

Diversity and stability in semi-natural grasslands: Temporal and spatial dynamics of plant and soil communities

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The relationship between biodiversity and ecosystem functioning remains highly debated. A number of biodiversity experiments carried out in grassland communities have shown that there is a positive relationship between plant species diversity and ecosystem stability. In these studies plant community diversity has been maintained by hand weeding, and therefore plant communities remain constant over time. In nature, plant communities are temporally and spatially dynamic. However, how changes in plant diversity in natural plant communities will affect stability is poorly understood. Also, ecosystem functioning is typically based on temporal changes in plant biomass and virtually nothing is known about how plant diversity affects the stability of other organisms. I will use results from a long-term biodiversity experiment in which plant communities were not weeded, to show how plant diversity affects the temporal dynamics of individual plant species, and of plant and nematode communities. I will show that plant diversity can greatly affect the dynamics of plant and soil communities, but that plant diversity does not necessarily lead to stability in natural communities. Diverse communities can be both stable and unstable.