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Supplement of

Key drivers of pyrogenic carbon redistribution during a simulated rainfall event

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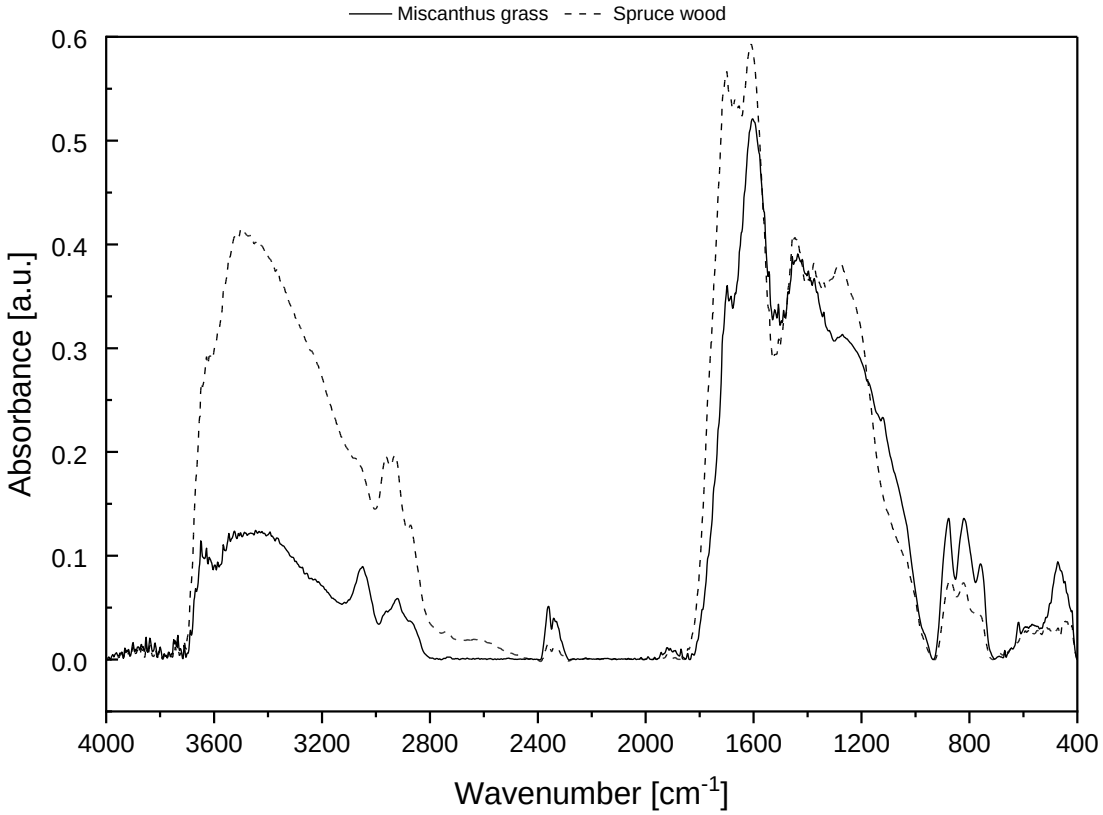

Figure S1: Mid-infrared absorption spectra for wood PyC (*Picea abies*) and grass PyC (*Miscanthus sinensis*) between 4000 to 400 cm^{-1} (64 scans on each sample with a resolution of 4 cm^{-1}) from Diffuse Reflectance Infrared Fourier Transform Spectroscopy (DRIFT) using a Bruker TENSOR 27 spectrophotometer (Fällanden, Switzerland).

Table S1: Key parameters of the rainfall simulator at the Swiss Federal Institute for Forest, Snow and Landscape Research (WSL), Birmensdorf.

Parameter	Unit
Pressure (main tube)	0.8 bar
Water flow (main tube)	6 l min^{-1} (max. possible = 30 l min^{-1})
Water temperature	16 °C
Water density	0.998946 g cm^{-3}
Rainfall intensity	102.8 mm h^{-1} (51.4 ± 1.4 mm)
Christiansen Uniformity Coefficient	84 %
Fall height of raindrops	7 to 8.5 m
Needles per square meter	250 (Ø = 0.05 mm)

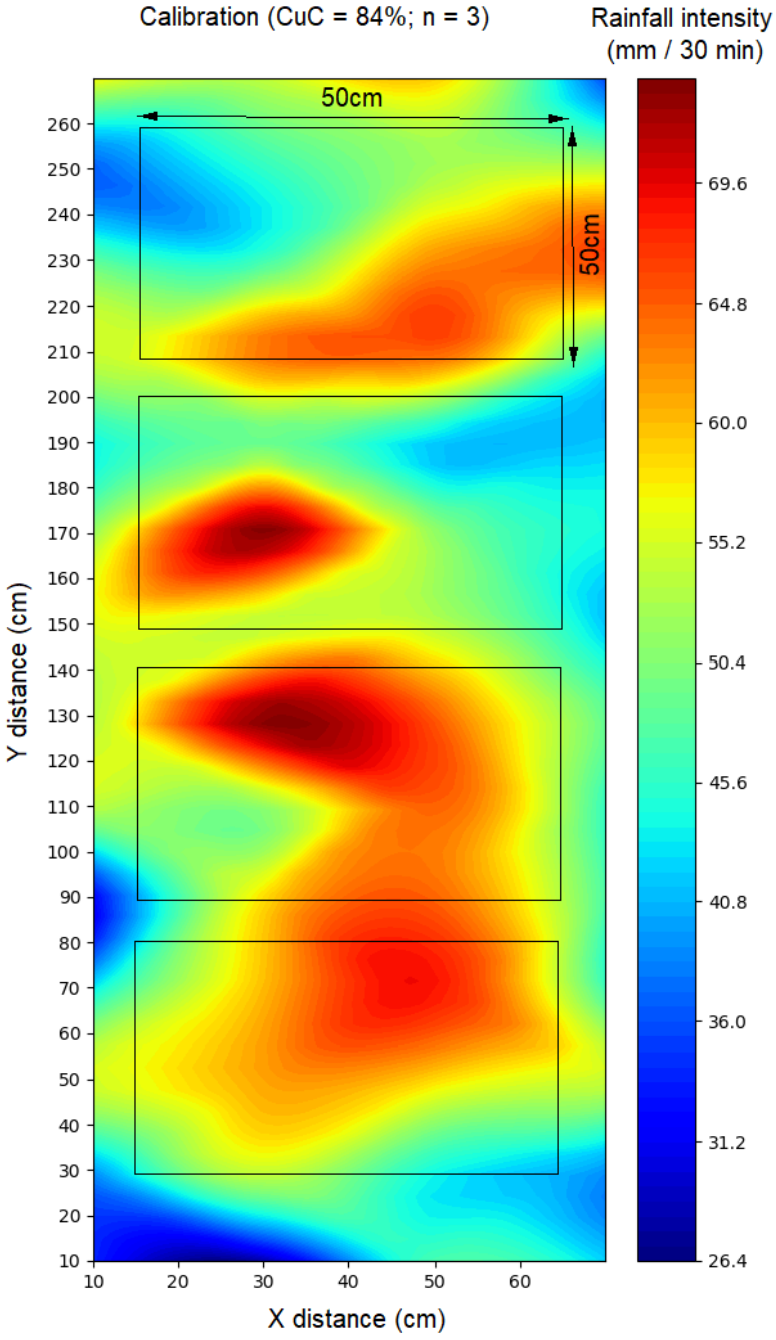

Figure S2: Heat map of averaged rainfall depth (mm) during three rainfall simulator calibration runs (30 minutes each). Christiansen uniformity coefficient (CuC) represented 84 % at a rainfall intensity of 102.8 mm h^{-1}. Rectangles represent the position where the four 0.25 m^2 plots were placed during the experiments.

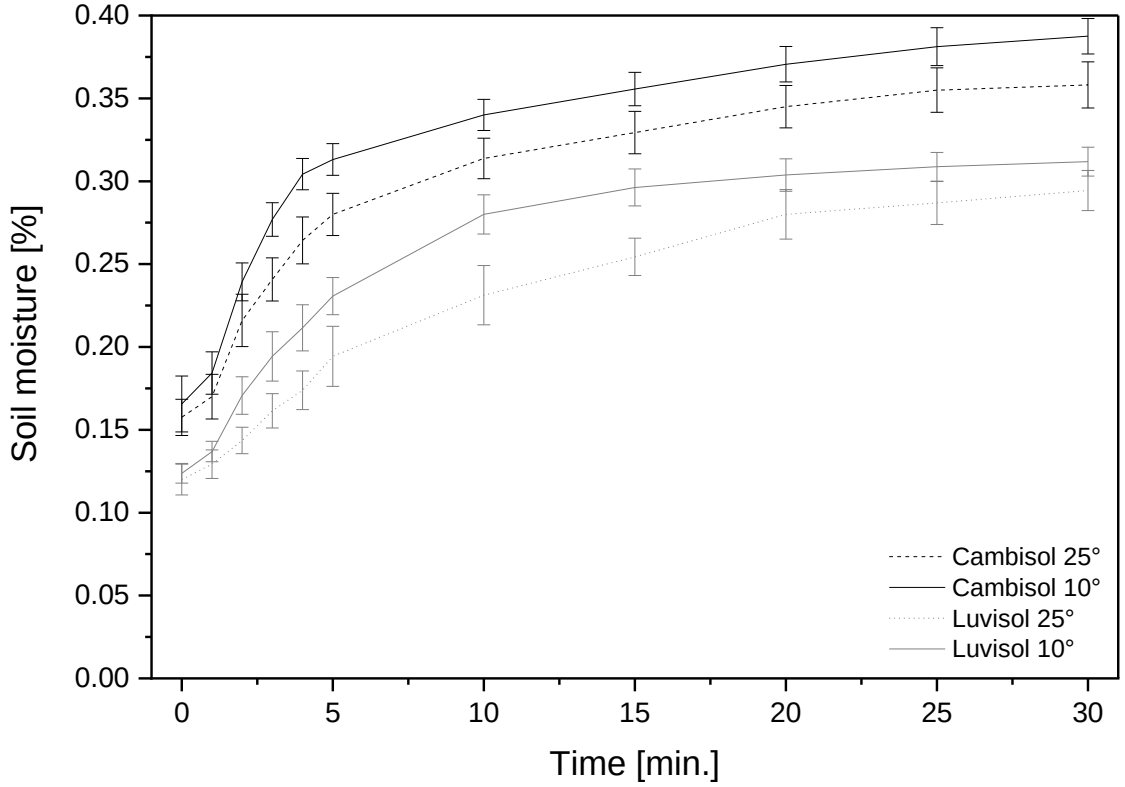

Figure S3: Evolution of soil moisture (%) during rainfall simulation experiments (51.4 mm for 30 minutes) for the Cambisol and Luvisol depending on slope angle (25° and 10°). Average values over all 0.25 m^2 plots per soil type and slope angle ± 1 standard error (n = 16).

Table S2: Results of the statistical model (two-way ANOVA) for the PyC fraction (= fraction of OC derived from the PyC in percent) in soil cores (see Figure 6) grouped by slope position (upslope, midslope and downslope and depth (0-1, 1-3 and 3-10 cm) with the full dataset (Full model), and subsets for the Cambisol and Luvisol only (ns = not significant at p < 0.05).

Driver	Full model		Cambisol		Luvisol	
	F value	Pr (>F)	F value	Pr (>F)	F value	Pr (>F)
Upslope / 0-1cm						
Soil type	13.4	0.0009				
Slope		ns		ns		ns
Feedstock	15.0	0.0005	10.3	0.005	5.6	0.03
Particle size	54.4	< 0.001	99.2	< 0.001		ns
Particle size : Soil type	28.6	< 0.001				
Upslope / 1-3cm						
Soil type	67.9	< 0.001				
Slope		ns		ns		ns
Feedstock	4.4	0.045		ns	4.7	0.046
Particle size		ns		ns		ns
Upslope / 3-10cm						
Soil type	8.4	0.007				
Slope		ns		ns		ns
Feedstock		ns		ns		ns
Particle size		ns		ns		ns
Midslope / 0-1cm						
Soil type		ns				
Slope		ns		ns		ns
Feedstock	11.2	0.002		ns	13.5	0.002
Particle size		ns		ns		ns

Table S2: continued

Driver	Full model		Cambisol		Luvisol	
	F value	Pr (>F)	F value	Pr (>F)	F value	Pr (>F)
Midslope / 1-3cm						
Soil type	11.2	0.002				
Slope		ns		ns		
Feedstock	7.2	0.01		ns	6.2	0.02
Particle size		ns	6.1	0.03	8.0	0.01
Soil type : Particle size	12.9	0.001				
Particle size : Feedstock					7.0	0.02
Midslope / 3-10cm						
Soil type		ns				
Slope		ns		ns		ns
Feedstock		ns		ns		ns
Particle size		ns		ns		ns
Downslope / 0-1cm						
Soil type	3.9	0.058				
Slope		ns		ns		ns
Feedstock		ns		ns		ns
Particle size		ns	4.2	0.059		ns
Downslope / 1-3cm						
Soil type		ns				
Slope		ns		ns		ns
Feedstock		ns	4.5	0.049		ns
Particle size		ns		ns		ns
Soil type : Feedstock	7.6	0.01				
Downslope / 3-10cm						
Soil type		ns				
Slope		ns		ns		ns

Feedstock	ns	ns	ns
Particle size	ns	ns	ns