Field studies on the slope length effect of grass cover and rainfall intensity on erosion on typical watersheds of the Loess Plateau, China

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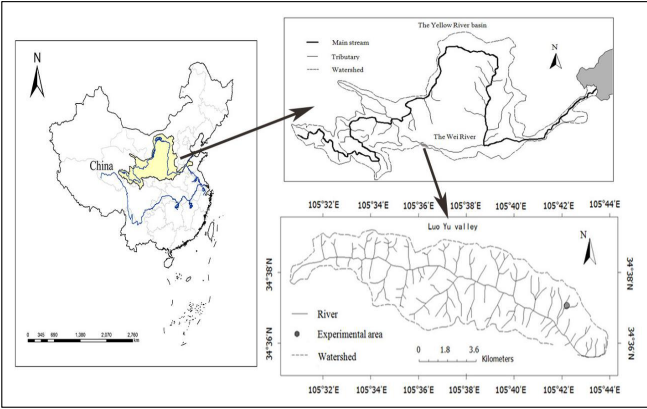[3]Nanjing Forestry University

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Abstract

Slope length is an important topographic factor for controlling soil erosion and pivotal parameters in the soil erosion model. The impact of slope length on soil erosion was studied under different grassland and different rainfall intensity through simulated rainfall experiments. The experiment included five rainfall intensity treatments (1, 1.5, 2, 2.5 and 3 mm h-1), four grass cover treatments (0, 30%, 60% and 90%) and five slope length treatments (2, 4, 6, 8 and 10 m). The results show that the rate of soil loss increased exponentially with increasing slope length under 0 and 30% grass cover. Under high grass covers (60% and 90%), the slope length increased sedimentation from runoff and reduced slope erosion.The increase of slope length led to enhancement of soil loss as rainfall intensity increased. At 1 mm min-1 rainfall intensity, natural grass slopes (60%) controlled soil loss very well and were not affected by slope length. At 1.5–2 mm min-1rainfall intensity, the soil erosion increased with slope length, but the overall soil erosion amount was small. This indicates that grass cover at 10 m slope length had a good impact on soil erosion. When the rainfall intensity exceeded 2 mm min-1, soil loss increased with slope length. Regression analysis showed that soil erosion was more strongly related to grass cover and rainfall intensity than to slope length.

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2 **Figure 1** Location of the study area