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## Developments of Rill Networks: An Experimental Plot Scale Study

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### ABSTRACT

Enumerating the relative proportions of soil losses due to rill erosion processes during monsoon and post-monsoon season is a significant factor in predicting total soil losses and sediment transport and deposition. Present study evaluated the rill network with simulated experiment of treatments on varying slope and rainfall intensity to find out the rill erosion processes and sediment discharge in relation to slope and rainfall intensity. Results showed a significant relationship between the rainfall intensity and sediment yield ( $r = 0.75$ ). Our results illustrated that due to increase in rainfall intensity represent the development of efficient rill network while, no rill was found with a slope of  $20^\circ$  and a rainfall intensity of  $60 \text{ mm} \cdot \text{h}^{-1}$ . The highest rill length was observed in plot E with  $20^\circ$  slope and  $120 \text{ mm} \cdot \text{h}^{-1}$  rainfall intensity at 360 minutes. Positive and strong correlation ( $R^2 = 0.734$ ,  $P < 0.001$ ) was observed between the cumulative rainfall intensity and sediment discharge. A longitudinal profile was delineated and showed that the depth and numbers of depressions amplified with time and were more prominent for escalating rainfall intensity for its steeper slopes. Information derived from the study could be applied to estimate longer-term erosion stirring over larger areas possessing parallel landforms.

### KEYWORDS

Rill Network; Slope Gradient; Rainfall Simulation; Sediment Yield

### Cite this paper

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