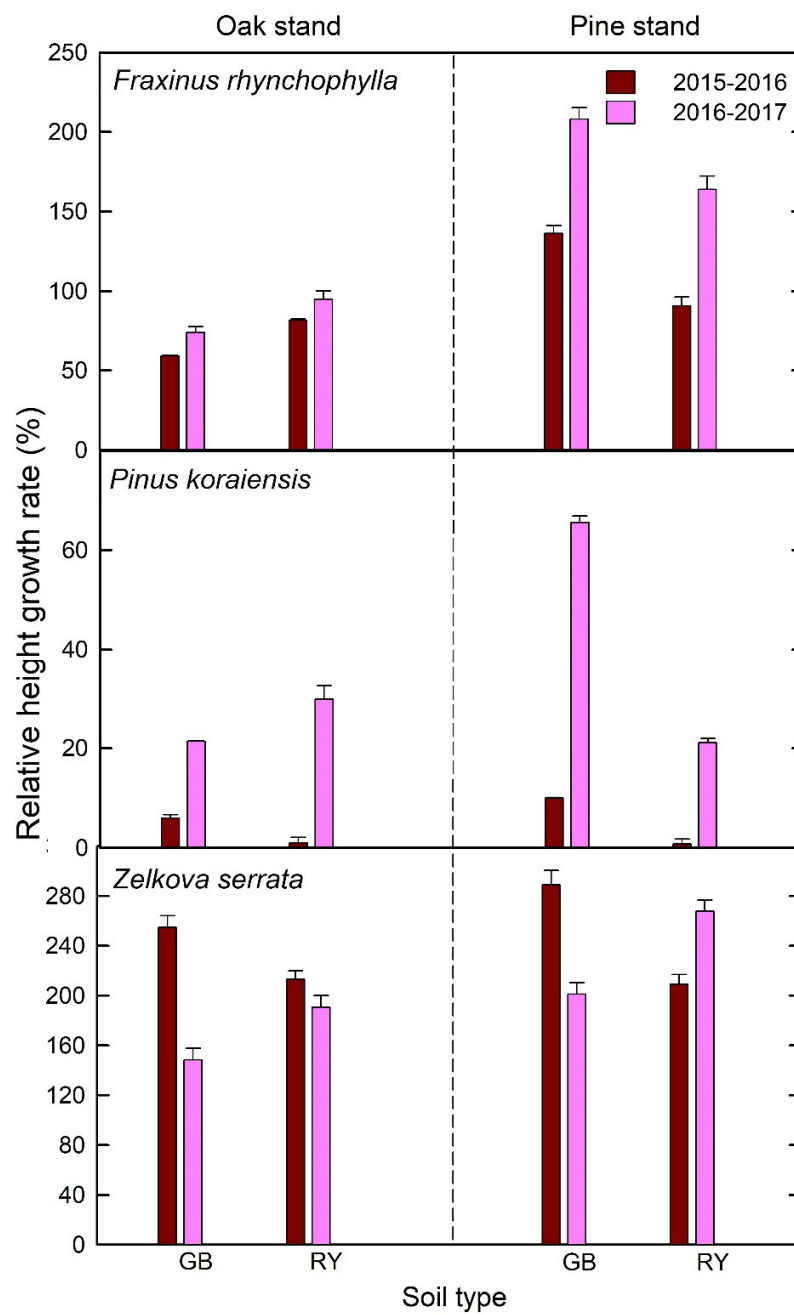


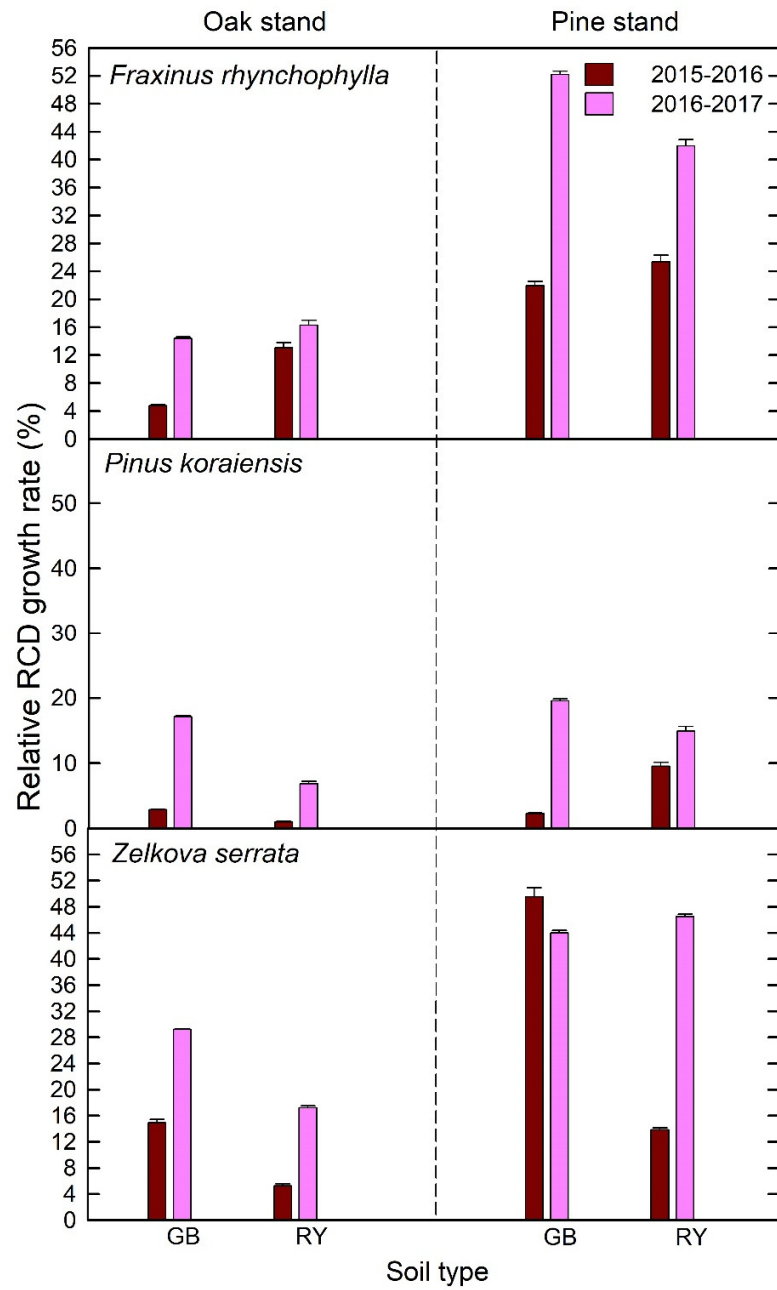
## Supplementary Materials



**Figure S1.** Crown structure of (A) pine stand and (B) oak stand.



**Figure S2.** Relative height growth rate of *Fraxinus rhynchophylla*, *Pinus koraiensis*, and *Zelkova serrata* in different soil and forest stands from 2015 to 2017.



**Figure S3.** Relative root collar diameter growth of *Fraxinus rhynchophylla*, *Pinus koraiensis*, and *Zelkova serrata* in different soil and forest stands from 2016 to 2017.

**Table S1.** P values estimated by two-way analysis of variance (ANOVA) for soil physical and chemical properties across soil horizons and stands.

Source of variables	<u>Sand</u>		<u>Silt</u>		<u>Clay</u>		<u>OM</u>		<u>pH</u>		<u>Total N</u>	
	F value	Pr > F	F value	Pr > F	F value	Pr > F	F value	Pr > F	F value	Pr > F	F value	Pr > F
Stand	52.45	<b>&lt;0.001</b>	34.90	<b>&lt;0.001</b>	23.58	<b>0.001</b>	51.62	<b>&lt;0.001</b>	41.81	<b>&lt;0.001</b>	18.12	<b>0.003</b>
Soil horizon	0.02	0.895	0.73	0.417	1.44	0.265	68.53	<b>&lt;0.001</b>	1.16	0.313	82.29	<b>&lt;0.001</b>
Stand × Soil horizon	3.16	0.114	1.39	0.273	2.29	0.169	4.17	0.075	0.13	0.729	0.00	0.985

Source of variables	<u>Available P</u>		<u>Exchangeable K<sup>+</sup></u>		<u>Exchangeable Ca<sup>2+</sup></u>		<u>Exchangeable Mg<sup>2+</sup></u>		<u>Exchangeable Na<sup>+</sup></u>		<u>CEC</u>	
	F value	Pr > F	F value	Pr > F	F value	Pr > F	F value	Pr > F	F value	Pr > F	F value	Pr > F
Stand	0.98	0.352	62.30	<b>&lt;0.001</b>	4.78	0.060	74.01	<b>&lt;0.001</b>	0.13	0.733	34.23	<b>&lt;0.001</b>
Soil horizon	16.74	<b>0.004</b>	10.56	<b>0.012</b>	2.34	0.165	15.41	<b>0.004</b>	1.13	0.320	7.95	<b>0.024</b>
Stand × Soil horizon	0.18	0.683	8.65	<b>0.019</b>	0.02	0.889	4.42	0.069	3.13	0.115	1.50	0.256

**Table S2.** P values estimated by two-way repeated measures analysis of variance (ANOVA) for height growth and RCD growth of three species at harvesting year across soil horizons and stands.

Species	Source	<u>Height growth</u>		<u>RCD growth</u>	
		F Value	Pr>F	F Value	Pr>F
<i>Fraxinus rhynchophylla</i>	Time	104.48	<b>&lt;0.001</b>	177.95	<b>&lt;0.001</b>
	Stand	20.65	<b>&lt;0.001</b>	70.99	<b>&lt;0.001</b>
	Time × stand	9.29	<b>0.001</b>	42.67	<b>&lt;0.001</b>
	Soil	0.55	0.466	0.01	0.935
	Time × soil	0.16	0.851	0.59	0.555
	Stand × soil	2.69	0.112	2.55	0.122
	Time × Stand × soil	1.59	0.213	1.30	0.280
<i>Pinus koraiensis</i>	Time	12.45	<b>&lt;0.001</b>	27.80	<b>&lt;0.001</b>
	Stand	0.11	0.747	5.93	0.035
	Time × stand	0.98	0.381	1.49	0.250
	Soil	0.01	0.936	0.26	0.621
	Time × soil	1.44	0.263	0.87	0.433
	Stand × soil	2.28	0.162	3.18	0.105
	Time × Stand × soil	1.60	0.230	0.58	0.572
<i>Zelkova serrata</i>	Time	132.56	<b>&lt;0.001</b>	60.67	<b>&lt;0.001</b>
	Stand	10.23	<b>0.008</b>	25.42	<b>&lt;0.004</b>
	Time × stand	1.53	0.239	9.72	<b>&lt;0.001</b>
	Soil	6.35	<b>0.029</b>	11.17	<b>0.007</b>
	Time × soil	0.53	0.591	4.34	<b>0.026</b>
	Stand × soil	3.21	0.101	5.60	<b>0.037</b>
	Time × Stand × soil	0.22	0.807	0.67	0.521

**Table S3.** P values estimated by two-way analysis of variance (ANOVA) for biomass growth of three species across soil properties and stands.

Species	Source of variables	Leaf	Stem	Fine root	Coarse root	Total biomass	Root to shoot ratio
<i>Fraxinus</i>	Stand	<b>&lt;0.001</b>	<b>&lt;0.001</b>	<b>&lt;0.001</b>	<b>&lt;0.001</b>	<b>&lt;0.001</b>	<b>&lt;0.001</b>
<i>rhynchophylla</i>	Soil type	0.741	0.618	0.197	0.626	0.420	0.209
	Stand × Soil type	0.209	0.249	0.133	0.228	0.175	0.935
<i>Pinus</i>	Stand	0.086	0.058	0.319	<b>0.042</b>	0.295	<b>0.001</b>
<i>koraiensis</i>	Soil type	0.423	0.451	0.666	0.341	0.625	0.086
	Stand × Soil type	0.364	0.269	0.586	0.228	0.237	0.116
<i>Zelkova</i>	Stand	0.125	<b>0.009</b>	<b>0.005</b>	<b>&lt;0.001</b>	<b>0.005</b>	<b>0.018</b>
<i>serrata</i>	Soil type	0.093	<b>0.025</b>	<b>0.029</b>	0.302	<b>0.032</b>	<b>0.042</b>
	Stand × Soil type	0.155	<b>0.041</b>	<b>0.028</b>	0.124	<b>0.041</b>	0.494