



Optimal plant root system architectures for preventing soil loss on slopes

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Plant root systems affect soil fixation on slopes at different scales. A single root exudes mucilage, stimulating microbial activity and adherence between soil particles. Individual root systems enmesh soil particles and bind aggregates. Deeper roots pin soil layers together, reinforcing the shear zone. Roots and macropores created by dead and decomposing roots influence infiltration rates and subsurface flow, even over an entire slope. Root system morphology and how it changes over time and in different substrates modifies the efficacy of any given species to fix soil on a slope. I will discuss the optimal (or not) types of root system architecture for mitigating slope instability. Why and how root system plasticity and temporal modifications occur will be introduced in an attempt to define a conceptual framework for screening plants that can be used to prevent soil loss on slopes. How these data can be successfully included into slope stability models will be discussed.