USDA Agricultural Research Service
Great Basin Rangelands Research Unit

Initial Seeded Perennial Grass Emergence Following the Application of Rejuvra™

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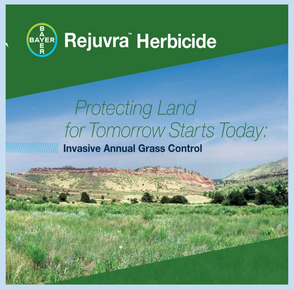


"Rejuvra - Consistent, long-term weed control: Up to four-year control of invasive grasses, depending on weather, grazing pressure, and other factors. Releases desirable perennial vegetation: Perennial plants respond quickly to the additional water and nutrients that become available when invasive annual grasses are controlled." Bayer

Introduction

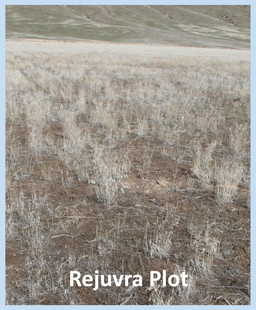
The accidental introduction and invasion of cheatgrass (*Bromus tectorum*) throughout millions of hectares of Intermountain West rangelands has resulted in astronomical changes to many plant communities. Resource managers need tools to conduct aggressive and effective weed control practices on cheatgrass-infested rangelands to improve restoration/rehabilitation efforts. The use of pre-emergent herbicides can be very effective in decreasing cheatgrass densities which are limiting to the establishment of perennial species. *Indaziflam*, Rejuvra™, is a pre-emergent herbicide recently available for research on Nevada rangelands.

Former big sagebrush/bunchgrass community converted to annual grass dominance significantly reduces sustainable grazing habitats as well as decrease critical wildlife habitats due to cheatgrass associated fuels and increased wildfire frequencies.

Methods

In 2018 we initiated research to measure the efficacy of Rejuvra on cheatgrass control and perennial grass emergence in northern Nevada compared to the widely used pre-emergent herbicide, *Imazapic*, Plateau®. Due to the environments of the cold desert, we applied these pre-emergent herbicides in the fall of the year (September 2018), fallow the site for 1-year and then seed with desirable perennial species (October 2019). Plots, 75m x 90m, were set up in a complete randomized block design with 2 replications which included **A**) Rejuvra (5oz/ac)[58 g ai/ha], **B**) Plateau (6oz/acre)[70 g ai/ha] and **C**) Control (No herbicide).

Rejuvra treated plots reduced cheatgrass initial densities by 94.8%, while Plateau treated plots reduced cheatgrass densities by 97.8%.

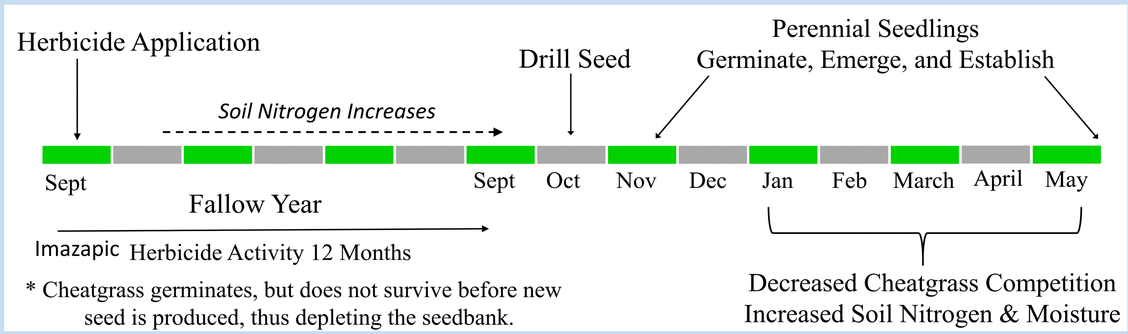


Level of cheatgrass control following Rejuvra application. Residual perennial vegetation is very sparse, therefor there is a need to establish perennial species through seeding methodologies. Photos April 2019.

	Lbs/acre
Native Seed Mix	***Total 12lbs (~120$/acre)***
'anatone' bluebunch wheatgrass	6
sherman big bluegrass	2
sandberg bluegrass	2
wyoming big sagebrush	1 (broadcast)
rocky mountain bee plant	1
Introduced Seed Mix	***Total 10lbs (~70$/acre)***
'hycrest' crested wheatgrass	4
siberian wheatgrass	4
'immigrant' forage kochia	1 (broadcast)
'snowstorm' forage kochia	1 (broadcast)
Intro/Native Mix	***12lbs (~115$/acre)***
'hycrest' crested wheatgrass	2
siberian wheatgrass	2
'anatone' bluebunch wheatgrass	4
sandberg bluegrass	1
wyoming big sagebrush	1
'immigrant' forage kochia	1
rocky mountain bee plant	1

Following 1-year fallow, treated plots were seeded October 2019 to introduced, native and introduced/native seed mixes using a Kincaid experimental no-till drill.

Imazapic herbicide application timeline



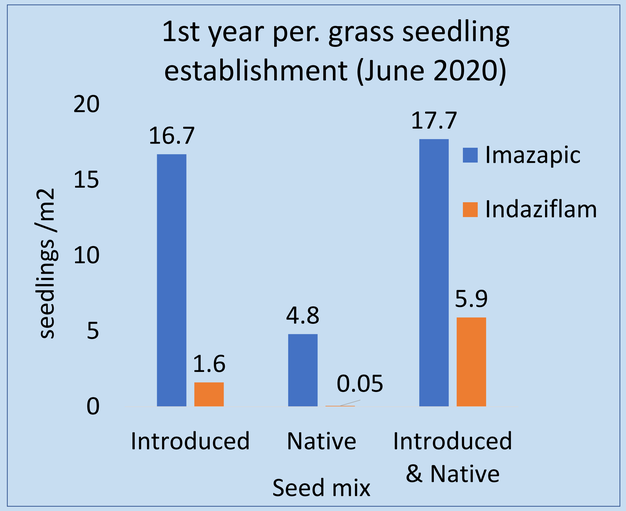
Rejuvra herbicide activity ⟶ (up to 4 years)?

Results and Discussion

In the spring of 2020, Rejuvra plots recorded significantly less initial emergence of perennial grasses in each seed mix compared to Plateau treated plots.

- Imazapic plots recorded 16.7, 4.8 and 17.7 perennial grass seedlings/m² in the introduced, native and introduced/native seed mixes, respectfully.
- Rejuvra (Indaziflam) plots however, only recorded 1.6, 0.5 and 5.9 perennial grass seedlings/m² in the same seed mixes.

Control plots did not record any seedlings of seeded species. The site only received 14.38 cm (5.6") of precipitation from October 2019 through September 2020.



The long activity period of Rejuvra (up to 4 years) could dictate that seeding efforts occur after the typical 1-year fallow period used with imazapic.

This research will continue to test seeding efforts 2, 3 and 4 years post initial Rejuvra application.