



University of Kentucky
UKnowledge

International Grassland Congress Proceedings

21st International Grassland Congress / 8th
International Rangeland Congress

Effects of Desertification on C and N Contents and Storages in Horqin Sandy Grassland, Northern China

Halin Zhao
Chinese Academy of Sciences, China

Yuqiang Li
Chinese Academy of Sciences, China

Ruilian Zhou
Ludong University, China

Follow this and additional works at: <https://uknowledge.uky.edu/igc>



Part of the [Plant Sciences Commons](#), and the [Soil Science Commons](#)

This document is available at <https://uknowledge.uky.edu/igc/21/6-2/23>

The 21st International Grassland Congress / 8th International Rangeland Congress took place in Hohhot, China from June 29 through July 5, 2008.

Proceedings edited by Organizing Committee of 2008 IGC/IRC Conference

Published by Guangdong People's Publishing House

This Event is brought to you for free and open access by the Plant and Soil Sciences at UKnowledge. It has been accepted for inclusion in International Grassland Congress Proceedings by an authorized administrator of UKnowledge. For more information, please contact UKnowledge@lsv.uky.edu.

Effects of desertification on C and N contents and storages in Horqin sandy grassland , northern China

Ha-Lin Zhao¹ , Yu-Qiang Li¹ , Rui-Lian Zhou²

¹*Cold and Arid Regions Environment and Engineering Institute , Chinese Academy of Sciences , Lanzhou , 730000 , China*

²*Faculty of Life Sciences , Ludong University , Yantai , 264025 , China*

Key words : desertification ; carbon and nitrogen ; content and storage ; sandy grassland ; northern China

Introduction Sandy grasslands are widespread in northern China , where desertification of grassland is very common because of overgrazing and wind erosion . However , very little is known about the effects of desertification on grassland C and N contents and storages in this region .

Materials and methods A field experiment was conducted in the Horqin sandy grassland during 2003 to 2004 , where degree of desertification gradients could be utilized to evaluate C and N contents and storages in plant , litter , and soil components relative to the degree of desertification .

Results The results showed that that (1) land desertification could result in significant decreases in soil carbon and nitrogen contents , but the decrease of carbon and nitrogen contents in the plant and litter was not significant in the desertification processes ; (2) the carbon and nitrogen storages decreased significantly with increase of grassland desertification degrees ; the carbon and nitrogen storages lost by the desertification reached up to 107.53Mt and 9.97Mt in Horqin Sand Land during the last one century , and the average amounts lost per unit area were 3.6 kg/m² and 0.3 kg/m² ; (3) the 92-96% carbon storage and 96-97% of the nitrogen lost by desertification came from soil organic C and total N ; the carbon and nitrogen storages lost in plants and litter accounted only for 3-7% and 2-3% of total lost carbon and nitrogen storage ; (4) most of the carbon and nitrogen in the grassland are lost in early stages of the desertification process (in the light and moderate desertified stages) , the amount of carbon and nitrogen lost was less in later desertification stages (in the heavy and severe stages) ; (5) the loss of soil organic C and N storages results mainly from decrease of nutrients-rich soil fine particles eroded by wind . The decrease of plant and litter carbon and nitrogen storages results mainly from loss of soil potential productivity .