



Estimation of soil loss and runoff within plots, of beech (*Fagus sylvatica* L.) stands in relation to different forest management practices and harvesting age in the Lombardia's Alps

A. Montagnoli, A. Di Iorio, G. Magatti, D. Chiatante

Department of Environmental and Chemical Sciences, University of Insubria, Como, ITALY
(antonio.montagnoli@uninsubria.it / Fax: +39 031-326230 / Phone: +39 031-326213)

In forestlands on steep slopes, where the shallow soil can be considered a non-renewable resource, erosion is of special concern. The increase in the precipitation intensity causes a significant positive trend in the proportion of total precipitation contributed by heavy precipitation events. The vegetation cover provides essential protection to the soil against the erosivity of rainfall and reduces considerably the water erosion rate. In particular, we focused our attention on the forestland cover subjected to different types of managements practices and harvesting age in order to evaluate which is more advantageous. With the aim of obtaining information on surface water flow and the loss of mineral soil, runoff-erosion plots (10 m long \times 3 m wide) were installed in a catchments in Lombardia's Alps (Val Intelvi, Como) at three co-eval stands (a coppice 40 years old, and two conversions from coppice to high forest respectively cutted in the 1995 and 2004). All the stands selected were located slopes with gradient between 28-32 degree. One erosion plot was set up in each of these areas to measure runoff and erosion. Runoff and sediment losses were collected from June through October 2005 every 15 days and after each heavy rainfall event. The soil loss samples were oven dried and then weighted. We also related the soil erosion and runoff with climate data, focusing on three rainfall events occurred at full and off summer season. The preliminary results showed that the harvesting practices significantly affect the runoff and soil loss with marked differences among the plots. The coppice forest showed the higher value of runoff, because the multy layer canopy and the multi-stemmed trees direct a lot of water to the ground. Moreover, the cop-

pice showed a lower soil loss value displaying its soil protection rule. The conversion to high forest stands showed the higher values of soil loss decreasing with the age of harvest. This might be explained with the smaller canopy cover due to the lower tree density. In particular the 2004 conversion, which had the lowest values of grass and canopy cover, showed the highest soil loss value after heavy precipitation event succeeding a period with high temperature.