



Spatio-temporal vegetation effects on slope stability

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The effects of tree vegetation on slope stability is well known and it is still object of research and analysis from both a modelling and quantitative point of view.

However, tree vegetation has been constantly subjected to silvicultural activity either in strictly productive areas or in other more conservative areas which were meant to contrast the hydrogeological risk.

From this point of view, it appears immediately important to understand the evolution resistance dynamics of root systems, which gives the possibility to correctly evaluate either the positive or negative effects of programmed cuts on woods.

The aim of this work is then to try to determine which conditions are actually present and what the evolution of the mechanical characteristics of root systems (and consequently of slope stability) can be.

In this purpose, we started an experimental design, by sampling and carrying out field and laboratory measurements on beech cuttings root systems. Two kinds of samples were taken into account: living beech cuttings from protected area beechwoods in order to determine the current characteristics of them and dead beech cuttings (cut in the previous years and at present in degradation) in order to have an indication of the evolution of the root mechanical characteristics.

Therefore tensile strength of single roots sampled from beech stumps of plants cut in the years 2008, 2006, 2004 and 2002 at a height of about 1450 metres above sea level on SW facing slopes in High Garfagnana (a mountain in the North of Tuscany) have been also analysed.

Living beech roots from areas at a height of 800, 1450 and 1600 metres above sea level (minimum, intermediate and maximum limit of distribution areas of local beechwoods) in a sufficient quantity as to determine the stress/strain curve have been sampled and tested,

to verify if the height difference of growing areas is a factor able to influence the mechanical characteristics of living plants.