

# Big Sagebrush Community Restoration in Utah: Lessons Learned



Danny Summers and Jason Vernon  
Utah Division of Wildlife Resources

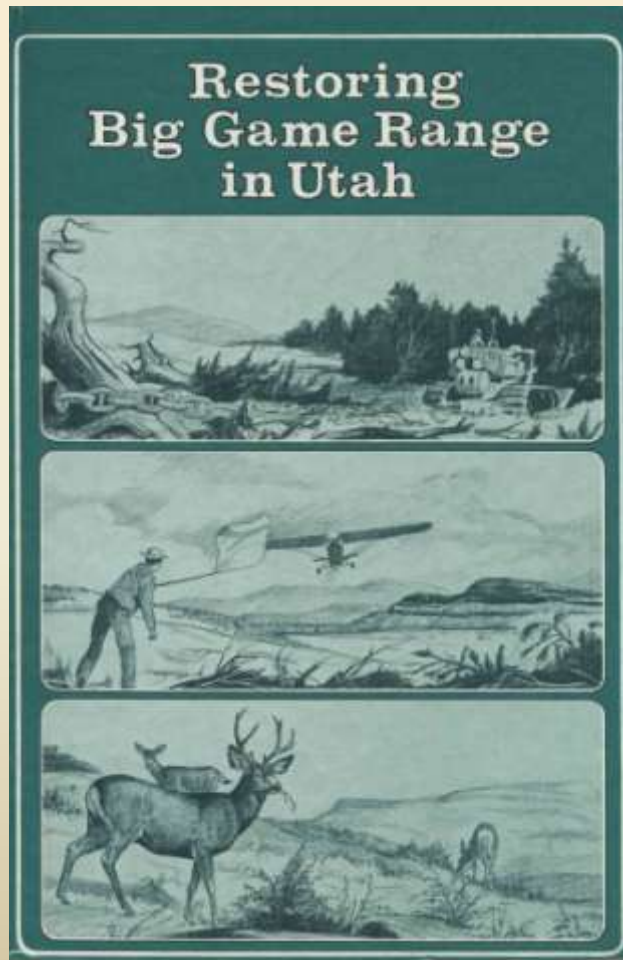


# Great Basin Research Center

- Interagency facility maintained in Ephraim since 1955
- Programs
  - Research
    - Habitat Improvement
    - Plant materials
  - Rangeland seed warehouse
  - Habitat monitoring



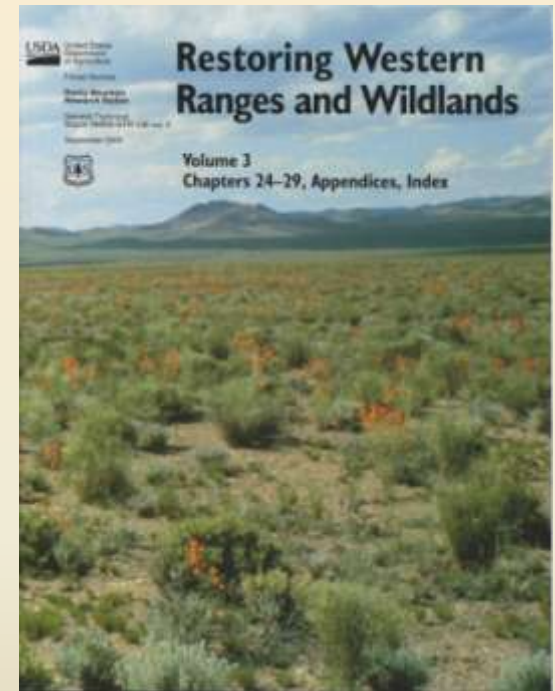
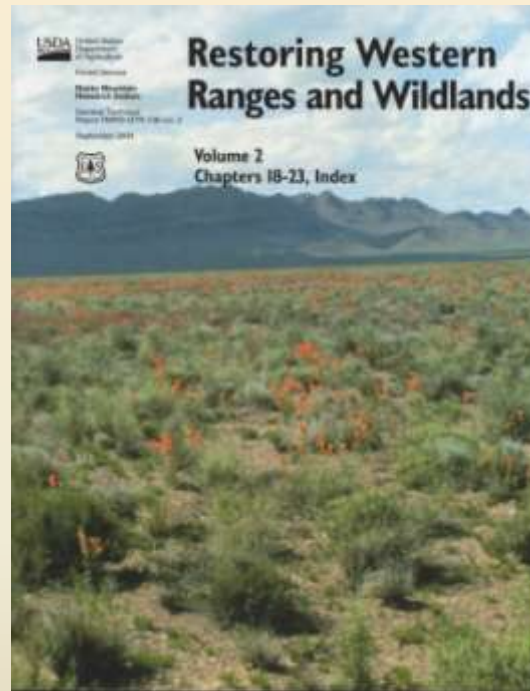
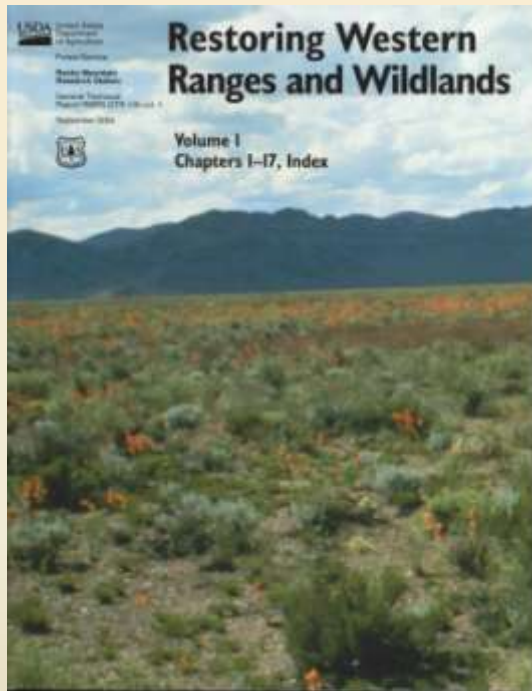
# Restoring Rangeland Resources



- A. Perry Plummer
- Donald R. Christensen
- Stephen B. Monsen
  - 1968
  - out of print



# Restoring Rangeland Resources



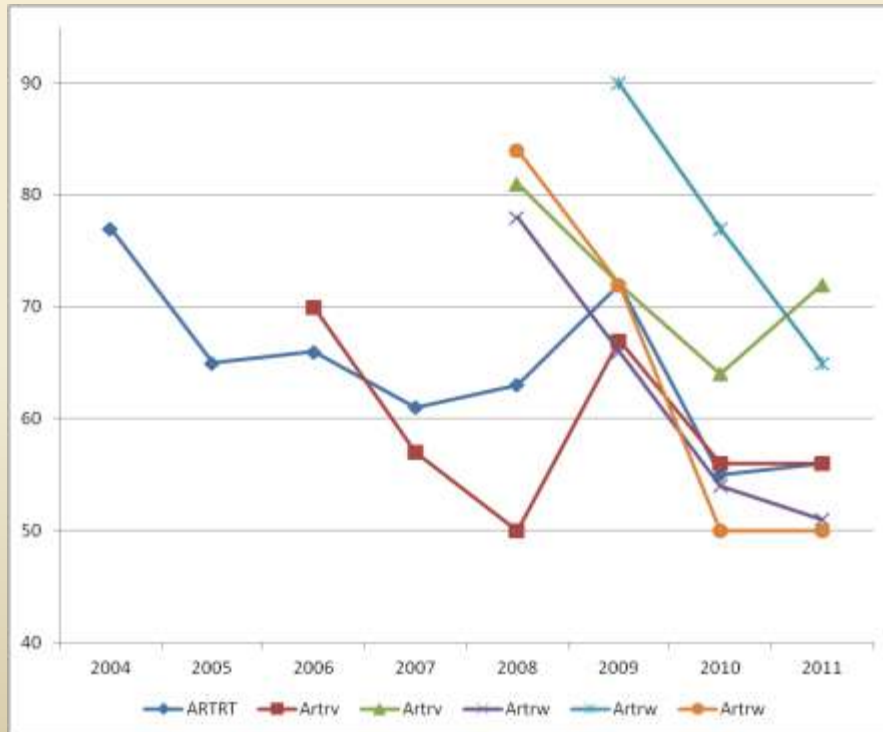
• Stephen B. Monsen      ■ Richard Stevens

■ Nancy L. Shaw

■ [http://www.fs.fed.us/rm/pubs/rmrs\\_gtr136.html](http://www.fs.fed.us/rm/pubs/rmrs_gtr136.html)

# Sagebrush Seed Storage

- Cold storage to maintain viability (35-38°F)
- Dehumidification (10-15%)



# Seed Quality and Identification

- Federal and State certification standards
- Certified vs. non-certified
- Source Identified
- Failing to use the plants adapted to the eco-type can result in poor seeding success.

SOURCE IDENTIFIED SEED		
	Species Name	<i>Sporobolus heterostachys</i>
	Common Name	Prairie Dropseed
	Germplasm ID, Gen.	G3/5
	G2 State, County, Elev.	WI, Dane, 1800 ft.
	G0 State, County, Elev.	WI, Southwest, 790 ft.
	G0 Indigenous? Yes	Yes
	Natural-Track? Yes	Yes
	Lot #	2989-SPOHET-3-SE; 00346
MEMBER OF ASSOCIATION OF OFFICIAL SEED CERTIFYING AGENCIES		

SELECTED CLASS SEED		
	Species Name	<i>Alfalfa</i>
	Common Name	Winterfat
	Germplasm ID, Gen.	Northern Cold Desert, G2/3
	G2 State, County, Elev.	OR, Multnomah, 2300 ft.
	G0 State, County, Elev.	ID, Bingham, 4100 ft.
	G0 Indigenous? Yes	No
	Natural-Track? Yes	No
	Lot #	00497 KL203
MEMBER OF ASSOCIATION OF OFFICIAL SEED CERTIFYING AGENCIES		

TESTED CLASS SEED		
	Species Name	<i>Antelope</i>
	Common Name	White Prairie Clover
	Germplasm ID, Gen.	Antelope, G3/5
	G2 State, County, Elev.	MT, Carbon, 3300 ft.
	G0 State, County, Elev.	ND, Stark, 2400 ft.
	G0 Indigenous? Yes	Yes
	Natural-Track? Yes	Yes
	Lot #	SFD-G2-FLD09-1
MEMBER OF ASSOCIATION OF OFFICIAL SEED CERTIFYING AGENCIES		

CERTIFIED CLASS SEED		
	KIND:	Mountain Big Sagebrush
	VARIETY:	Hobbs Creek, "Natural-Track"
	CERT. #:	WC-1852
	LOT #:	ARTVHC-02001
MEMBER OF ASSOCIATION OF OFFICIAL SEED CERTIFYING AGENCIES		

# Special Seed Needs

Mountain big sagebrush-Source Identified—Southwest Washington County

**This collection must be Source Identified through the Utah Crop Improvement Association as low elevation Mountain Big Sagebrush.**





# Purity

- Purity can effect how the seed is planted.
  - Low purity can stop flow, especially in airplanes
- UDWR standard 30% pure minimum
- PLS 24% minimum





# Project Planning

- Advanced proactive restoration project planning allows for seed purchasing of site adapted seed.
  - Utah Watershed Restoration Initiative
- Buying early and in larger quantities generally brings lower prices.
  - Identifying needs for seed early through the project planning process allows for this.



# Seedbed Preparation & Seeding

- Removal of competition
- Fall & winter
  - Seed on top of snow
- Recommended Seeding rates 0.1 – 0.25 lb.pls/ac
- Depth: Surface – 3mm deep
- Surface compaction can help

# Seedbed Preparation and Controlling Competition

- Fire
  - Fire Rehabilitation
  - Prescribed fire
    - burning off undesirable weeds prior to seeding
- Herbicides
  - Plateau
  - Roundup

# Seedbed Preparation Equipment

- Bullhog (Masticator/Shredder)
- Chain
- Pipe harrow
- Aerator
- Drill





# Seeding Equipment

Rangeland Drill



Truax Rough Rider Drill



Pulled Tubes to  
Broadcast Seed





# Broadcasters











# Swain Fire 2000 – Fillmore, UT

Deer Winter Range Sagebrush was Key Species to Restore  
Chained, then Aerially Applied Seed





# Swain Fire - Fillmore, Utah

Burned 2000 Photo 2002

## NON-CHAINED AREA

Low diversity  
Dominated by annuals  
Lack of litter



500 Sagebrush seedlings per acre

## CHAINED AREA

Plant diversity  
Shrubs, forbs, grasses  
Litter



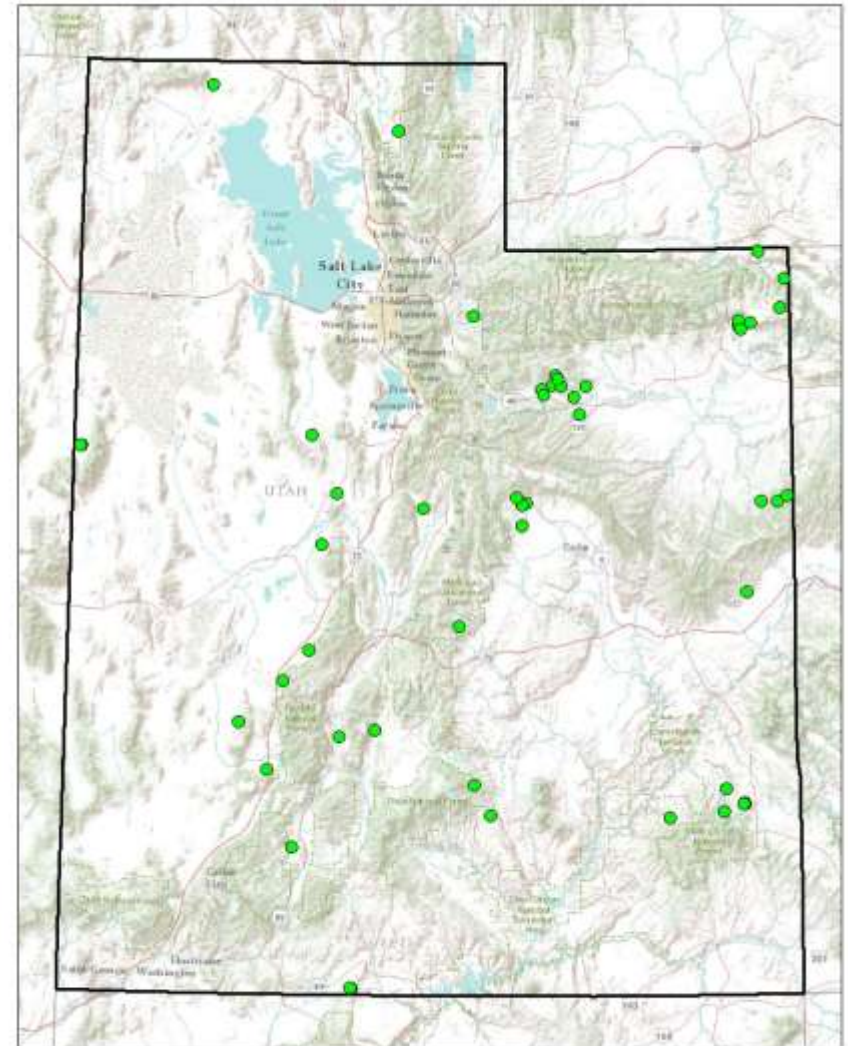
5894 Sagebrush seedling per acre

# Current Efforts



# Monitoring Projects

- 2004-2009
  - ~100 projects
  - 56 monitoring seeded sage sites statewide
- Data
  - Pre-treatment
  - Post-treatment
    - 3-4 years





# Successful Seeding Treatments

- Pinyon Juniper Removal
- Fire Rehab Chaining
- Grass Diversification (herbicides)
- Harrowing





# Santaquin Chaining 2004





# Santaquin Chaining 2010



20 – 800 plants/acre



# Bullhog/Masticator





# Diamond Mtn Bullhog 2004

Diamond  
Bull Hog 9R-4  
6/29/04  
200' FWD



# Diamond Mtn Bullhog 2010



0 – 2900 plants/acre



# Goslin Mountain Bullhog 2008





# Goslin Mountain Bullhog 2010



300 – 880 plants/acre



# Roller Chopper





# Wildcat Roller Chopper 2005

Wildcat Push  
16R-16 7/21/05  
O FWD



# Wildcat Roller Chopper 2010

WILDCAT PUSH  
16R-16 8-16-10  
0' FORWARD

0 – 1560 plants/acre



# Fire Rehabilitation using Chaining





# Big Cedar Cove 2003





# Big Cedar Cove 2008

## Milford Flat Fire 2007





# Big Cedar Cove 2011

## Milford Flat Fire 2007

320 plants/acre





# Milford Flat Fire 2011





# Buckskin 2005





# Buckskin Fire 2008

1220 plants/acre

Buckskin Hand  
Thinning-Control  
27R-18 06/17/08  
100' Back



# Spray and Drill





# Little Donkey 2004





# Little Donkey 2007



80-6440 plants/acre80



# Little Donkey Jan. 2012













# Harrow

- Plateau to control cheatgrass



# Brush Creek Dixie 2007





# Brush Creek Dixie 2009





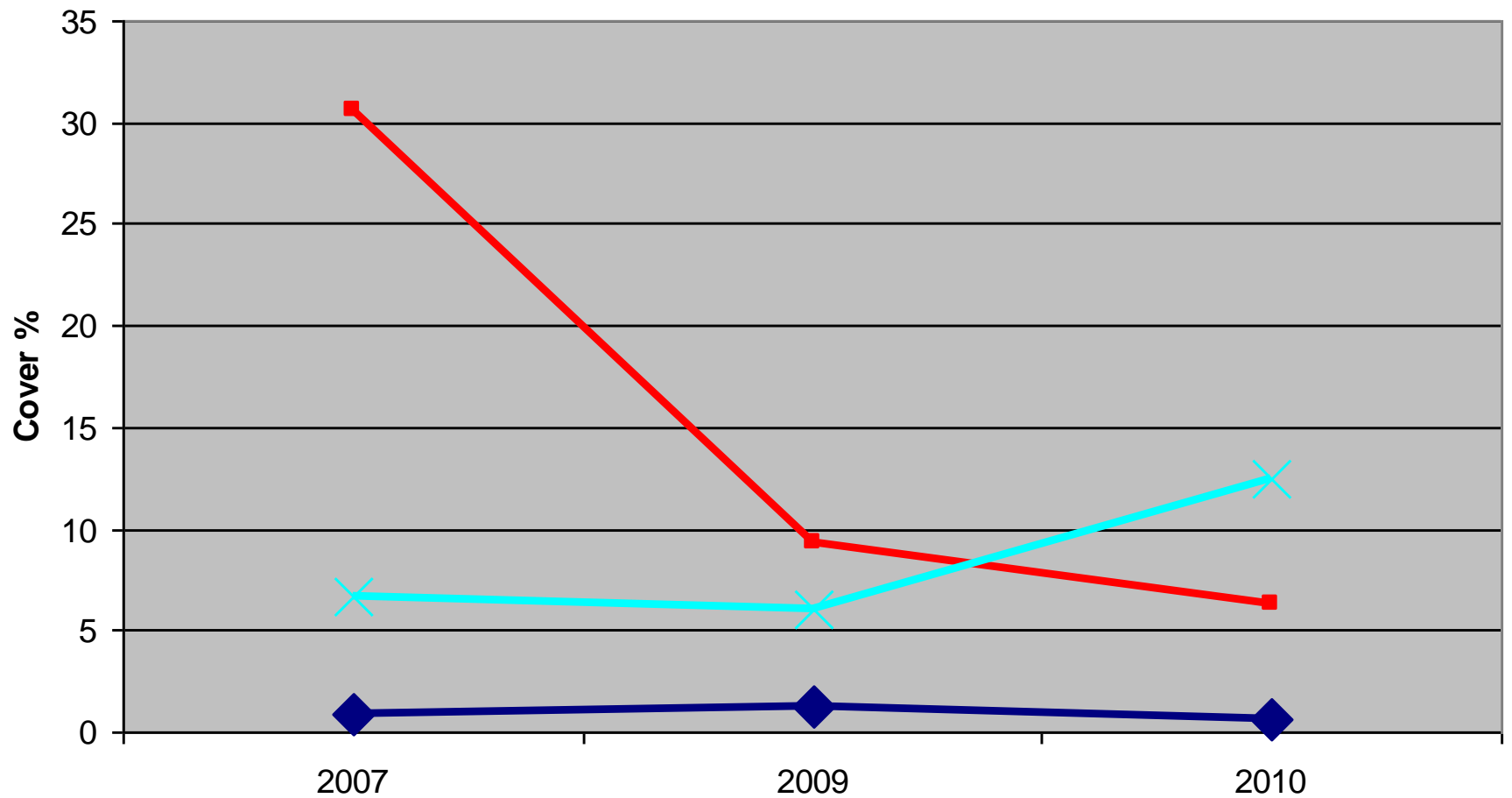
# Brush Creek Dixie 2010



4420 – 5100 plants/acre



## Brush Creek Dixie



◆ Grass ■ Cheatgrass x Sage



# Projects to enhance sagebrush without seeding



# McCook Ridge Chaining 1982





# McCook Ridge Chaining 1988





# McCook Ridge Chaining 2000





# McCook Ridge Chaining 2005

## Bullhog Retreatment





# McCook Ridge Chaining 2010





# Alton Millcreek Bullhog 2007





# Alton Millcreek Bullhog 2010



140 - 540 plants/acre



Seeding without seed bed  
preparation



# Millville Face 2006





# Millville Face 2011





# Conclusions

- Control competition
- Prepare seedbed
- Precipitation





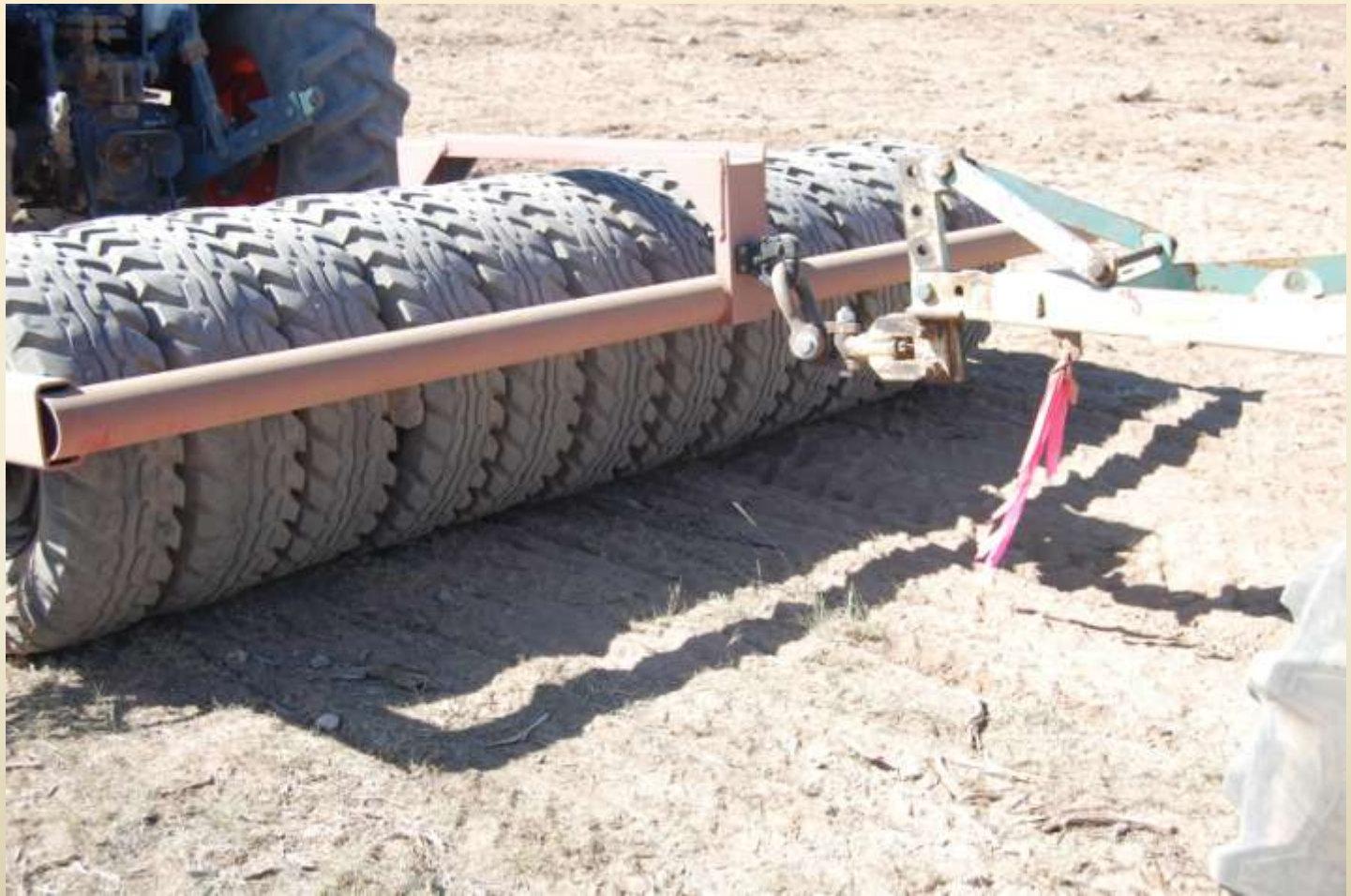
# New Glenwood Research Project

- Drill
- Chain
- Plateau herbicide
- Disking or burning
- Wheel Packer





# Wheel Packer





Thank You

