

Table S1. ANOVA table showing the effects of pH and mineral nutrition treatments on the measured parameters in trembling aspen, jack pine, and white spruce seedlings.

Trembling aspen						
p-value	tdw	s/r ratio	Pn	E	ChlO	ChlY
nutri	0.1435	0.5272	0.0002	<0.0001	0.8623	0.0015
pH	<0.0001	0.0478	<0.0001	0.0023	<0.0001	<0.0001
Nutri x pH	0.2456	0.031	0.7181	0.4015	0.0033	0.0993
p-value	Mg	P	Ca	Fe	Mn	Zn
pH	<0.0001	<0.0001	0.0011	0.1262	0.0433	<0.0001
Jack pine						
p-value	tdw	s/r ratio	Pn	E	ChlO	ChlY
nutri	0.1765	<0.0001	0.0033	0.0009	0.5763	0.8062
pH	0.0013	0.2198	0.2656	0.0712	<0.0001	<0.0001
Nutri x pH	0.1107	0.8615	0.8682	0.2563	0.3745	0.0215
p-value	Mg	P	Ca	Fe	Mn	Zn
pH	<0.0001	0.0039	<0.0001	0.0002	<0.0001	0.0061
White spruce						
p-value	tdw	s/r ratio	Pn	E	ChlO	ChlY
nutri	0.6937	<0.0001	<0.0001	<0.0001	0.0539	0.2199
pH	0.024	0.3273	0.0002	<0.0001	0.0005	0.0001
Nutri x pH	0.0089	0.0763	0.6236	0.8809	0.187	0.0355
p-value	Mg	P	Ca	Fe	Mn	Zn
pH	0.0002	<0.0001	0.0003	0.0066	<0.0001	0.1072

Abbreviations: tdw, total dry weight ($n = 8$); s/r ratio, shoot to root dry weight ratio ($n = 8$); Pn, net photosynthetic rate ($n = 8$); E, transpiration rate ($n = 8$); ChlO, chlorophyll concentrations in old leaves ($n = 6$); ChlY, chlorophyll concentrations in young leaves ($n = 6$); foliar elemental concentrations ($n = 6$).

Table S2. Composition of 100% modified Hoagland's solution used in the study.

Compound	Concentration
KNO ₃	6.0 mM
Ca(NO ₃) ₂ · 4H ₂ O	4.0 mM
NH ₄ H ₂ PO ₄	2.0 mM
MgSO ₄ · 7 H ₂ O	1.0 mM
KCl	8.46 µM
H ₃ BO ₃	4.17 µM
MnSO ₄ · H ₂ O	0.29 µM
ZnSO ₄ · 7H ₂ O	0.33 µM
CuSO ₄ ·5H ₂ O	0.08 µM
H ₃ MoO ₄	0.08 µM
Fe-EDTA	20 µM

Table S3. The pH levels of 25% and 100% Hoagland's solutions that were required to achieve the aimed initial pH in sand culture.

Aimed Sand pH	Solution pH (25%)	Solution pH (100%)
5.0	3.5	3.8
6.0	5.0	5.0
7.0	9.5	9.0
7.5	10.0	9.5
8.0	10.5	10.0
8.5	11.0	10.5
9.0	11.5	11.0