

Maize yield reduction due to erosion in a high potential area of Central Kenya highlands

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Abstract

The effect of cumulative soil loss on maize (*Zea mays* L.) growth and yield were investigated on a humic nitisol in Kenya during the 1993 long-rains (LR) and short-rains (SR). The runoff plots had been subjected to different levels of erosion from 1991 to 1992. The maize grain and above-ground dry matter (AGDMY) yields, crop height, and leaf area index (LAI) were measured in fertilised and non fertilised plots. Crop growth parameters were always greater in the least eroded plots. In the fertilised plots in the 1993 LR, maize grain yield in the most eroded plot was 83% less than in the least plots. On average, there was a crop height and LAI difference of about 143 cm and 3.18 between plants grown in the least and most eroded plots. In the non-fertilised crops, there was a crop height and AGDMY reduction of 52% and 90%, respectively, due to the loss of the first 2.5 cm of topsoil in the least eroded plots. No grain yields were obtained from plots where fertiliser was not applied in either season. The differences in crop growth due to erosion were larger in the non-fertilised compared to fertilised crops indicating that fertilizer application masked the effect of erosion on crop growth. During the 1993 SR, the effects of erosion on crop response were similar to 1993 LR. Maize grain and AGDMY were highly and negatively correlated with cumulative soil loss, while LAI and crop height also decreased significantly with cumulative soil loss for both fertilised and nonfertilised crops during both seasons. Key Words: Runoff, soil erosion, yield, *Zea mays*.