

Supplementary Material

Tab. S1 - Results of ANOVA for the effect of traffic intensity (TI), slope class (SC) and their interaction (TI × SC) on soil physical (BD: bulk density, TP: total porosity, MP: macroporosity, MIP: microporosity, PR: penetration resistance, MC: moisture content) and chemical (FF: forest floor, OC: organic carbon, N: nitrogen, P: phosphorous, K: potassium, pH: acidity) properties.

Soil physical properties	Source of variance	df	F-value	P-value*	Soil chemical properties	Source of variance	df	F-value	P-value*
BD (g cm ⁻³)	TI	2	108.0	0.000	FF (kg ha ⁻¹)	TI	2	111.3	0.001
	SC	1	96.3	0.011		SC	1	105.6	0.001
	TI × SC	2	95.0	0.105		TI × SC	2	110.2	0.215
TP (%)	TI	2	114.3	0.001	OC (%)	TI	2	85.7	0.025
	SC	1	103.4	0.012		SC	1	97.3	0.002
	TI × SC	2	101.3	0.035		TI × SC	2	102.3	0.160
MP (%)	TI	2	100.5	0.007	N (%)	TI	2	99.6	0.001
	SC	1	56.8	0.006		SC	1	100.6	0.001
	TI × SC	2	89.7	0.114		TI × SC	2	103.4	0.002
MIP (%)	TI	2	64.3	0.026	P (ppm)	TI	2	61.6	0.004
	SC	1	75.6	0.074		SC	1	62.7	0.016
	TI × SC	2	102.3	0.036		TI × SC	2	63.5	0.203
PR (MPa)	TI	2	56.8	0.001	K (ppm)	TI	2	65.4	0.016
	SC	1	59.6	0.021		SC	1	74.3	0.008
	TI × SC	2	87.6	0.112		TI × SC	2	83.1	0.106
MC (%)	TI	2	109.0	0.036	pH	TI	2	57.2	0.004
	SC	1	105.3	0.008		SC	1	57.5	0.104
	TI × SC	2	55.4	0.129		TI × SC	2	86.3	0.152

(*): P-values < 0.05 are shown in bold.

Tab. S2 - Results of ANOVA for the effect of traffic intensity (TI), slope class (SC) and their interaction (TI × SC) on the morphology and growth characteristics (GR: germination rate, SL: stem length, MRL: main root length, SD: stem diameter, SDB: stem dry biomass, RDB: root dry biomass, TDB: total dry biomass, SQI: seedling quality index) of alder and maple seedlings.

Seedling characteristics	Source of variance	Alder			Maple		
		df	F-value	P-value [*]	df	F-value	P-value [*]
GR (%)	TI	2	106.8	0.000	2	111.2	0.000
	SC	1	88.4	0.008	1	75.1	0.009
	TI × SC	2	9.4	0.084	2	13.0	0.074
SL (cm)	TI	2	108.0	0.000	2	111.3	0.000
	SC	1	96.3	0.011	1	105.6	0.001
	TI × SC	2	95.0	0.023	2	110.2	0.015
MRL (cm)	TI	2	114.3	0.000	2	85.7	0.025
	SC	1	103.4	0.012	1	97.3	0.002
	TI × SC	2	101.3	0.005	2	102.3	0.000
SD (mm)	TI	2	100.5	0.007	2	99.6	0.000
	SC	1	56.8	0.006	1	100.6	0.000
	TI × SC	2	89.7	0.014	2	103.4	0.002
LRL (cm)	TI	2	116.8	0.000	2	117.3	0.000
	SC	1	108.4	0.005	1	99.6	0.010
	TI × SC	2	55.3	0.027	2	51.3	0.021
SDB (g)	TI	2	64.3	0.026	2	61.6	0.004
	SC	1	13.1	0.074	1	62.7	0.004
	TI × SC	2	102.3	0.036	2	63.5	0.003
RDB (g)	TI	2	56.8	0.001	2	65.4	0.006
	SC	1	18.6	0.221	1	74.3	0.008
	TI × SC	2	87.6	0.012	2	83.1	0.006
TDB (g)	TI	2	69.6	0.026	2	57.2	0.004
	SC	1	105.3	0.108	1	57.5	0.004
	TI × SC	2	55.4	0.029	2	86.3	0.012
SQI	TI	2	96.7	0.008	2	105.3	0.001
	SC	1	62.5	0.015	1	84.3	0.025
	TI × SC	2	11.4	0.108	2	16.2	0.202

* P-values less than 0.05 are shown in bold.

Tab. S3 - Relationship between seedling growth characteristics and soil physicochemical properties (*r* value).

Seedling characteristics	Seedling species	Soil physical properties					
		BD (g cm ⁻³)	TP (%)	MP (%)	MIP (%)	PR (MPa)	MC (%)
SL (cm)	Alder	- 0.627	0.610	0.342	0.288	- 0.519	0.255
	Maple	- 0.619	0.607	0.318	0.302	- 0.540	0.270
SDM (mm)	Alder	- 0.436	0.462	0.355	0.279	- 0.496	0.218
	Maple	- 0.630	0.450	0.426	0.266	- 0.523	0.220
MRL (cm)	Alder	- 0.851	0.573	0.445	0.260	- 0.524	0.288
	Maple	- 0.840	0.580	0.376	0.302	- 0.509	0.292
LRL (cm)	Alder	- 0.860	0.561	0.309	0.379	- 0.514	0.295
	Maple	- 0.881	0.555	0.384	0.342	- 0.571	0.281
SDB (g)	Alder	- 0.647	0.607	0.322	0.229	- 0.522	0.290
	Maple	- 0.633	0.619	0.363	0.350	- 0.594	0.280
RDB (g)	Alder	- 0.819	0.530	0.406	0.319	- 0.566	0.266
	Maple	- 0.864	0.518	0.408	0.338	- 0.540	0.251
TDB (g)	Alder	- 0.564	0.488	0.305	0.307	- 0.527	0.217
	Maple	- 0.544	0.782	0.316	0.318	- 0.582	0.238
Seedling characteristics	Seedling species	Soil chemical properties					
		FF (kg ha ⁻¹)	OC (%)	N (%)	P (ppm)	K (ppm)	pH (%)
SL (cm)	Alder	0.302	0.306	0.207	0.307	0.255	0.210
	Maple	0.318	0.304	0.219	0.305	0.243	0.203
SDM (mm)	Alder	0.261	0.220	0.240	0.300	0.216	0.200
	Maple	0.270	0.225	0.224	0.284	0.237	0.209
MRL (cm)	Alder	0.318	0.214	0.206	0.310	0.215	0.217
	Maple	0.335	0.273	0.210	0.295	0.224	0.215
LRL (cm)	Alder	0.311	0.208	0.233	0.247	0.220	0.220
	Maple	0.364	0.232	0.242	0.261	0.230	0.224
SDB (g)	Alder	0.318	0.280	0.202	0.311	0.274	0.234
	Maple	0.315	0.292	0.207	0.315	0.270	0.218
RDB (g)	Alder	0.307	0.239	0.210	0.304	0.205	0.240
	Maple	0.318	0.250	0.225	0.318	0.222	0.236
TDB (g)	Alder	0.304	0.211	0.250	0.282	0.208	0.202
	Maple	0.314	0.218	0.253	0.270	0.216	0.200

Note: all *r* values are significant at $P < 0.05$.