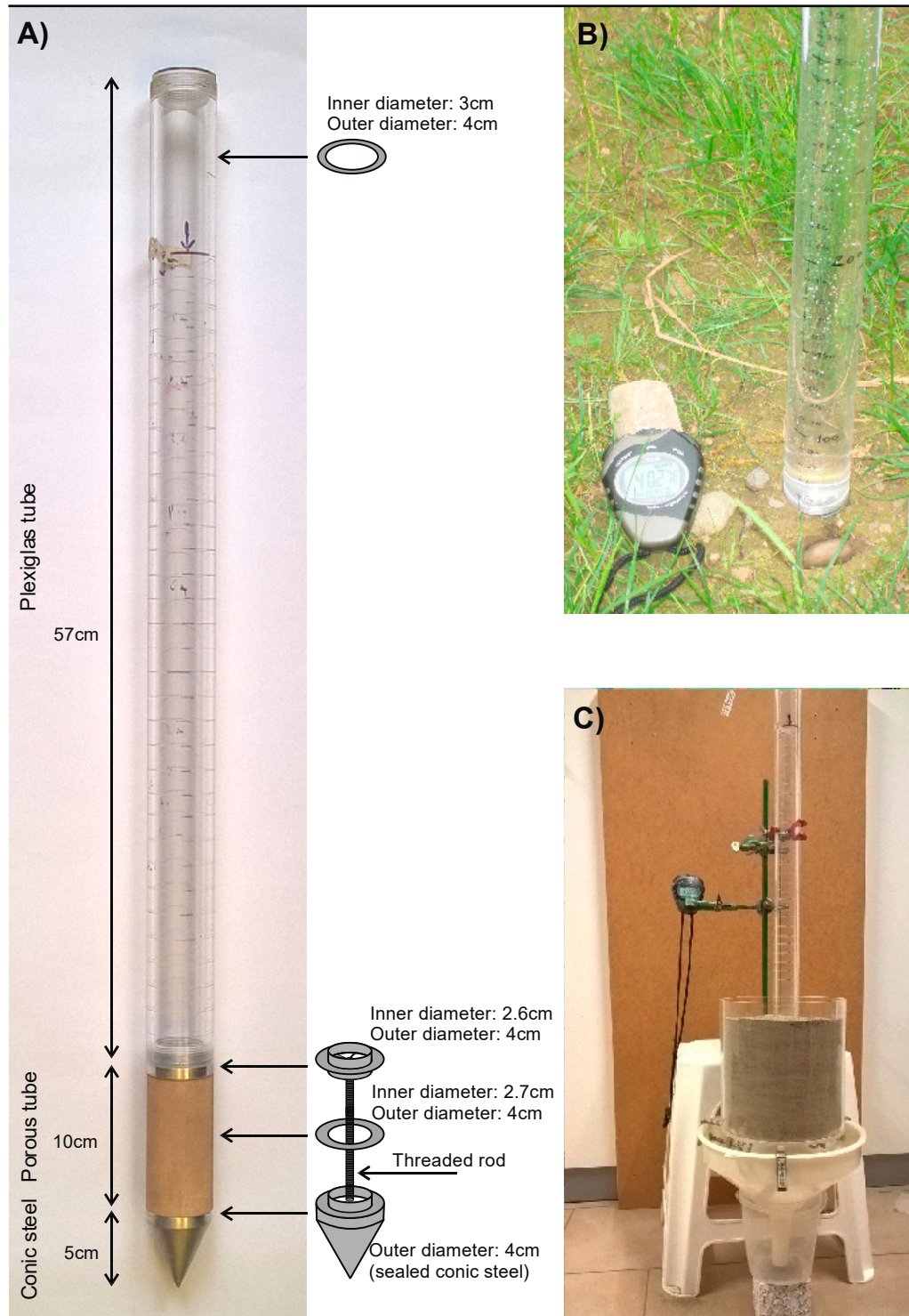
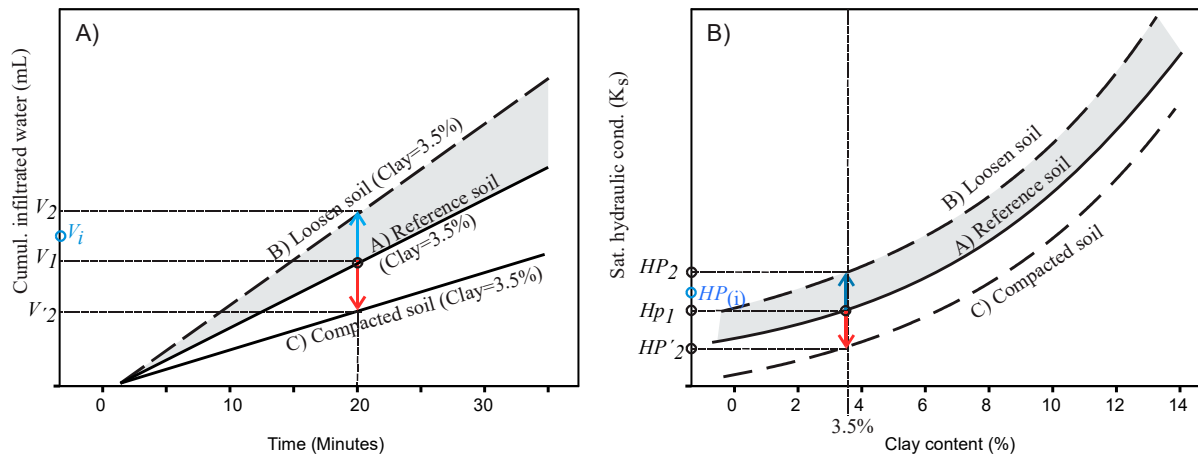


## Supplementary material S1



Experimental design; A) Infiltrometer device developed in this study; B) in situ infiltration experiments; and C) Laboratory experiments carried out on soil columns of 19 cm in diameter and 20 cm in height

## Supplementary Material S2



The method used for the calibration based on the relationships between cumulative infiltration and corresponding time obtained by means of our infiltrometer (A).  $V_1$ ,  $V_2$ , and  $V'_2$  are infiltrated water measured in reconstructed soil with exclusively mineral soil (reference soil), loosen soil, and compacted soil, respectively;  $HP_2$ ,  $HP_1$  and  $HP'_2$  are measured hydraulic properties of loosen, reference, and compacted soil, respectively (B);  $HP_{(i)}$  is unknown and can be derived from  $V_1$  using eq. 1 (see text for explanation)

## Supplementary Material S3

Statistics performed with S Plus Software (refer to Table 2)

Clay	KsatMoy	TetaSat	Ksat	Alpha	n	m	mL
0.1	0.0010178	36.55430175	0.00061305	0.013583349	2.489663	0.598339	61.97
2.8	0.000584	38.94883549	0.00109577	0.019604805	2.06972	0.516843	73.14
3.5	0.001268	39.59484267	0.00127383	0.021561401	1.983286	0.495786	82.33
7.5	0.0032624	43.49730031	0.00301146	0.03713295	1.619885	0.382672	93.41
10.6	0.01222	46.78435603	0.00586636	0.056587873	1.453417	0.311966	121.77
13.6	0.008152	50.20169918	0.01118456	0.085071724	1.362386	0.265993	153.88

\*\*\* Nonlinear Regression Model \*\*\*

Formula:  $KsatMoy \sim K * \exp(0.2151 * Clay)$

Parameters:

numeric matrix: 1 rows, 3 columns.

	Value	Std. Error	t value
K	0.00061324	0.000144724	4.23731

Residual standard error: 0.00316134 on 5 degrees of freedom

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\*\*\* Nonlinear Regression Model \*\*\*

Formula:  $TetaSat \sim K * \exp(0.024 * Clay)$

Parameters:

numeric matrix: 1 rows, 3 columns.

	Value	Std. Error	t value
K	36.3336	0.0384148	945.821

Residual standard error: 0.110999 on 5 degrees of freedom

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\*\*\* Nonlinear Regression Model \*\*\*

Formula: Alpha ~ K \* exp(0.14 \* Clay)

Parameters:

numeric matrix: 1 rows, 3 columns.

	Value	Std. Error	t value
K	0.0127891	0.0000763049	167.605

Residual standard error: 0.000676332 on 5 degrees of freedom

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\*\*\* Nonlinear Regression Model \*\*\*

Formula: n ~ K \* exp(-0.04 \* Clay)

Parameters:

numeric matrix: 1 rows, 3 columns.

	Value	Std. Error	t value
K	2.32998	0.0493405	47.2224

Residual standard error: 0.0969526 on 5 degrees of freedom

**Software Reference:** Axum 7 for Windows User's Guide, Insightful Corporation, Seattle, WA. United States.