

**Doctoral Scholarship (UNIVERSITÄT HALLE)**  
**Bewerbungsfrist: 31.07.2010**

Topic: “The role of seed limitation, herbivory and plant invasions for species diversity and biomass production in herbaceous communities”

The question how biodiversity affects the functioning of communities and ecosystems has become a major topic in ecological research. Several experiments have shown that the number of plant species and functional groups positively affects ecosystem processes due to niche complementarity or facilitation. It is thus expected that biofuels derived from low-input high-diversity mixtures of grassland plants can provide more usable energy, greater greenhouse gas reductions, and less agricultural pollution than biofuel produced from soybean or corn. Hence, it is desirable to explore the potential of natural, species-rich plant communities for sustainable biomass production more widely. However, diversity and productivity in natural ecosystems can be much lower than potentially possible due to seed and dispersal limitation. In addition, species composition, diversity and productivity of plant communities can be profoundly influenced by 1) the presence of exotic plant species and 2) by herbivores. The central aim of our project is to explore how diversity of native species, invasion by exotic species, and herbivory affect productivity of herbaceous plant communities, thereby contributing to an improved understanding how the co-evolutionary history among species contributes to the functioning of terrestrial ecosystems. Using already established semi-natural plant communities as a study system, the PhD student will experimentally investigate the following questions:

- How is local plant diversity constrained by seed and dispersal limitation, and can community biomass be increased by seed addition from the regional species pool?
- How is the relationship between plant species diversity and community biomass affected by exotic plant species compared to communities dominated by native species?
- How is recruitment of native versus exotic plant species affected by background diversity and productivity, and are species-rich communities more resistant to invasions than species-poor ones?
- How do natural levels of herbivory affect plant community structure and productivity, and how does it determine invasibility of plant communities by exotic species?
- How do plant functional traits govern community response to seed addition and herbivory in terms of invasibility and productivity?

Research field:

Biodiversity and Ecosystem Functioning

Parties involved:

Martin-Luther-University Halle-Wittenberg, Helmholtz Centre for Environmental Research - UFZ

Supervisors:

Prof. Dr. Isabell Hensen, Prof. Dr. Helge Bruelheide, MLU Halle, Dr. Harald Auge, UFZ, Dept. Community Ecology

Deadline for applications: 31.07.2010

Contact for further information: <http://www.higrade.ufz.de/index.php?en=14667>