



Higher plant diversity enhances soil stability in alpine ecosystems

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Vegetation can improve the stability of soil and is especially important in steep alpine terrain. So far, stabilising effects have been mainly studied for tree roots, however, information about the role of non-tree roots in maintaining the stability of disturbed alpine ecosystems above the treeline is lacking. In this paper, we examined the contribution of grasses, herbs and shrubs growing on ski slopes improving soil stability. Soil cores were taken of machine-graded or un-graded ski slopes with either natural or artificial snow and of the adjacent undisturbed pastures as control. The aggregate stability (AS) of the soil cores and the root density (RD) were then determined. AS was found to increase with increasing plant cover and species diversity and correlated positively with RD. AS and RD were lower on machine-graded than on un-graded ski-slopes, and significantly higher in undisturbed control plots. The application of artificial snow significantly reduced the AS and RD at a depth of 10 to 20 cm. The study suggests that higher plant diversity and root density can enhance aggregate stability of the topsoil.