Perennial Grass Emergence Following Indaziflam and Imazapic Applications on Great Basin Rangelands

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- Exotic and invasive annual grasses, such as cheatgrass (Bromus tectorum), continue to provide an early maturing fine-textured fuel that increases the chance, rate, spread and season of wildfires throughout the Intermountain West resulting in conversion of big sagebrush/bunchgrass communities to cheatgrass dominance **(Fig. 1)**.

- Resource managers and land owners require viable tools to combat this ongoing challenge in an effort to reduce wildfire threats and improve grazing and wildlife resources.

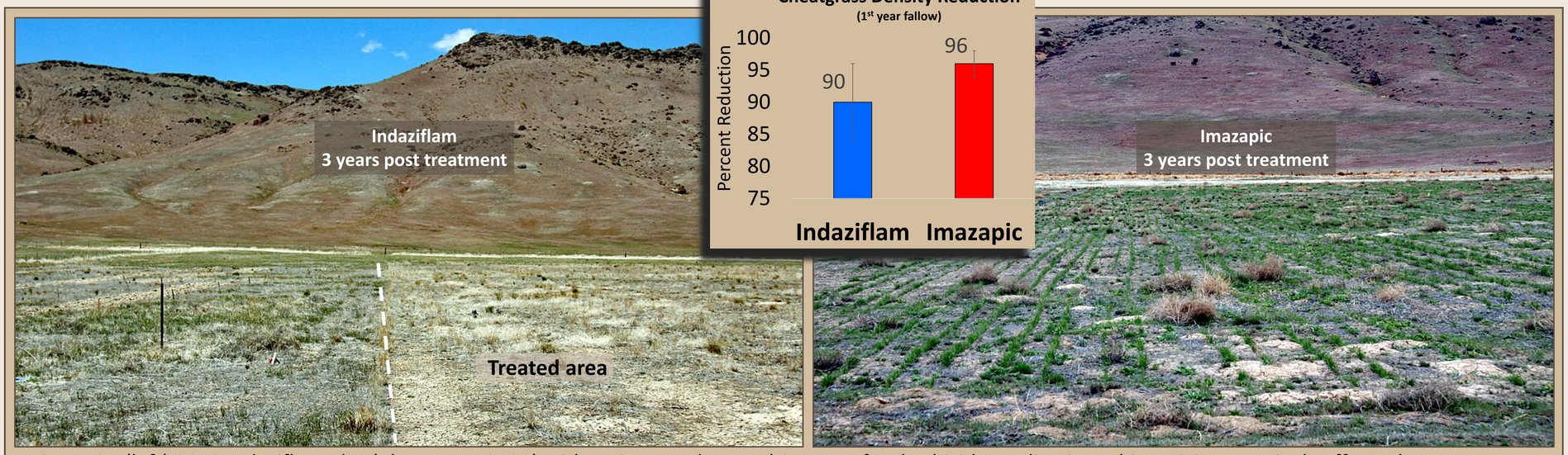

Figure 2A (left) 2018 Indaziflam plot (photo May 2022) with active weed control 3 years after herbicide application. This activity negatively affects the establishment of seeded species. Figure 2B (right) 2018 Imazapic plot (photo May 2022) with little weed control and no effect on seeded drill rows.

Figure 1. Former big sagebrush/bunchgrass community converted to cheatgrass dominance post wildfire.

Table 1. Seed mixes. Species and rates (lbs/acre)

MIX	SPECIES	RATE
Introduced	Siberian wheatgrass	8
	Forgae kochia	2
	(total)	10
Native	Snake River wheatgrass	6
	Squirreltail 'Pueblo'	1.4
	Western wheatgrass	0.6
	Sherman big bluegrass	1
	Sandberg bluegrass	1
	Wyoming big sage	1
	Yarrow	0.5
	(total)	11.5

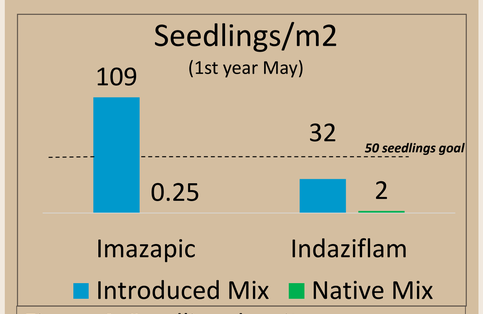

Figure 4. Seedling density
(measured May 2022 seeded October 2021)

Seed mixes were seeded using a no-till drill in October 2021, 3 years post herbicide application. Imazapic treated plots recorded the highest perennial grass emergence **(Fig. 3.)**

RESULTS

To evaluate success, we use a predicted estimate of 20% survival of first year seedlings, with a goal of 10 established grasses per m^2 (2^{nd} year) in order to suppress cheatgrass long term through competitive exclusion. Only the Imazapic treated introduced seed mix met the initial goal of 50 1^{st} year seedlings/m^2 (Fig 4.)

(50 seedlings x .2 [survival]=10 2^{nd} year seedlings {predicted})

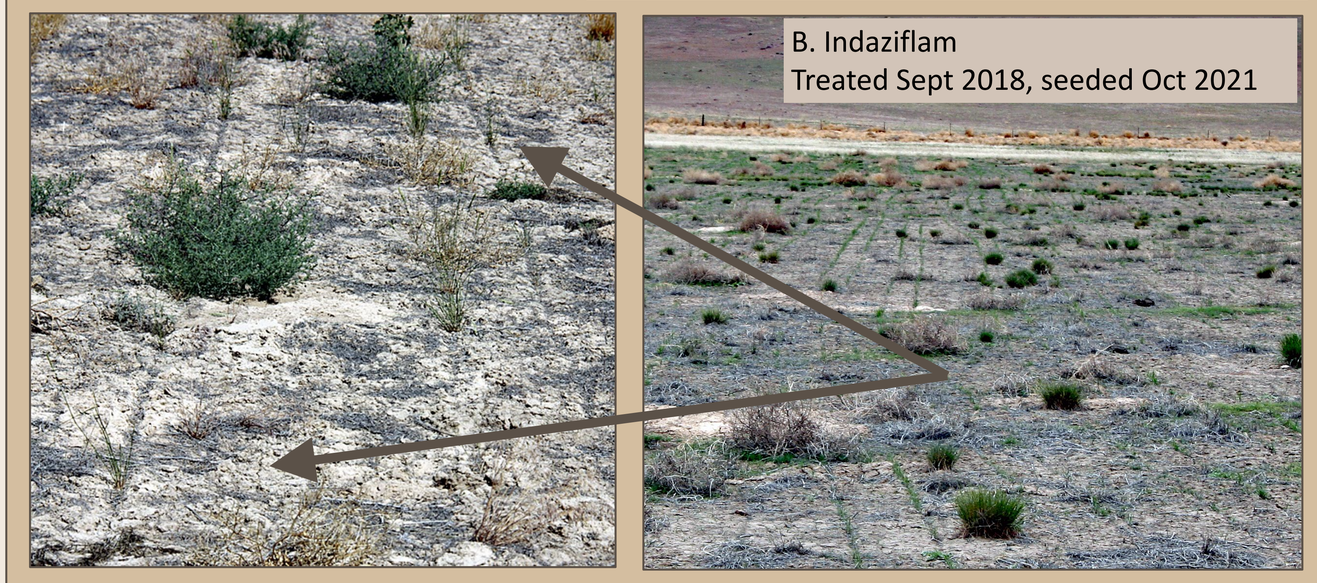

Figure 3. (A) Imazapic *(Sept. 2018 application)* plot, with good 1^{st} year seedling establishment. Photo April 2022

(B) Indaziflam *(Sept 2018 application)* plot, introduced perennial grass seedlings. Photo June 2022 *While Indaziflam treatment seedling establishment was "spotty" it demonstrates the potential of successful seeding efforts.*

- Chemical applications of soil-active pre-emergent herbicides has increased in popularity as well as applications on Great Basin rangelands. We compared Imazapic (Plateau), to the more recently developed herbicide, Indaziflam (Rejuvra) In Northern Nevada. The site received less than 7" of precipitation throughout the study period.

- Active "soil" herbicides will affect seeded species. Imazapic activity typically lasts about 1 year while Indaziflam can have activity up to 4 years **(Fig. 2A and B)**. We tested this effect 1,2, and 3-years post herbicide application on seeding efforts.