



The impact of char accumulation in abandoned charcoal hearths on soil and leaf nutrients content in a forest plantation in Wallonia

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Abandoned charcoal hearths are the legacy of past char production, a very spread and long-lasting activity in the European forests in place until several decades ago. These sites present a large char accumulation in the topsoil and represent a unique opportunity to study in the field the long-term effect of (bio)char accumulation on pedogenesis, soil properties and plants growth. In this regard, there are very few studies analysing the long-term effect of biochar on forest trees in the temperate zone. Here we present first results of the effect of char on soil properties, vegetation growth and nutrients cycle in an 18 years old forest plantation planted on a field comprising three charcoal hearths at Regniessart, Southern Wallonia, Belgium. In particular, we analysed the soil and leaf nutrients content, as well as the growth performance, of two tree species, namely *Fagus sylvatica* L. and *Betula pendula* Roth, growth inside the charcoal hearths.

Our results show that char accumulation affected significantly the soil development and its properties. Besides a significant C and N accumulation, both as charred and not charred organic matter, the soil in charcoal hearths showed a higher CEC and a higher content of available cations such as K, Na, Ca, Mn and Zn, sometimes even in the subsoil, beneath the charcoal enriched layer. Char accumulated in soil apparently did not affected the height and diameter growth of both tree species. Nevertheless, interestingly the C and the Mn concentration of the beech leaves trees growing inside the hearths were higher compared to those growing in the native forest soil. Additional analyses on the single tree rings will reveal if a higher nutrient content in soil and a different elements stoichiometry in the leaves affected the growing performance of the trees in previous years.