

RESULTS

Cheatgrass Densities (plants/ft²)

	Control (no herbicide)	Herbicide Treated
May 2017	2.6	0
May 2018	1.3	0

Perennial Grass Seedling Establishment (recorded May)

Year	Seedmix	Seedlings/ft ²	Annual precipitation (Oct. to Sept.)
2018	Introduced	0.8	4.9"
	Native	0.4	
2019	Intro/Native	0.7	10.4"
	Introduced	2.5	
	Native	0.9	
	Intro/Native	2.4	

	2018	rate	2019	rate
Introduced	Siberian wheatgrass	7	Siberian wheatgrass	7
	Russian wildrye	3	Russian wildrye	3
	Forage kochia	2	Forage kochia	2
	(total)	12lb	(total)	12lb
Native	Ricegrass	4	Ricegrass	4
	Sand drop seed	1	Sand drop seed	1
	Needle and thread grass	2	Needle and thread grass	2
	Sandberg bluegrass	2	Western wheatgrass	1
	Winterfat	3	Galletta grass	1
	Rocky Mt. bee plant	0.5	Winterfat	12
	(total)	12.5lb	(total)	22lb
Intro/ Native	Siberian	4.5	Siberian	4.5
	Rice grass	2	Rice grass	2.5
	Sand drop seed	0.5	Sand drop seed	0.5
	Needle and Thread grass	1	Needle and thread grass	1
	Sandberg bluegrass	1	Sherman big bluegrass	1
	Rocky Mt. bee plant	0.5	Globemallow	0.5
(total)	9.5lb	(total)	10lb	



Figure 4. Siberian wheatgrass successfully established in the arid environments of Dry Lake Valley where perennial grass densities were nearly absent prior to weed control and seeding efforts. Practically zero shrubs or forbs established.

DISCUSSION

Annual grass weed control using pre-emergent herbicides was found to be effective (decreased competition), however very limited “spotty” perennial seedling establishment occurred regardless. More research should be conducted to determine what affects the successful establishment of critical shrub species like winterfat or “shrub loss mitigation” species like forage kochia. The use of introduced species, such as Siberian wheatgrass or Russian wildrye, in these arid sites increases seedling density establishment rates, provides increased forage value, cover and the chance to further suppress annual weeds through competitive exclusion (cheatgrass suppression).

INTRODUCTION

Resource managers have a difficult task restoring or rehabilitating degraded habitats throughout the Great Basin (Fig. 1). These challenges are multiplied many times over when these habitats are extremely arid. Researchers have reported that favorable conditions to establish seeded plants in these arid environments may only occur 1 out of every 4 years. Others have reported the necessary conditions needed for natural or “seeded” seedling recruitment may only occur 1 or 2 years out of every 15.



Figure 1. Dry Lake Valley, eastern Nevada, is a degraded winter fat plant community that averages less than 6” of annual precipitation.

METHODS

- We tested the use of pre-emergent herbicides Imazapic and Sulfometuron Methyl in a replicated complete block design in a degraded winterfat/Indian ricegrass/galletta grass community in eastern Nevada from 2016-2020 (Fig. 2).
- Herbicide treated plots were fallowed for 1-year and then seeded the following October with a no-till drill (2017 and 2018) (Fig 3).
- The site averages less than 6” (178 mm) of annual precipitation, while during this study the site received as little as 4.9” (122 mm) in 2020 and as much as 10.4” (264 mm) in 2019. Each herbicide treated plot was seeded with a Native, Introduced or Introduced/Native seed mix (Table 1).



Figure 2. Release of residual native species after annual weed control using pre-emergent herbicide.



Figure 3. Seeding of Native, Introduced or Native/Introduced seed mixes using a no-till drill.