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A small, portable wind tunnel and first results of field experiments in the central Ebro-Basin/Spain

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In the semi-arid region of the central Ebro-Basin (Zaragoza, Spain) desertification caused by wind and water erosion is a major problem. The almost permanently blowing wind and the mostly torrential precipitation cause severe ecological and economical damages. The dominating water erosion has been researched and quantified in a sufficient quality. In contrast the importance of wind erosion damage is almost unknown.

The main objective of this study at Mariá de Huerva (Zaragoza, Spain) therefore was, to determine which process is the **dominating factor** that causes degradation under different land use management.

For conducting about 60 wind erosion test runs a **small, portable wind tunnel** was developed. As wind source serves a fan with 5.5 hp and 163 cm^3. The turbulent rotating air stream is led through a 2 m transition section made of heavy PVC-foil. The frame of the honeycombed air straighter has the size 70 x 70 x 15 cm (H x W x L). The channel itself is 3 m long, made of three separate sections of Aluminium and Perspex sheets. The open floor results in a 2 m^2 test area.

Even if this fairly simple device is not able to simulate all of the aerodynamic parameters which are necessary to represent exactly the natural wind conditions, the **mobility** together with the capability to produce **verifiable data** recommend its utilisation. The comparison of the test results from 1997 and 2004 confirms our approach.

Recent publications have pointed out that especially in semi-arid regions wind and water erosion can occur almost simultaneously both in space and in time. For that reason, in further research we try to implement a **portable rain simulator** into the

wind tunnel. This measurement setup will increase the amount of quantitative data about the relative importance of wind and water erosion in rural semi-arid regions with changing management systems.