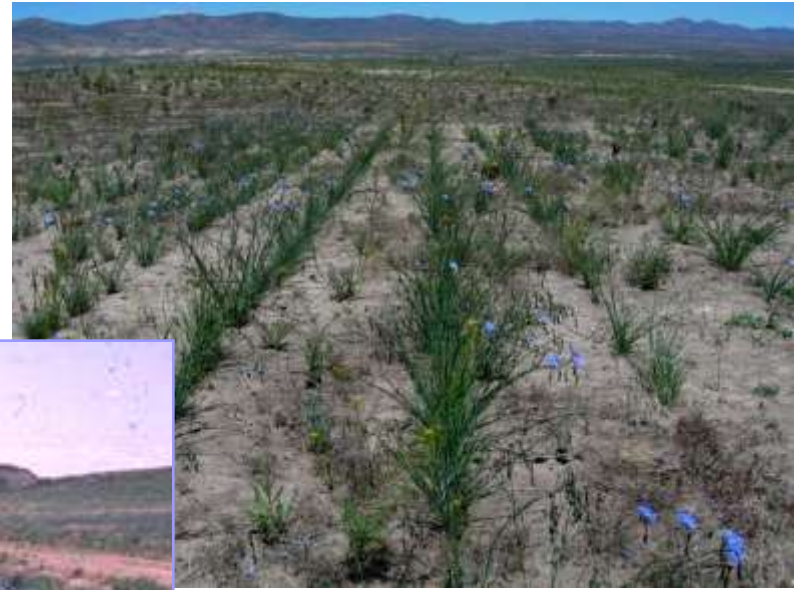


## Objectives

- ✓ Improve sagebrush establishment
- ✓ Develop forb seeding technology
- ✓ Drill comparison
  - > Reduce surface disturbance
  - > Conserve residual natives and biological soil crusts
  - > Minimize cheatgrass
- ✓ Examine ESR monitoring protocols
- ✓ Install studies for long-term grazing comparisons

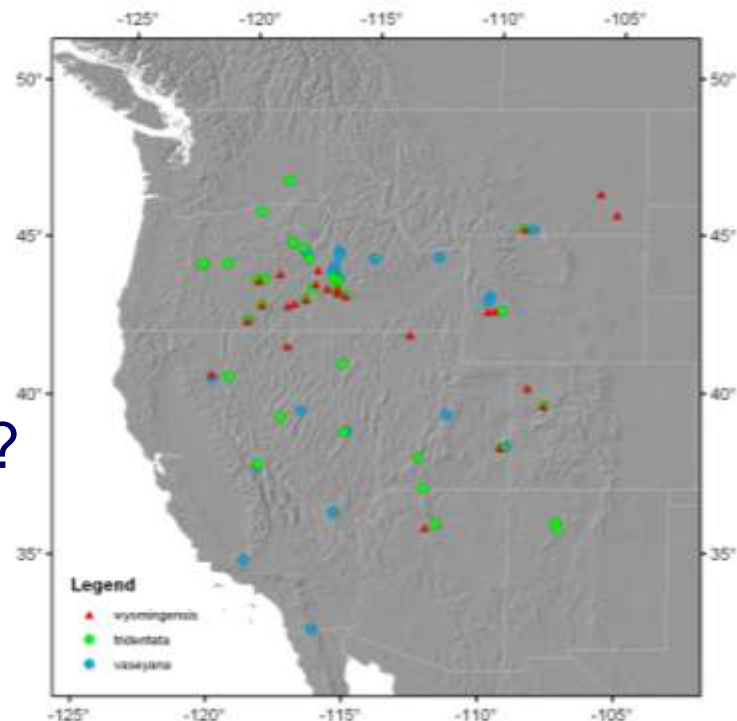


# Native Seedlings



# Ecological Genetics in Big Sagebrush (*Artemisia tridentata*)

- How do quantitative traits (growth and phenology) vary across the landscape?
  - What climatic factors are driving adaptive variation?
  - Between races? Within races?
- How will climate change affect big sagebrush?
  - Shifts in distributions?
  - Species, race, population level?



# Science Delivery

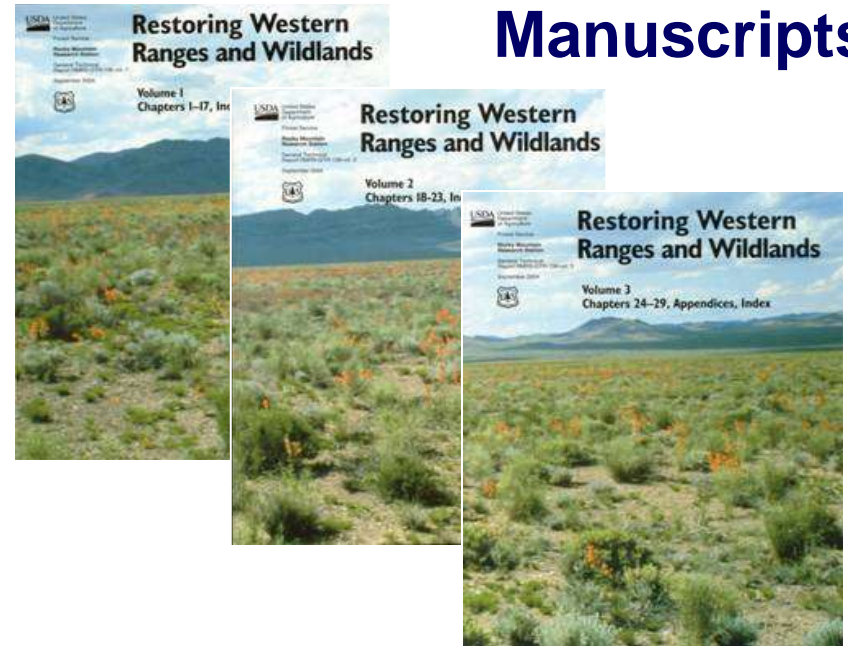
**Websites**  
**Tech notes**  
**Video**



**Plant guides**  
**Planting guides**  
**Seed transfer guidelines**



**Manuals**  
**Manuscripts**



**Workshops**  
**Symposia**  
**Field tours**

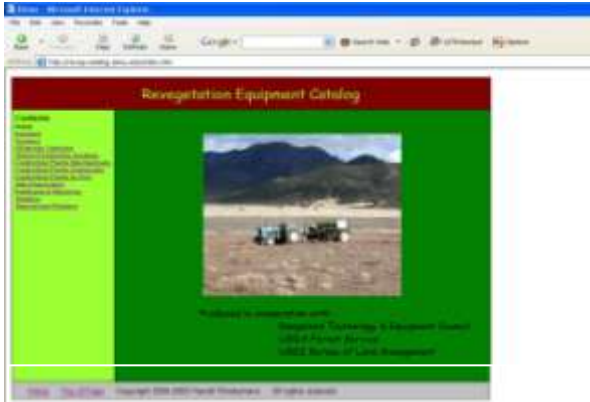


*Links on GBNPSIP website and brochure.*

# Websites

## Developed by GBNPSIP Cooperators:

- Revegetation Equipment Catalog
- Western Colorado Entomology Native Plant Seed Production
- Native Wildflower Seed Production



## Contributions from GBNPSIP Cooperators:

- Seed Testing Protocols
- AOSA Test Method for Species without Rules
- Native Plant Propagation Protocols
- Seeds of Success



*Links on GBNPSIP webpage and brochure*

# Acknowledgments:

USDI BLM National Native  
Plant Materials Development Program  
and Great Basin Restoration Initiative

GBNPSIP Cooperators

Private industry



# Any Questions?

