

GRASSMICRO



Function follows diversity: Consequences of altered plant or soil microbial diversity for nutrient turnover in grasslands

Optimal management of grasslands is a key strategy towards their agronomic and environmental sustainability, helping to meet ever-increasing demand for food. Central to achieving this is a greater insight into the functional relationship between the plant and the plethora of microorganisms that are associated with its roots: the microbiome. A critical knowledge gap is the consequence of varying plant and microbial diversity on the soil nutrient turnover of two macronutrients: nitrogen (N) and phosphorus (P), both essential for plant growth. Two-step approach will be taken to address this question. Firstly, to investigate how altering plant diversity (i.e., monocultures vs high diversity swards, presence/absence of N-fixing legumes) influences how the microbiome breaks-down complex nutrient forms of N and P for the plants to assimilate. In the second step, we will view the question from the opposite direction. Here we will study the differences in how high vs. low soil microbial diversity make N and P plant-available and how such distinctions impact the growth performance of a plant and its consequential response to a number of environmental stresses. The findings of this project will emphasize to farmers the importance of maintaining above- and belowground biodiversity for the sustainability of grassland production systems.

Project Duration: 36 months (18M Helmholtz Zentrum München + 18M Teagasc)

Collaborating Institutions: Teagasc Johnstown Castle Soil Research Centre, Ireland
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