Tropentag, October 7-9, 2008, Hohenheim

"Competition for Resources in a Changing World:
New Drive for Rural Development"

Short-Term Effects of Stocking Rate and Management System on Yield Performance and Forage Quality in the Inner Mongolia Grassland Ecosystem

Philipp Schönbach[1], H.W. Wan[1], Anne Schiborra[1], M. Gierus[1], Katrin Müller[2], B.M. Tas[2], Andreas Susenbeth[2], Y.F. Bai[3], F. Taube[1]

[1] *University of Kiel, Institute of Crop Science & Plant Breeding - Grass and Forage Science/Organic Agriculture, Germany*

[2] *University of Kiel, Institute of Animal Nutrition & Physiology, Germany*

[3] *The Chinese Academy of Sciences, Institute of Botany, China*

Abstract

Overgrazing leads to degradation of the natural grassland in Inner Mongolia (China). Increasing stocking rates affect the long-term productivity of the *Leymus chinensis* and *Stipa grandis* dominated steppe. The aim of this study is to figure out the impact of grazing intensity and management system on yield performance and forage quality in a semi-arid environment. In this context short-term effects of grazing by sheep were determined experimentally in grasslands within the Xilin River Basin (116°42' E, 43°38' N).

Two grazing systems (mixed and traditional) and seven grazing intensities (0, 1.5, 3, 4.5, 6, 7.5, 9 sheep ha^{-1}) were analysed in a split-block designed grazing experiment with two replications. Each system included areas for grazing and for haymaking. While in the Mixed System (MS) an annual shift between grazed and hay plots occurred, the Traditional System (TS) indicates a permanent separation of haymaking and grazing areas throughout the years. Due to the annual shift between haymaking and grazed sites we assume higher recovery and productivity potentials in the MS. Analysis of variance was performed for 2005 and 2006 separately using the Mixed Model of SAS 9.1.

Intensification of grazing showed negative effects on annual herbage mass production in the short-term. Forage quality parameters were also affected by stocking rate. Crude protein (CP) content decreased with increasing stocking rates in both experimental years. Other quality parameters, like in vitro digestibility (CDOM) and fibre concentration (NDF and ADF), showed inconsistent responses between the years. System related effects on yield parameter and forage quality were only marginal after two years. Concluding, herbage mass productivity and CP content were affected in the strongest form by altering stocking rates.

Keywords: Forage quality, stocking rate, management system, semi-arid grassland

Contact Address: Philipp Schönbach, University of Kiel, Institute of Crop Science & Plant Breeding - Grass and Forage Science/Organic Agriculture, Hermann-Rodewald-Str. 9, 24118 Kiel, Germany, e-mail: pschoenbach@email.uni-kiel.de