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Effects of rainfall intensity and soil surface heterogeneity on steady infiltration rate

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Field tests were carried out using rainfall simulation on semi-arid soil of Upper Volta and Niger to study the effect of rainfall intensity on steady infiltration rate. Experimental results support a physically-based model pointing out the prevailing influence of soil surface characters: for an homogeneous surface as a crust, the steady infiltration rate is not related to rainstorm intensity but principally to initial conditions. By way of compensation, for an heterogeneous surface as a cultivated field, the infiltration capacity is an ascending function of rainfall intensity. Moreover such results have been observed on arid soils (Northern Niger) and ferrallitic soils (Ivory Coast) and suggest consequently a general applicability of this model.

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Rainfall erosion indexes estimated from daily precipitation amount

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The erosivity index, EI, is highly correlated with the precipitation, P, amount. The relationship between P and EI also contains a random component because of the variation in rainfall intensity that can occur within an event of a given precipitation amount. The analysis of hundreds of rain gauge charts allowed us to present in this study a first approximation of the seasonal and spatial distribution of the annual mean EI within the dry tropical forest zone of Venezuela. Two equations were determined for predicting EI values from observed precipitation data. One equation uses the EI "tempered" and the other uses the EI "tropical". The first one gave better calculated values when compared to the observed EI indices.

The results presented in the study also showed that there exists a significant difference in erosivity indices for a given precipitation amount between tempered and tropical regions. In our conditions we found EI values twice as big as the ones reported by works done in mid latitude areas.

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