

# POTENTIAL HAZARD DERIVED FROM WASTEWATER REUSE WITHIN THE RECLAMATION STRATEGY OF A TECHNOSOL



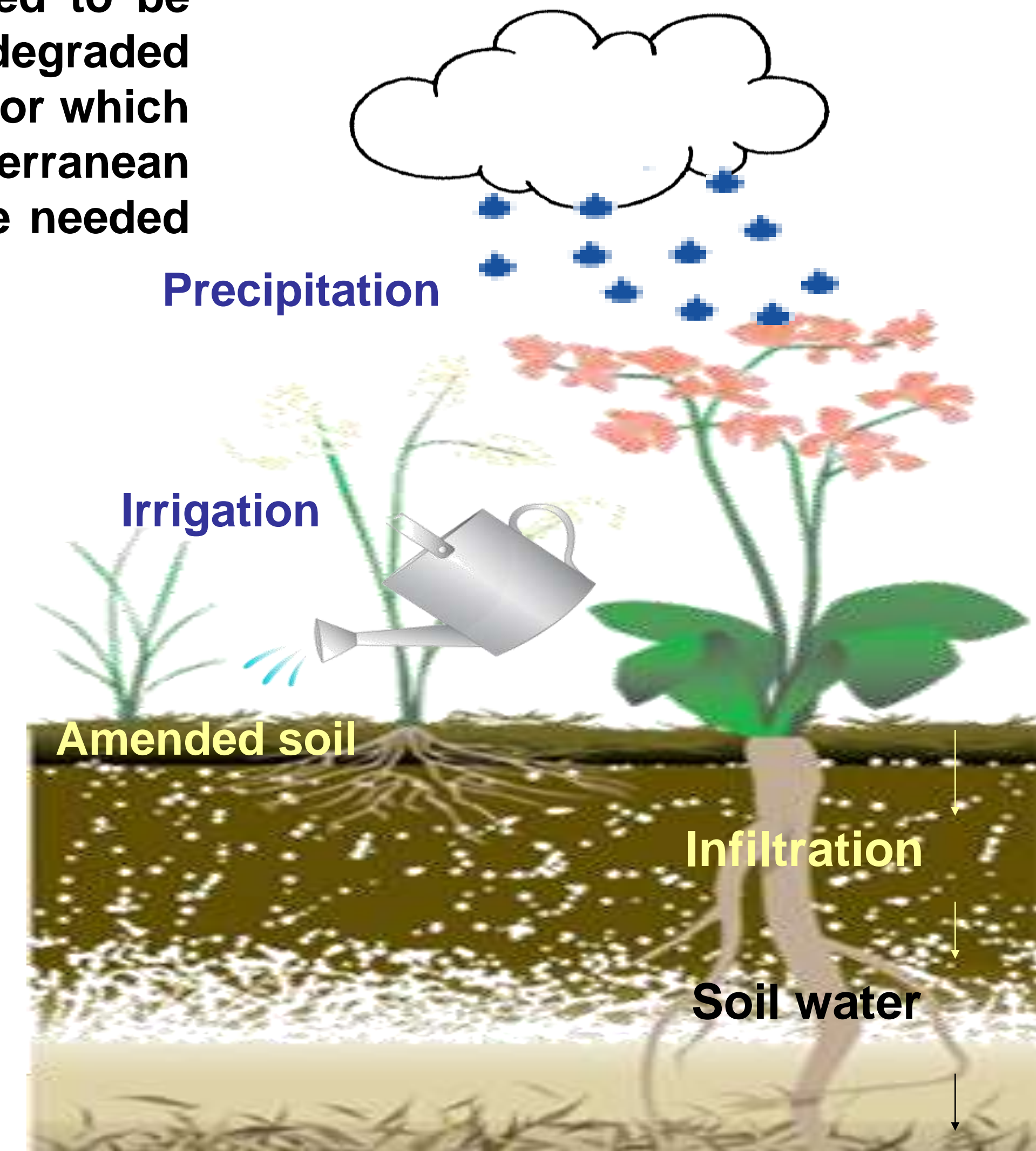
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The studied area is an iron mine tailing sited in Alquife (Granada) planned to be reclaimed for residential, leisure and agro-industrial activities. The soil is a degraded technosol with low water retention capacity, therefore it needs conditioners for which compost from wastes is added. The ecosystem is under a continental Mediterranean type of climate with summers extremely dry; consequently irrigation will be needed and quality of irrigation water was tested.

The aim of this work is to **Evaluate the capacity of a technosol to buffer waste components**

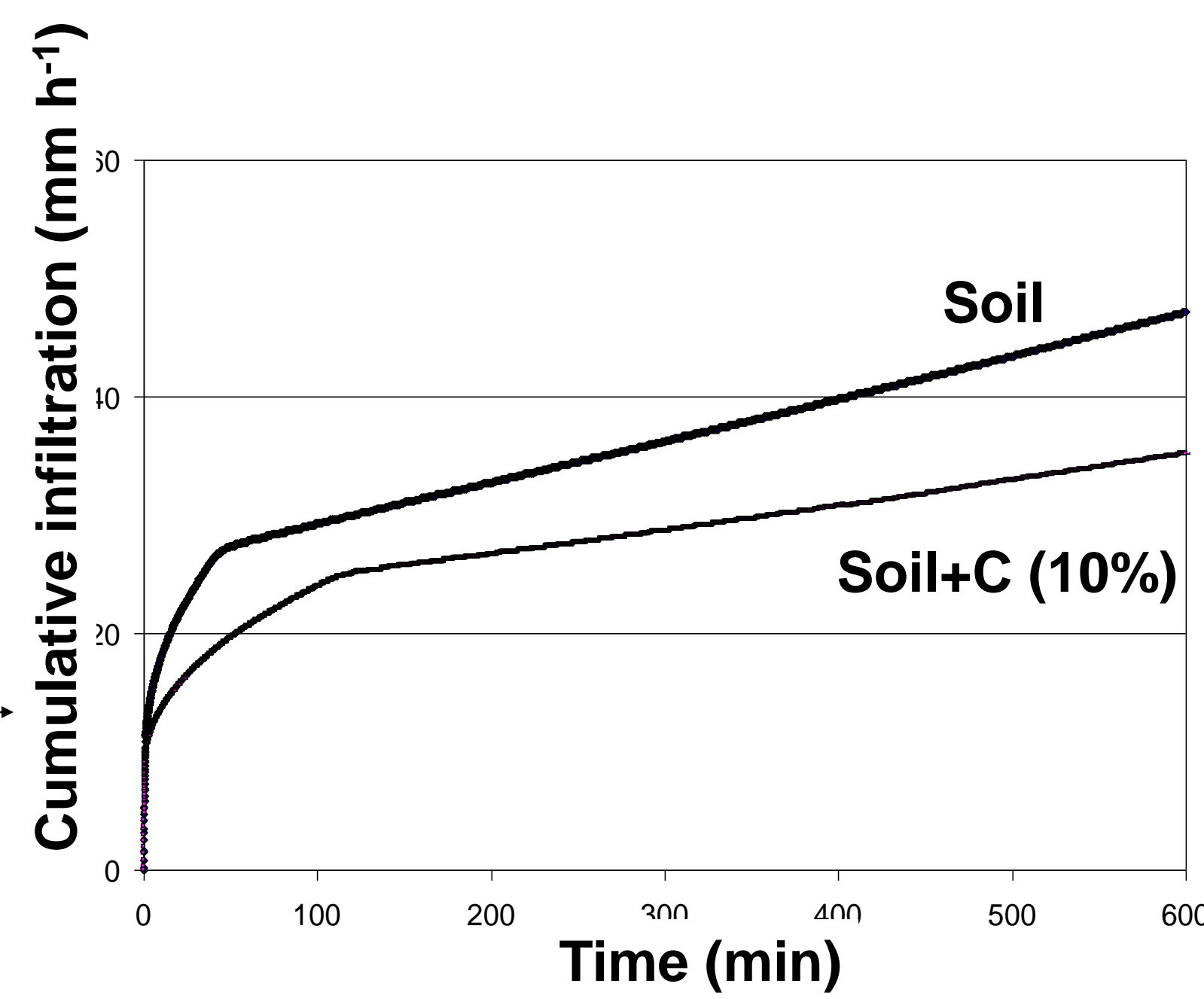
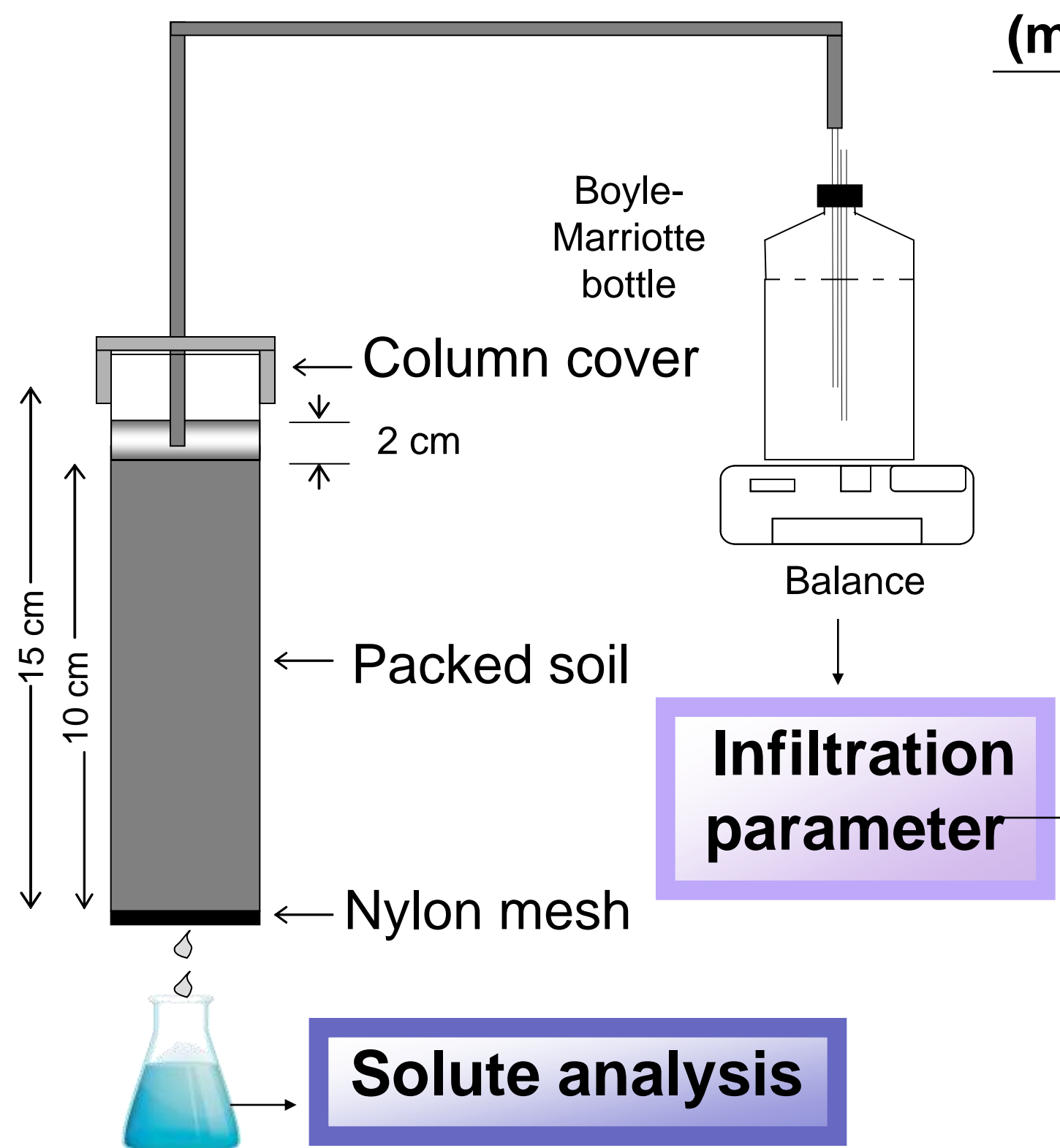


Substances harmful for the environment and dangerous for human health. **Percolation to groundwater**

**Compost (C):** mixture of sewage sludge at 0, 1, 5 and 10% (w/w)  
**Influents:** tap water (TW) and synthetic wastewater (WW)  
**Infiltration time:** 24h

	TW	WW	C	soil
pH	8.3	7.3	pH	6.9
EC (dS m <sup>-1</sup> )	0.3	2.2	EC (dS m <sup>-1</sup> )	1.6
OC (mg L <sup>-1</sup> )	9.0	560.0	OC (%)	19.4
NO <sub>3</sub> <sup>-</sup> (mg L <sup>-1</sup> )	1.5	350.0	N <sub>total</sub> (%)	2.3
PO <sub>4</sub> <sup>3-</sup> (mg L <sup>-1</sup> )	0	350	P <sub>Olsen</sub> (mg kg <sup>-1</sup> )	217
Surfactant (mg L <sup>-1</sup> )	-	100	FeOx (%)	-
				24

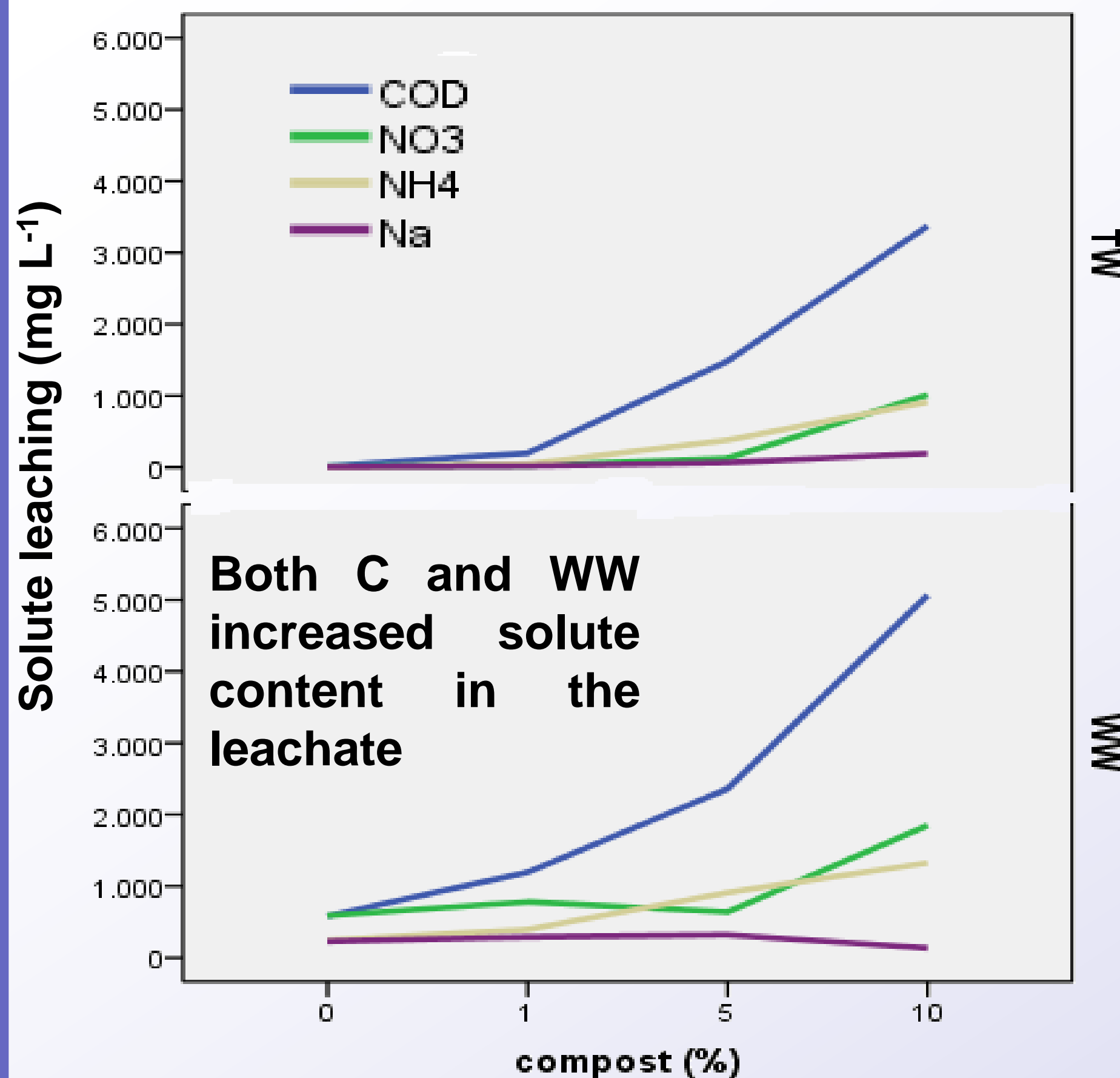
## Experimental setup



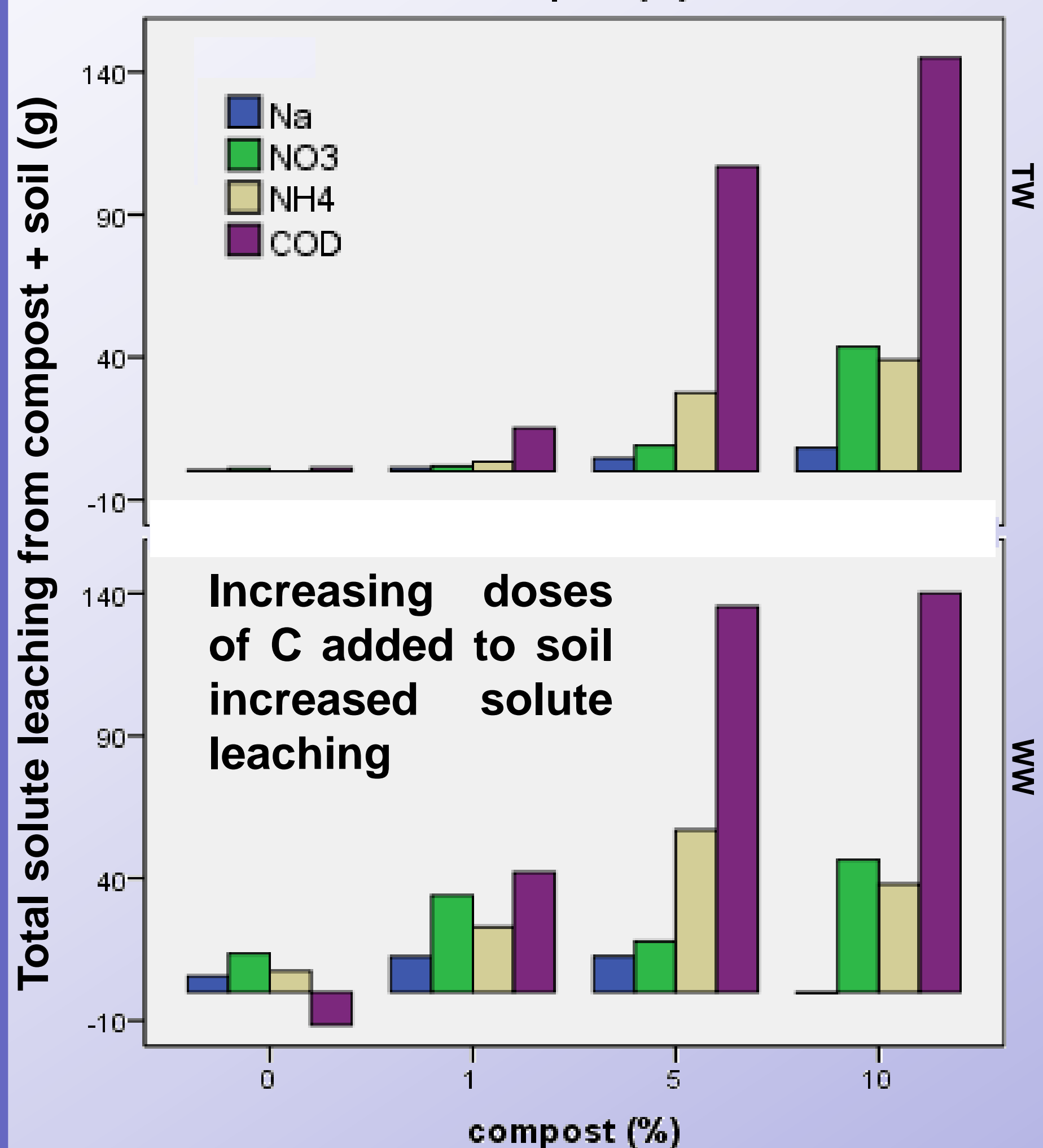
Hydraulic properties after infiltration experiments. Mean values and standard deviation (in brackets)

Compost %	TW			WW		
	K <sub>s</sub> (mm h <sup>-1</sup> )	S mm h <sup>-1/2</sup>	TI mL	K <sub>s</sub> mm h <sup>-1</sup>	S mm h <sup>-1/2</sup>	TI mL
0	6.28 (0.06)	45 (5)	80 (3)	5.67 (0.72)	45 (2)	70 (4)
1	5.54 (0.01)	41 (1)	76 (8)	7.05 (0.97)	33 (5)	86 (2)
5	6.00 (0.01)	35 (5)	72 (6)	5.95 (0.07)	31 (3)	74 (2)
10	3.53 (0.02)	28 (4)	43 (5)	3.17 (0.09)	20 (2)	32 (4)

Addition of C at 10% increases the water retention capacity of soil due to lower K<sub>s</sub> and S values



Rates higher than 1% compost produce percolation of a considerable quantity of nitrogen compounds and unstable organic matter into groundwater.



PO<sub>4</sub><sup>3-</sup> is not detected in the leachate. Therefore, PO<sub>4</sub><sup>3-</sup> presents in WW could be fixed mainly due to the high iron oxide (Feox) content of the soil.

PO<sub>4</sub><sup>3-</sup> adsorption on soils with different FeOx content

