

Tree-ring formation dynamics in *Fagus sylvatica* and *Quercus petraea* in a dry and a wet year

Supplementary Material

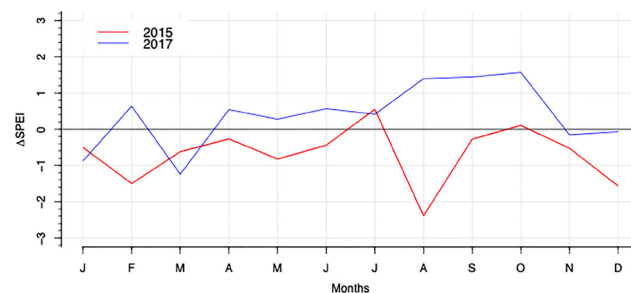


Fig. S1. Differences in SPEI in the years in which monitoring of cambium activity was conducted in oak and beech. Delta SPEI is the difference between the SPEI for 2015 and 2017, respectively, and the multi-year SPEI (1923–2019). The average SPEI value for 2015 was -0.682 , and for 2017 0.381 . According to the paired two-sided t-test for monthly values, the difference in averages was statistically significant ($t=3.03$, $p=0.011$)

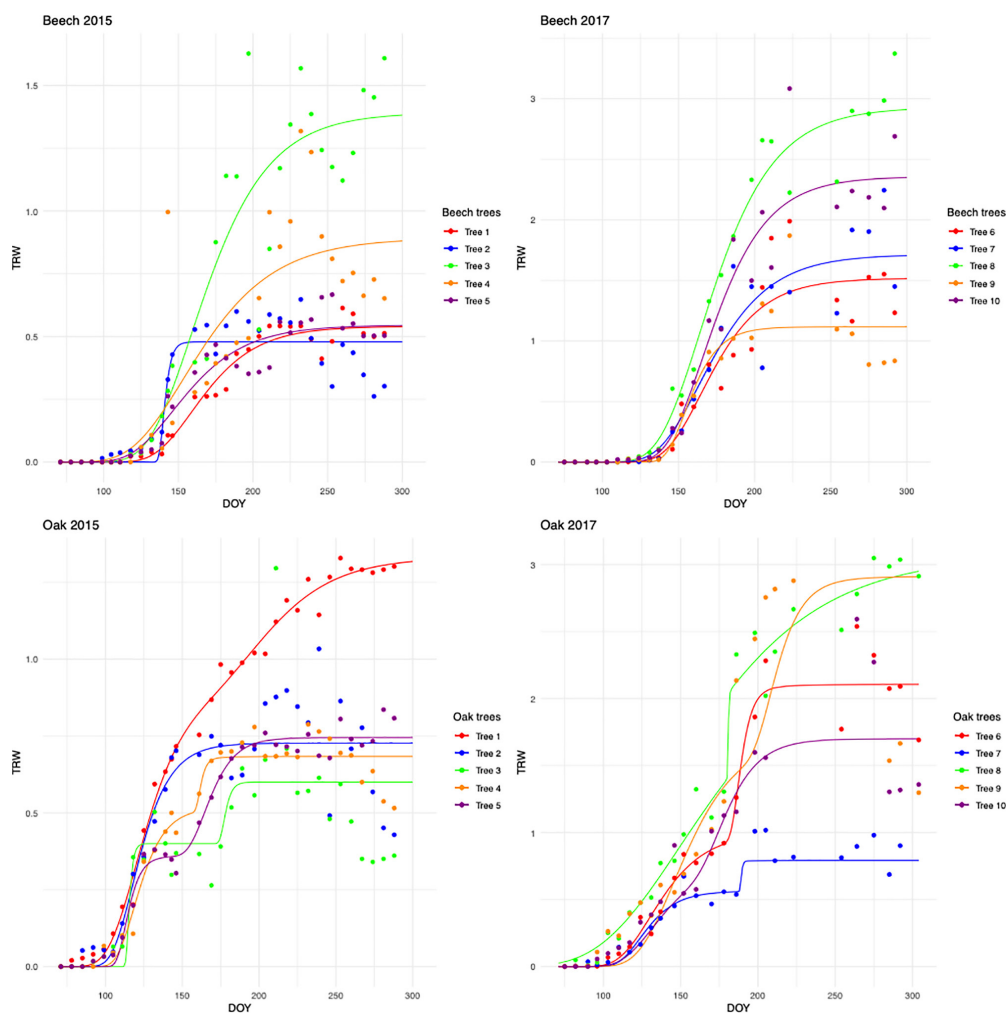


Fig. S2. Dynamics of annual growth in the individual trees studied. The curve for beech fit with the Gompertz function, and oak fit with the double Gompertz function

Table S1. Diameters at breast height (DBH) and parameters and statistics for the annual growth models for *F. sylvatica*. The height of the tree stand was 26 m and age about 63 (Forest Data Bank www.bdl.lasy.gov.pl/)

	DBH	a	b	k	RSS	TSS	R2
Tree1	31.8	0.5403	6.5357	0.0412	0.0524	1.7005	0.9692
Tree2	31.8	0.4786	47.9964	0.3428	0.2438	1.6212	0.8496
Tree3	33.1	1.3921	5.5255	0.0348	1.2656	11.5773	0.8907
Tree4	29.3	0.8926	4.4978	0.0294	1.4443	5.2668	0.7258
Tree5	25.1	0.5457	5.3936	0.0370	0.1215	1.7217	0.9294
Average 2015	30.2±3.2	0.7523	5.6258	0.0376	10.7105	25.9796	0.5877
Tree6	33.7	1.5178	7.1965	0.0437	0.9712	11.1433	0.9128
Tree7	31.2	1.7138	6.2218	0.0381	1.3835	14.0037	0.9012
Tree8	27.4	2.9302	6.0559	0.0369	0.9149	36.6777	0.9751
Tree9	25.5	1.1167	12.4336	0.0806	0.9261	7.3745	0.8744
Tree10	30.2	2.3576	7.0306	0.0423	1.5669	25.8656	0.9394
Average 2017	29.6±3.2	1.8987	7.3044	0.0450	22.0420	102.9624	0.7859

Table S2. Diameters at breast height (DBH) and parameters and statistics for the annual growth models for *Q. petraea*. The height of the tree stand was 25 m and age about 93 years (Forest Data Bank www.bdl.lasy.gov.pl/)

	DBH	a1	a2	b1	b2	k1	k2	RSS	TSS	R2
Tree1	42.0	0.4144	1.3318	6.8365	6.4049	0.0341	0.0532	0.0478	7.0164	0.9932
Tree2	31.8	0.3116	0.8108	2.9168	11.5727	0.0240	0.0967	0.2521	2.9035	0.9132
Tree3	30.6	0.2064	0.5712	62.2166	66.9020	0.3507	0.5978	0.8175	2.2644	0.6390
Tree4	39.5	0.1665	0.6833	69.0231	10.5674	0.4283	0.0892	0.1083	2.4316	0.9555
Tree5	29.9	0.3861	0.7449	14.9189	20.0857	0.0907	0.1778	0.0389	2.7148	0.9857
Average 2015	34.8±5.6	0.2209	0.7867	18.6680	9.4473	0.1086	0.0818	6.0624	20.2391	0.7005
Tree6	36.9	0.9990	2.1054	6.5329	38.0183	0.0502	0.2031	0.6393	17.8932	0.9643
Tree7	34.4	0.5734	0.8567	8.3124	17.8518	0.0674	0.0863	0.1042	2.4621	0.9430
Tree8	53.5	1.6064	3.0023	4.0981	8.1978	0.0315	0.0400	0.2396	30.1859	0.9921
Tree9	42.7	2.1469	3.4048	2.6677	44.3247	0.0171	0.2449	0.0895	19.7541	0.6810
Tree10	40.1	0.7992	1.7646	6.6237	12.2914	0.0546	0.0686	1.7003	12.0889	0.9543
Average 2017	41.5±7.4	0.8984	1.9102	35.9956	5.3474	0.1978	0.0426	27.7818	105.2097	0.7359

Table S3. Descriptive statistics for leaf phenological tree-rings formation phases and of *F. sylvatica* and *Q. petraea* in 2015 and 2017

Phenophase	Species	Year	Min	Mean	Standard deviation	Max
SWO (DOY)	<i>F. sylvatica</i>	2015	92.0	92.0	0.0	92.0
		2017	90.0	90.0	0.0	90.0
	<i>Q. petraea</i>	2015	102.0	102.0	0.0	102.0
		2017	96.0	96.0	0.0	96.0
BRO (DOY)	<i>F. sylvatica</i>	2015	102.0	102.0	0.0	102.0
		2017	96.0	96.0	0.0	96.0
	<i>Q. petraea</i>	2015	105	112.6	4.2	114.5
		2017	113.5	113.5	0.0	113.5
UNF (DOY)	<i>F. sylvatica</i>	2015	108.0	108.6	1.3	111.0
		2017	103.0	103.0	0.0	103.0
	<i>Q. petraea</i>	2015	121.5	121.5	4.9	128.5
		2017	124.0	124.0	0.0	124.0
FEX (DOY)	<i>F. sylvatica</i>	2015	114.5	114.5	0.0	114.5
		2017	120.5	120.5	0.0	120.5
	<i>Q. petraea</i>	2015	133.5	133.9	0.9	135.5
		2017	137.0	137.0	0.0	137.0
OCA (DOY)	<i>F. sylvatica</i>	2015	88.5	98.4	10.8	114.5
		2017	78.5	90.1	6.5	93.0
	<i>Q. petraea</i>	2015	71.0	72.4	1.9	74.5
		2017	71.0	74.2	1.8	75.0
BVE (DOY)	<i>F. sylvatica</i>	2015	114.5	120.1	3.1	121.5
		2017	113.5	120.5	4.9	127.5
	<i>Q. petraea</i>	2015	81.5	85.7	3.8	88.5
		2017	78.5	88.5	9.5	99.5
BSW (DOY)	<i>F. sylvatica</i>	2015	141.0	141.0	0.0	141.0
		2017	134.0	141.5	7.5	149.0
	<i>Q. petraea</i>	2015	121.5	125.7	3.8	128.5
		2017	120.4	130.3	5.9	134.0
FMV (DOY)	<i>F. sylvatica</i>	2015	152.0	152.0	0.0	152.0
		2017	143.0	153.6	9.4	168.0
	<i>Q. petraea</i>	2015	135.5	139.9	2.5	141.0
		2017	135.0	141.2	6.3	150.0
EWF (DOY)	<i>Q. petraea</i>	2015	152.0	165.2	8.2	172.0
		2017	163.0	167.0	2.2	168.0
CES (DOY)	<i>F. sylvatica</i>	2015	221.5	232.0	9.6	239.0
		2017	254.0	256.0	4.5	264.0
	<i>Q. petraea</i>	2015	221.5	227.8	5.2	235.5
		2017	251.0	250.6	21.5	275.0
DUR – number of DOYs	<i>F. sylvatica</i>	2015	124.5	133.6	6.0	140.5
		2017	161.5	165.9	6.9	175.5
	<i>Q. petraea</i>	2015	150.5	155.4	5.9	164.5
		2017	152.0	186.4	22.2	204.0