

EGU22-3548

<https://doi.org/10.5194/egusphere-egu22-3548>

EGU General Assembly 2022

© Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.



## Soil inoculation improves ecosystem function in degraded grasslands

Yu Hui Li<sup>1</sup>, Xu Han<sup>1,2</sup>, Ying bin Li<sup>1</sup>, Qi Li<sup>1</sup>, and Martijn Bezemer<sup>3,4</sup>

<sup>1</sup>Institute of Applied Ecology, Chinese Academy of Sciences, Shenyang 110016, China

<sup>2</sup>University of Chinese Academy of Sciences, Beijing 100049, China

<sup>3</sup>Department of Terrestrial Ecology, Netherlands Institute of Ecology (NIOO- KNAW), P.O. Box 50, Wageningen 6700 AB, Wageningen, The Netherlands

<sup>4</sup>Institute of Biology, Above-Belowground Interactions group, Leiden University, P.O. Box 9505, 2300 RA Leiden, The Netherlands

The improvement and protection of ecosystem function are important in the restoration of grassland ecosystem, especially in degraded grasslands. Soil inoculation provides an effective way for the restoration of degraded ecosystems. Here we conducted a field soil inoculation experiment and selected two well-developed soils (meadow steppe and upland meadow) to transplant them into degraded grasslands at three inoculation amounts (0.01 m<sup>3</sup>, 0.03 m<sup>3</sup> and 0.05 m<sup>3</sup> per square meter). After three years of soil inoculation, we assessed the ecosystem multifunctionality (including plant productivity, and functions related to nutrient cycling) of different treatments with different identity and amount of soil inoculation. Principal co-ordinates analysis suggested that different identity of soil inoculum resulted in different development of soil fungal and bacterial communities. Ecosystem multifunctionality was significantly improved with the increase of soil inoculation amounts. Spearman's correlation analysis showed a positive association between ecosystem multifunctionality and soil fungal richness, plant cover, and the amount of soil inoculation. Our results indicate that soil inoculation can enhance ecosystem multifunctionality by affecting the soil biotic and plant communities. Our finding has important implications for better restoration of biodiversity and ecosystem functioning in degraded grassland ecosystems.