Facilitating Cheatgrass (*Bromus tectorum*) Fuels Reduction: What Defines a Resistant Plant Community

USDA Agricultural Research Service
United States Department of Agriculture
Great Basin Rangelands Research Unit

Dan Harmon, Charlie Clements and Bob Blank

USDA-ARS-Great Basin Rangelands Research Unit
920 Valley Road, Reno NV 89512
daniel.harmon@ars.usda.gov

Managing cheatgrass to prevent habitat loss is critical for the survival of native plants, wildlife and sustainable livestock grazing practices.

The best means to suppress cheatgrass is the presence of a long-lived perennial grass.

Rehabilitation and Drill Seeding

Treatments:

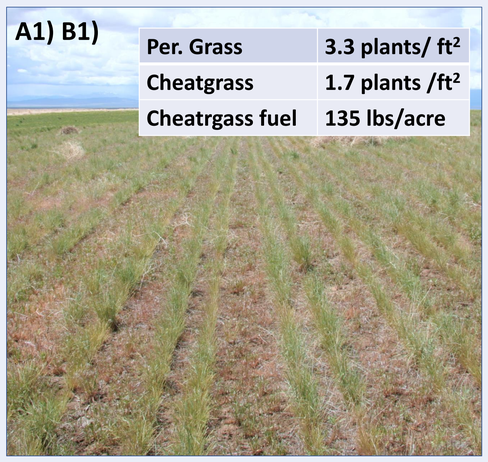
A) Seed mix *1)* Native perennial grass only mix vs. *2)* Introduced Perennial grass seed mix

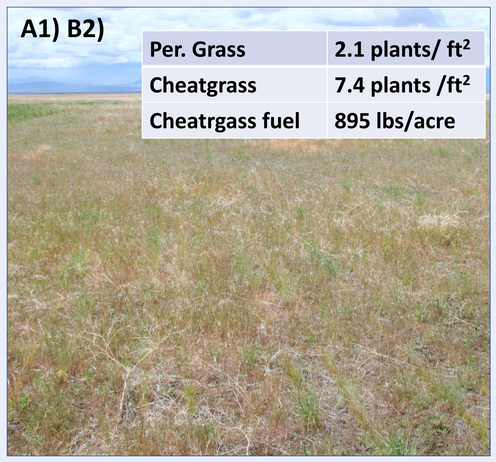
B) Pre-seeding cheatgrass control *1)* herbicide fallow vs. *2)* fire

Response variables:

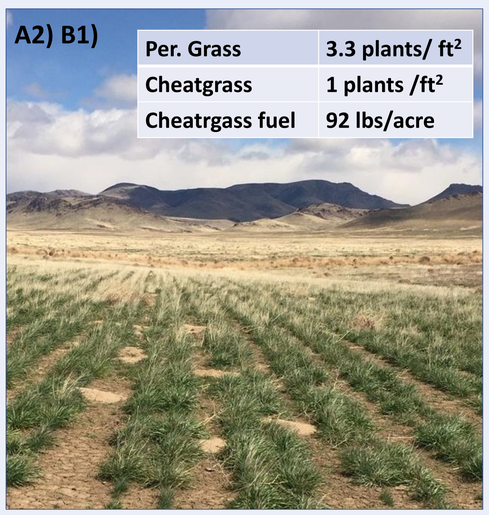
Perennial grass density & Cheatgrass density & Fuel

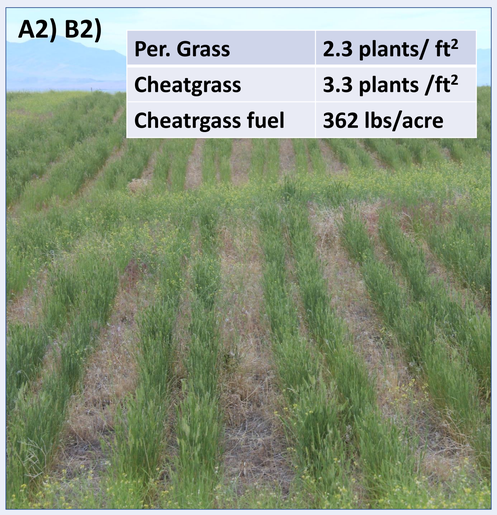
Treatment	Species	Rate lbs/acre
Introduced Mix	'Hycrest' crested wheatgrass *(Agropyron cristatum)*	4
	Siberian wheatgrass *(Agropyron fragile)*	4
Native Mix	'Anatone' bluebunch wheatgrass *(Pseudoroegneria spicate)*	6
	Sherman big bluegrass (Poa secunda)	2
	Sandberg bluegrass *(Poa secunda)*	2





Native Seed Mix

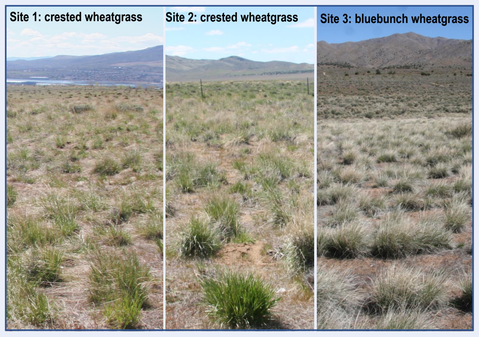




Non-Native Seed Mix

The Effect of Litter on Cheatgrass Suppression

3 replicated suppression sites



Treatments:

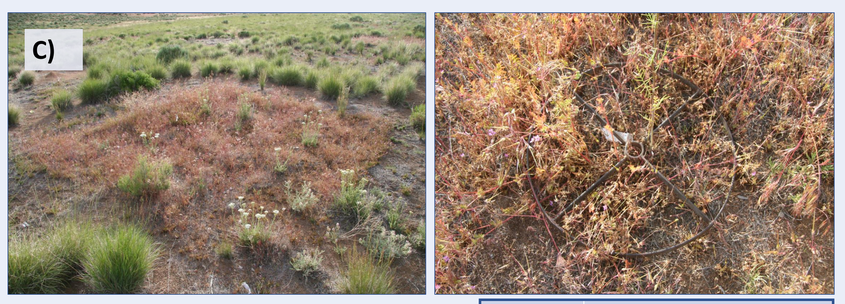
A) Perennial grass intact

B) Perennial grass intact & *2,000lbs/acre litter added*

C) Perennial grass removed (glyphosate)

Response variables:

Cheatgrass density



	Cheatgrass density plants/ft2		
Treatment	Site 1	Site 2	Site 3
A	15.1	4.9	2.4
B	32.0	6.4	7.9
C	31.6	9.4	10.5

Summary

Competition for resources is the means by which resistance can be defined. In order to facilitate resistance, perennial plants must have the potential to establish, persist and effectively compete for resources. While non-native grasses have the greatest establishment potential , if establishment can be achieved , native grasses such as bluebunch wheatgrass can be effective at suppression. Many native grasses are unlikely to be as effective at suppression. Using grazing to reduce fuels (litter) will increase cheatgrass suppression potential.

Perennial Grass Competition for Soil Moisture and Nitrogen

(mechanisms for suppression)

Treatments:

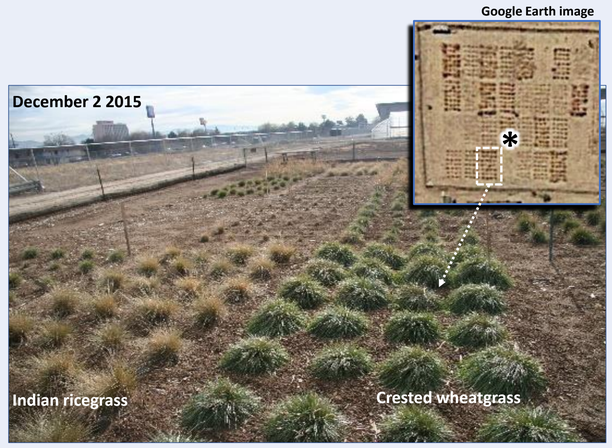
Perennial Grass Species

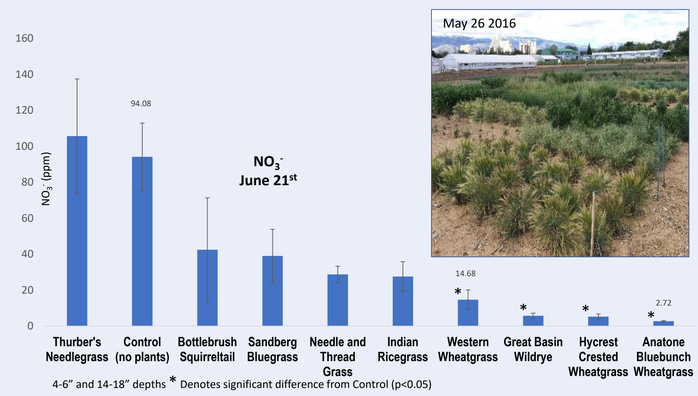
Response Variables:

Gravimetric soil moisture & ppm soil NO_3^-

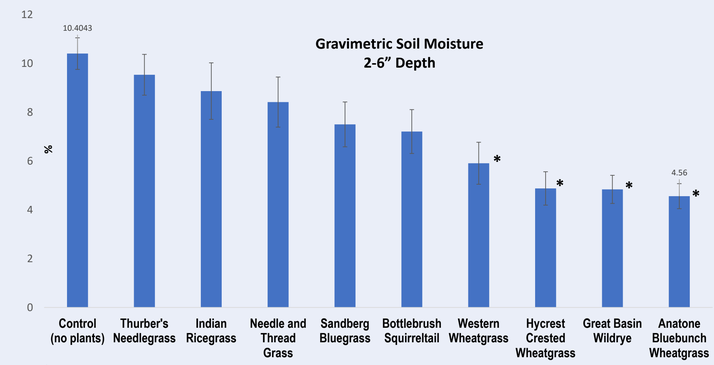
Methods:

At monthly intervals, gravimetric soil moisture and ppm NO_3^- were measured at 2 depths (4-6" and 14-18") in each replicated plot (3) for each perennial grass species (9). 1 plot* = 28 plants of individual species (4 x 7 plants 1ft spacing)





4-6" and 14-18" depths * Denotes significant difference from Control (p<0.05)



* Denotes significant difference from Control (p<0.05) mean of April, May, June, Sept, Oct