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Progenic C, charcoal and biochar research – what can be learnt from each other?

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Pyrogenic C occurs in soils in many forms originating from multiple sources ranging from voluntary additions of charcoal during natural or prescribed fires to voluntary additions in form of biochar during agricultural operations. While fire-derived pyrogenic C may be added to soil in unknown amounts as a continuum ranging from partly burned wood to graphitic material depending on the fire conditions, biochar is added in known amounts and usually produced under controlled conditions. Research interest in pyrogenic C mainly derived from its potential importance as longterm carbon sink. Many efforts were devoted to answer the question about its form, functions and fate in the environment. The different pyrogenic C types were found to affect significantly the soils C and N cycles. Usually only the most stable recalcitrant part of pyrogenic C is able to survive microbial decay may have residence times of many centuries. A significant part of pyrogenic C can be affected by vertical as well as horizontal transport processes, which may alter its mean residence times. For pyrogenic research, biochar addition to soil as recent agricultural practice presents the unique opportunity to study quantitatively the fate of one well defined part of the continuum. In particular, progress about processes concerning shortterm environmental behaviour of pyrogenic C are to be expected. This presentation will synthesise the literature information on the fate of pyrogenic C in the environment and show new results about the longterm effect of pyrogenic C on soil microbial functioning and C sequestration potential.