USDA Agricultural Research Service
Great Basin Rangelands Research Unit

Perennial Grass Establishment Following Fall and Spring Imazapic Applications

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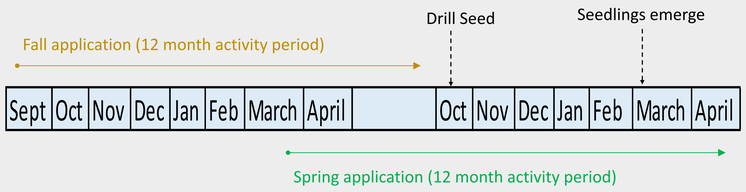
Introduction

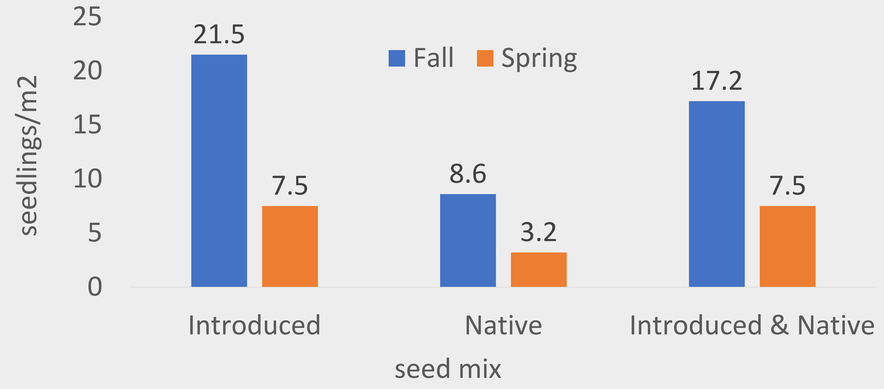
It is critically important that land managers have useful information available to them when attempting proper weed control practices in efforts to improve restoration/rehabilitation efforts on cheatgrass-infested rangelands. We were approached on the topic of applying the well-known pre-emergent herbicide, *Imazapic* (Plateau) in the spring of the year compared to the fall of the year on cheatgrass-infested rangelands and then seeding that treated habitat the following fall. Our experience has been that *Imazapic* has a soil activity of 12-15 months and the residual activity could damage seedlings of seeded species that were treated with *Imazapic* in the spring of the year and seeded the following fall and therefor decrease overall establishment of seeded species compared to fall treated *Imazapic* plots that fallowed for 1-year before applying seeding methodologies.

Pre-emergent herbicides can be a very effective tool at controlling cheatgrass densities and opening the window for added seedling survival of perennial species following seeding methodologies.

Methods

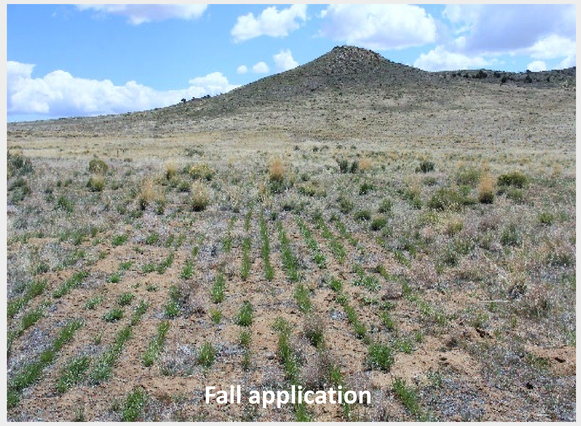
We initiated an experiment by which we applied *Imazapic* in the fall of 2017 and the spring of 2018 @ 70g ai/ha (6oz/ac) in a completely randomized block design which included A) *Imazapic* Fall 2017, B) *Imazapic* Spring 2018 and C) Control (No herbicide) in 75m x 90 m plots with two replications. The treated plots were seeded in the fall of 2018 with introduced, native and introduced/native perennial grass seed mixes using a Kincaid experimental no-till drill.

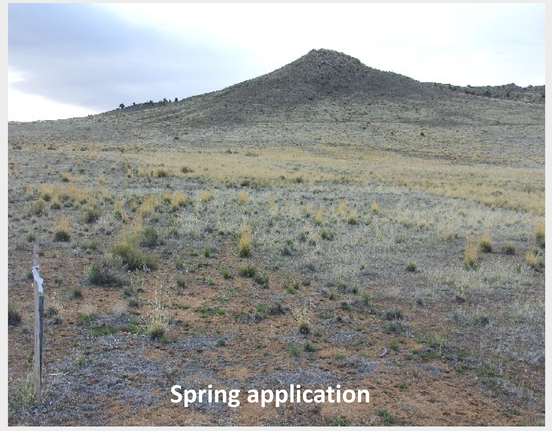




October (2018) drill seeding after Imazapic Fall (Sept 2017) and Spring (April 2018) application.

May 2019 seedlings in Fall application plot (introduced seed mix).





Perennial grass initial emergence and establishment was significantly higher when the pre-emergent herbicide, *Imazapic*, was applied in the fall of the year and seeded to desirable species following a 1-year fallow period.

Results and Discussion

Establishment of perennial grasses in each seed mix was significantly higher in *Imazapic* fall treated plots. Fall plots recorded 21.5, 8.6 and 17.2 perennial grasses/m² in the introduced, native and introduced/native seed mixes, respectfully. *Imazapic* spring treated plots recorded 7.5, 3.2 and 7.5 perennial grasses/m² in the same seed mixes, respectfully. Control (No herbicide) plots did not record any seedlings of seeded species.

	lbs /acre rate
Introduced Mix	
siberian wheatgrass	6lbs
'hycrest' crested wheatgrass	2lbs
forage kochia	2lbs
10lb total	
Native Mix	
'anatone' bluebunch wheatgrass	8lb
sherman big bluegrass	2lb
sandberg bluegrass	0.5lb
Rocky mt bee plant	0.5lb
yarrow	1lb
12lb total	
Introduced/Native Mix	
siberian wheatgrass	2lb
'hycrest' crested wheatgrass	2lb
'anatone' bluebunch wheatgrass	4lb
sandberg bluegrass	1lb
sherman big bluegrass	2lb
forage kochia	1lb
12lb total	

The *Imazapic* spring treated plots continued to show cheatgrass control in the spring of 2019, 1-year following application which is another indicator that this non-selective, soil-active pre-emergent herbicide has the residual effect to cause additional mortality to seedlings of seeded species.

The cold desert environments of northern Nevada rangelands receive the vast majority of precipitation during the winter months, spring applications of *Imazapic* in environments that receive warm season precipitation may experience less perennial grass mortality than cold desert environments of northern Nevada.