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CHARACTERIZATION OF ROOT GROWTH DYNAMICS IN THE INITIAL PHASE OF SOIL DEVELOPMENT – LINKING 3D SAMPLING AND MINIRHIZOTRON OBSERVATIONS

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To characterize the role of root growth for soil development in the initial state of ecosystem development root systems of the primary vegetation growing on raw soils from quaternary calcareous sediments was studied. Two abundant plant species, *Lotus corniculatus* and *Calamagrostis epigeios* were selected and studied in detail under field conditions. A 3-dimensional root sampling procedure and observations from minirhizotron were used to link information on root distribution at high resolution of data on growth dynamics obtained from minirhizotron observations for same pioneer plant species.

The present study is focussing on the active response of root growth to heterogeneously distributed nutrient pools in soils, and will in reverse characterize the effects that root proliferation may have on the allocation of nutrients. This will provide information to what degree roots may actively change their chemical environment and how the chemical status of a soil in the initial state of soil development may drive the spatial distribution of roots. Linking data from 3D root sampling with those of the seasonal root growth dynamics will provide a unique chance to develop a dynamic root growth model for plant species prevailing in the primary state of succession. As such the model will integrate the effects caused by both plant species and soil conditions and will strive for validate and improving current soil hydrological models. At the same time it will support the assessment of root derived carbon and nutrient allocation in soils. From this perspective the linking of information from 3D root distribution and minirhizotron studies is supposed to open up new opportunities to explore the role of roots for soil development.