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Characteristics of Soil nutrient loss under different rainfall pattern in slope plots

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Rainfall intensity and duration directly affect the process of soil nutrient loss. In this paper, long-term, low-intensity rainfall (LL) (58.4mm rainfall, 605min duration) and short-term, high-intensity rainfall (SH) (59.2mm rainfall, 287min duration) were selected to study the pathway for soil nitrogen and phosphorus loss and load differentiation under different rainfall modes by using a slope experiment plot. The results indicated that: (1) The difference between the runoff duration of LL (3410min) and that of SH (410min) was obvious, and the runoff rate was 14.44% and 28.55%, respectively; (2) There were different nutrient concentration distributions. On one hand, the concentration of TN in the surface flow was lower than that in the interflow. The average TN concentration in the surface flow of LL and SH was 13.7 and 16.94 mg·L⁻¹, respectively. The average TN concentration in the interflow of LL and SH was 59.25 and 50.89 mg·L⁻¹, respectively. On the other hand, the concentration of TP in the surface flow was higher than that in the interflow. The concentration of TP ranged from 0.42 to 1.44 mg·L⁻¹ in the surface flow, and from 0.21 to 0.91 mg·L⁻¹ in the interflow; (3) The interflow is the main pathway of nitrogen loss, while the surface flow is the main pathway of phosphorus loss. The respective TN load of LL and SH runoff was 4.04 and 8.49 kg·hm⁻², of which the contribution rate of the interflow was 88.49% and 85.54%, respectively. Additionally, the respective TP load of LL and SH runoff was 0.11 and 0.33 kg·hm⁻², of which the contribution rate of the surface flow was 65.79% and 70.67%, respectively; (4) The amount of rainfall was almost the same but its intensity was different. High intensity rainfall would cause greater soil nutrient loss. The amount of total nitrogen and phosphorus loss in a sloppy land due to SH rainfall was 2-3 times higher than that due to LL rainfall.