



## **A modified hood infiltrometer to estimate the soil hydraulic properties from transient water flow measurements**

David Moret-Fernández (1), Borja Latorre (), Carolina Peña (), and Cesar González-Cebollada ()

(1) Estación Experimental de Aula Dei (CSIC), Zaragoza, Spain (david@eead.csic.es), (2) Estación Experimental de Aula Dei (CSIC), Zaragoza, Spain (borja.latorre@eead.csic.es), (3) Estación Experimental de Aula Dei (CSIC), Zaragoza, Spain (carolina.pena@eead.csic.es), (4) Área de Mecánica de Fluidos, Escuela Politécnica Superior de Huesca, Universidad de Zaragoza (cesargon@unizar.es)

In-situ measurements of soil hydraulic properties on cover soil surfaces are of paramount importance in many agronomic or hydrological researches. The hydraulic properties can be estimated from the cumulative infiltration curve measured with tension infiltrometers. Transient water flow analysis, which means shorter experiments, facilitates its use for in situ field application. This paper presents a portable and modified design of the hood infiltrometer, the hat infiltrometer (HI), which applied on covered soil surfaces, allows estimating the soil hydraulic properties from the measured transient cumulative infiltration curve. The HI consists of a water-supply reservoir jointed to a hat base placed on the soil surface. The base of the hat is closed by a sticks plus plasticine ring system. The HI was tested on two different soils at saturated conditions, and the estimated sorptivity (S) and hydraulic conductivity (K) were compared to the corresponding values obtained with a disc infiltrometer (DI). An additional field experiment was performed to compare the hydraulic properties measured with HI on a bare and a plant-covered soil. Results demonstrated that this design allows hermetically closing the base of the hat without soils surface disturbing. No significant differences between the K and S values estimated with DI and the HI were observed. The S values measured with HI on the covers soil were significantly higher than that measured on the adjacent bare soil. These results indicate that HI can be a viable alternative to estimate the soil hydraulic properties of cover soil surfaces from the measured transient infiltration curve.