

Supplementary Material

Tab. S1 - Main stand and sample tree characteristics of Birch, Oak and Pine. (HG): basal area weighted mean height; (DG): quadratic mean diameter; (VD): solid wood volume; (DBH): diameter at breast height; (N_{ST}): number of sampled trees; (Min): minimum; (Max): maximum; (SPH): Spechthausen; (SEH): Seilerhof; (EIH): Eichenheide; (WAD): Waldeck.

Species/ Group	Stand No.	Federal state	Region	Stand characteristics				Sample tree characteristics									
				Age [years]	HG [m]	DG [cm]	VD [m ³ /ha]	Area [ha]	Height [m]	DBH [cm]	N _{ST}	Root depth [m]			Root dry mass [kg]		
												Min	Max	Mean	Min	Max	Mean
Birch	1	Brandenburg	SPH	60	19.6	18.0	135	2.36	12.2-22.0	8.2-21.1	9	0.5	1.7	1.2	3.7	33.6	15.0
	2	Brandenburg	SPH	90	26.9	35.0	356	10.38	24.9-29.4	33.0-44.8	3	1.2	2.3	1.9	84.8	347.7	192.7
	3 ¹	Brandenburg	SPH	65	22.4	25.0	273	7.30	17.0-26.4	12.9-31.2	16	0.6	2.5	1.5	13.1	169.6	50.7
	4 ²	Brandenburg	SPH	120	31.6	47.0	180	1.71	30.6	52.9	1		1.8			257.7	
	5 ³	Brandenburg	SPH	50	20.9	24.0	253	2.87	17.2-37.0	20.3-22.8	7	1.0	2.3	1.4	14.9	102.2	54.6
	6 ⁴	Saxony-Anhalt	EIH	55	23.0	27.0	230	4.10	20.4-20.8	20.2-25.6	2		1.1		34.0	49.5	41.8
	7 ⁵	Saxony-Anhalt	EIH	65	25.0	24.0	245	3.10	18.7-27.3	18.3-26.0	4	0.7	1.3	1.0	37.4	73.5	52.1
	8 ⁶	Thuringia	WAD	40	20.7	20.0	184	1.24	16.5-22.2	11.9-22.1	6	0.8	1.2	1.0	11.2	65.3	36.2
Oak	1	Brandenburg	SPH	120	31.6	47.0	180	1.71	25.8-30.8	27.1-42.0	5	1.4	2.6	1.8	52.2	159.0	110.9
	2	Brandenburg	SPH	50	20.9	24.0	253	2.87	8.1-21.7	7.4-38.0	22	0.7	2.4	2.6	2.5	124.9	26.7
	3	Brandenburg	SEH	109	29.7	43.0	415	1.98	22.7-28.8	28.1-36.3	3	1.6	1.7	1.7	68.4	116.0	93.3
	4	Saxony-Anhalt	EIH	60	23.0	27.0	230	4.10	18.6-20.3	19.0-21.6	2		1.2		33.3	34.0	33.7
	5	Saxony-Anhalt	EIH	65	25.0	24.0	245	3.10	15.4-18.7	15.4-17.1	3	0.9	1.0	1.0	14.9	26.3	22.0
	6	Thuringia	WAD	40	18.7	20.0	241	1.24	16.9-19.5	16.9-20.9	2	0.7	1.2	1.0	25.2	46.0	35.6
	7	Thuringia	WAD	30	12.0	13.0	80	1.20	12.0-12.1	13.1-16.9	2		0.7		10.1	25.2	17.6
Pine	1	Brandenburg	SPH	32	17.8	19.0	285	3.32	13.5-19.3	10.6-20.5	7	1.0	1.6	1.3	5.1	27.8	13.5
	2	Brandenburg	SPH	15	8.0	9.0	20	5.80	6.7-8.4	7.2-9.4	3	1.0	2.1	1.5	1.4	2.3	1.9
	3	Brandenburg	SPH	65	22.4	25.0	273	7.30	21.3	17.9	1		1.3			18.9	
	4	Brandenburg	SPH	100	30.0	46.0	215	1.96	29.9-32.5	40.9-53.2	2	1.7	2.7	1.9	175.9	363.7	112.9
	5	Brandenburg	SPH	60	21.5	24.0	343	3.60	12.2-20.4	10.8-28.0	9	1.3	2.3	1.7	5.0	65.7	24.2
	6	Brandenburg	SPH	37	17.8	19.0	285	0.86	14.1-18.9	10.9-28.0	6	1.4	2.1	1.7	6.3	46.0	23.8
	7	Brandenburg	SPH	34	19.1	19.0	278	1.39	14.0-16.4	12.8-15.0	3	1.4	1.8	1.6	8.0	8.7	8.2
	8	Brandenburg	SPH	220	31.1	49.0	125	0.55	29.3-31.8	45.5-52.4	3	2.1	2.6	2.4	244.1	246.4	248.7
	9	Brandenburg	SPH	85	27.3	32.0	334	1.91	25.4-32.7	20.6-38.8	10	1.3	2.3	1.9	31.1	121.3	66.2
	10	Saxony-Anhalt	EIH	95	22.0	25.0	232	2.90	22.1	29.0	1		1.6			61.4	
	11	Saxony-Anhalt	EIH	100	23.0	27.0	230	4.10	19.5-20.2	22.8-25.5	2	1.0	1.2	1.1	46.1	61.9	54.0
	12	Saxony-Anhalt	EIH	65	25.0	24.0	245	3.10	22.1-23.7	22.6-23.2	2		1.2		32.3	47.0	39.7
	13	Thuringia	WAD	80	26.9	35.0	356	0.73	15.8-24.6	14.8-31.7	5	0.8	1.2	1.0	14.6	79.2	42.3

¹ together with Pine Stand No. 3; ² together with Oak Stand No. 1; ³ together with Oak Stand No. 2; ⁴ together with Oak Stand No. 4 & Pine Stand No. 11; ⁵ together with Oak Stand No. 5 & Pine Stand No. 12; ⁶ together with Oak Stand No. 6.

Fig. S1 - Location of the research areas in Germany.



Fig. S2 - Classification of root system.

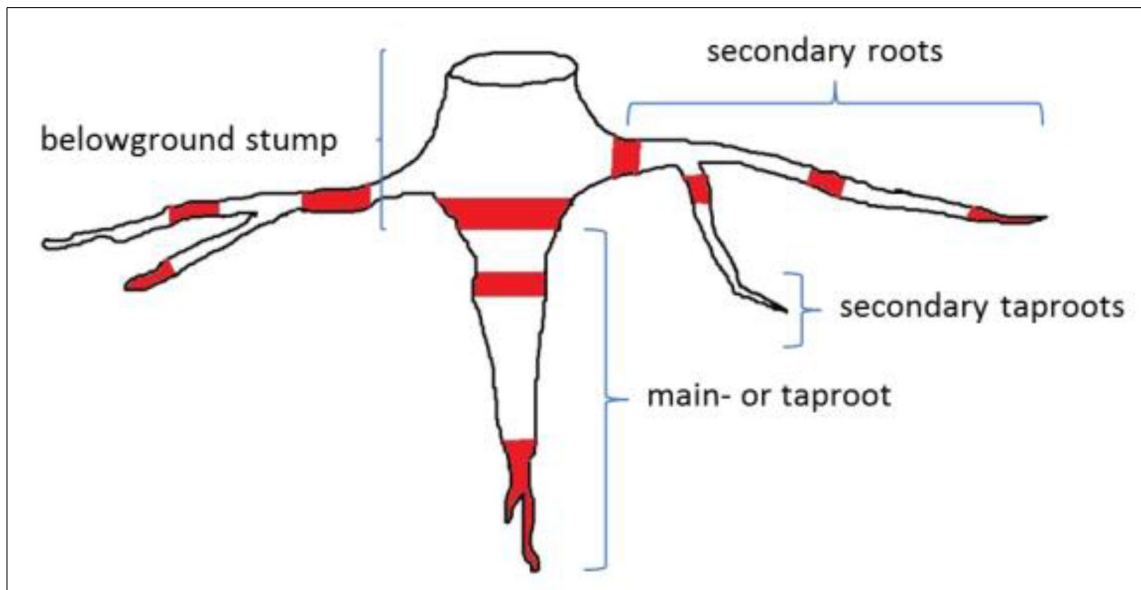


Fig. S3 - Schematic description and picture taken in the forest stand drawing the method to pull down the tree (Photo: Burkhard Demant).



Fig. S4 - Excavating and pulling out broken roots or roots remained in the soil (Photos: Burkhard Demant / Mirko Neubauer).

