

# Susceptibility of Native Annual Forbs to *Indaziflam* and *Imazapic*

Dan Harmon and Charlie Clements

USDA, Agricultural Research Service, 920 Valley Road, Reno, NV 89512

[daniel.harmon@usda.gov](mailto:daniel.harmon@usda.gov)



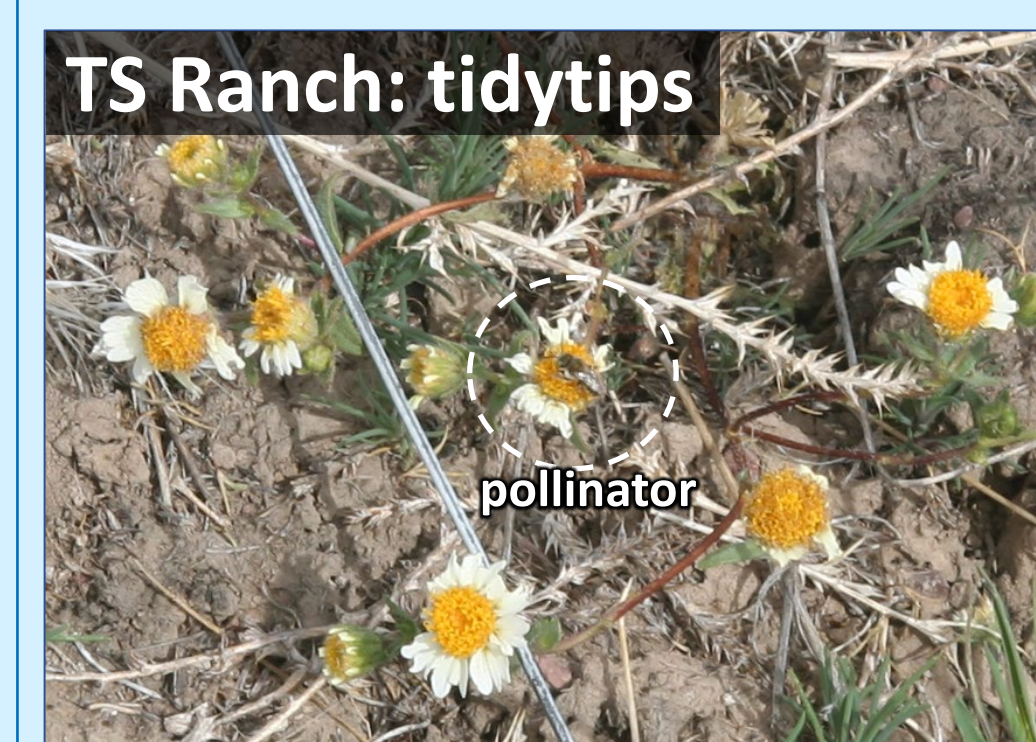
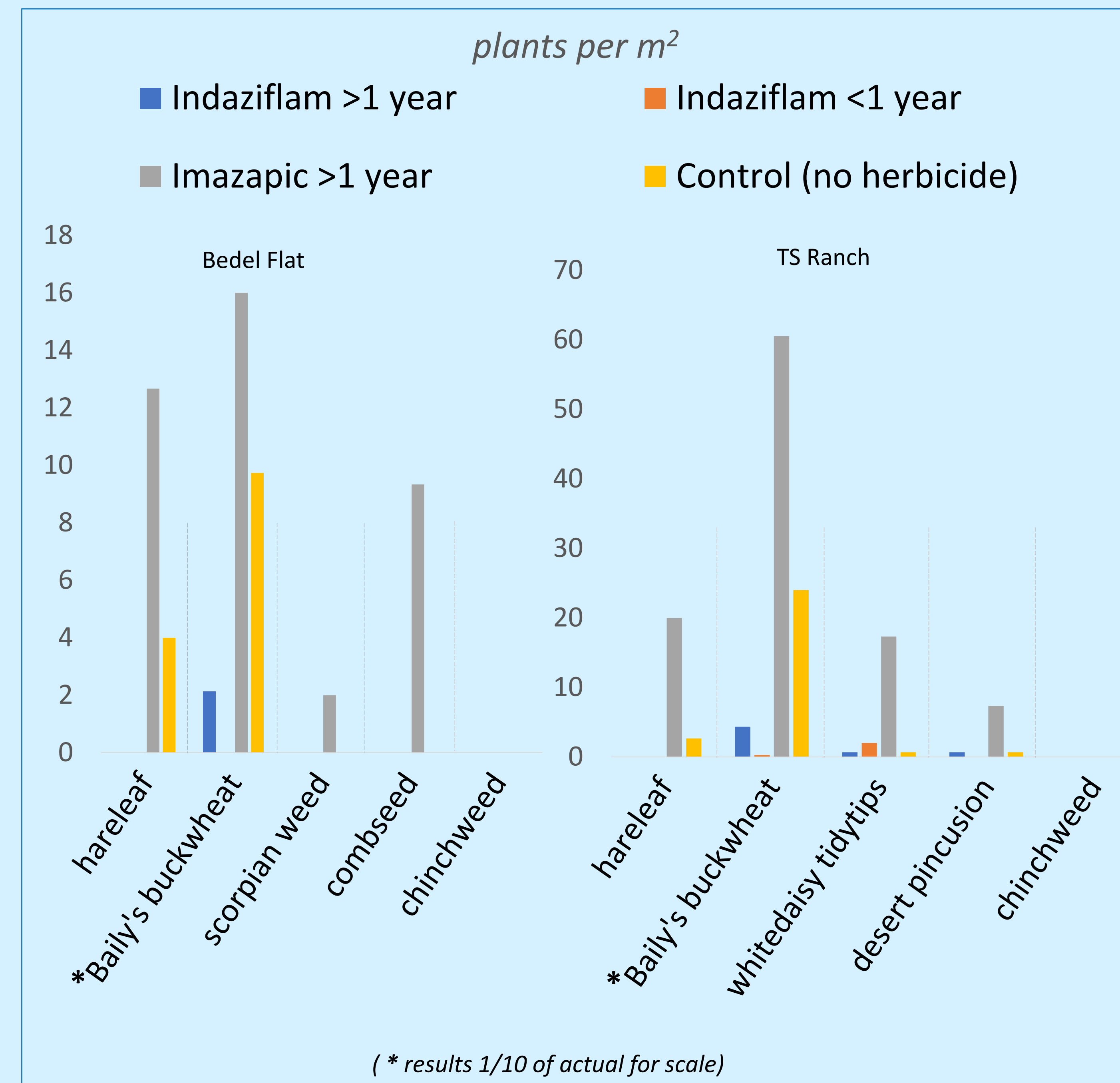
## Results

Overall, the reduced cheatgrass competition and decreased herbicide activity on *Imazapic* plots lead to the greatest forb establishment densities.

These results indicate that *Indaziflam* is remaining active the second year after application, however some seedling establishment did occur.

	<i>Indaziflam</i> >1 year	<i>Indaziflam</i> <1 year	<i>Imazapic</i> >1 year	Control (no herbicide)
hareleaf	0	0	16	3
Bailey's buckwheat	32	1	383	169
whitedaisy tidytips	1	2	17	1
desert pincusion	1	0	7	1
scorpion weed	0	0	2	0
combseed	0	0	9	0
chinchweed	0	0	0	0
Mean (both sites) plants per m <sup>2</sup> (May 2020)				

**FUTURE: Replicated plots were seeded in Oct 2020. Monitoring of new and past plots will continue in 2021.**



## Introduction

Management techniques to minimize the negative impacts of exotic plant invasions can include a diverse array of tools. One such tool, pre-emergent herbicides, can primarily target annual grasses while posing little threat to established perennial plants.

The effect pre-emergent herbicides have on annual forb populations, has not been well studied.

We have observed large "flushes" of native annual forbs, after herbicide control of the dominant weed cheatgrass.



A recently rangeland approved herbicide Rejuvra® (*Indaziflam*) has an activity period of up to 4 years vs. *imazapic* 12-15 month activity period. Our question was, "how does the longer acting herbicide effect annual forb establishment."

## Methods

At two field sites in northern Nevada, we seeded (broadcast) replicated plots (1m<sup>2</sup>) of individual native annual forbs. Plots were seeded October 2019 on (1) *Indaziflam* (treated Sept. 2018) (2) *Indaziflam* (treated Sept 2019) (3) *Imazapic* (treated Sept 2018) and (4) control (no herbicide). Monitoring occurred in May 2020.

Site	Forb	Bulk seed g/m <sup>2</sup>
Bedell Flat	hareleaf	( <i>Lagophylla ramosissima</i> ) 60
	Bailey's buckwheat	( <i>Eriogonum baileyi</i> ) 125
	scorpion weed	( <i>Phacelia</i> spp.) 11
	combseed	( <i>Pectocarya recurvata</i> ) 30
	chinchweed	( <i>Pectis papposa</i> ) 11
TS Ranch	hareleaf	( <i>Lagophylla ramosissima</i> ) 60
	Bailey's buckwheat	( <i>Eriogonum baileyi</i> ) 125
	whitedaisy tidytips	( <i>Layia glandulosa</i> ) 30
	desert pincusion	( <i>Chaenactis stevoides</i> ) 30
	chinchweed	( <i>Pectis papposa</i> ) 11



Because native annual forb seed is not commercially available and field collected seed can contain large amounts of weed seeds, forb seed was grown on weed free plots for use with field seeding trials. Seed from 10-20 native annual forbs is grown each year for use in field seeding trials.