



## **Development of soil quality along a chronosequence under natural succession in the Dragonja catchment, SW Slovenia**

Rutger van Hall and Erik Cammeraat

University of Amsterdam, IBED, Earth Surface Science, Amsterdam, Netherlands

Agricultural fields have been increasingly abandoned in several regions in Southern Europe. In many cases this leads to natural vegetation succession which may have a direct impact on soil quality, biodiversity and hydrological connectivity. This research aims at getting insight on the effects of natural vegetation succession on the development of soil quality in the Sub-Mediterranean Dragonja catchment in SW Slovenia. This site was chosen due to its uniform geology, geomorphology and soil types. Four different stages of vegetation succession (i.e. field, abandoned field, young forest, semi-mature forest) were selected and sampled on both north-, and south-facing slopes, resulting in 8 treatments for which 6 representative sites were sampled.

Samples were analysed on OC and TN content, EC, pH, bulk density, aggregate stability and grain size distribution. To get insight on the changes in biodiversity vegetation records were made distinguishing five different plant functional groups (i.e. juveniles, grasses, herbs, shrubs and trees).

Age group (i.e. stage of vegetation succession) significantly influenced the OC and TN content, aggregate stability, bulk density and pH. Directly after abandonment, between age group 0 and 1, OC and TN content, aggregate stability and pH increased significantly and bulk density decreased significantly. OC content was most affected by age group and furthermore significantly correlated to TN content, aggregate stability, bulk density and pH. Regarding biodiversity, there was a significant increase in cover by trees between age group 1 and 2 and a significant decrease between age group 2 and 3. Cover by herbs decreased significantly between age group 1 and 2. The number of different trees and shrubs increased significantly between age group 0 and 1, and the number of different juveniles increased significantly between age group 2 and 3. Another factor significantly influencing the soil's quality is aspect. Although not found for each age group south-facing slopes generally had higher OC and TN content, and higher pH than north-facing slopes. On average OC content was 28% higher and TN content 25% higher on south facing slopes. Aspect did not have a significant influence on the biodiversity although on average vegetation cover is slightly (7%) higher and 16% more species were found on north facing slopes.