

Mob Grazing Research: On-Ranch Results - University of Nebraska-Lincoln

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Introduction

Vegetation and soil responses to mob grazing on subirrigated meadows were quantified on two ranches in the Sandhills area of northern Rock and Brown County in 2012 and 2013; responses to mob grazing was quantified on a third ranch in 2013 only. Ranches 1 and 2 had been practicing mob grazing since 2001 and 2006, respectively; Ranch 3 had not practiced mob grazing until 2013 (Table 1). Mob grazing was limited to the growing season on all ranches and generally began shortly after standing water disappeared from the meadow (late May to early June) and was applied intermittently (depending on plant growth and management considerations) into August. The mob-grazed pastures on all ranches had been hayed prior to the initiation of mob grazing. The mob-grazed meadows on Ranches 1 and 2 were adjacent to subirrigated meadow that has continued to be hayed. Vegetation and soil responses were also measured on the hayed subirrigated meadow on these two ranches.

Table 1. Livestock numbers and stocking rate and density.

	2012		2013		
	Ranch 1	Ranch 2	Ranch 1	Ranch 2	Ranch 3
Class of cattle	Cow-calf	Heifers	Cow-calf	Cow-calf	Heifers
Number in herd	750 + bulls	705	800 + bulls	550	114
Moves/day	8	2 or 3	3	2 or 3	2
Stocking rate					
Mob period	2.3 AUM/ac	2.0 AUM/ac	3.4 AUM/ac	2.9 AUM/ac	
Off season		0.2 AUM/ac		2.1 AUM/ac	
Stocking density	800,000 lb/ac	230,000 lb/ac	270,000 lb/ac	86,500 lb/ac	250,000 lb/ac

Plant Production

Standing vegetation was clipped at ground level in 10 quadrats (2.7 ft² in size) in late July in both the mob-grazed pastures and adjoining hay meadows. The quadrat area was protected from grazing by building exclosure cages around them. The clipped vegetation was dried and weighed, and biomass per acre (lbs/acre) calculated. The hayed meadow on Ranch 1 was grazed in spring 2012, so arriving at an estimate of aboveground plant production for 2012 was not possible; however, plant production on the mob-grazed pastures was 3,780 lbs/acre in 2012. Plant production was similar, at about 3,300 lbs/acre, on the mob-grazed meadow and the hay meadow on Ranch 1 in 2013 (Figure 1). Because of problems with exclosure cages on Ranch 2 in both years, plant production was measured on the hay meadow in 2012 and the mob-grazed meadow in 2013 only. Plant production was near 4,000 lbs/acre on the hay meadow and mob-grazed meadow in the two years.

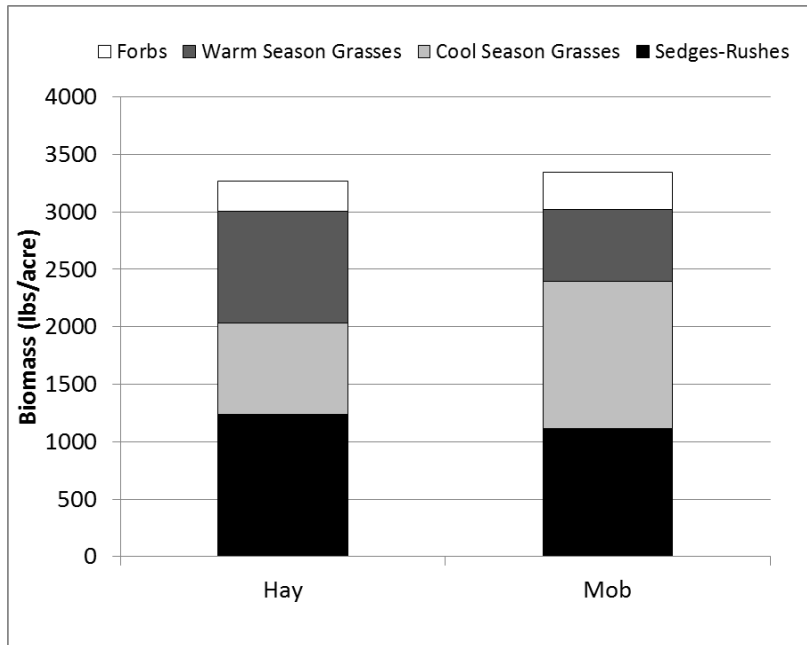


Figure 1. Aboveground plant production on hay and mob-grazed meadows on Ranch 1 in 2013.

Botanical Composition

Relative species composition (%) was estimated based on using the modified step-point method in July of each year. Mob-grazed meadow tended to have a greater number of plant species than hay meadows (Figures 2 and 3). Mob grazing appeared to favor grasses. Grazing as a disturbance is commonly reported to increase plant diversity, so the relatively high number of grass species on the mob-grazed pastures was expected.

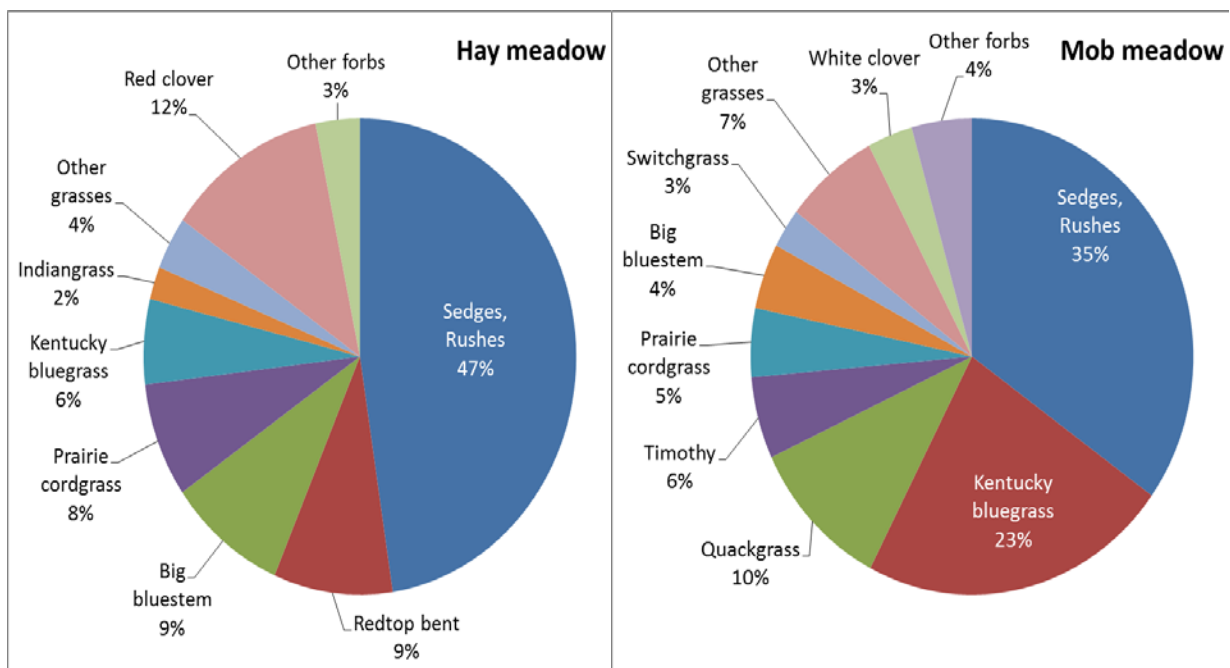


Figure 2. Botanical composition of hay meadow and mob-grazed meadow on Ranch 1 in 2013.

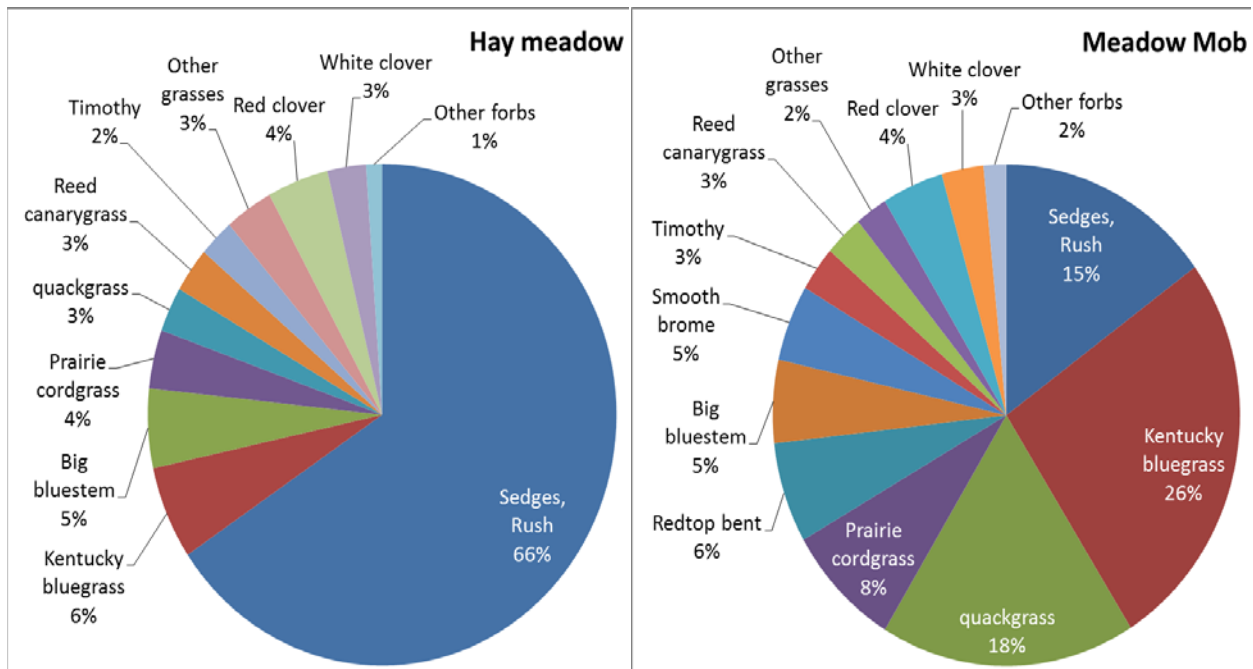


Figure 3. Botanical composition of hay meadow and mob-grazed meadow on Ranch 2 in 2013.

Utilization

Utilization was determined by clipping all standing vegetation within 10 quadrats before grazing occurred in a mob-grazed pasture and by clipping the remaining vegetation in another 10 quadrats immediately after the grazing animals were removed from the pasture. The pre-grazing and post-grazing clipping was conducted on three of the pastures on Ranch 1 in mid-June 2012 and on each ranch in early to mid-July 2013. The live pre-grazing standing vegetation was dried and weighed and represented forage available. The vegetation clipped post-grazing was divided into two categories: stubble (standing live residue) and trampled plant material. Percentage utilization and trampled and grazing efficiency (% of standing live vegetation consumed the grazing cattle) were calculated using these data.

Trampled

The percentage of live standing vegetation that was trampled during a mob grazing period on Ranch 1 was 20% in 2012 (Figure 4). In 2013, percentage trampled ranged from 46 to 61% on the three ranches (Figure 5). The reason for the relatively low percentage trampled in 2012 was not readily apparent, although it might have been related to the earlier grazing date in 2012 (June) than in 2013 (July). Percentage trampled in 2013 was greater than what ranchers had expected and represented about 50% of standing vegetation.

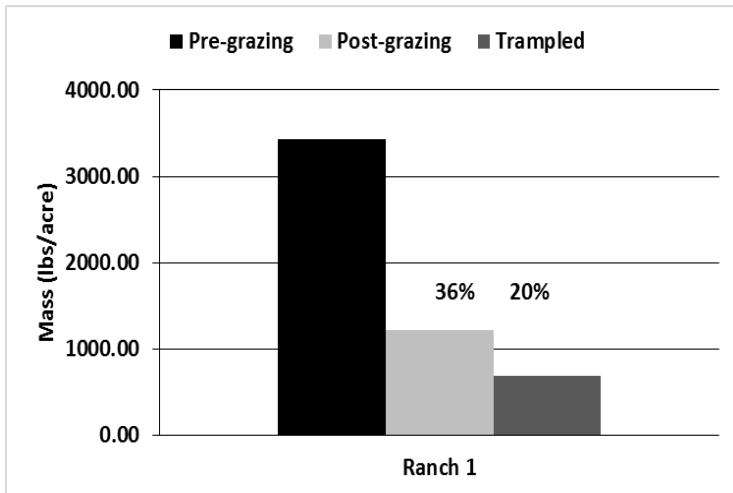


Figure 4. Percentage of the pre-grazing standing live vegetation that was trampled or remained following grazing as stubble in 2012 on Ranch 1.

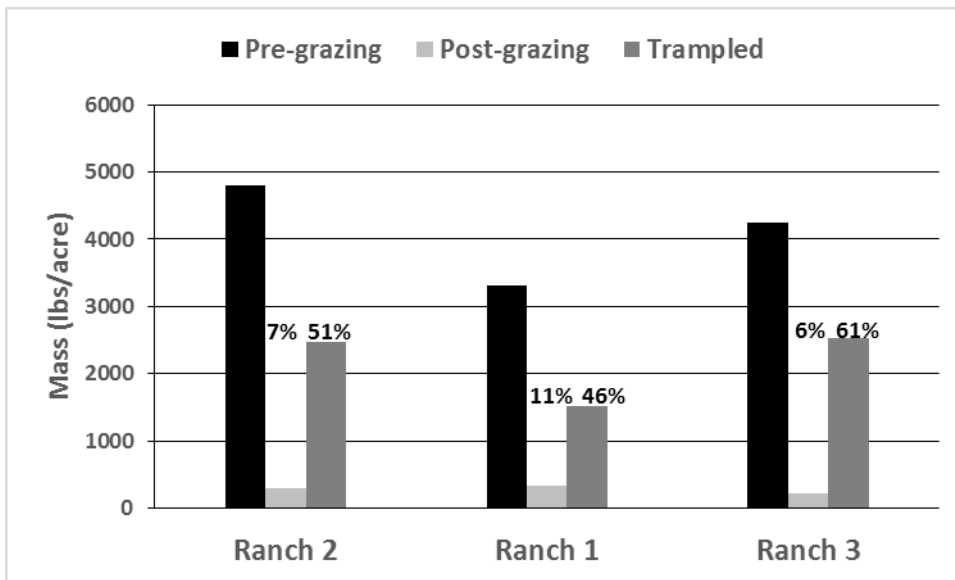


Figure 5. Percentage of the pre-grazing standing live vegetation that was trampled or remained following grazing as stubble.

Grazing Efficiency

Grazing efficiency in 2012 on Ranch 1 was about 44%, with 36% of the pre-grazing standing live remaining as stubble after grazing and 20% trampled (Figure 4). On the three ranches in 2013, the amount of standing live vegetation (stubble) remaining following a grazing period was generally less than 300 lbs/acre and equivalent to less than 11% of the standing live vegetation available immediately before the grazing period. Grazing efficiency can be calculated by subtracting the sum of percentage trampled and percentage remaining from standing live vegetation available before grazing. Grazing efficiency ranged from 32 to 43% in 2013. Grazing efficiency was generally less than expected largely because of the high levels of trampling. The highest level of trampling and lowest grazing efficiency was on Ranch 3 with a quackgrass-dominated meadow that was grazed when the grass was in an elongation

stage of growth. The lowest amount of trampling and highest grazing efficiency was on the meadow with a good diversity of grasses and grazed when most of the grasses were in a vegetative stage of growth.

Soils

Soil samples were taken to a depth of eight inches from the ranch meadows in 2012. Soil organic matter content of the mob-grazed pastures and the hay meadows was comparable on Ranch 1 and 2 in 2012. Soil organic matter ranged from 3 to 3.4% on both ranches. Other soil properties, such as cation-exchange capacity and phosphorus content, did not differ between mob-grazed and hay meadows.

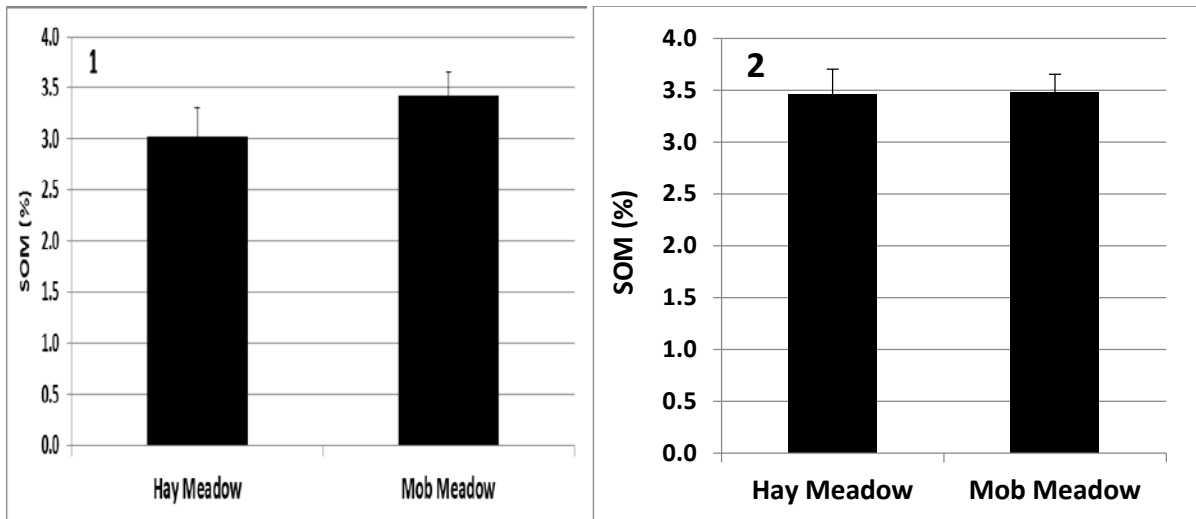


Figure 6. Soil organic matter (%) of hay meadow and mob-grazed meadow on Ranches 1 and 2.

Conclusions

Mob grazing during the growing season on subirrigated meadows in the northern Nebraska Sandhills did not have measurable effects on botanical composition, aboveground plant production, or soil properties (e.g., soil organic matter). Even at trampling levels of 46 to 61%, there was no apparent response of soil properties to mob grazing. High grazing efficiency is often given as justification for the high management input required of mob grazing. Grazing efficiencies were in the range of what is reported for other management-intensive grazing systems/strategies (e.g., short duration grazing). High grazing efficiencies were limited by the high trampling levels documented on at least two of the ranches and the study site at the Barta Brothers Ranch. Trampling does not appear to significantly affect soil properties and plant production, at least within a 10-year period; therefore, the benefits of high trampling levels is not obvious. The mob-grazed meadow on Ranch 1 had the lowest trampling and subsequently the highest grazing efficiency, which appears to be the best strategy when mob grazing.