

Supplementary Material 1 to The short-term effects of experimental forestry treatments on site conditions in an oak-hornbeam forest

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Supplementary Material 1 – Results of the soil profile analyses

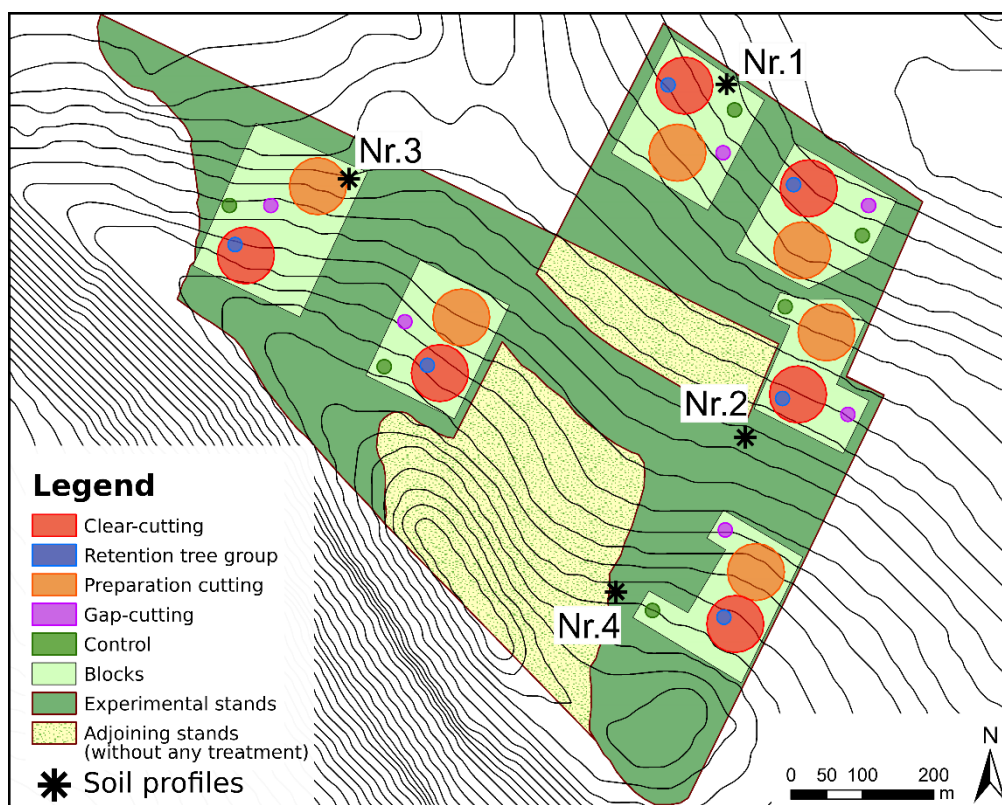


Figure S1.1. Four soil profiles were conducted across the experimental site for studying the soil conditions. All soil profiles were established and analyzed in 18-19 June 2014. The locations are marked with asterisks.

Here we present a short description of soil characterization in the localities shown in Figure A1.1. and a brief overview about the results of the four soil profiles. According to the (MSZ-08-0205:1978) standards the following variables are shown in the tables: # – the number of the layer distinguished by expert judgement; layer – upper and lower limit horizon (cm from mineral soil surface); Coarse fragments – volume of the coarse particles (%); pH – pH measured by using H₂O and KCl solutions, respectively; CaCO₃ – presence / content of carbonates within a given layer (%); y₁ – hydrolytic acidity; y₂ – exchangeable acidity; soil texture – the volumetric content of clay (<0.002 mm), silt (0.002-0.02 mm), fine sand (0.02-0.2 mm) and coarse sand (0.2-2 mm), separately (%); C – soil organic carbon content (%); N – total nitrogen content (%); P_{AL} – extractable phosphorus (mg/100 g soil); K_{AL} – extractable potassium (mg/100 g soil).

Soil pH was potentiometrically measured using supernatant suspension of 10 g air-dried and sieved (<2 mm) samples and 25 ml of distilled water (pH(H₂O)) and 25 ml of 1 mol/l KCL (pH(KCL)) solution,

respectively (MSZ-08-0205:1978). In the case of y_1 , 40 g air-dried soil sample was extracted with 100 ml 1 mol/l $\text{Ca}(\text{CH}_3\text{COO})_2$ solution; regarding y_2 , extractions were made using unbuffered 1 mol/l KCl solution. In both cases, measurements were performed by titration (Ballenegger and di Gléria 1962). Kúron's method was applied for gauging h_y of air-dry soils (Verstraeten & Livens, 1971): with 50% (v/v) H_2SO_4 solution and 35.2% RH according to (MSZ-08-0205:1978). Chemical compounds were evaluated on composite samples of the 1:1 mixture of the four, sieved (<0.5 mm) subsamples per plot. Total soil carbon and nitrogen content were determined by dry combustion method using Elementar vario MAX CNS-analyzer (Elementar Analysensysteme, Langenselbold, Germany) applying the ISO standards (ISO 10694:1995; ISO 13878:1998): soil samples were weighed up to 80-100 g, and a tungsten oxide catalyst was added. The applied combustion temperature was 1140°C. Plant available phosphorus and potassium were determined by ammonium lactate (AL) solution method (0.1 M NH_4 -lactate + 0.4 M HOAc, adjusted to pH 3.75) developed by Egnér et al. (1960 cf. Carter & Gregorich, 2008) according to the operative Hungarian standards (MSZ 20135:1999). P_2O_5 was measured colorimetrically, K_2O was quantified by flame photometry.

Soil profile Nr.1

Bedrock:

loess with other sediments, limestone and sandstone stones and boulders are present

Genetic soil type:

brown forest soils with clay illuviation (luvisol)

Soil texture

loam / clay loam

Coarse fragments:

below the depth of 100 cm; 10 V/V%

Notes:

iron and manganese concretion in the deeper layers



	Layer (cm)	Coarse fragm. (%)	pH (H ₂ O)	pH (KCl)	CaCO ₃ (%)	y ₁	y ₂	h _y	Soil texture				SOC (%)	N (%)	P ₂ O ₅ K ₂ O	
									Clay (%)	Silt (%)	Fine sand (%)	Coarse sand (%)			mg/100 g soil	
1	0-10	-	4.9	4.0	-	30.74	21.89	2.08	23	34	37	6	4.57	0.20	2.6	9.5
2	10-20	-	4.6	3.7	-	30.01	21.70	1.74	21	30	43	6	2.05	0.10	1.5	6.3
3	20-40	-	4.8	3.7	-	26.52	21.70	1.93	9	46	39	6	1.90	0.10	0.4	6.6
4	40-70	-	4.8	3.7	-	19.17	18.03	2.40	33	26	35	6	1.40	0.08	1.6	7.8
5	70-100	-	5.1	3.7	-	12.58	11.09	2.86	33	24	36	7	0.60	0.05	-	8.0
6	100-150	-	6.1	5.2	-	8.82	-	2.81	29	30	37	4	0.62	0.04	1.9	6.4
7	150-200	-	7.4	6.9	15	-	-	1.75	17	28	42	13	0.85	0.03	1.6	5.1

Soil profile Nr.2

Bedrock:

loess with other sediments

Genetic soil type:

brown forest soils with clay illuviation
(luvisol)

Soil texture:

loam / clay loam

Coarse fragments:

minimal

Notes:

iron and manganese concretion in the deeper layers



	Layer (cm)	Coarse fragm. (%)	pH (H ₂ O)	pH (KCl)	CaCO ₃ (%)	y ₁	y ₂	h _y	Soil texture				SOC (%)	N (%)	P ₂ O ₅	K ₂ O
									Clay (%)	Silt (%)	Fine sand (%)	Coarse sand (%)			mg/100 g soil	
1	0-10	-	4.6	3.7	-	39.01	23.38	1.95	23	26	45	6	3.97	0.19	4.0	7.5
2	10-20	-	4.4	3.5	-	37.41	26.23	1.64	21	30	43	6	2.52	0.13	1.0	5.3
3	20-50	-	4.7	3.6	-	25.10	20.01	1.64	21	32	41	6	1.21	0.07	0.2	5.2
4	50-90	-	5.1	3.8	-	13.57	10.08	2.84	31	30	34	5	0.58	0.04	2.2	8.8
5	90-130	-	5.5	4.8	-	10.39	4.77	2.91	29	30	35	6	0.46	0.04	6.2	8.8
6	130-210	-	7.8	6.8	5	-	-	1.83	17	32	44	7	0.72	0.04	2.8	5.4
7	210-250	-	7.7	6.9	2	-	-	3.80	39	20	28	13	0.47	0.04	2.9	7.2

Soil profile Nr.3

Bedrock:

limestone and loess with other sediments

Genetic soil type:

rendzic leptosol and brown forest soils with clay illuviation (luvisol)

Soil texture:

loam

Coarse fragments:

increasing downwards


Notes:

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	Layer (cm)	Coarse fragm. (%)	pH (H ₂ O)	pH (KCl)	CaCO ₃ (%)	y ₁	y ₂	hy	Soil texture				SOC (%)	N (%)	P ₂ O ₅	K ₂ O
									Clay (%)	Silt (%)	Fine sand (%)	Coarse sand (%)			mg/100 g soil	
1	0-10	-	4.6	3.7	-	40.89	20.49	2.23	19	28	44	9	5.70	0.26	0-10	-
2	10-20	-	4.6	3.5	-	33.75	19.29	1.96	25	26	39	10	2.53	0.12	10-20	-
3	20-30	-	5.3	4.1	-	18.08	7.33	2.36	29	26	34	11	2.25	0.12	20-30	-
4	30-70	21	6.9	6.2	-	-	-	3.61	35	26	27	12	2.63	0.12	30-70	21

Soil profile Nr.4

<p>Bedrock:</p> <p>limestone and loess with other sediments</p> <p>Genetic soil type:</p> <p>brown forest soils with clay illuviation (luvisol)</p> <p>Soil texture:</p> <p>loam / clay loam</p> <p>Coarse fragments:</p> <p>minimal</p> <p>Notes:</p> <p>-</p>	
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	Layer (cm)	Coarse fragm. (%)	pH (H ₂ O)	pH (KCl)	CaCO ₃ (%)	y ₁	y ₂	hy	Soil texture				SOC (%)	N (%)	P ₂ O ₅	K ₂ O
									Clay (%)	Silt (%)	Fine sand (%)	Coarse sand (%)			mg/100 g soil	
1	0-10	-	47	3.6	-	31.99	16.63	1.44	11	26	44	19	3.66	0.15	3.0	6.4
2	10-20	-	4.3	3.6	-	25.39	19.12	0.99	11	26	42	21	2.04	0.08	0.8	3.5
3	20-50	-	4.3	3.5	-	24.71	24.11	0.99	13	26	41	20	0.89	0.05	0.5	2.8
4	50-80	-	4.7	3.5	-	24.16	23.02	2.11	25	22	38	15	0.59	0.04	0.1	6.1