

SOIL LOSS, INFILTRATION AND RUNNOF RATES IN SOIL UNDER DESERTIFICATION IN THE BRAZILIAN SEMI-ARID REGION: INFLUENCE OF VEGETATION COVER AND RAINFALL INTENSITY

Edivan Rodrigues de Souza¹, Cintia Maria Teixeira Lins¹, Thaís Emanuelle Monteiro dos Santos Souza², Martha Katharinne Silva Souza Paulino¹, Danilo Rodrigues Monteiro¹, Valdomiro Souza Júnior¹, Pablo Rugero Magalhães Dourado¹, Francisco Ernesto de Andrade Rego Junior¹, Yuri Jacques Agra da Silva³, and Bruce Schaffer⁴

¹Universidade Federal Rural de Pernambuco

²Universidade Federal de Pernambuco

³Universidade Federal do Piauí Centro de Tecnologia

⁴University of Florida Tropical Research and Education Center

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Abstract

Desertification is a problem in regions with arid, semi-arid and dry sub-humid climates and is characterized by the degradation of natural resources. The influence of vegetation cover and rainfall intensity on the dynamics of water infiltration, surface runoff and soil loss was measured *in situ* in a Desertification Zone in the semi-arid region of Brazil. Twenty-four plots were evaluated in two areas, each with the same type of soil that is predominant in the region: 1) Luvisol with dense vegetation cover (LD) and 2) Luvisol with sparse vegetation cover (LS). Rainfall of 60 and 100 mm h⁻¹ was simulated with a rainfall simulator. Soil hydraulic conductivity, soil water retention curves and soil carbon and nitrogen stocks were also determined. Water infiltration was greater in the LD (53 mm h⁻¹) compared to the LS (15 mm h⁻¹), while the runoff rates were 27 mm h⁻¹ for the LD and 61 mm h⁻¹ for the LS. Rainfall intensity significantly influenced when runoff started and the runoff rate, accelerating soil loss. Vegetation cover significantly influenced the total soil carbon and nitrogen stocks, as well as the saturated hydraulic conductivity of the soil. This is the first study in the semi-arid desertification region of Brazil that used simulated rainfall to assess the effects rain intensity on soil properties. The results of this study can be used as a reference for calibrating erosion models in areas undergoing a desertification process

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