Great Basin Native Plant Selection and Increase Project

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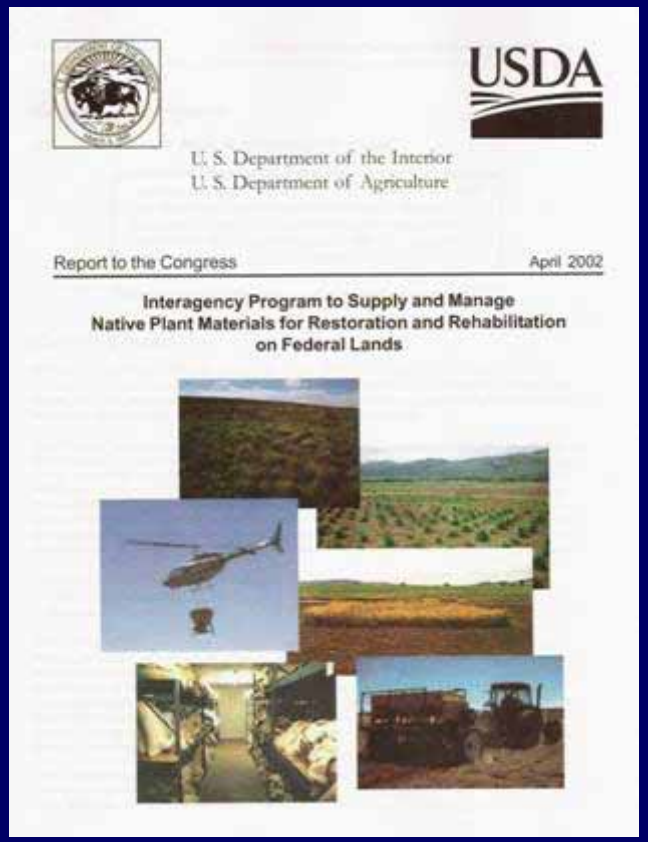
Great Basin communities




Federal Interagency Native Plant Materials Development Program

- Strategy for addressing short- and long-term native plant needs
- Support and enhance facilities and equipment for native plant development and technology transfer
- Private sector partnerships
- Education and outreach



GBRI----Use of Native Species

GBRI defines restoration as, “a set of actions that promotes plant community diversity and structure that allows plant communities to be more resilient to disturbance and invasive species over the long-term.”

The use of native species is, “recommended dependent on seed availability, cost and chance for success”.

Goals of the Great Basin Native Plant Selection and Increase Project

- Regional (4 state) approach for identifying needs and selecting and developing native seed sources.

- Multiple collaborators (including private industry) working together to improve availability of native seed and the knowledge needed to use it successfully.

- Focus on native forbs and grasses.

Great Basin Native Plant Selection and Increase Project

- USDI BLM Great Basin Restoration and Native Plant Program
- USDA FS Rocky Mountain Research Station, Shrub Sciences Laboratory
- Utah Division of Wildlife Resources

•USDA Agricultural Research Service,

* Bee Biology and Systematics Laboratory
* Eastern Oregon Agricultural Research Center
* Forage and Range Research Laboratory
* Western Regional Plant Introduction Station

USDA NRCS Aberdeen Plant Materials Center

Association of Official Seed Certifying Agencies

Utah Crop Improvement Association

Brigham Young University

Colorado State University

Oregon State University, Malheur Experiment Station

USDA FS National Seed Laboratory, Genetics Laboratory, PNW Corvallis and Lucky Peak Nursery

Native Seed Industry

Phase I. Plant Materials Development

1. Enhance facilities and equipment
2. Selection of research species (grasses and forbs)
3. Seed zone delineation
4. Seed technology
5. Cultural practices for seed production
6. Seed increase (private sector)

Facilities and Equipment

Seeding and planting

Seedling production

Seed harvesting

Seed cleaning

Seed storage

Weather stations

Common gardens

Selection of research species:

Candidate Forb Species: Identification and Ranking

- **Field surveys**
- **Regional lists**
- **Consultations**
- **Wildlife habitat values**
- **Herbarium searches**
- **Seed production potential**

Forbs: Research Species

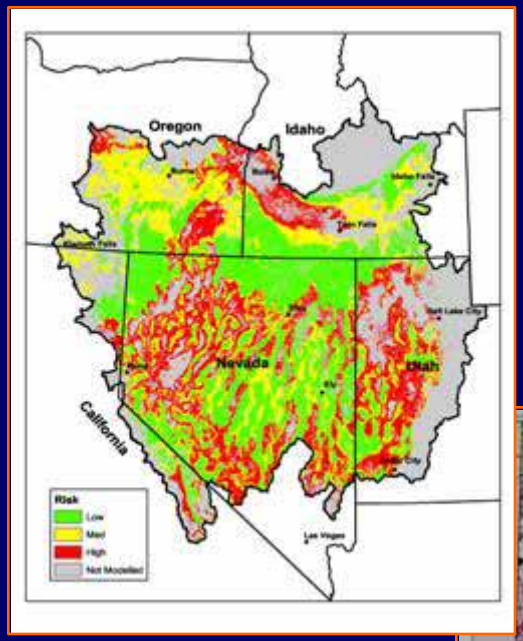
Agoseris glauca
Allium acuminatum
Astragalus filipes, A. utahensis
Balsamorhiza sagittata
Cleome lutea
Crepis acuminata
Dalea ornata
Erigeron pumilus
Eriogonum ovalifolium
E. umbellatum
Lomatium dissectum, L. grayi, L. triternatum
Lupinus argenteus, L. sericeus
Penstemon acuminatus, P. deustus, P. speciosus
Perideridia bolanderi
Phlox longifolia
Sphaeralcea coccinea, S. grossulariifolia, S. munroana

Selection of research species:

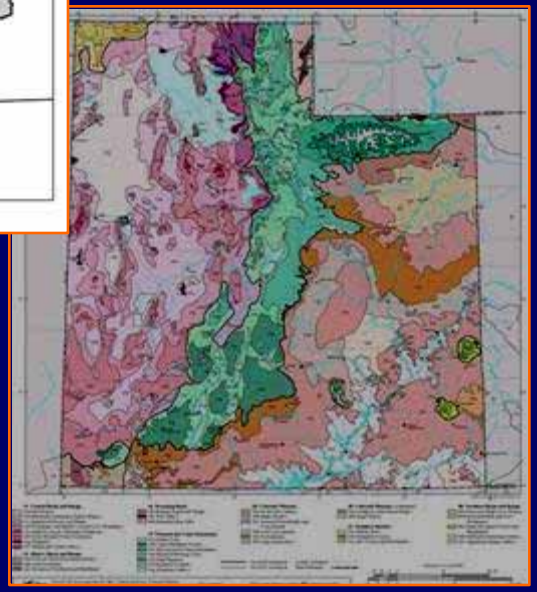
Commercially Available Native Grasses

Big squirreltail	
Sand Hollow	SW Idaho
Squirreltail	
Fish Creek	SC Idaho
Toe Jam Creek	NC Nevada
Bluebunch wheatgrass	
Anatone	SE Washington
Goldar	SE Washington
P-7	Primarily SE WA, E OR, & WC ID
Great Basin wildrye	
Magnar	SW Saskatchewan
Trailhead	C Montana
Indian ricegrass	
Nezpar	WC Idaho
Rimrock	SE Montana
Thickspike wheatgrass	
Critana	NC Montana
Bannock	SE Idaho, NC Oregon, C Washington

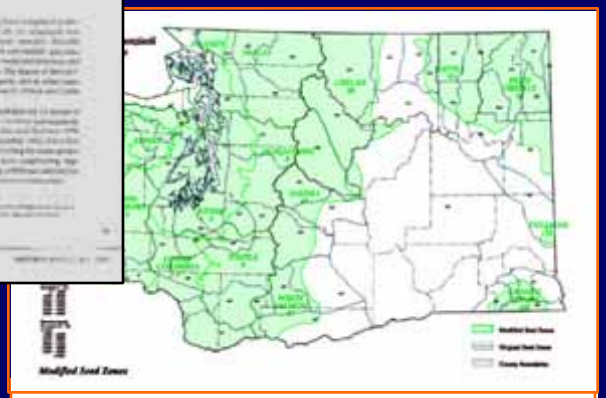
Seed zone delineation and seed transfer guidelines:



Cheatgrass risk assessment



Omernik ecoregions



Forest tree seed zones

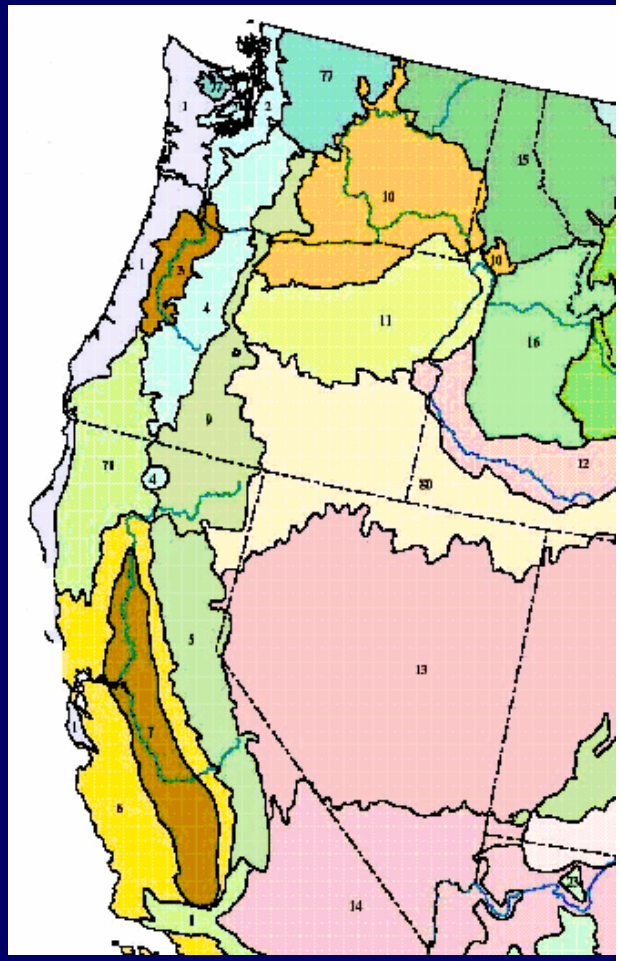
Seed zone delineation:

Ecoregions proposed as a starting point when developing seed zones (Omernik)

Start with Level III Ecoregions and subdivide where common sense dictates

Maintain variability:

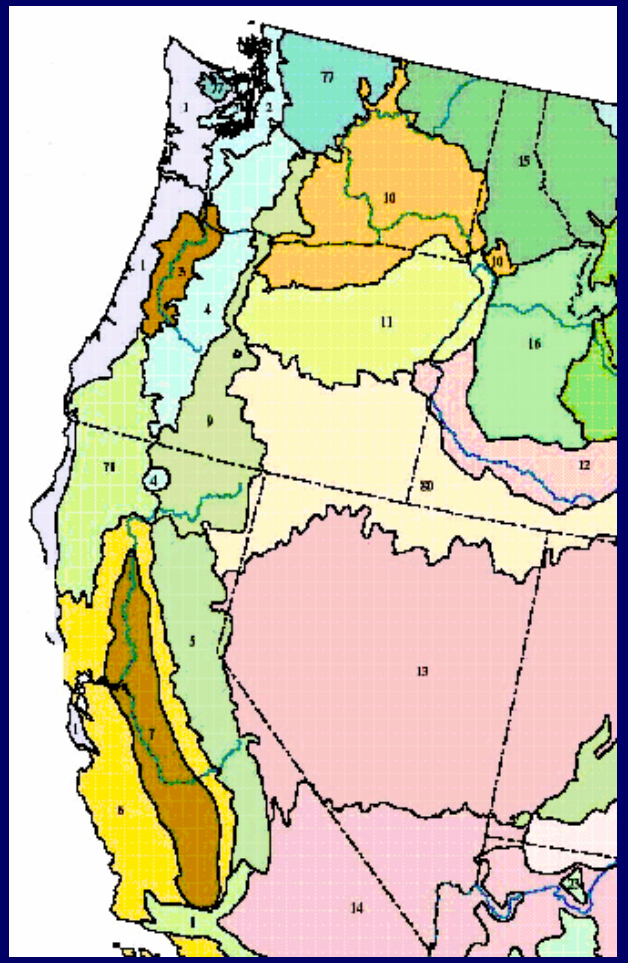
- Numerous collections/zone
- Numerous plants/collection
- Maintain variability through agricultural seed production



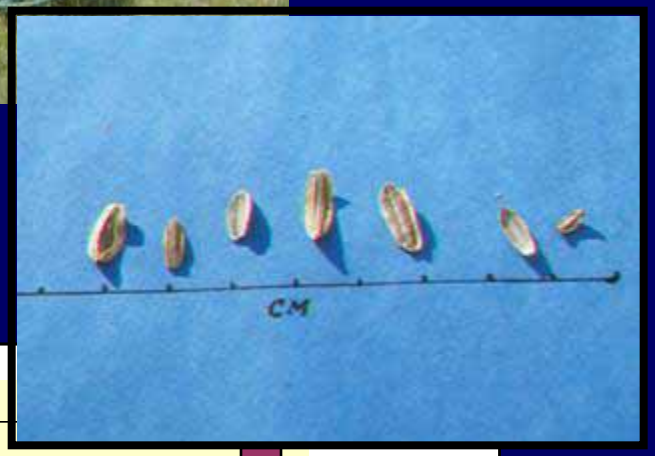
Seed zone delineation:

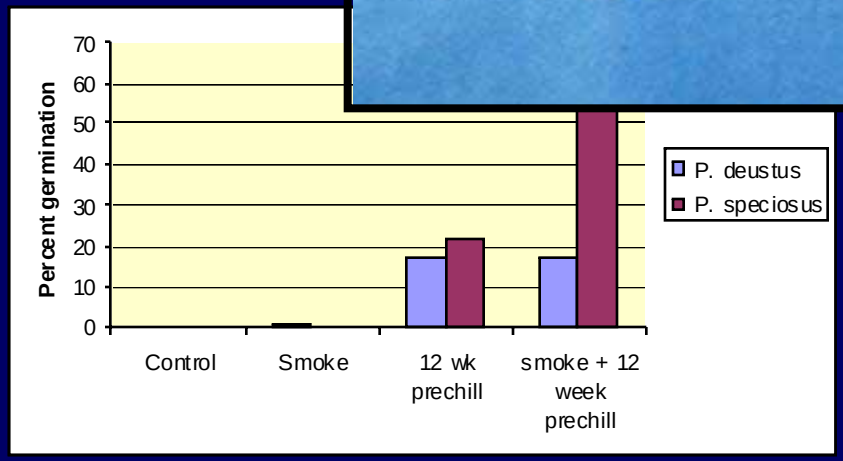
Proposed Provisional "Seed Zones" for the Intermountain Region

- Columbia Plateau (10)
  - > 15" rainfall / 3,500 ft
  - < 15" rainfall / 3,500 ft
- Northern Basin (80)
  - Low (< 4,500 ft)
  - High (> 4,500 ft)
- Snake River (12)
  - Upper
  - Lower
- Central Basin (13) (pseudo-elev)
  - Salt flats – salt desert shrub
  - Sage
  - Sage-Juniper
  - Sage-Woodland (Carbonate soils)



Seed and seeding technology:





Harvesting

Cleaning, conditioning

Storage

Testing

Dormancy

Germination requirements

Seeding methodology

Seed technology and seed testing procedures:

USDA-FS National Seed Laboratory, Dry Branch, GA

1. Seed testing protocols
2. Seed cleaning protocols
3. Seed harvesting problems
4. Ex situ conservation
5. Training, technology transfer

Cultural practices for seed production:

Soils

Nursery propagation

Weed control, herbicides

Drip irrigation

Seeding techniques

Seed harvesting – agricultural fields

Seed production guidelines

Cultural practices for seed production:

Pollinators, Seed Predators, Diseases

- **Plant breeding systems**
- **Native pollinators**
- **Pollination of:**
  - **Seed fields**
  - **Managed stands**
  - **Seeded areas**

- **Examine seed predators and diseases on wildland collections and in seed fields**
- **Develop management prescriptions**
- **Literature review, problem solving**

Seed increase (private sector):

Cooperative Native Seed Increase Program

Arrowleaf balsamroot

Royal penstemon

Nineleaf biscuitroot

Seed increase (private sector):

- Buy-back program
- Open market

Enhancing Native Shrub Seed Production

Species: Antelope bitterbrush, Wyoming big sagebrush

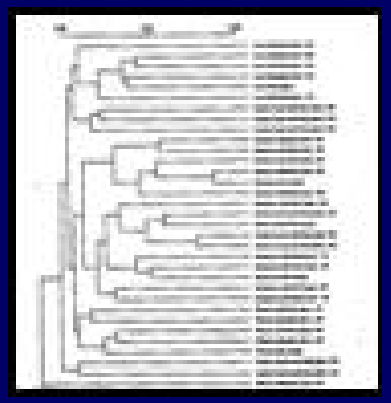
Problem: Stand loss
Big sagebrush: Subspecies identification

Objective:
Examine effects of harvesting techniques and cultural treatments on:

- seed yields
- plant health
- seedling recruitment

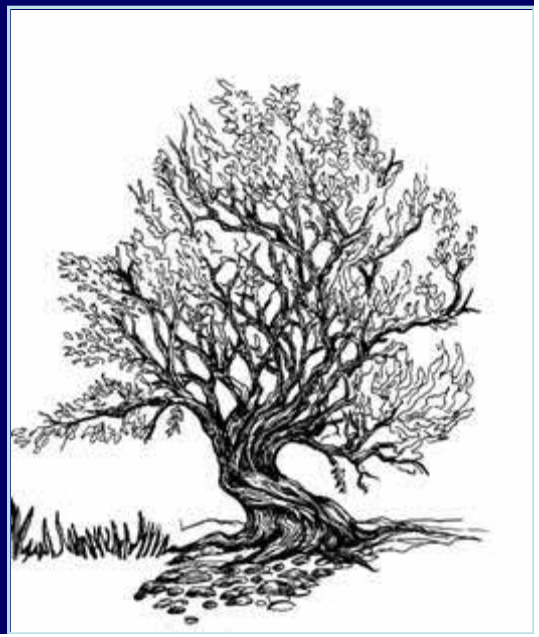
Phase I. Plant Materials Development:

Goal: Make research species and the technology required for their use available to seed growers and land managers



Developing a native plant material program:

1. Define objectives
   - > Scale and time frame
   - > Resource availability (funds and cooperators)
   - > Consider research and operational aspects
2. Select species carefully (but be flexible)
3. Determine type of plant materials required and funds/facilities required for producing or maintaining them
4. How can the program be institutionalized?



Phase II. Emphasis on wildland seedings using natives

Greenhouse studies

- Seedbed/microsite requirements
- Native and native/invasive interactions

Small plot studies

- Seeding requirements
- Response to environmental variables, microsite requirements

Large scale seedings

- Operational equipment
- Multi-species seedings

Equipment for Reestablishing Sagebrush

Sagebrush requires a firm seedbed

Seeding Equipment for Diverse Native Mixes (including sagebrush)

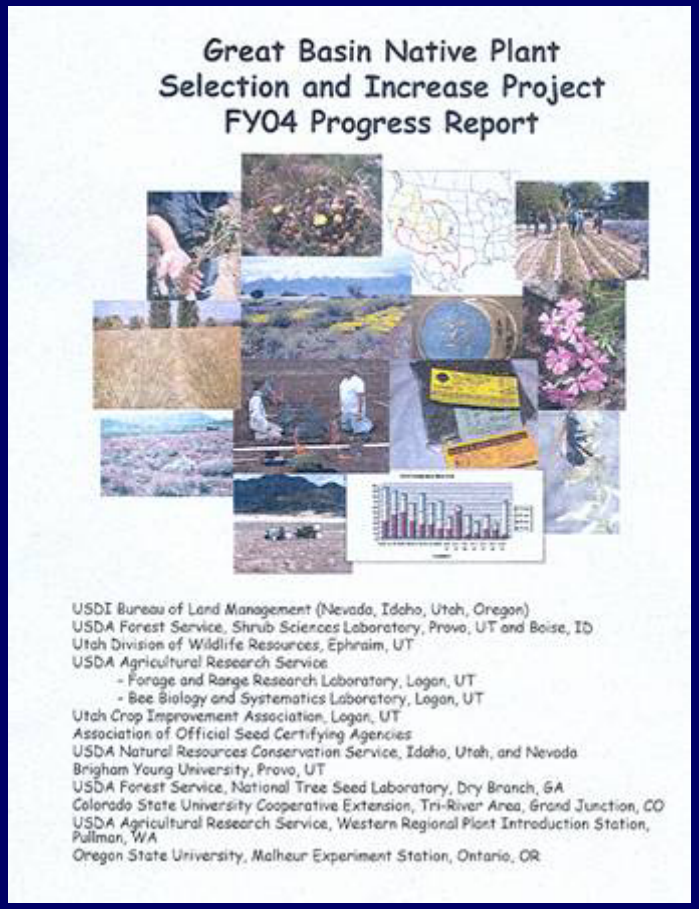
Rough-Rider

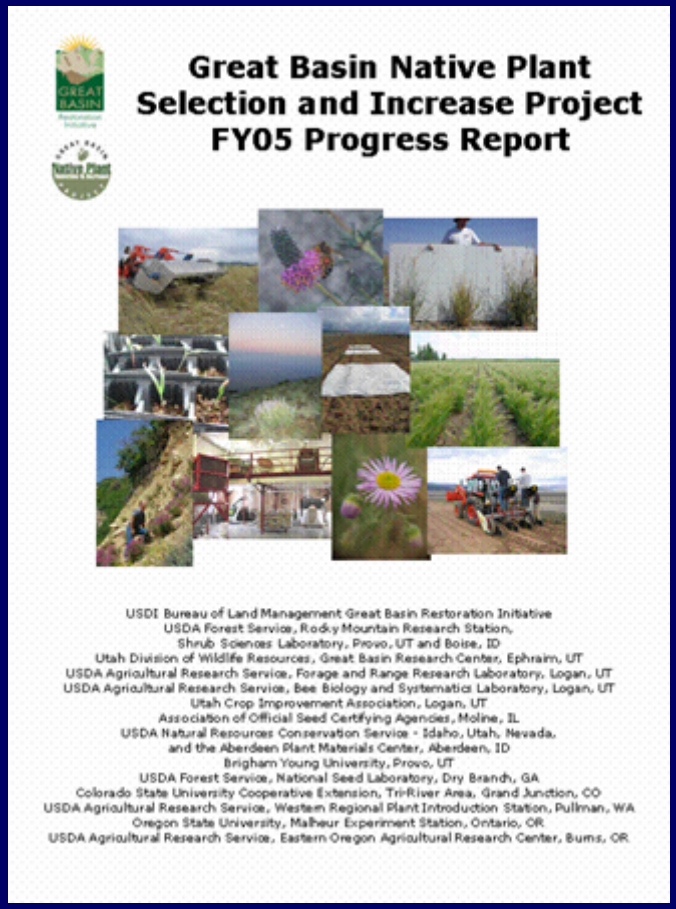
Brillion press wheels

Brillion imprints

Technology Transfer

GBNPSIP Annual Reports





Annual Reports for 2002 - 2005 - available on web site

SRM 2007 Symposium - Reno

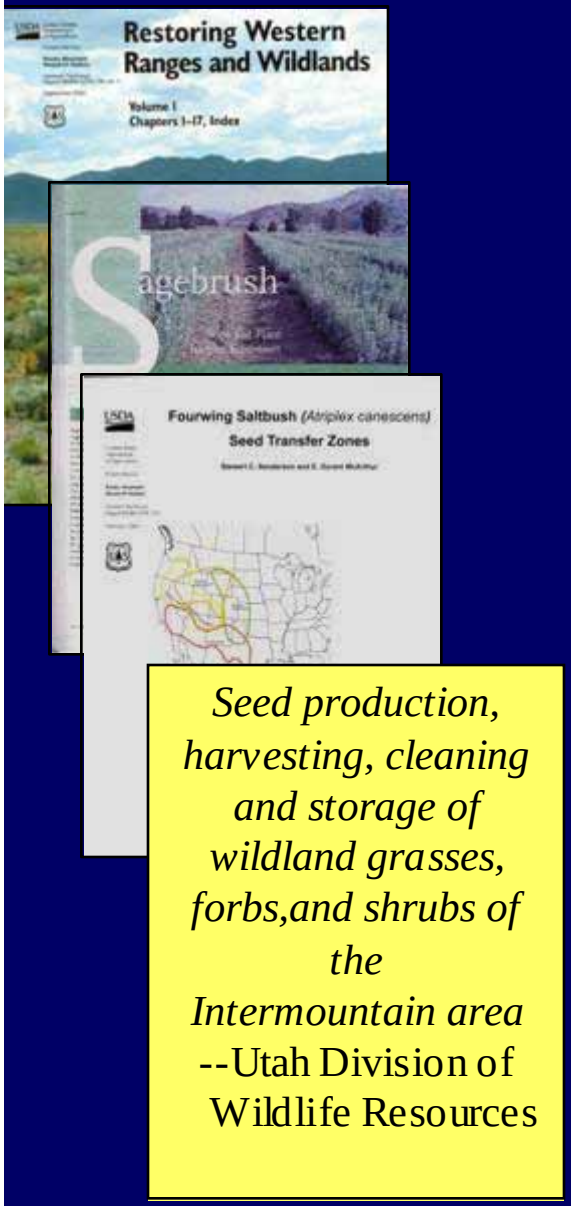
Website:

Great Basin Native Plant Selection and Increase Project

- Cooperators
- Links
- Results
- Literature

Address:
http://www.fs.fed.us/rm/boise/research
Webmaster: Ann DeBolt

Technology Transfer Publications and Websites: A Few Examples



Seed production, harvesting, cleaning and storage of wildland grasses, forbs,and shrubs of the Intermountain area
--Utah Division of Wildlife Resources

Website Contributions:

- Seed/plant predator management for seed fields (CSU)
- Plant propagation protocols (U Idaho)
- Suggested testing methods for species without AOSA Rules (AOSA)
- Seed cleaning and testing procedures (National Seed Laboratory)
- Seeding planning tool (VegSpec)

REVEGETATION EQUIPMENT CATALOG

Harold Wiedemann (retired), Texas A&M University

- **Web-based**
- **Provides equipment descriptions, features, vendor lists**

On the web:

www.reveg-catalog.tamu.edu

Native Seedings

Acknowledgments:

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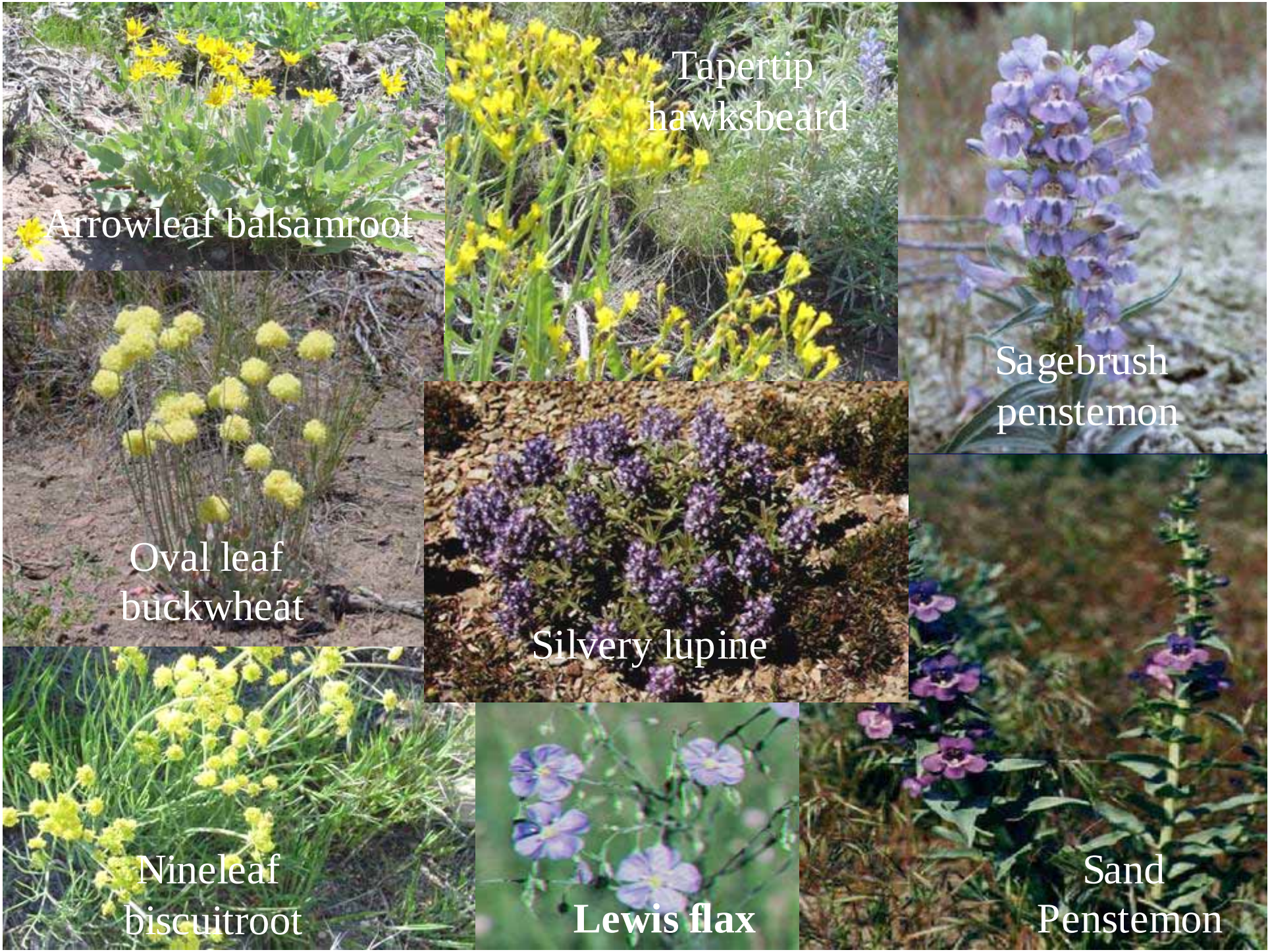
Arrowleaf balsamroot
Tapertip hawksbeard
Sagebrush penstemon
Oval leaf buckwheat
Silvery lupine
Nineleaf biscuitroot
Lewis flax
Sand Penstemon