Universal Soil Loss Equation

$$A = R \times K \times LS \times P \times C$$

A: specific soil loss [t/ha year], associated to phenomena of rill and interill erosion;

R: Rainfall-Runoff Erosivity Factor: climatic factor relevant to the intensity and duration of precipitations [MJ mm/ha h year];

K: Soil Erodibility Factor: pedologic factor that expresses the erodibility of the ground [t h/MJ mm];

LS: geometrical factor function of the steepness and length of the slope;

P: Supporting Practices Factor: reduction factor taking into account possible interventions of protection, control and conservation;

C: Cover-Management Factor: reduction factor depending on the vegetation.
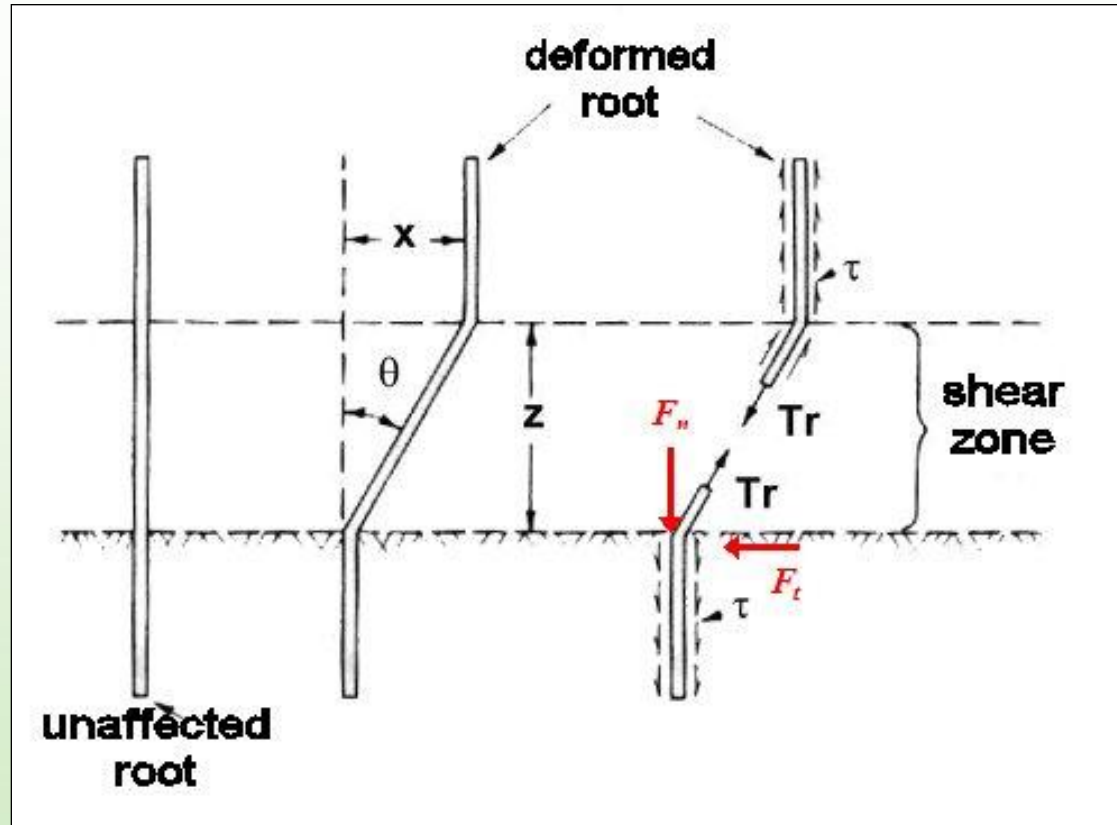
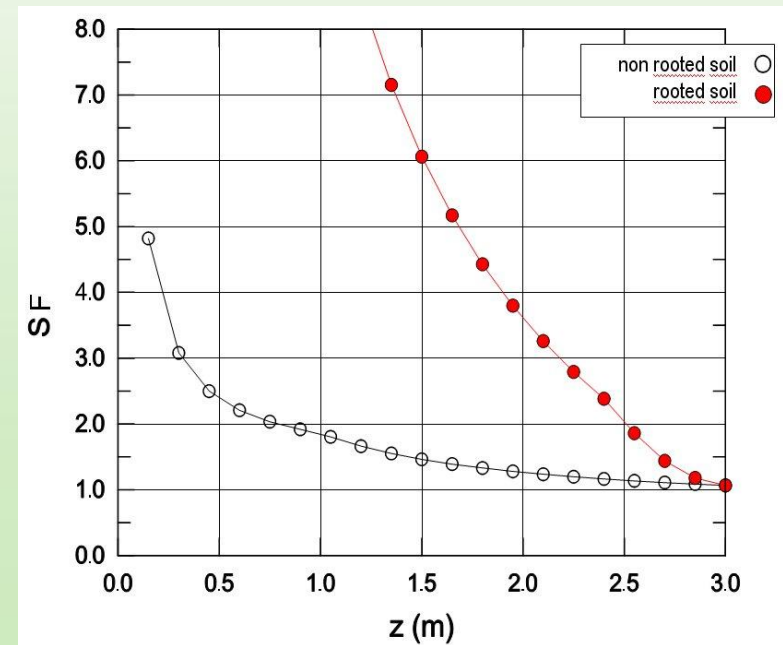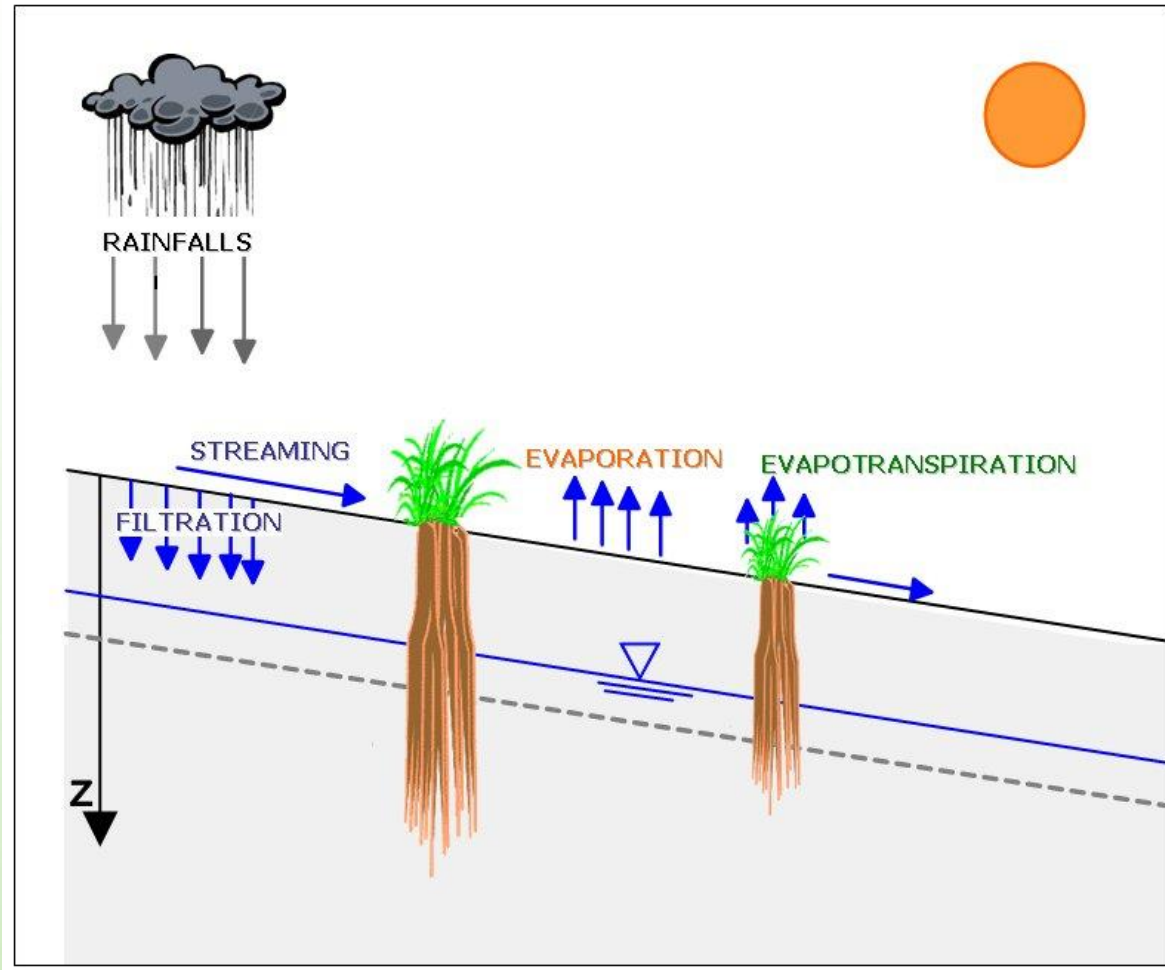**Simplified model of soil reinforcement for the single root**
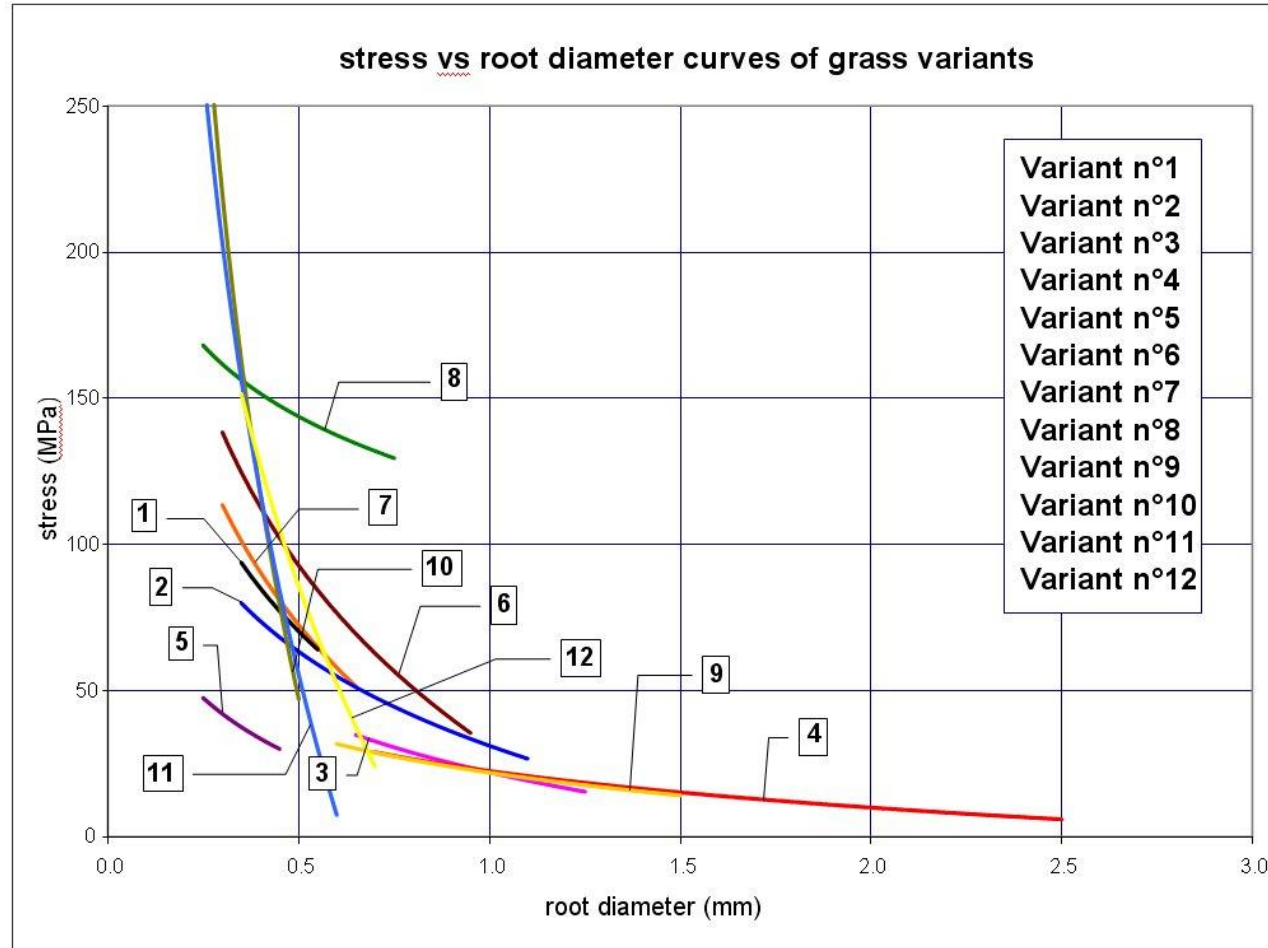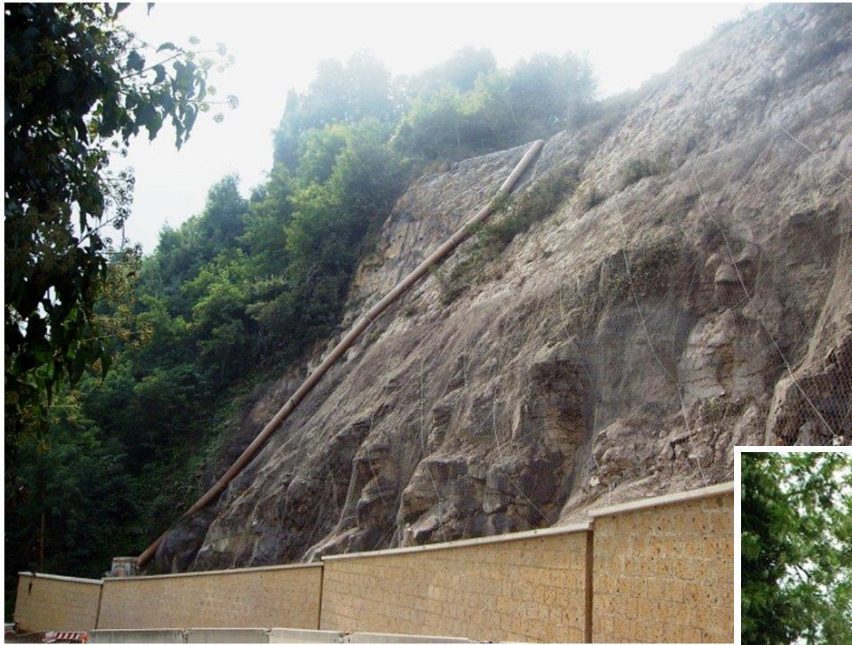
Experimental results of tensile tests on some grassy species
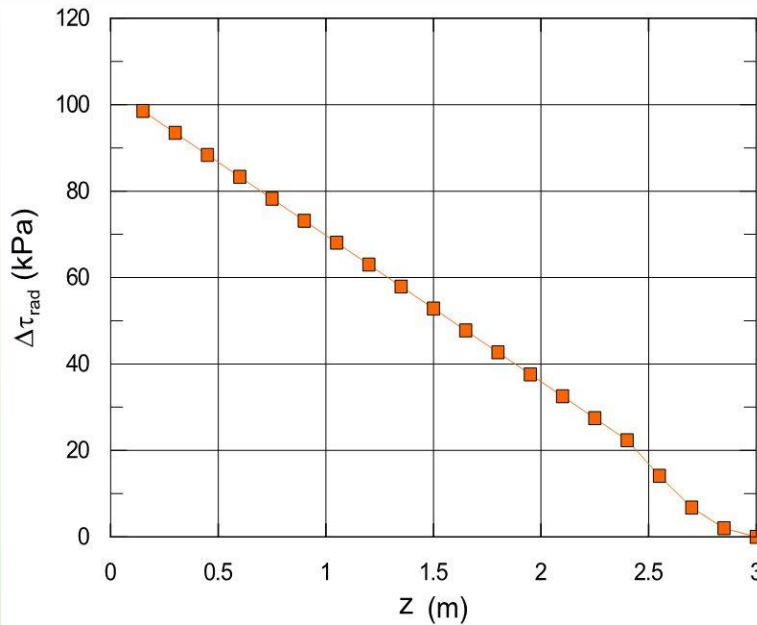
Increase in shear resistance *Δτrad* due to the roots, plotted against depth

Safety factor SF of non rooted (empty circles) compared to rooted soil (red filled circles)

Schematic representation of principal contributions to water balance

Orvieto (Terni, central Italy), road "SP111 della Badia" Situation of the slope in December 2004, before intervention

Same slope after renaturation intervention (May 2006)

a) clogged drains

b) clean drains

Same slope of previous slide showing
(a) trench drains before treatment (September 2005) and
(b) 8 months later (May 2006)