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Root architecture of plant inlays used for biotechnical slope stabilisation

R. Stangl, F. Florineth

Institute for Soil Bioengineering and Landscape Construction,

University of Natural Resources and Applied Life Sciences, Vienna

(rosemarie.stangl@boku.ac.at / Fax: ++43-1-47654-7349 / Phone: ++43-1-47654-7303)

Soil bioengineering is a traditional approach to deal with erosion problems and shallow seated landslides. It is a cost-effective attempt for erosion control using locally available materials and low cost labour. The use of living plants and parts of plants is based on the capability of certain species to develop adventitious roots. Parts of stems and branches are installed as mechanical elements for stabilisation purposes. New roots grow along the buried plant inlays and, thus, also guarentee new sprout development. Within the scope of perennial field studies various root systems from hedge brush layers, live crib walls and live slope grids were isolated. The root characteristics of Alnus incana, Alnus viridis, Fraxinus excelsior and Prunus padus, grown from rooted plant inlays, and various willows, grown from live cuttings, were studied. The poster will present the root development within layer constructions aged up to several decades which were applied for the stabilitsation of various slope failures. Due to inter- and intraspecific root intergrowth root bodies with diameters up to 8 m were found. The root collectives turned out to contribute essentially to soil stabilisation with both enormous lateral and depth effect. Additionally, the above ground biomass of the collective partners was significantly higher than those of single individuals of the same species. These findings suggest that the whole collective benefits from the nutrient uptake of the single roots. Furthermore the role of hedge brush layers, live crib walls and live slope grids for slope stability and slope protection will be discussed.