



## **Grazing and Burning Effects on Plant Community Diversity and Heterogeneity in Fescue Prairie**

Nadia Mori, Ken J. Walburger and Jim T. Romo; University of Saskatchewan; Contact Author Email: [nadia.mori@usask.ca](mailto:nadia.mori@usask.ca)

Burning and grazing are key processes in the natural disturbance regime of Fescue Prairie. The objective of this study was to determine the effects of grazing, fire, and their interaction on plant species diversity and heterogeneity in a 130-ha remnant Fescue Prairie near Saskatoon, Saskatchewan. Experimental plots of 10x10 m in size were factorially arranged as a split-plot in a randomized complete block design with 2 replicates established in 2006 and 2 more started in 2007. Whole-plot treatments were grazing with cattle and no grazing, and sub-plot treatments were burning and no burning. Plant community diversity was assessed using species richness and the Shannon-Weiner diversity index (H). Spatial and temporal heterogeneity in species composition were determined among treatments using Sorensen's dissimilarity index. Burning increased H ( $P < 0.01$ ) ( $\bar{x} = 1.75$ ) compared to unburned treatments ( $\bar{x} = 1.54$ ) ( $SE \pm 0.058$ ). Grazing had no effect ( $P = 0.13$ ) on H ( $\bar{x} = 1.63$ ;  $SE \pm 0.074$ ). Burning, grazing, and their interaction had no significant effect ( $P > 0.10$ ) on species richness. Richness varied between years ( $P = 0.04$ ) averaging 14.2 species per  $m^2$  in year 1 versus 15.8 in year 2 ( $SE \pm 0.65$ ). Spatial heterogeneity ( $P > 0.25$ ;  $\bar{x} = 46\%$ ;  $SE \pm 3.0$ ) and temporal heterogeneity ( $P > 0.21$ ;  $\bar{x} = 42\%$ ;  $SE \pm 3.8$ ) were not affected by burning, grazing, and their interaction. In the short term, burning and/or year-to-year differences in growing conditions had greater effects on species diversity and richness than grazing or the interaction of burning and grazing.

2009. 62nd Society for Range Management Annual Meeting. Paper No. 24-2.