
Promoting Native Vegetation and Diversity in Exotic Annual Grass Infestations

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Background

Invasions by exotic annual grasses are a severe problem.

These invasions often result in an increased fire frequency, which ultimately facilitates invasion of adjacent areas.

Efforts to control and revegetate are often unsuccessful.

1. Climatic conditions rarely favor seedling establishment of native perennial species.
2. Exotic annual grasses reestablish because of abundant seed production and persistent seed banks.



Medusahead

One of the most problematic exotic annual grasses invading rangelands.

Decreases biodiversity, reduces livestock forage production, and degrades ecological function of native plant communities.

Negatively impacts native plant communities by competition, suppression, and increasing fire frequency.

Medusahead litter also has a slow decomposition rate, allowing litter to accumulate and suppress other plants, and increases the amount and continuity of fine fuel, increasing fire frequency.

Would revegetation attempts be more successful if attempted before the medusahead reached near monoculture levels?

Study Info

Objective: can selective treatments be applied that would promote native vegetation in medusahead infestations?

Site location: Six sites in northwest and west foothills of Steen Mountain.

Each site had 6 treatment plots

1. Imazapic
2. Spring burn
3. Fall burn
4. Spring burn and imazapic
5. Fall burn and imazapic
6. Control



Results

Prescribed burn treatments without imazapic application were ineffective as medusahead control and did not promote native vegetation, although the spring burn treatment did increase annual forb cover and density.

Control of medusahead by imazapic was improved when used with prescribed burning. Imazapic combined with prescribed burning also produced the greatest positive response from native functional groups.

Imazapic treatments reduced annual forb cover in the first post-treatment year, and density in both years post-treatment. This can be expected with use of a pre-emergence herbicide, due to the similarity in life cycle between annual grasses and native forbs.



Fall burn + Imazapic

Discussion

To promote large perennial bunchgrass, the most effective treatment would be fall burning followed by a fall application of imazapic.

If an increase in perennial forbs is more important, prescribed spring burning and fall application of imazapic would be the preferred treatment. Spring burning when bunchgrasses are actively growing can increase mortality and decrease the size of native perennial bunchgrasses.

The increase in plant species diversity with prescribed burning combined with imazapic suggest that ecosystem functions and resiliency may be improved with invasive plant control in communities with some residual native vegetation.

Implications

- ❖ Invasive plant infestations with some native vegetation remaining should receive priority for restoration efforts over near monocultures of invasive plant species.
- ❖ Prescribed spring and fall burning followed by imazapic application provided the best control of medusahead and the greatest increases in the native perennial functional groups.
- ❖ Effective control of medusahead with imazapic application will negatively affect the native annual forbs.
- ❖ Retreatment of medusahead infestation a couple of years post-treatment, probably with imazapic or other herbicides, may be needed to ensure that these plant communities continue to progress toward a plant community dominated by native species.
- ❖ The expense of and difficulty in restoring wildlands invaded by medusahead and other exotic annual grasses suggests that more efforts should be directed at preventing these invasions.

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