

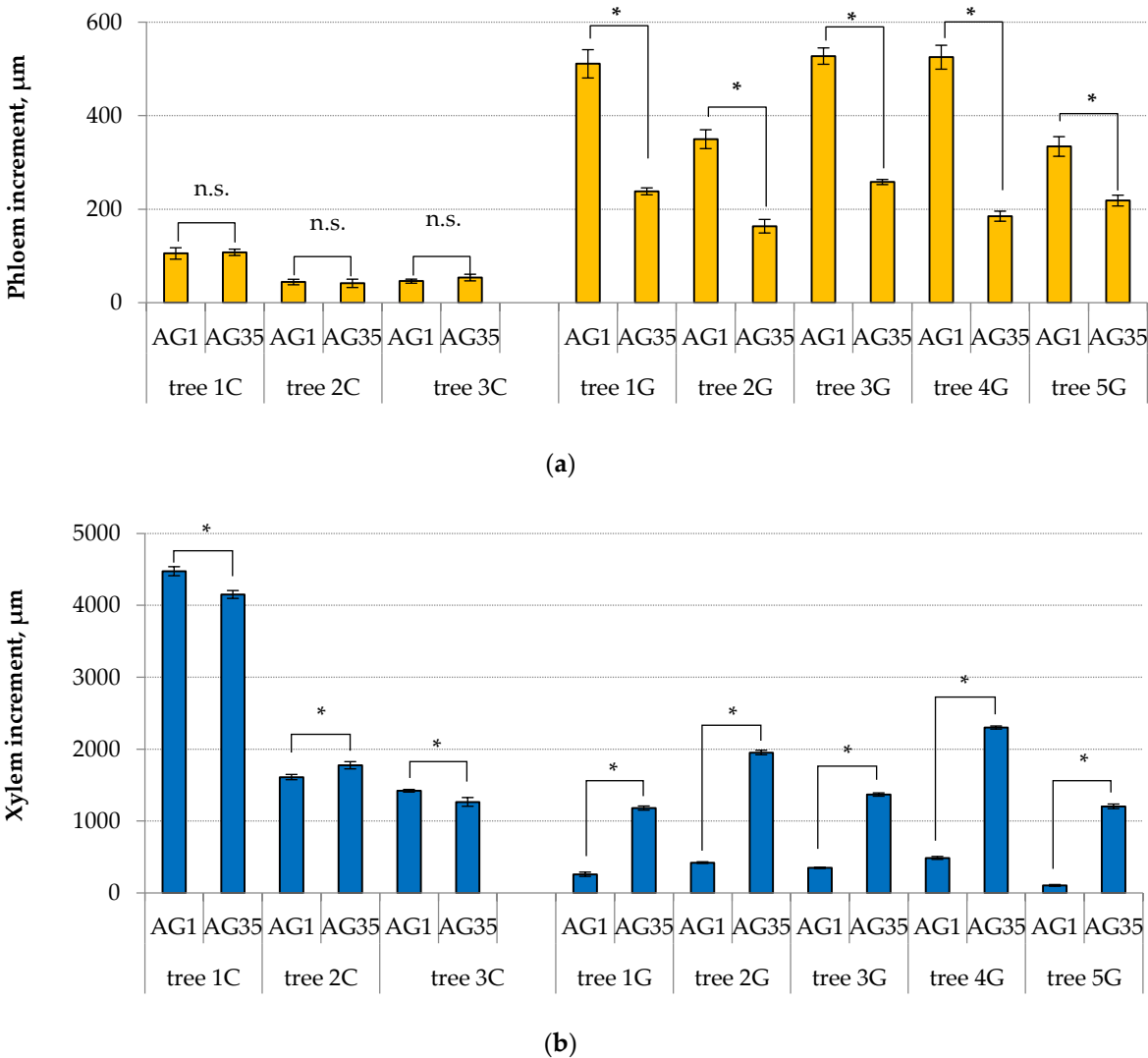
Changes in the Differentiation Program of Birch Cambial Derivatives following Trunk Girdling

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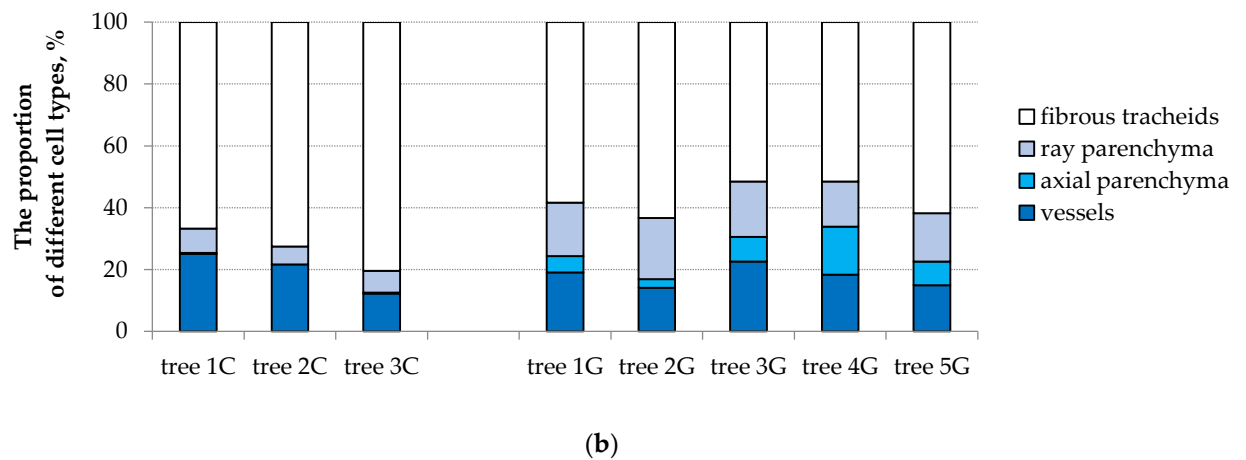
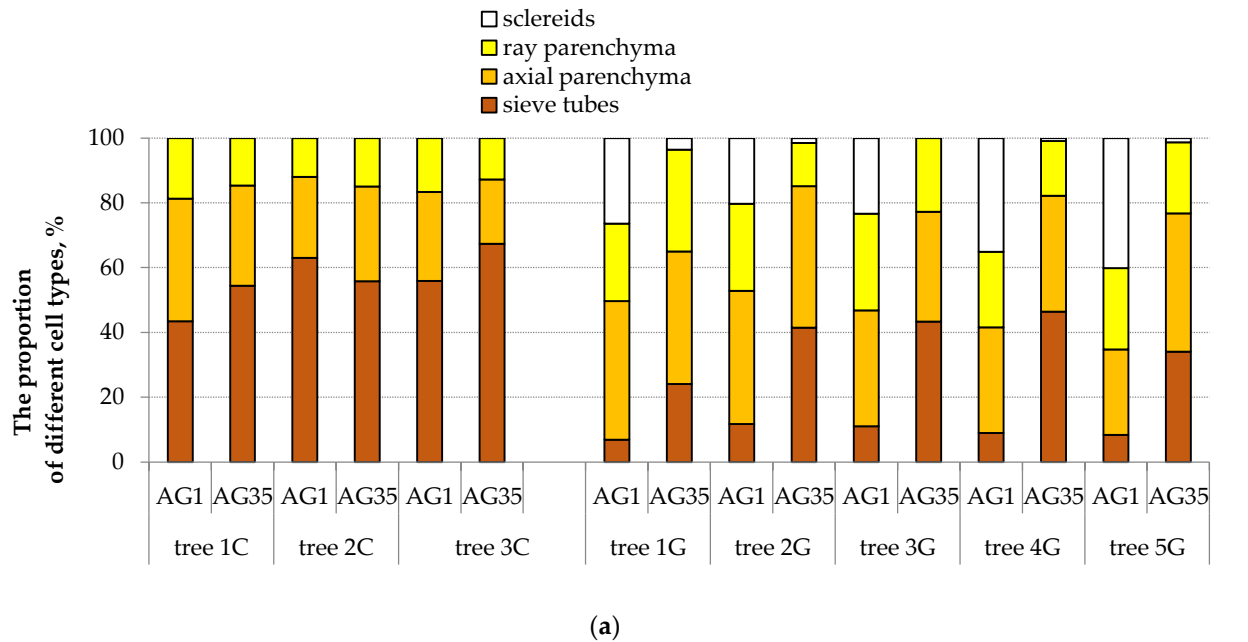
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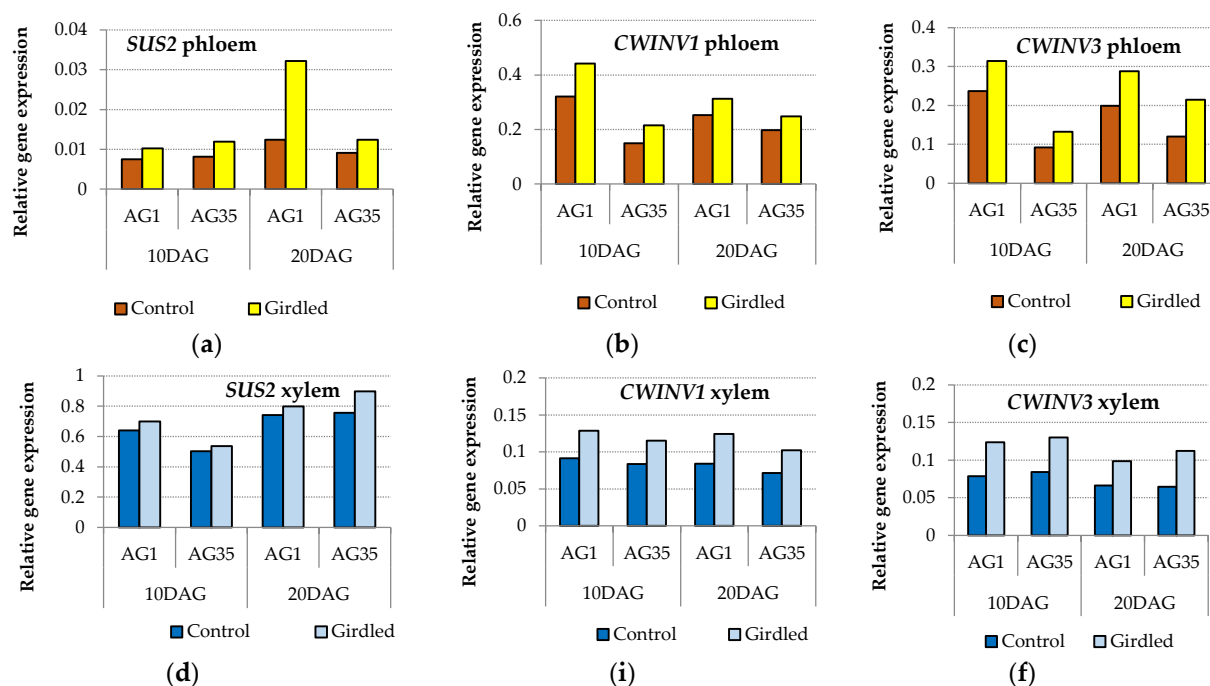


Supplementary Figure S1. Width of phloem increment (a) and xylem increment (b), formed after the girdling in control (1C-3C) and girdled (1G-5G) trees 1 and 35 cm

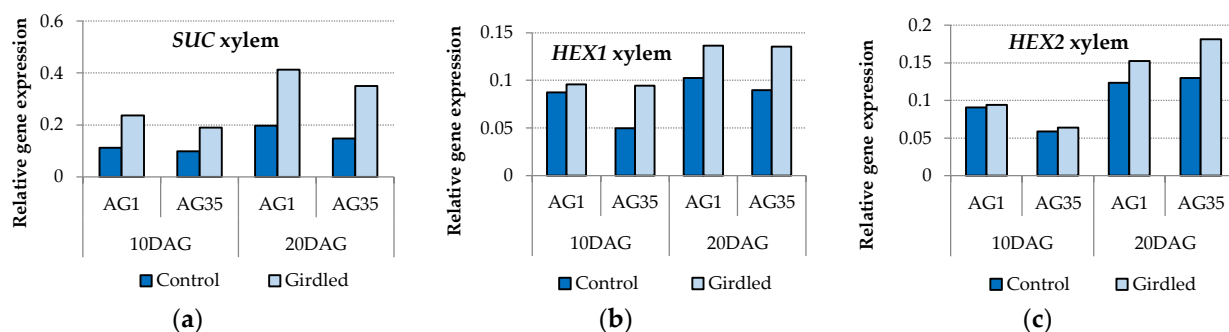
above girdle (AG1 and AG35, respectively). The data in the diagrams are presented as $M \pm SD$. Asterisks mark significant differences between groups (* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$), n.s. – no differences.



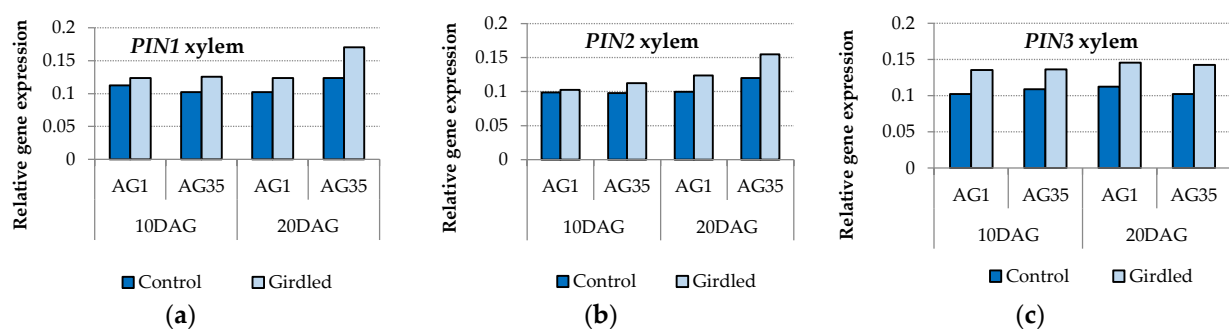
Supplementary Figure S2. Anatomical characteristics of conducting tissues. (a) the proportion of different cell types in late phloem; (b) the proportion of different cell types in xylem of AG35 level. 1C-3C – control trees, 1G-5G – girdled trees.



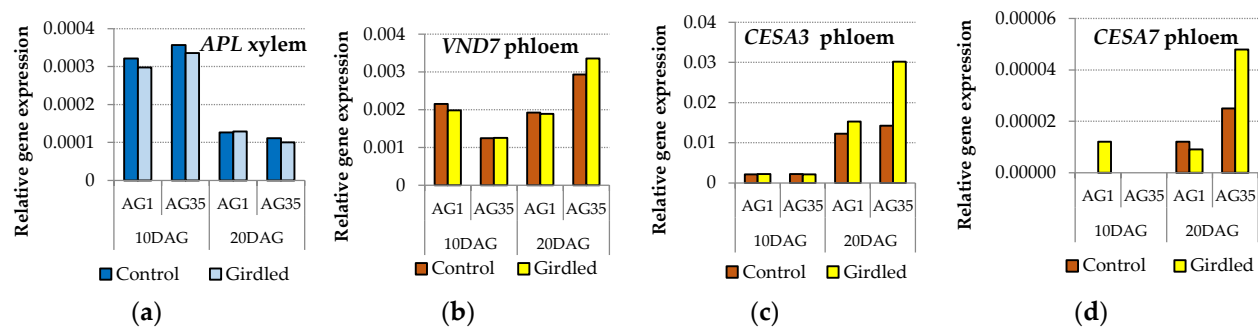
Supplementary Figure S3. Relative gene expression of *SUS2*, *CWINV1* and *CWINV3* genes in the phloem (a – c) and xylem (d – f) of control and girdled trees 10, 20 days after girdling (10DAG, 20DAG, respectively).



Supplementary Figure S4. Relative gene expression of *SUC* (a), *HEX1* (b) and *HEX2* (c) genes in the xylem of control and girdled trees.



Supplementary Figure S5. Relative gene expression of *PIN1* (a), *PIN2* (b) and *PIN3* (c) genes in the xylem of control and girdled trees.



Supplementary Figure S6. Relative gene expression of *APL* (a), *VND7* (b), *CESA3* (c) and *CESA7* (d) genes in the xylem (a) and phloem (b – d) of control and girdled trees.

Supplementary Table S1. The relative water content of bark and wood in control and girdled trees 10, 20, 30 days after girdling (10DAG, 20DAG, 30DAG, respectively) and at the end of the growing season (autumn) 1 and 35 cm above girdle (AG1 and AG35, respectively).

		Bark		Wood	
		AG1	AG35	AG1	AG35
Girdled	10DAG	93.42	98.16	132.30	126.58
		86.59	95.30	118.18	121.31
		97.10	112.16	128.82	132.58
		102.09	109.84	125.64	122.41
		92.44	93.51	98.09	99.61
	20DAG	93.63	113.74	108.96	104.26
		95.30	127.89	80.29	89.91
		79.08	86.48	89.70	80.90
		101.17	110.49	94.14	103.03
		93.02	109.76	94.01	97.56
	30DAG	100.53	114.22	76.79	71.76
		82.34	88.27	73.01	58.25
		122.22	134.16	96.06	87.57
		98.35	102.87	82.09	91.48
		99.08	105.12	72.48	80.52
	autumn	62.04	58.49	70.38	51.38
		75.18	56.53	61.24	45.19
		59.94	60.13	62.58	59.81
		86.42	68.47	94.89	70.34
		64.25	54.69	57.07	48.06
Control	10DAG	106.07	105.30	126.33	127.34
		87.97	94.72	110.43	124.07
		94.91	98.59	141.27	133.26
	20DAG	97.29	94.33	120.71	131.62
		129.54	138.10	87.05	85.13
		112.12	115.45	112.79	105.72
	30DAG	93.39	90.35	82.15	72.20
		97.89	102.87	99.28	79.43
		104.14	104.74	113.34	94.60
	autumn	60.62	58.29	52.01	50.32
		70.97	74.67	49.37	48.33
		50.24		41.98	69.40

Relative water content data indicate that girdling did not have a significant effect on the water content in the bark and wood. The differences in relative humidity between levels AG1 and AG35 in girdled trees were 6–15% in bark and 7–12% in wood, which corresponded to the differences between similar levels in control trees. At the same time, in all samples taken from girdled trees in the first 30 days after girdling, the relative water content of the wood was higher compared to the samples taken after the end of the growing season. This fact indicates the preservation of the transport function of the xylem in girdled trees and the supply of sufficient water to the tissues located above the girdle.