



Deciphering plant soil microbe interaction in the rhizosphere - insights and challenges

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Plant microbe interaction are assumed to play a key role for plant health and growth but also influence soil properties and various ecosystem services. Recently, we could show the influence of agricultural management on plant growth, the rhizosphere microbiome of lettuce and barley and on the expression of plant defence related genes. Improving plant growth and health can be improved by organic amendments or inoculants is assumed to be a so-far under-explored strategy to influence plant growth directly or via microbiome shifts.

The last decade brought about remarkable methodological progress for rhizosphere microbiome studies through new cultivation-independent methods (DNA/RNA- or microscopy-based analysis) but also in other disciplines of rhizosphere research. Despite the enormous progress made in the availability of novel approaches that allow a cultivation-independent study of the rhizosphere microbiome, our present understanding of the factors that modulate the rhizosphere (microbiome, water availability, nutrient cycling, soil properties) is, however, still very fragmented and limited. Therefore of a new DFG financed priority programm 2089 was recently launched aiming at unraveling the spatio-temporal pattern in the rhizosphere that brings together the different aspects, processes and scales of rhizosphere research under a common framework in order to utilize this knowledge for improving our understanding of resilience of agricultural soils.