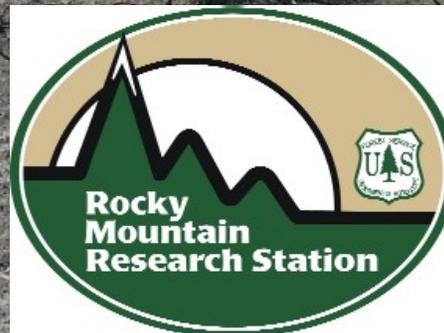


Seed and Seeding Technologies for Reestablishing Wyoming Big Sagebrush in Diverse Seed Mixes



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GBNPSIP funded activities: 2007

- Seeding Equipment:



1. Reestablishing diverse native Wyoming big sagebrush communities: a comparison of seeding equipment.
2. Equipment and Strategies to Enhance the Post-wildfire Establishment and Persistence of Great Basin Native Plants

- Sagebrush Seed:



3. Effect of Moisture Content, Storage Temperature, Duration, and Packaging Material on Wyoming Big Sagebrush Seed Viability
4. Wyoming Big Sagebrush Hydrothermal Time to Germination

Seeding Equipment and Techniques

1. Examine the ability of two drills (Rangeland and Minimum-till) to establish species mixes.
2. Compare establishment at multiple seeding rates.
3. Compare establishment of weedy species in areas seeded with each drill.



Seed Drills



1st Study: Seeded in 2006

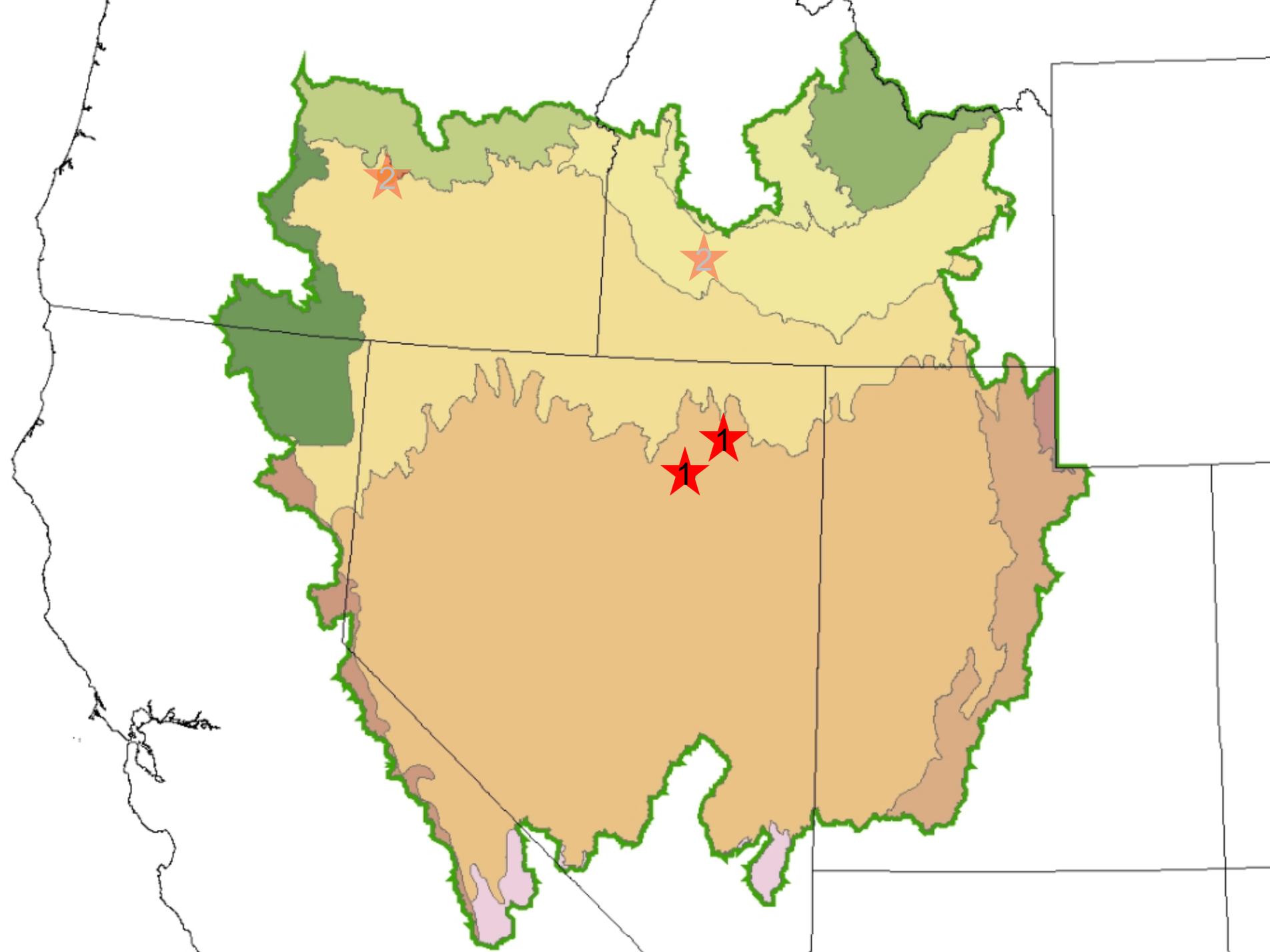
Drill

Seeding Rates

Minimum-till	No Seed
	Low
	High
Rangeland	No Seed
	Low
	High
No Drill	No Seed

Min-Till/Control
Min-till/Low
Min-till/High
No Drill/Control
Range/Control
Range/Low
Range/High

x5



Sites and Seed Mixes

Drill mix

Fourwing saltbush

Blue flax

Munro globemallow

Bluebunch wheatgrass

Bottlebrush squirreltail

Indian ricegrass

Broadcast

Wyoming big sagebrush

Rubber rabbitbrush

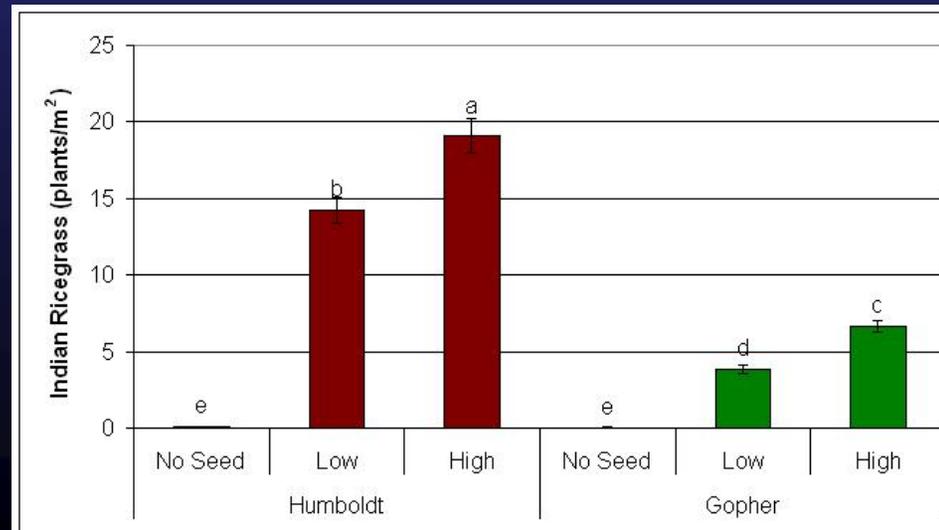
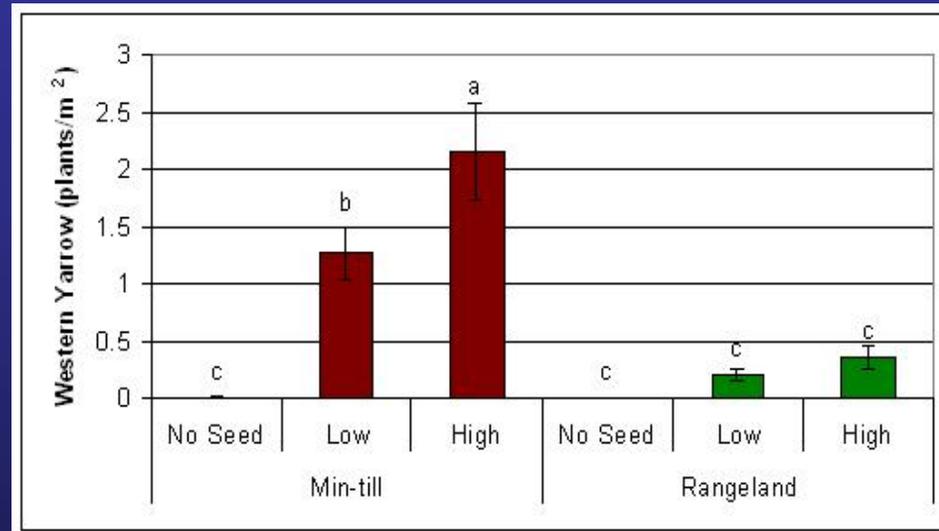
Western yarrow

Sandberg bluegrass



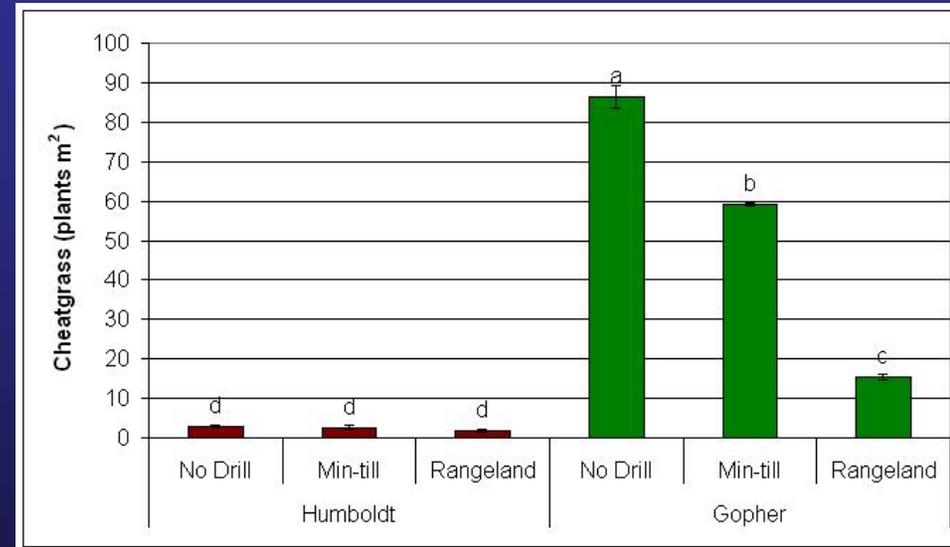
Results: Density of Seeded Species

- Broadcast Species:
 - Significantly higher emergence at both low and high seeding rates from minimum-till drill
- Drilled Species:
 - No difference between drill types



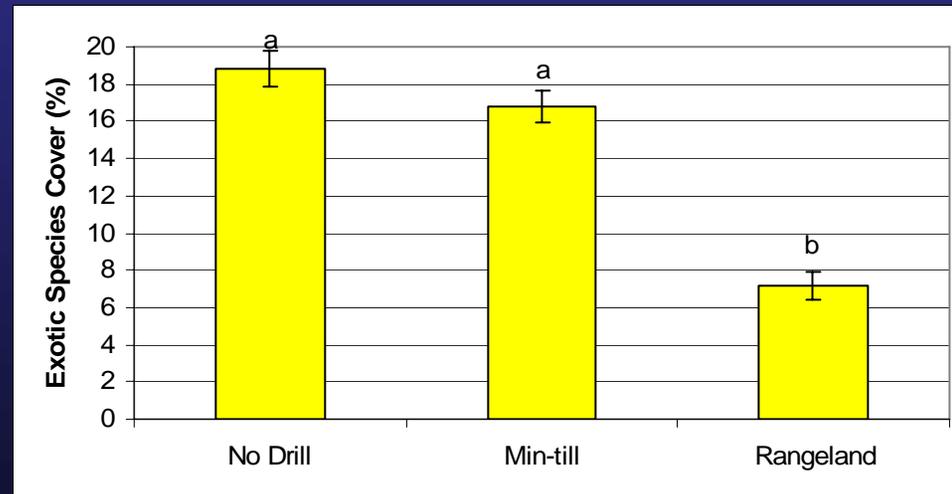
Results: Density of Seeded species

- Cheatgrass:
 - Greater density at one site in un-drilled plots and in plots seeded with the minimum-till drill



Results: Cover of Exotic Species

- Unseeded plots:
 - Rangeland drill produced lower cover of exotic species than the minimum-till drill or no drill at all
- Seeded plots:
 - Again, rangeland drill has lower cover of exotic species than minimum-till drill







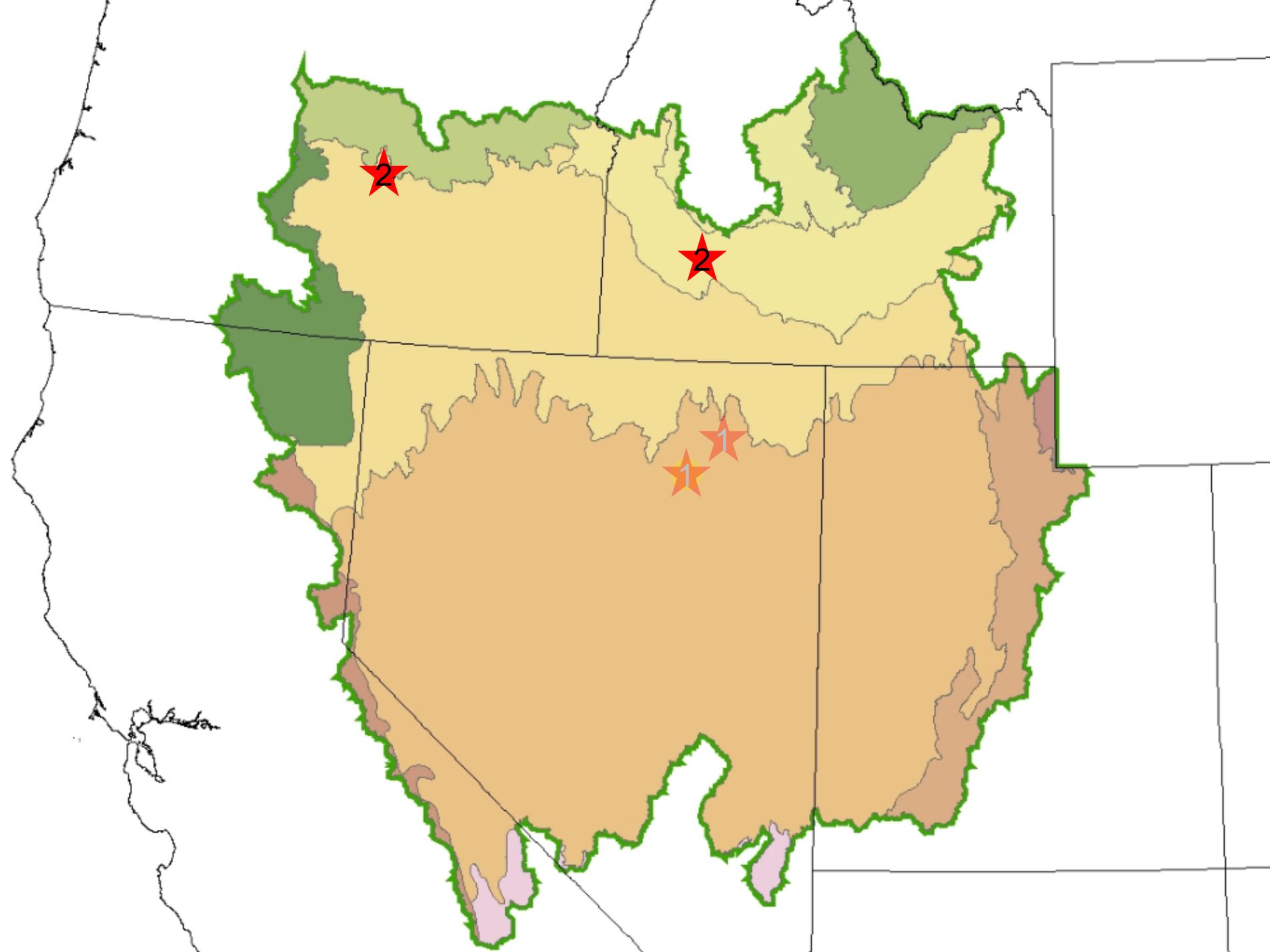


1st Study: Conclusions

- Compared to the rangeland drill, the new, minimum-till drill provided:
 - greater emergence of “broadcast” species
 - Similar emergence of drilled species
 - Greater density of cheatgrass and other non-native species
- Use the Right Tool for the Right Job:
 - When seeding a diverse seed mix including small-seeded species for broadcast, a newer minimum-till drill may provide better emergence at lower seeding rates (= \$\$\$\$ saved)

2nd Study: Seeded in 2007

Seeding Method	Seeding Rate			
Minimum-till	No Seed	Min-Till/Control	x5	
	Low	Min-till/Low		
	Med	Min-till/Med		
	High	Min-till/High		
Minimum-till + Broadcast	Medium	Min-till + BC/Med		
Minimum-till + Winter Broadcast	Medium	Min-till + winter BC/Med		
Rangeland	No Seed	No Drill/Control		
	Low	Range/Control		Min-till/Med
	Med	Range/Low		
	High	Range/Med		
Rangeland + Broadcast	Medium	Range/High	Range/Med	
Rangeland + Winter Broadcast	Medium	Range + BC/Med		
No Drill	No Seed	Range + winter BC/Med		No Drill/Control



Sites and Seed Mixes

Drill mix

Sulfur buckwheat

Munro globemallow

Bluebunch wheatgrass

Bottlebrush squirreltail

Indian ricegrass

Broadcast

Wyoming big sagebrush

Rubber rabbitbrush

Sandberg bluegrass

Scabland Penstemon



Drill, drill broadcast, and hand broadcast: Nov 2007



Winter hand broadcast: Jan 2008



Seeds



3rd Study: Seed Storage

- 5 seedlots
- 4 moisture contents
 - 8, 10, 12, 14% M.C.
- 2 storage containers
 - Plastic mesh, 4mil plastic sheet
- 3 storage temperatures
 - Ambient, 2°, -12°



4th Study: Hydrothermal time to Germination for ARTRW

- 5 seedlots
- ~10 water potentials
- ~10 Temperatures

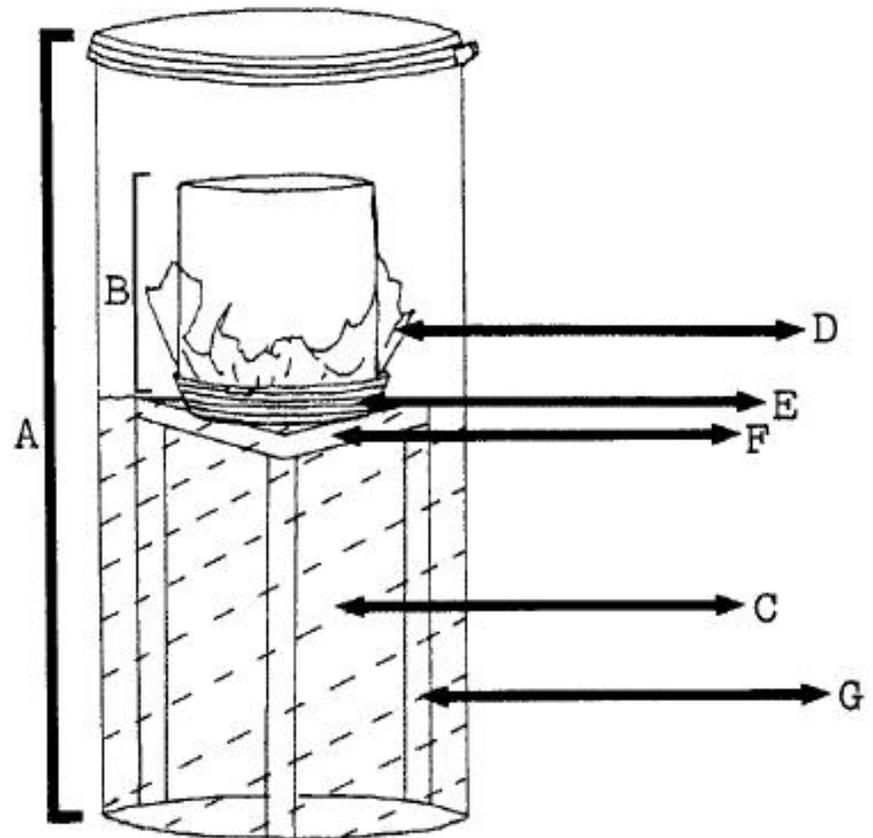
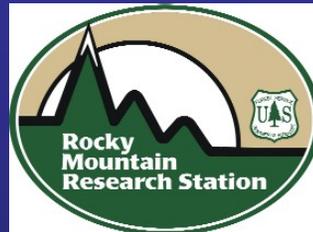


FIG 1 Matric potential control system for seed priming and germination. A, germination vial, B, priming/germination cup, C, osmotic solution; D, cellulose membrane, E, snap-top lid with 25 mm diameter hole, F, plastic screen; G, support rods

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- Funding:



- Site selection:

- Tom Warren, Nevada BLM Elko Field Office
- Dave Rose, BLM Burns Interagency Fire Zone
- Mike Barnum, Idaho BLM Four Rivers FO



- Field and Data Help:

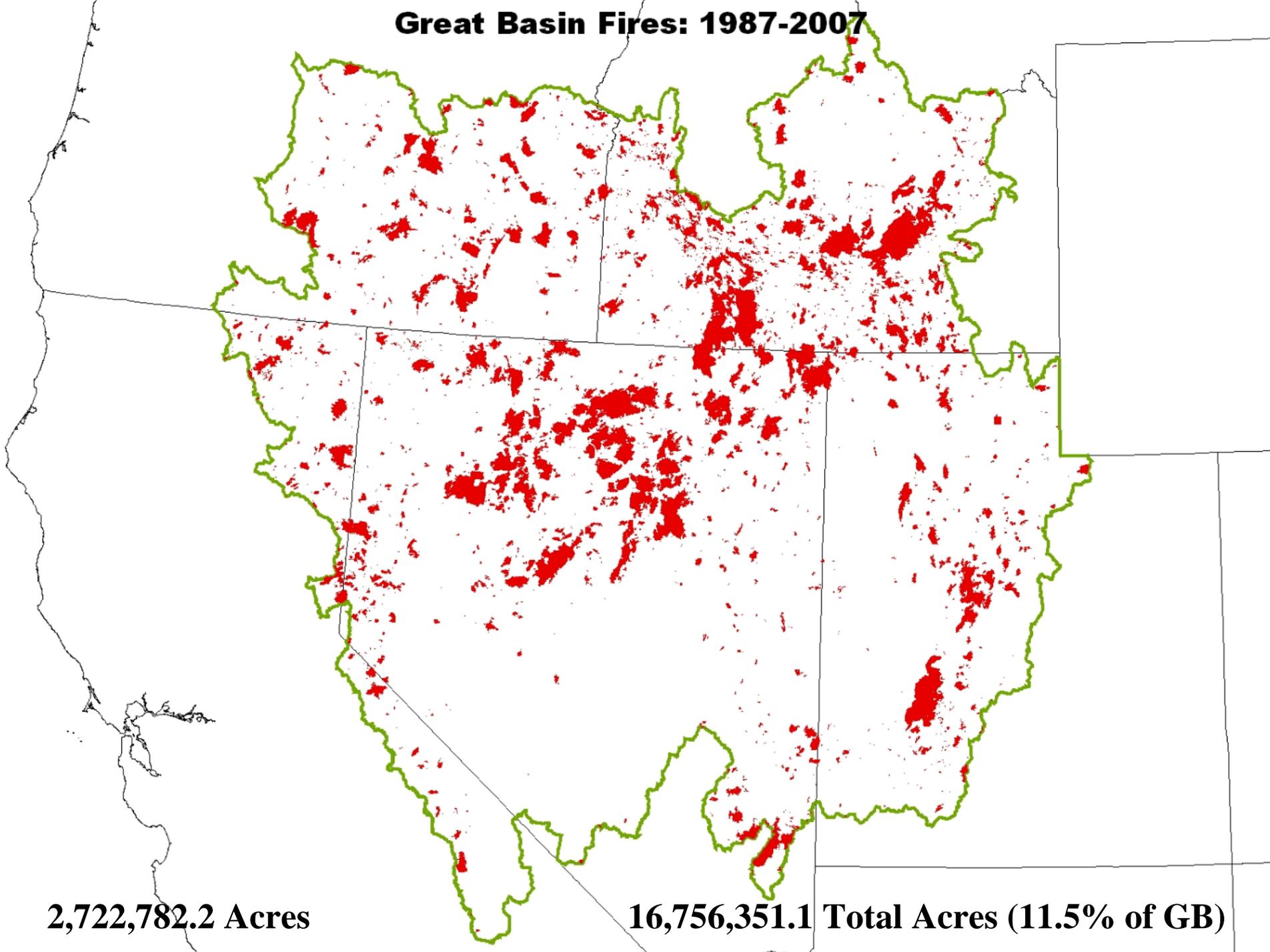
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- Kelsey Sherich
- Scott Jensen
- Hilary Parkinson
- Lance Kosberg
- Erin Denney
- Dallis Gilbert
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Aberdeen PMC
(Brent Cornforth,
Boyd Simonson
Charlie Bair)







Great Basin Fires: 1987-2007



2,722,782.2 Acres

16,756,351.1 Total Acres (11.5% of GB)





Seeding equipment

