



## **Laboratory results of a portable wind and rainfall simulator**

**W. Fister, J.B. Ries, R.-G. Schmidt**

Trier University, Department of Physical Geography, Trier, Germany (e-mail: w.fister@gmx.de / phone: +49/(0)651-201-4512 / fax: +49/(0)651-201-2998)

Soil degradation and desertification is often caused by wind and water erosion. For many years researchers have been studying both processes separately. Recent field researches, especially in semi-arid environments, showed very complex interactions between wind and water erosion rates. In these studies it was emphasized, that in future it is necessary to measure both processes together to better quantify and predict soil degradation.

The main objective of this study is to simultaneously investigate both processes with a single device operational in the field. Therefore a small portable wind and rainfall simulator (3 m long, 0.7 m height and 0.7 m wide) was constructed. Included are three full cone pressure nozzles positioned at about 50 cm, 150 cm and 250 cm in flow direction of the tunnel. Measurements yield rainfall intensities around 30-100 mm/h. Laboratory calibration tests show that the rotating whirl of the air stream has been reduced significantly by the honeycomb. Wind pressure/speed measurements with a pitot tube anemometer indicate that wind speed increases with height until about 15 cm. Wind direction tests with the tuft method show that the wind velocity near surface is quite homogenous at all three cross sections. Additional, comparative tests with a portable wind tunnel from Kiel University (Germany) were made for better analysis.

With the ability to measure both processes simultaneously in the field, we are sure to obtain valuable quantitative information regarding the relative impact of wind and water erosion in the Mediterranean region, especially taking into account different soil

surfaces treatments.