



University of Kentucky
UKnowledge

International Grassland Congress Proceedings

21st International Grassland Congress / 8th
International Rangeland Congress

Dynamics of *Leymus chinensis* and *Hierochloe glabrain* Grassland Plantings within the Songnen Plains of China

Guangzhi Fan
Northeast Normal University, China

Yunfei Yang
Northeast Normal 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/21/1-4/32>

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.

Dynamics of *Leymus chinensis* and *Hierochloe glabra* in grassland plantings within the Songnen Plains of China

Fan Guang-zhi, Yan Yun-fei

Key Laboratory of Vegetation Ecology, Ministry of Education, Institute of Grassland Science, Northeast Normal University, Renmin Street, 5268, Changchun 130024, China. E-mail: yangyf@nenu.edu.cn

Key word: *Leymus chinensis*, *Hierochloe glabra*, vegetative reproduction, population dynamics, series progress, planting grassland

Introduction Two grasses, *Leymus chinensis* and *Hierochloe glabra* are rhizomatous plants distributed broadly within the Songnen Plains of China (Yang *et al.*, 2006; Guo *et al.*, 2004). Because germination rate of seeds is less in *L. chinensis* than *H. glabra* there is a successional progression in plantings from *H. glabra* to *L. chinensis*. The capability of vegetative reproduction is stronger in *H. glabra* population than in *L. chinensis* population. Therefore *L. chinensis* is a late successional grass and *H. glabra* is an early successional grass. *H. glabra* usually forms many patches of dominant species in the planted grassland at early stage. *H. glabra* is then replaced by *L. chinensis* with successional progression occurring gradually. Eventually, *L. chinensis* would become the dominant species in the community. More complete understanding of the dynamics of populations of *L. chinensis* and *H. glabra* could provide an improved understanding for management of these reseeded grasslands.

Materials and methods The experiment was carried out at the Pasture Ecology Research Station of Northeast Normal University, Changling, Jilin province of China (44°45'N, 123°31'E). In the middle of May 2004, 15 mixed communities with different proportions of *L. chinensis* to *H. glabra* were sampled. Each sample area was 0.25 m × 0.25 m and the depth was 0.25 m. Numbers of tillers and buds were counted, the accumulated length of rhizomes was measured and the rhizomes were washed, dried and weighed. Thereafter the quantitative characters of each sample were changed from the sample area into unit area of 1 m × 1 m and statistic analysis was regarded, respectively (This is a confusing sentence-please rewrite).

Results The corresponding quantitative characters in two populations, as the number of tillers (NTLc), biomass of rhizomes (BRLc), accumulated length of rhizomes (LRLc) and the number of buds (NBLc) of *L. chinensis* increased, the number of tillers (NTHg), biomass of rhizomes (BRHg), accumulated length of rhizomes (LRHg) and the number of buds (NBHg) of *H. glabra* decreased with a pattern of the logarithm function, respectively (Figure 1). The correlation coefficients (*r*) between NTHg and NTLc, between BRHg and BRLc and between LRHg and LRLc were different ($P < 0.01$), NBHg and NBLc were different ($P < 0.05$) in successional development of the planted grassland.

Conclusions There was a significant negative correlation between NTHg and NTLc, between BRHg and BRLc, between LRHg and LRLc and between NBHg and NBLc in planted grassland. The quantitative characters of *H. glabra* population decreased gradually with increasing presence of *L. chinensis*. Because of their different biologic characteristics (*L. chinensis* is taller than *H. glabra* in tiller height) *L. chinensis* restrains the photosynthesis of *H. glabra* in the middle and late period of the growing season, which restricts the expansion of rhizomes and the biomass accumulation of rhizomes of *H. glabra*. Thus, bud generation of *H. glabra* was reduced. Although they are both rhizomatous grasses, *L. chinensis* replaces *H. glabra* and becomes the dominant species in these planted grasslands over time.

References

- Yang Y. F., Zhang B. T. (2006) Growth patterns of *Leymus chinensis* clones under different habitat conditions in Songnen Plain of China. *Chinese Journal of Applied Ecology*, 17(8): 1419-1423.
- Guo L. H., Yang Y. F., Zhang B. T. (2004) Vegetative propagative ability and growth regulation of *Hierochloe glabra* experimental clones on the Songnen Plain of China. *Acta Prataculturae Sinica*, 13(4): 57-61.

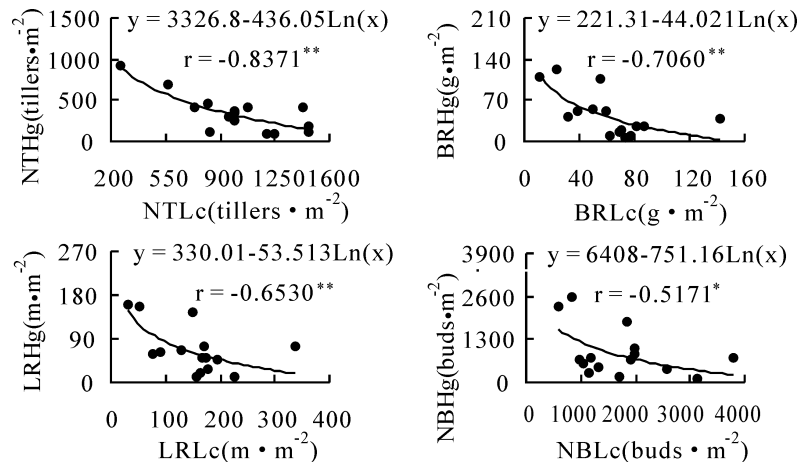


Figure 1 Observed data and simulated curves of the quantitative characters both *Hierochloe glabra* and *Leymus chinensis* in different series progress.