NORTH DAKOTA-Impacts of Bale Grazing on Herbage Production & Forage Quality

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Bale grazing is the practice of allowing livestock access to hay bales in a hayfield or improved pasture to reduce labor and feed delivery costs. This technique is practiced in the northern Great Plains; it improves soil health and forage production through manure distribution while maintaining adequate livestock performance. Recent data has shown a positive relationship between bale grazing and nitrogen capture, as well as forage growth; however, farmer concerns prompted the need for further research.

This project was conducted on four North Dakota ranches to examine winter hay bale grazing effects on subsequent year's herbage production and nutritional quality 6 and 18 months after treatment on improved pastures planted to domesticated cool-season grasses. Parameters measured: herbage production, nutritional quality, soil nutrient content, body condition, and system costs. Herbage production and nutritional quality are presented in this report.

Herbage production 6 months after treatment the following growing season on bale grazed (BG) treatment was greater 15´ from the bale center when compared to the control (C). However, it was not different 0-10´ from bale center compared to C (Table 1).

BG had higher crude protein (CP) content 0-10´ from bale center than 15´ from bale center, and higher CP content compared to the C 0-10´ from bale center. Phosphorus content in grass growth the following growing season was greater on the BG compared to C at distances from 0-5´ from the bale center (Table 2).

Table 1. 2016 grass biomass production on BG and C sites near peak production.

Treatment	Feet from Bale Center			
	0´	5´	10´	15´
	lb ac^{-1} produced in late June/early July[1]			
BG	5262^{a}	5307^{a}	4601^{a}	8583^{b}
C	5345^{a}	5809^{a}	5874^{a}	6145^{a}

[1]Herbage production by treatment/distances from bale with the same letter (a, b) are not significantly different (P > 0.1)

Table 2. 2016 grass quality on BG and C sites near peak production.

Treatment	Feet from Bale Center			
	0´	5´	10´	15´
	Crude Protein (%) content in late June/early July[1]			
BG	17.2^{ax}	17.3^{ax}	15.9^{ax}	13.0^{bx}
C	9.8^{ay}	9.8^{ay}	10.2^{ay}	10.9^{ax}
	Phosphorus (%) content in late June/early July[1]			
BG	0.30^{ax}	0.30^{ax}	0.27^{ax}	0.27^{ax}
C	0.23^{ay}	0.23^{ay}	0.22^{ax}	0.24^{ax}

[1]Nutritional parameters by treatment/distances from bale with the same letter (a, b) within row are not significantly different (P > 0.1), and with same letter (x, y) within columns are not significantly different (P > 0.1).