Short-Duration/High-Intensity Grazing: Effects on Vegetation & Soil Health in Southeastern New Mexico

BACKGROUND

Regional Rangeland Loss

Area grasslands have diminished in size and productivity from historical values due to land use conversion, anthropogenic development, & brush encroachment. This trend is unfortunately impacting much of North America's rangelands.

Soil Health Degradation Onsite

The project area was used for row crop, dairy, and energy production throughout the 20th century, leaving soil in poor condition with high occurrences of bare ground.

Invasive & Undesirable Plants

Invasive Lehmann lovegrass (*Eragrostis lehmanniana*) and undesirable catclaw acacia (*Senegalia greggii*) have encroached during a period of natural revegetation in the last 20 years.

Lesser Prairie-Chicken Habitat

Neighboring properties contain premium lesser prairie-chicken (LPC) habitat. However, previous land uses within project area resulted in a lack of sufficient habitat characteristics for use by LPC.

OBJECTIVES

- **Determine Economic Feasibility**
- **Reduce Bare Ground Measures**
- **Reduce Invasive/Undesirable Plant Species**
- **Improve Soil Health**

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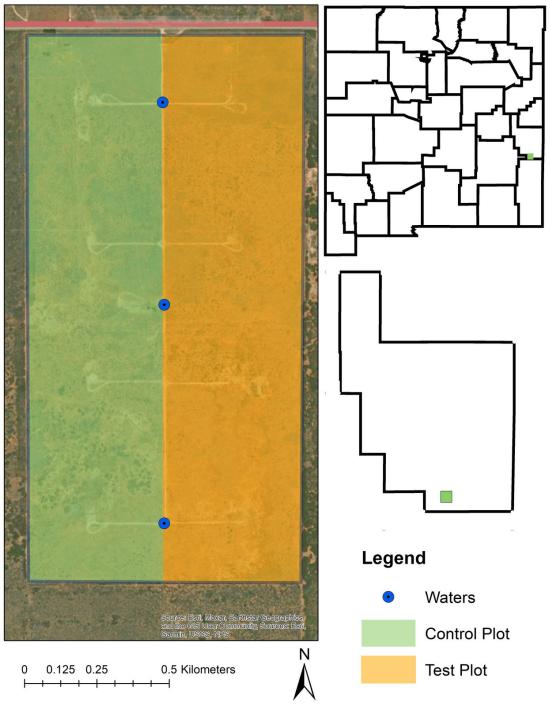
GRAZING PARAMETERS



Study Site

Privately owned parcel (320 acres) split in half. Vegetative communities in each plot vary due to soil condition and invasive species encroachment. Eastern plot was grazed with SD/HI treatment.

Previous Grazing

The property was previously grazed simultaneously in its entirety. Grazing duration and rest were dictated by the producer's needs.

Grazing Trial Timing

Access to property, grazing timing, and number of head were determined by the producer and his needs. Property is utilized in spring and early summer (April through early June) due to lack of shinnery oak (*Quercus harvardii*), removing potential for shinnery toxicity. The vast majority of annual precipitation is received between May and August (largely occurring after grazing trials). Pastures are rested for 10 months after the completion of grazing trials.

Stocking Rate

Grazing goal for SD/HI test area was 10,000 to 15,000 lb of cattle per acre. This ensured that residual growth was left on the landscape for wildlife use (e.g., forage and nesting cover).

Paddock Design/Construction

Stocking rate calculations resulted in approximately 5-acre paddocks moved daily. Paddocks were constructed with electric fencing. Cattle were allowed to move through previous days' paddocks to access water. Significant excess grazing did not occur during this time.

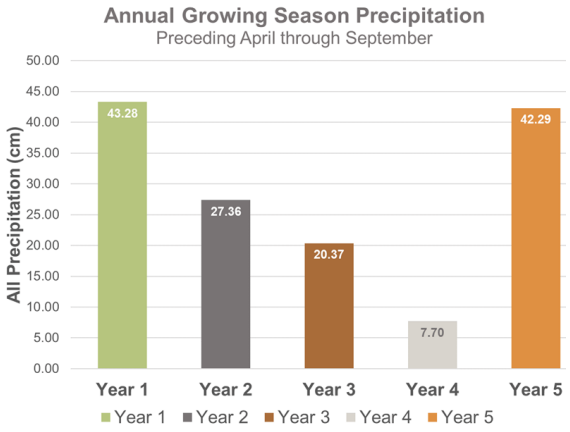

Immediately After SD/HI Grazing Treatment


1 Month After SD/HI Grazing Treatment

RESULTS

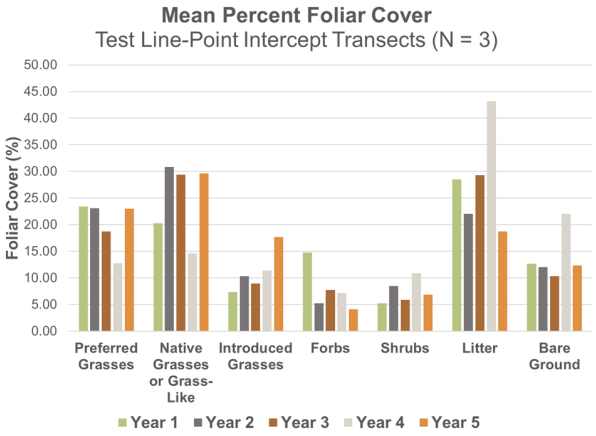
Precipitation

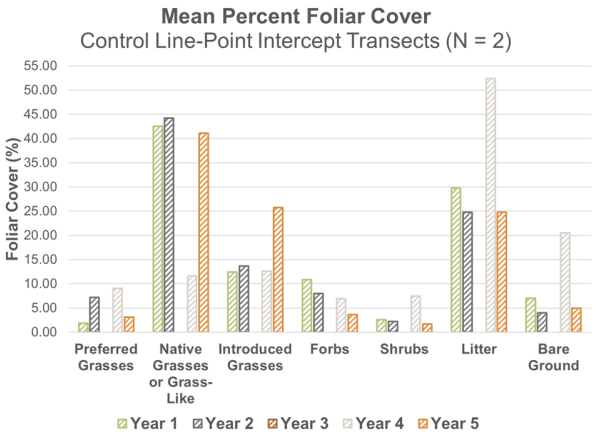
The region receives an average of 43 cm (16 in.) of precipitation each year. The region is considered semi-arid and is characterized by prolonged periods of drought. Annual precipitation throughout the study period was highly variable with persistent drought conditions.



Vegetative Cover

Foliar cover was measured with the Line-Point Intercept method each year (with the exception of Year 3 Control data due to travel restrictions from the COVID-19 pandemic). Vegetative results have statistically been variable, likely due to small sample size and short project duration. In Year 1, species diversity was greater in the control plot. After Year 5, species diversity was lower on the control plot than in the test plot. Species richness was essentially unchanged between Years 1 and 5 in the test plot. The Preferred Grasses category (species that the LPC relies heavily upon) was the only category to differ significantly between the test and control plots.





Soil Health

Haney soil test results indicated that the test plot has greater overall soil health conditions. The test plot had better results in soil respiration, nutrient availability, and storage. Additional testing (PLFA soil test) indicated that both plots were above average with excellent biomass and active microbial communities.

KEY FINDINGS

- **Grazing system was economically feasible for the producer.**
- **No negative impacts to breeding success with cattle BCS largely unaffected.**
- **LPC observed in test plot in years 4 & 5.**
- **Bare ground measures and species richness were strongly correlated with growing season precipitation.**
- **No measurable impact on invasive grass and undesirable brush species.**
- **Soil health indicators reflected better conditions in the test plot.**

RECOMMENDATIONS

Any producer interested in adopting a system of this type should consider the following:

- How large is the property? Are there any areas that should be prioritized?
- How much time can I invest in this system?
- How much money do I want to invest in this system?
- How will water be supplied to each paddock?
- What is my stocking density objective?

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