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Sediment Deposition in Riparian Ecosystems evaluated by different Methods

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Riparian forests play an important role in carbon cycling in agro-ecosystems. The riparian forests filter and trap carbon enriched sediments produced by erosion and prevent this reaching the waterways. Carbon dynamics may change significantly in riparian forests when compared to the neighboring agricultural sites. The presence a permanent and diverse soil cover (forest), a more diverse and functional soil microbial environment and a different soil water regime in the riparian zone are the environmental conditions related to a differentiated carbon dynamic. The first methodological step for carbon related studies in riparian forests is the precise and expeditious assessment of sediment retention rates and amounts, to differentiate them from the under laying native soil. This paper combines three methodological approaches (¹³⁷Cs, WEPP and soil morphology) to study the effect of a riparian forest in trapping sediment mobilized from upslope sugarcane fields in Brazil. A good correlation was found between the results provided by the three methodologies. All showed that most of the sediment deposition occurs in the first few meters of the riparian forest and decreases towards its interior. Estimates of soil loss provided by ¹³⁷Cs and WEPP were similar. The morphology of the sediment and the ¹³⁷Cs distribution in the profile suggests that deposition occurred during an extreme storm and probably a single erosion event.