Thermal Analysis of Stable Organic C in a Cultivation Chronosequence. (S03-plante105702-Poster)

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Abstract:

The stable pool of soil organic C, unaffected by land use management, is of interest in establishing baseline values for C sequestration and soil quality. Hydrogen peroxide resistant organic matter (OM) has been proposed to be interfoliar or chemically recalcitrant. We hypothesized that the peroxideresistant fraction may represent the pool of stable soil C. Soils from a cultivation chronosequence were selected to provide soils with a range of biologically stable organic C contents. The clay fraction of each soil was extracted using physical fractionation techniques and analysed using differential thermal analysis before and after H2O2 treatment. Peroxide treatment resulted in differing quantities of resistant OM, however the same proportion of organic C was oxidized in most soils (~85%). Differential scanning calorimetry (DSC) combined with thermogravimetry (TG) revealed two types of OM in the clay samples. OM of higher thermal stability was more resistant to peroxide treatment. The biological, chemical, and thermal stabilities of OM cannot be equated and therefore the concept of a stable pool must be qualified.

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