

The Role of Sucrose and Sawdust Application on Cheatgrass Removal

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BACKGROUND

Cheat Grass Invasion and Treatment

- On 25 million acres of Western rangeland, it is estimated that 4000 acres per day are being converted to annual cheatgrass dominated stands (GBRI, 2006).
- The introduction of cheatgrass in rangeland ecosystems has caused a significant impact on the health and productivity of native plant communities (GBRI, 2006)
- Cheatgrass is an annual that depends on high levels of nitrogen in the soil to sustain its rapid growth (Averett et al. 2004).
- Soil Carbon amendments notably reduced nitrogen availability, slower plant growth, and lower competition from exotic species (Averett et al. 2004).

PURPOSE AND HYPOTHESIS

There are two objectives of this experiment. The first is to test the effectiveness of various soil treatments on cheatgrass (*Bromus tectorum*) canopy cover. The second is to compare the two treatment types side by side to evaluate their relative effectiveness in treating cheatgrass. The treatments we selected are easily applied to large areas and have been shown to be effective in controlling cheatgrass. This will give us an idea as to their relative usefulness and provide a comparison of the various affects associated with each.

We hypothesize that canopy cover of cheatgrass will temporarily decrease as a result of sucrose and sawdust application.

MATERIALS AND METHODS

Field Experiment

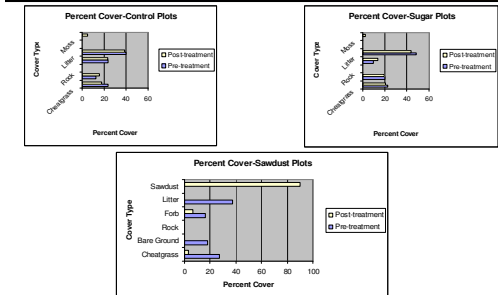
- A grid of thirty 1m² plots were set up in the meadow.
- Site selection was based on finding an area with fairly uniform plant community composition, uniform topography, and seclusion from other group projects.
- This area was basically covered with cheatgrass litter from the growth of previous years as well as new growth, forbs, and bare ground. All plots have been raked to remove the dead material from the previous year's growth.
- Each treatment has ten plots to compare data and was randomly placed on the grid.
- Ten plots were left alone as control plots to compare the recruitment of cheatgrass in future years.
- Ten plots have sugar applied to the surface.
- Ten plots have sawdust applied to the surface.

1- control	2- sugar	3- control	4- sawdust	5- control	6- sugar
7- sawdust	8- sugar	9- control	10- sawdust	11- sugar	12- sawdust
13- sugar	14- sawdust	15- control	16- sugar	17- control	18- sawdust
19- control	20- control	21- sawdust	22- sawdust	23- sugar	24- sugar
25- sawdust	26- sawdust	27- sugar	28- control	29- sugar	30- control

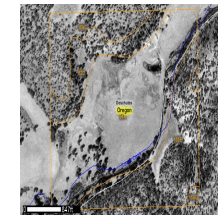
Measurement Methods

- Plots were measured using the point intercept method to determine percent canopy cover.
- For our transect location we determined the centerline of each plot running at an azimuth of 325 degrees.
- We then recorded the type of cover every 5 centimeters along the centerline.
- The cover types consisted of cheatgrass, litter, rock, bare ground, forb, moss, and sawdust. Moss and sawdust were not included in the first inventory because they were not present at the time.
- On May 6th each plot was raked to remove the dead material from the soil surface and inventoried prior to treatment.
- On May 12th each plot was treated. The sugar plots were treated with 500 grams of sugar which was sprinkled with our hands. Each sawdust plot was covered uniformly by hand with a 6cm layer above the soil surface.
- Plots were inventoried post treatment on May 27th.

RESULTS



The difference in sawdust cover is due to immediate treatment, not differences in soil chemistry.



Soil Name: Omahaling fine sandy loam,
0 to 5 percent slopes
Map Symbol: 94A
Ecological Site: Wet Meadow
Soil Properties and Qualities:
Depth: Bedrock at a depth of 60 inches or more
Drainage class: Somewhat poorly drained
Depth to water table: 24 to 36 inches
below the surface in April through June
Permeability: Moderate over very rapid
Available water capacity: About 8 inches

CONCLUSIONS

- There were no recordable changes to cheatgrass regeneration as expected due to the lack of time and the growing season progression.
- Changes in cheatgrass regeneration may be present next year during the growing season, but did not present a significant change as of now because we applied after the growing season began and the sugar and sawdust may have not had sufficient time to alter the soil chemical composition.
- Future treatments will be needed in order to ensure an accurate representation of the effects of carbon amendments on the plant communities in Camp Polk Meadow. Next year, the plots should be seeded and inventoried.

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