Mob Grazing Effects on Pasture Utilization and Nutrient Deposition in South Dakota

M.K. Ohrtman[1,4], S.A. Clay[1], A. Smart[2], D. Clay[1], and W. Schacht[3]
[1]South Dakota State University, Department of Plant Science, Brookings, SD 57007
[2]South Dakota State University, Department of Natural Resource Management
[3]University of Nebraska, Lincoln, Department of Agronomy and Horticulture, Lincoln, NE 68583
[4]michelle.ohrtman@sdstate.edu

This project was funded by a USDA NRCS CIG (Award # 69-3A75-11-174) and NCR SARE (Award # SA1200692)

Introduction

Ranchers need more productive grazing systems because of increasing feed costs and loss of pastureland production. Mob grazing, or ultra high stocking densities in rotational grazing (Figure 1), can increase harvest efficiency and herbage production by recycling aboveground portions of plants as manure or urine or trampling vegetation into the ground by the hooves of grazing animals.

Figure 1. Mob grazing herd of 500 head at Quinn, SD.

No research has quantified vegetation utilization (consumption and trampling) and manure deposition in mob versus more traditional rotational grazing systems and across different climate conditions and management strategies in northern Great Plains' rangelands. This information is important for understanding (1) mob grazing effects on harvest efficiency and nutrient return and (2) the potential for this grazing system to meet management objectives in this region.

Study Sites

We sampled 9 producer sites in South Dakota (Figure 2).

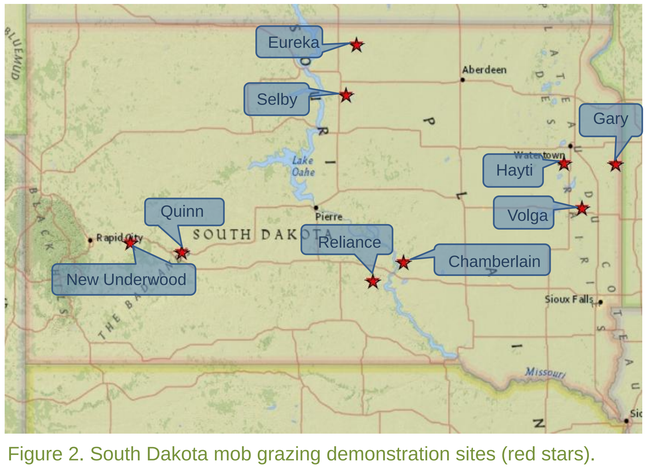

Figure 2. South Dakota mob grazing demonstration sites (red stars).

Producers are located across a gradient of drier, lower producing sites in the west (17 in. [42.5 cm] average annual rainfall) to more productive, wet regions in the east (25 in. [62.5 cm] average annual rainfall).

Methods

Producers demonstrate a range of stocking densities and operational methods. For mob systems:

- Stocking densities between 20,000 and 1,000,000 lbs/acre.
- Paddock sizes between <0.5 and 30 acres.
- Herd sizes between 50 and 500 head.
- Herds predominantly consist of cows, cow-calf pairs, heifers, and yearlings.
- Animal (calf pairs or ≥1 year old individuals) weights 700 to 1,700 lbs.
- Up to 11 moves per day (most use 1-2 moves per day).
- Mob graze every year or allow for 1 or more years of recovery.
- Move water or have a central water system (Figure 3).
- Off-season grazing (e.g. flash, winter) or no other grazing.

Figure 3. Water systems used for mob grazing operations in South Dakota. Central water used in Reliance, SD (above left) and movable water used in Eureka, SD (above right).

Figure 4. Quadrats used to sample vegetation and manure at Hayti, SD.

In 2012, we sampled vegetation and manure deposits within quadrats (0.25 m^2 and 1 m^2) along transects (Figure 4) in mob grazing systems at each site before and after grazing (Figure 5).

Where available, we also performed this sampling in nearby rotation grazing pastures for comparison.

Figure 5. Transects sampled for vegetation utilization and manure deposition before (above left) and after (above right) mob grazing in Chamberlain, SD.

Results

- 2012 was a drought year in South Dakota (precipitation was between 6 and 9 in. [15 and 22.5 cm] below average).
- More forage was utilized in mob than rotation grazing, irrespective of location and stocking density.
- An average of 17% new litter was added in mob systems compared to 5% in rotation pastures (Figure 6).

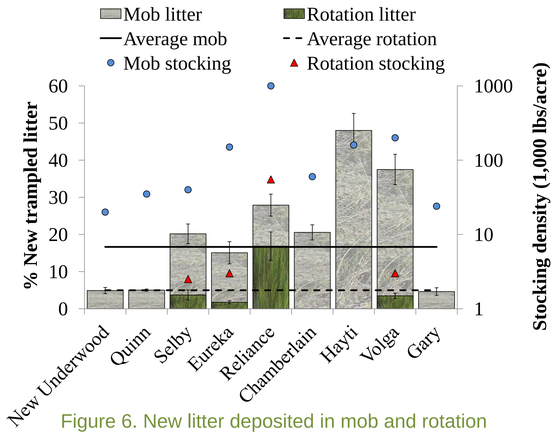

Figure 6. New litter deposited in mob and rotation pastures at South Dakota demonstration sites. Sites are listed in order from west (left) to east (right).

- An average of 50% of forage was consumed in mob systems vs. 35% in rotation (Figure 7).
- The remaining forage was left standing or trampled.

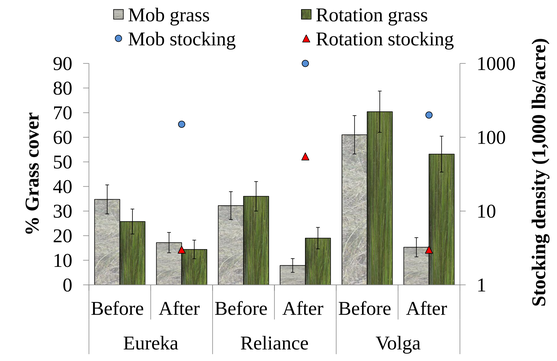

Figure 7. Percent grass observed before and after grazing at 3 South Dakota demonstration sites with side by side mob and rotation grazing pastures.

- The density of manure distribution was between 2 and 4 times greater in mob grazing pastures than rotation sites (Figure 8).

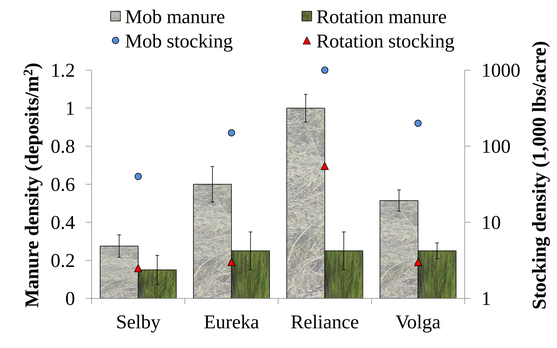

Figure 8. Manure deposition in mob vs. rotation grazing systems at South Dakota demonstration sites.

Conclusions

- Mob grazing can enhance utilization and nutrient addition in northern Great Plains' pastures across different climates and management methods.
- Mob grazing benefits were observed during a drought.
- Greater pasture utilization will allow for increased stocking rates, greater profitability for livestock producers, and may promote grassland health and sustainability.
- Mob grazing will not work the same for everyone and management- and site-specific assessments are necessary to determine if this practice is feasible.