Soil organic carbon, nitrogen and phosphorus losses in eroded sediments from run-off plots on a clay soil in Kenya

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Abstract

Poor crop growth in many parts of Kenya may be due to unfavorable soil chemical characteristics brought about by unchecked accelerated soil erosion. However information on the effects of erosion on soil fertility is lacking. Therefore the objective of this study was to assess the effect of erosion on C, N and P in a sub-humid area of Kenya. The research was conducted from 1991-1993 on a clay soil using l6 run-of plots, measuring 3 x I0m, with an average slope of 3l% These plots had experienced different levels of erosion for four seasons and soil loss ranged from 16.7-247.3 t. ha Although no significant correlations were observed between enrichment ratios (ER) and soil loss, ER was more than one for C, N and P and the eroded sediments, especially from fertilized plots, were particularly enriched with P.The soil washed from the plots was 9-32% richer in organic carbon, 6-19% in total nitrogen and 247-936% richer in P than the soil from which it originated. It was concluded that loss of organic C, N and P through erosion can significantly reduce the fertility of sloping agricultural land in Kenya.