



University of Kentucky  
UKnowledge

International Grassland Congress Proceedings

21st International Grassland Congress / 8th  
International Rangeland Congress

## Effects of Different Management on Soil Organic Carbon Dynamics in Chinese Grassland Systems

Feng Shi

*Chinese Academy of Agricultural Sciences, China*

Yu'e Li

*Chinese Academy of Agricultural Sciences, China*

Qingzhu Gao

*Chinese Academy of Agricultural Sciences, China*

Lin Jin

*Chinese Academy of Agricultural Sciences, 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/21/8-1/35>

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](mailto:UKnowledge@lsv.uky.edu).

## Effects of different management on soil organic carbon dynamics in Chinese grassland systems

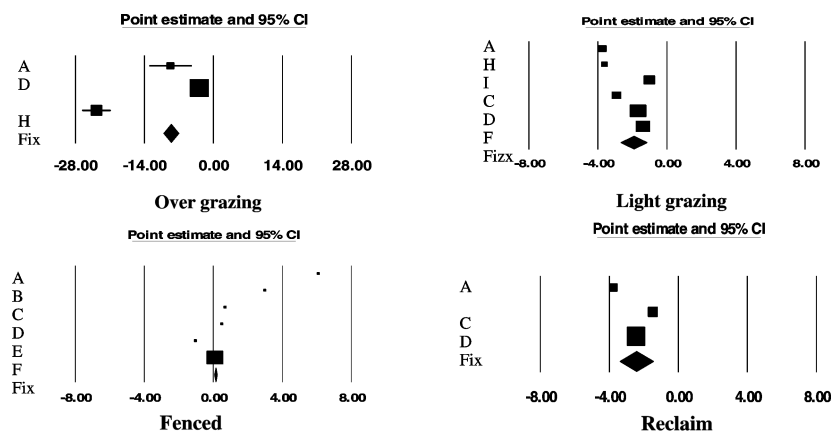
Shi Feng , Li Yu-e , Gao Qing-zhu , Jin Lin

Institute of Environment and Sustainable Development in Agriculture , Chinese Academy of Agricultural Sciences , Beijing 100081 , E-mail shifeng@ami.ac.cn

**Key words** grazing , reclaim , fenced grassland , soil organic carbon , meta analysis

**Introduction** The grassland ecosystem is one of the most important land ecosystems in the world . In China grassland area is nearly 400million ha , occupies 41.7% of the national territory area . Meanwhile it is a large global carbon storage (Cheng et al . , 2000) . Therefore , it is a vital significance to study the effects of the human management on soil organic carbon dynamics in grassland ecosystems .

**Materials and methods** By reviewing one hundred references and analyzing the change of soil organic carbon under grassland management in long-term experiment , we built the SOC&MANAGEMENT database . Finally , we used meta-analysis to estimate carbon annual change with grassland management in China .



A :alpine meadow B :mountain meadow C :temperate meadow D :temperate steppe E :temperate desert F :temperate desert steppe H :alpine steppe I :shubby grassland

**Figure 1** The annual increase (t C · hm<sup>-2</sup> · yr<sup>-1</sup>) of SOC and grassland for types of management in China .

**Results** In the Figure 1 , the diamond position and the size have represented the fixed estimate effect and 95% confidence interval . There is a large SOC losses under the over-grazing condition : -8.677tC · hm<sup>-2</sup> · yr<sup>-1</sup> while the light grazing and reclamation makes the SOC decreased respectively : -1.95tC · hm<sup>-2</sup> · yr<sup>-1</sup> and -2.455tC · hm<sup>-2</sup> · yr<sup>-1</sup> . The enclosure management increased the soil organic carbon : 0.096tC · hm<sup>-2</sup> · yr<sup>-1</sup> .

**Conclusions** The soil structure in grassland aggravates unceasingly with the grazing intensity increasing . In addition , massive organic matter expose in the air , which accelerates the decomposition of SOC and reduces the carbon accumulation . But the conversion of grassland into farmland leads the aboveground biomass to move away and reduce the biological carbon transportation into underground . However , the fenced grassland can increase the SOC as it was not affected by the domestic animal or human management .

### References

Chen Z Z , Wang S P , Wang Y F . 2000 . Typical grassland ecosystem of China . Beijing : Science press 211-253 .  
Li X Z , Chen Z Z , 1998 . Influence of stocking rates on C , N , P contents in plant-soil system . *Acta Agraria Sinica* 27 : 90-98 .