

# Increasing plant species richness by seeding has marginal effects on ecosystem functioning in agricultural grasslands

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## Abstract

Experimental evidence shows that grassland plant diversity enhances ecosystem functioning. Yet, the transfer of results from controlled biodiversity experiments to naturally assembled ‘real world’ ecosystems remains challenging. Here, we address this issue by experimentally sowing locally absent plant species in 73 agricultural grasslands along a land-use intensity gradient, to test how ecosystem functions related to productivity and nutrient cycling respond to species enrichment. We found that only one of 12 ecosystem functions responded to changes in species richness. In fact, ecosystem functioning was rather driven by environmental conditions and land-use intensity. This suggests that the functionally-relevant niche space is saturated in naturally assembled grasslands, and that competitive, high-functioning species are already present. While nature conservation and cultural ecosystem services certainly benefit from species enrichment, our study indicates that plant species enrichment may deliver only weak increases in ecosystem functioning in both moderately intensive and traditionally managed agricultural grasslands.

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Figure 1: This is a caption