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Interill erosion of organic matter and phosphate from conventionally and organically farmed Devon Silt soils

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Interill erosion is a complex phenomenon involving the detachment of soil particles by raindrop impact. Resistance to interrill erosion varies between soils, in addition to significant changes in soil conditions during storms as a result of changes in roughness and surface conditions. The enrichment of soil organic matter (SOM) and phosphate (P) in interill sediment is well documented, however, the role interill erosional processes have on the enrichment remain unclear. In this study , the organic matter (OM) and P content of sediment generated from two Devon loam silts that were from different management systems, conventional and organic was tested. Artificial rainfall was applied to the soils using a high and a low rainfall intensity to determine the effects of rainfall kinetic energy on the OM and P enrichment in interill sediment. The results show interill erodibility was lower from organic soils, irrespective of rainfall intensity. Sediment from both soils showed a significant enrichment in OM and P. However, sediment from organic soils, showed a greater degree of OM and P enrichment, despite lower soil P and interill erodibility. Consequently, results show slight erosion may be more detrimental than severe erosion. As a result, this study has shown the enrichment of OM, and P in interill sediment is neither directly related to SOM, and P content of the soil, nor soil interill erodibility, but is dominated by interill erosion processes which, are thought to be selective. Due to complex interactions between SOM, P and interill erosional processes, the nutrient status of sediments should not be predicted on the soils OM, and P content or interill erodibility. The results show a better understanding of interill erosion, in particular, on its role in the selective removal of OM, and P in addition to how variations in rainfall kinetic energy effect the enrichment process is required for effectively predicting OM and P loss based on erodibility.