



University of Kentucky
UKnowledge

International Grassland Congress Proceedings

21st International Grassland Congress / 8th
International Rangeland Congress

Restoration of Vegetation and Soil Nutrients on the Northern Area of Loess Plateau

Long Bai

Shenyang Agricultural University, China

L. M. Liu

Shenyang Agricultural University, China

B. Zhao

Shenyang Agricultural University, China

Y. Liu

Shenyang Agricultural University, China

H. X. Wang

Shenyang Agricultural University, China

See next page for additional authors

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/21/6-2/2>

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.

Presenter Information

Long Bai, L. M. Liu, B. Zhao, Y. Liu, H. X. Wang, and T. Kobayashi

Restoration of vegetation and soil nutrients on the northern area of Loess Plateau

L .Bai¹ , L .M .Liu¹ , B .Zhao¹ , Y .Liu¹ , H .X .Wang¹ and T .Kobayashi²

¹ Shenyang Agricultural University . 120 , dongling Road , shenyang , 110161 , china . E-mail : bailong124@hotmail .com

² Faculty of Horticulture , Chiba University , Matsudo 271-8510 , Japan

Key words : Restoration of Vegetation , soil nutrient , Land-use type , Loess Plateau

Introduction Severe loss of soil and water quality has occurred on the northern area of the Loess Plateau . Past research showed that 80% of the mud and sand streamed into the Yellow river came from the northern area of the Loess plateau , and most of the mud and sand came from sloping fields (Wei , T .X . 2002) . Since the grain-for-green policy was implemented , not only has the expansion of sloping fields been controlled , but also the restoration of vegetation was facilitated . So far , most research has reported on the effect of returning sloping fields into woodlands and grasslands on water and soil conservation , but little research has been conducted on vegetation restoration and soil nutrients . In this research , Shenmu County in Shanxi province , located in the north of Loess Plateau , was chosen as the survey area . We analyzed the effect of returning sloping fields into woodlands and grasslands on restoration of vegetation and soil nutrients . The research results are expected to supply a scientific basis for ecosystem restoration .

Materials and methods Four land-use types were chosen in the Liu-dao-gou test-site on shenmu , in the summer of 2004 and 2005 . Sixty quadrats of 25 m² were set on grassland , and 20 quadrats of 25 m² were set on three other land-use types . In the grassland , survey we measured species composition , the coverage and plant height . In the woodland , we measured the tree height , the mean annual growth and the tree diameter . The total soil nitrogen and carbon were measured on four land-use types .

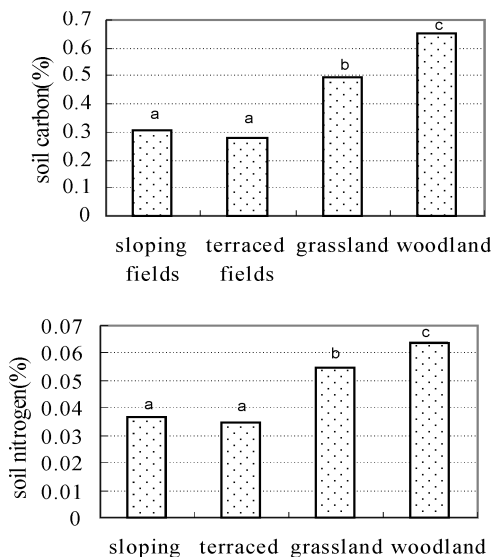


Figure 1 Change of soil carbon , soil nitrogen among four land-use types (Different alphabet indicates a significant) .

Results Thirty four species occurred in the grassland area . Among these species , the occurrence frequency of *Stipa bungeana* , *Lespedeza davurica* , *Cleistogenes squarrosa* and *Artemisia scoparia* were more than 80% . The total carbon and nitrogen contents in sloping fields and terraced fields were very low , 0 .3% and 0 .03% , respectively . In grassland , the corresponding contents were 0 .5% and 0 .05% . Whereas the total carbon and nitrogen contents in woodland were highest , 0 .6% and 0 .06% , respectively (Figure 1) .

Conclusions This survey area a temperate steppe zone , is characterized by vegetation such as *Stipa bungeana* and *Lespedeza davurica* etc . which is favored by a warm environment . The representative vegetation has been restored gradually over 20 years of returning sloping fields into grassland . However , in some areas vegetation degradation occurred . Returning sloping fields into woodland plays a significant role in restoration of soil nutrients . The content of total carbon and nitrogen in woodlands increased two times more than that in a sloping field during 20 years .

Reference

Wei , T .X . (2002) Sediment sources and effects of vegetation on erosion control in the gully-hilly loess area in north China . *Journal of Beijing Forestry University* Z1 , 32-27 .