



Sediment dynamics in restored riparian forest with agricultural surroundings

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The riparian forests are considered Permanent Preservation Areas due to the ecological services provided by these forests. One of these services is the interception of the sediments before they reach the water bodies, which is essential to preserve water quality. The maintenance and restoration of riparian forests are mandatory, and the extent of these areas is defined based on water body width, following the Brazilian Forest Code. The method used to define the size of riparian forest areas elucidates the lack of accurate scientific data of the influence of the riparian forest in maintaining their ecological functions, particularly regarding the retention of sediments. In this study, we investigate the dynamics of erosion and sedimentation in restored riparian forests of a Semideciduous Tropical Forest situated in agricultural areas inserted in sugarcane landscapes in the state of São Paulo, Brazil. We defined two sites with soils of contrasting texture to monitor the dynamics and amount of deposited sediments. Site A is in the municipality of Araras and the soil is mainly clay. Site B is in the municipality of São Manuel and is dominated by sandy soils. In both areas, we defined plots to install graded metal stakes that were partially buried to monitor the dynamics of sediments. In site A, we defined eight plots and installed 27 metal stakes in each one. Three of the plots presented 30 m of riparian forest, two presented 15 m of riparian forest and three, 15 m of pasture followed by 15 m of forest. The design of the metal stakes was similar for all plots and was defined based on the type of erosion observed in site A. In site B, we defined seven points to monitor the sediments inside the reforested areas. Here, we observed erosive processes of great magnitude inside the forests, which results in a different design for the metal stakes. A total of nearly 150 metal stakes were installed to monitor these processes and also to verify the deposition in areas not yet affected by erosive processes of great magnitude. The monitoring of the metal stakes started in January of 2016. The data of intensity and frequency of rainfall were collected from rain gauges installed in the areas. The results show great deposition in site B, dominated by sandy soil whereas in site A, a sheet erosion process is dominant. Site A is dominated by clay soils that are not susceptible to erosion processes. In site B, a small amount of deposition was observed inside a gully, which means that the sediments may be being carried to the water bodies. A large amount of sediment was observed in areas which present a spontaneous vegetation followed by a small track of forest. Strong events were responsible for generating most of the sediments. The results will be important to support the discussion about an ideal width of riparian vegetation to ensure the retention of sediments and quality of water bodies.