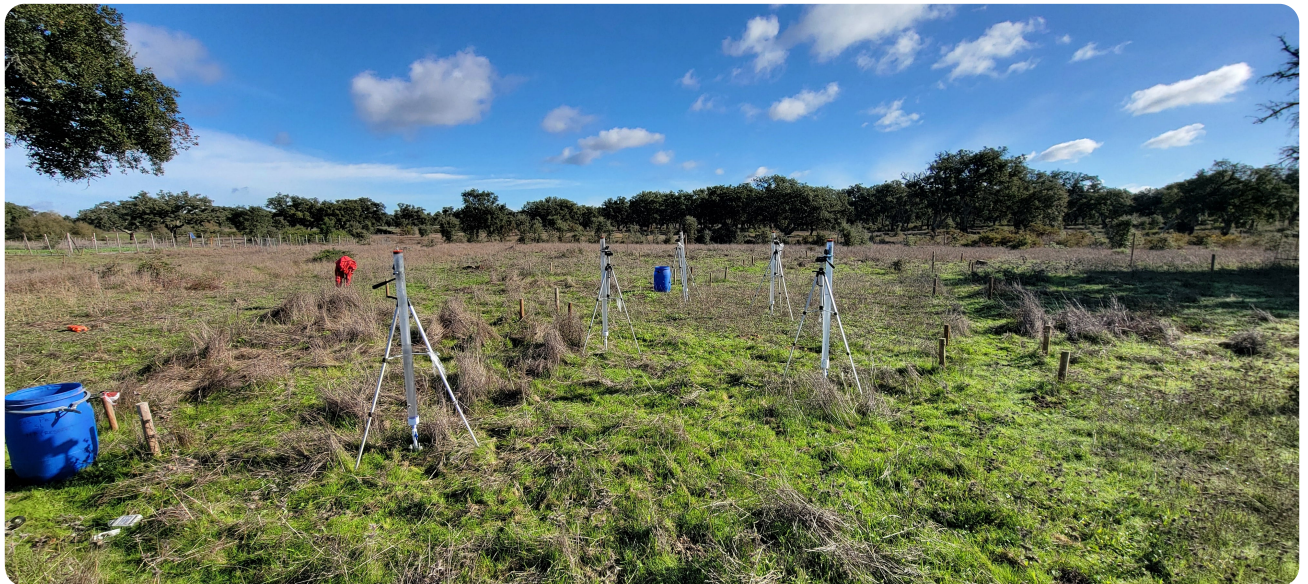




A cost-effective and adaptable instrument for soil infiltration measurements

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Infiltrimeters deployed at an experimental site at Companhia das Lezírias, Portugal. Photo by Pedro Leite.

Measuring soil infiltration rates is critical for applications in soil research, agriculture, water management, environmental conservation, and urban development. However, many existing devices are expensive, complex, or require advanced technical skills. To address this, researchers developed a simplified constant-head infiltrometer automated with a repurposed pressure datalogger.

The device is constructed from affordable, readily available materials and uses a water level datalogger to monitor gas pressure changes inside a PVC pipe reservoir. Field tests demonstrated a strong relationship between gas pressure and water level changes, validating the device's accuracy and reliability for measuring in different soil types and covers. Lightweight and easy to assemble without technical expertise, the design is also compatible with various ponding infiltration methods. Flexible data analysis is supported using Excel spreadsheets or R scripts. The adaptable design allows for modifications, such as varying reservoir sizes or alternative materials, to suit diverse application needs.

This cost-effective and user-friendly infiltrometer offers an accessible alternative to some more expensive and bulky commercial systems, enabling users to easily conduct multiple tests and capture the spatial and temporal variability of soil infiltration rates in the field.

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