



Effects of amelioration measures concerning water availability, soil physical properties and growth of trees

M. Hümann and R. Schneider

University of Trier, faculty of Geo-sciences, department of soil science, Trier, Germany, (M.Huemann@uni-trier.de), (schneider@uni-trier.de)

In many countries, surplus agricultural production and ecological problems due to intensive cultivation have increased the interest in afforestation of arable soils. These areas, which are designated for afforestation arrangements, often possess bad basic requirements for an effective growth of plants (marginal earning sites). The available soils are often poor in nutrients, extremely dry or very wet as well as compacted and skeletal. For preparing these territories in terms of an ecological and economic forest growth, as well as changing environmental conditions due to the climatic change (expected dryer summers and wetter winters), amelioration methods are appropriate i.e. increase of water availability, water storage capacity and soil physical properties. Therefore, deep loosening measures were applied in 1993 and 1994 on prospective afforestation sites in the German low mountain range (Eifel and Hunsrück). The plots have been subdivided and arranged by different loosening machines. 14 years after the experimental setup (2008) the areas became reinvestigated concerning the prevailing soil properties including different aspects of the water balance and the resulting plant development. The current deliverables thereby indicate that an afforestation on so called marginal earning sites develop much better through a previous soil physical improvement as on neighbouring plots without a treatment. Bulk densities have been decreased sustainably and water absorption as well as water storage capacity were increased effectively. Hence, positive effects regarding the landscape, the ecology and the economy can be reached by a successful operated deep loosening of the soil and due to that the enhanced fouling of the trees. Additionally the results of the accomplished researches have shown, that against the background of the climate change an adaption to modified environmental conditions could be much more easier for the adolescent trees on plots with improved basic requirements.