

Supplementary material

Table S1. ANOVA results (*F* and *p*-values) for the effects of root pruning intensities and seedling sizes on dieback rate, leaf phenology, and root emergence at the early establishment stage.

Growth_Parameters	Size		Root Pruning		Size * Root Pruning	
	<i>F</i>	<i>p</i>	<i>F</i>	<i>p</i>	<i>F</i>	<i>p</i>
Dieback	6.53	0.005	60.20	<0.001	4.04	0.006
Bud Burst Stage	0.06	0.946	0.59	0.626	0.65	0.691
Leaf Unfolding Initiation Stage	90.25	<0.001	65.56	<0.001	0.14	0.990
Full Leaf Unfolding Stage	24.18	<0.001	26.24	<0.001	0.97	0.467
Mid-Leaf Fall Stage	31.78	<0.001	191.10	<0.001	2.61	0.043
New Root Growth Stage	0.09	0.918	784.71	<0.001	0.09	0.997

Table S2. Four-parameter logistic growth models and R^2 for height, diameter at breast height, and root collar diameter by root pruning intensities and sapling sizes.

Index	Treatment	Logistic Growth Model	R^2
Height	L-CK	$Y = 307.91 + (489.33 - 307.91) / (1 + 10^{((109.97 - X) * 0.020)})$	0.9766
	L-P1	$Y = 306.66 + (486.67 - 306.66) / (1 + 10^{((112.34 - X) * 0.021)})$	0.9767
	L-P2	$Y = 307.41 + (377.78 - 307.41) / (1 + 10^{((110.01 - X) * 0.022)})$	0.9315
	L-P3	$Y = 307.28 + (357.99 - 307.28) / (1 + 10^{((112.40 - X) * 0.021)})$	0.9042
	M-CK	$Y = 234.05 + (405.94 - 234.05) / (1 + 10^{((114.98 - X) * 0.018)})$	0.9815
	M-P1	$Y = 231.96 + (398.50 - 231.96) / (1 + 10^{((110.40 - X) * 0.019)})$	0.9687
	M-P2	$Y = 234.01 + (353.24 - 234.01) / (1 + 10^{((121.45 - X) * 0.017)})$	0.9754
	M-P3	$Y = 232.16 + (325.91 - 232.16) / (1 + 10^{((118.96 - X) * 0.016)})$	0.9587
	S-CK	$Y = 136.68 + (297.54 - 136.68) / (1 + 10^{((114.76 - X) * 0.019)})$	0.9890
	S-P1	$Y = 137.97 + (295.29 - 137.97) / (1 + 10^{((116.96 - X) * 0.021)})$	0.9846
	S-P2	$Y = 134.37 + (270.54 - 134.37) / (1 + 10^{((120.27 - X) * 0.019)})$	0.9804
	S-P3	$Y = 133.89 + (234.10 - 133.89) / (1 + 10^{((116.17 - X) * 0.017)})$	0.9696
DBH	L-CK	$Y = 15.80 + (29.70 - 15.80) / (1 + 10^{((116.13 - X) * 0.020)})$	0.9854
	L-P1	$Y = 15.70 + (29.49 - 15.70) / (1 + 10^{((119.41 - X) * 0.018)})$	0.9844
	L-P2	$Y = 15.92 + (23.02 - 15.92) / (1 + 10^{((120.75 - X) * 0.018)})$	0.9496
	L-P3	$Y = 15.91 + (20.44 - 15.91) / (1 + 10^{((124.21 - X) * 0.017)})$	0.9257
	M-CK	$Y = 10.88 + (23.37 - 10.88) / (1 + 10^{((106.58 - X) * 0.019)})$	0.9908
	M-P1	$Y = 10.99 + (22.76 - 10.99) / (1 + 10^{((105.25 - X) * 0.021)})$	0.9885

	M-P2	$Y = 10.96 + (20.70 - 10.96) / (1 + 10^{((113.34 - X) * 0.018)})$	0.9832
	M-P3	$Y = 10.76 + (19.49 - 10.76) / (1 + 10^{((111.78 - X) * 0.019)})$	0.9846
	S-CK	$Y = 6.55 + (18.02 - 6.55) / (1 + 10^{((119.10 - X) * 0.021)})$	0.9890
	S-P1	$Y = 6.52 + (17.72 - 6.52) / (1 + 10^{((118.43 - X) * 0.021)})$	0.9917
	S-P2	$Y = 6.51 + (16.48 - 6.51) / (1 + 10^{((125.88 - X) * 0.020)})$	0.9921
	S-P3	$Y = 6.58 + (14.64 - 6.58) / (1 + 10^{((125.74 - X) * 0.022)})$	0.9889
RCD	L-CK	$Y = 28.30 + (44.61 - 28.30) / (1 + 10^{((115.79 - X) * 0.018)})$	0.9690
	L-P1	$Y = 28.49 + (44.39 - 28.49) / (1 + 10^{((116.58 - X) * 0.018)})$	0.9679
	L-P2	$Y = 28.70 + (40.45 - 28.70) / (1 + 10^{((107.80 - X) * 0.023)})$	0.9498
	L-P3	$Y = 28.63 + (37.78 - 28.63) / (1 + 10^{((103.90 - X) * 0.023)})$	0.9180
	M-CK	$Y = 21.99 + (38.74 - 21.99) / (1 + 10^{((105.96 - X) * 0.023)})$	0.9794
	M-P1	$Y = 22.12 + (38.32 - 22.12) / (1 + 10^{((107.05 - X) * 0.027)})$	0.9789
	M-P2	$Y = 21.94 + (36.48 - 21.94) / (1 + 10^{((109.07 - X) * 0.019)})$	0.9758
	M-P3	$Y = 22.15 + (34.81 - 22.15) / (1 + 10^{((106.41 - X) * 0.021)})$	0.9728
	S-CK	$Y = 15.12 + (35.88 - 15.12) / (1 + 10^{((105.77 - X) * 0.021)})$	0.9909
	S-P1	$Y = 14.89 + (35.40 - 14.89) / (1 + 10^{((104.56 - X) * 0.025)})$	0.9900
	S-P2	$Y = 14.52 + (33.49 - 14.52) / (1 + 10^{((115.89 - X) * 0.022)})$	0.9911
	S-P3	$Y = 14.52 + (32.14 - 14.52) / (1 + 10^{((121.73 - X) * 0.021)})$	0.9908

Table S3. ANOVA results (*F* and *p*-values) for the effects of root pruning intensities and seedling sizes on stem phenology.

Growth_Parameters	Size		Root Pruning		Size * Root Pruning	
	<i>F</i>	<i>p</i>	<i>F</i>	<i>p</i>	<i>F</i>	<i>p</i>
RG0.H	0.30	0.746	0.25	0.864	0.13	0.991
RG0.H	2.05	0.151	0.77	0.523	0.27	0.944
RG0.DBH	6.33	0.006	0.39	0.760	0.15	0.987
RG0.DBH	5.72	0.009	2.15	0.121	0.26	0.948
RG0.RCD	0.78	0.470	0.16	0.925	0.83	0.557
RG0.RCD	1.77	0.192	0.16	0.925	2.48	0.052
RGD.H	0.90	0.419	0.63	0.606	0.09	0.997
RGD.DBH	1.34	0.282	0.44	0.724	0.26	0.951
RGD.RCD	1.16	0.331	0.18	0.909	0.62	0.711

Table S4. ANOVA results (*F* and *p*-values) for the effects of root pruning intensities and seedling sizes on leaf traits and stem growth rates during the rapid growth period.

Growth_Parameters	Size		Root Pruning		Size * Root Pruning	
	<i>F</i>	<i>p</i>	<i>F</i>	<i>p</i>	<i>F</i>	<i>p</i>
MGR.H	0.68	0.520	16.09	<0.001	1.59	0.194
MGR.DBH	1.48	0.248	11.26	<0.001	2.87	0.030
MGR.RCD	10.82	<0.001	2.42	0.091	0.215	0.968
Leaf Area	25.17	<0.001	571.9	<0.001	49.88	<0.001
Leaf Thickness	3.331	0.053	29.26	<0.001	0.5136	0.7921

Table S5. ANOVA results (*F* and *p*-values) for the effects of root pruning intensities and seedling sizes on end-of-season growth indicators.

Growth_Parameters	Size		Root Pruning		Size * Root Pruning	
	<i>F</i>	<i>p</i>	<i>F</i>	<i>p</i>	<i>F</i>	<i>p</i>
H	406.75	<0.001	99.85	<0.001	8.07	<0.001
DBH	384.10	<0.001	88.83	<0.001	11.48	<0.001
RCD	88.18	<0.001	29.66	<0.001	1.03	0.433
H/DBH	18.90	<0.001	3.79	0.024	9.59	<0.001
H/RCD	940.36	<0.001	157.01	<0.001	16.48	<0.001
DBH/RCD	958.93	<0.001	138.34	<0.001	29.27	<0.001
RGR.H	34.80	<0.001	515.87	<0.001	47.21	<0.001
RGR.DBH	10.33	<0.001	436.10	<0.001	58.85	<0.001
RGR.RCD	444.60	<0.001	62.22	<0.001	2.64	0.041