



Effect of biological soil crusts of the Sahel (Niger) on wind erosion

J. L. Rajot (1,2), R. Paris (2), O. Malam Issa (3,4), A. Maman (3), A. Abdourhamane Touré (5), C. Valentin (1), and B. Marticorena (2)

(1) BIOEMCO UMR IRD 211, Paris, FRANCE, (2) LISA UMR CNRS 7583 Universités Paris Est Créteil et Paris Diderot, Créteil, France, (3) BIOEMCO UMR IRD 211, Niamey, NIGER, (4) Université de Reims Champagne Ardenne, GEGENAA EA 3795, (5) Université Abdou Moumouni, Département des Sciences de la Terre, Niamey, Niger

Biological Soil crusts (BSC) are widespread in semi arid areas like the Sahel where they are colonizing sandy soils prone to water and wind erosions. This study aimed at understanding the effect of BSC on wind erosion. It was performed at the ICRISAT Sahelian Center of Sadore (Niger) in an old fallow. The annual rainfall depth is around 560 mm. The experimental set up comprised five circular plots (diameter 10 m) with BSC cover varying from 5 % to 40 %. Vegetation and litter inside the experimental plots were removed without breaking the crusts during the whole experiment duration (1.5 year), while shrubs and annual grass were maintained around the plots to minimize wind erosion. Both horizontal flux of wind-blown sediment and wind erosion threshold were measured with BSNE sand catchers and Sensit recording saltating particles impacts. Meteorological parameters such as wind velocity and direction and rainfall were also monitored. The measured flux followed the classical cycle of wind erosion in the Sahel with a maximum occurring by the beginning of the rainy season from May to July. Wind erosion thresholds did not show important variation during the whole year. Moreover they are almost the same (about 13 m/s) whatever the plot, i.e. whatever the BSC cover percentage. This value is higher than that measured on cultivated field. This suggest that the threshold is likely linked to the presence of loose sand particles at the crust surface and do not represent the real threshold of BSC. In the same way, there is still not a clear relationship between the flux intensity and the BSC cover. This seems to indicate that the physical crusts colonized by BSC play also a role in the soil erodibility to wind erosion as it was clearly demonstrated in the case of water erosion.