

Table 9 Treatment effects on starch concentration (mg glucose g⁻¹ dry weight) of cane, trunk, and root tissue of Chancellor in 2014 and 2015. Data is separated by tissue type, month, and year due to significant interaction effects.

Treatment ^a	Tissue				Tissue			
	Trunk (mg g ⁻¹)	Cane (mg g ⁻¹)	Root (mg g ⁻¹)	Mean (T) (mg g ⁻¹)	Trunk (mg g ⁻¹)	Cane (mg g ⁻¹)	Root (mg g ⁻¹)	Mean (T) (mg g ⁻¹)
	November 2014				November 2015			
Control	23.4	14.5	101.4	46.4 b	32.2 aB	20.2 aC	68.4 bA	40.3
CT	30.0	12.1	114.3	52.2 a	35.6 aB	18.5 aC	76.8 aA	43.6
ELR-3	33.8	22.1	109.6	55.2 a	32.5 aB	21.2 aC	74.9 aA	42.8
ELR-5	27.2	24.1	113.2	54.8 a	26.2 bB	24.3 aB	69.4 bA	40.0
Mean (tissue)	28.6 B ^b	18.2 C	109.7 A		31.6	21.1	72.4	
<i>P</i> -value T	0.096				0.224			
<i>P</i> -value tissue	< 0.001				< 0.001			
<i>P</i> -value T x tissue	0.510				0.073			
	January 2015				January 2016			
Control	11.6 b ^c A ^d	12.6 aA	NA ^e	12.1	13.2	13.3	NA	13.2
CT	14.1 aA	9.5 bB	NA	11.8	14.3	14.2	NA	14.2
ELR-3	11.1 abA	11.2 aA	NA	11.1	13.1	13.8	NA	13.4
ELR-5	12.8 abA	11.0 abA	NA	12.0	12.6	12.8	NA	12.7
Mean (tissue)	12.4	11.1	NA		13.3	13.5	NA	
<i>P</i> -value T	0.697				0.202			
<i>P</i> -value tissue	0.064				0.683			
<i>P</i> -value T x tissue	0.046				0.943			
	April 2015				April 2016			
Control	15.3	14.4	71.9	33.9	19.1 aB	19.4 aB	68.1 cA	35.5
CT	18.0	14.7	61.4	31.4	21.7 aB	20.4 aB	88.6 aA	43.6
ELR-3	18.3	23.1	70.9	37.4	20.4 aB	23.4 aB	78.8 bA	40.8
ELR-5	15.3	68.0	71.1	33.5	20.2 aB	24.0 aB	74.3 bA	39.5
Mean (Tissue)	16.7 B	17.3 B	68.8 A		21.8	20.3	77.4	
<i>P</i> -value T	0.469				0.002			
<i>P</i> -value tissue	< 0.001				< 0.001			
<i>P</i> -value T x tissue	0.797				0.002			

^aCT = cluster thinning at E-L 31 (Coombe 1995); ELR-3 = 3 leaves removed at E-L,19; ELR-5 = 5 leaves removed at E-L 19

^bMain effects means followed by different letters are significantly different (Tukey's HSD test, $P < 0.10$).

^cDifferent lowercase letters indicate mean differences within each tissue for the treatment main effect (i.e., means between rows) at $P = 0.10$

^dDifferent uppercase letters indicate mean differences within each treatment for the tissue main effect (i.e., means between columns) at $P = 0.10$

^eNA: roots were not collected due to frozen soil

Table 10 Treatment effects on sucrose concentration ($\mu\text{g g}^{-1}$ dry weight) of cane, trunk, and root tissue of Chancellor in 2014 and 2015. Data is separated by tissue type, month, and year due to significant interaction effects.

Treatment ^a	Tissue	Trunk	Cane	Root	Mean (T)	Trunk	Cane	Root	Mean (T)
		($\mu\text{g g}^{-1}$)	($\mu\text{g g}^{-1}$)	($\mu\text{g g}^{-1}$)	($\mu\text{g g}^{-1}$)	($\mu\text{g g}^{-1}$)	($\mu\text{g g}^{-1}$)	($\mu\text{g g}^{-1}$)	($\mu\text{g g}^{-1}$)
November 2014					November 2015				
Control		5737.87 a ^c A ^d	5366.56 bA	4359.60 aA	5154.68	2531.73 bB	5008.82 aA	2853.71 bB	3464.75
CT		5649.42 aA	3973.50 bB	5527.90 aA	5050.27	4278.69 aA	5007.43 aA	3617.99 abB	4301.37
ELR-3		2715.83 bC	6400.71 aA	4677.21 aB	4597.94	2354.85 bB	4288.56 aA	4096.66 aA	3580.02
ELR-5		3657.28 bB	5237.67 bA	5263.81 aA	4719.59	3611.15 abB	4941.29 aA	3468.15 abB	4006.93
Mean (tissue)		4440.10	5244.61	4957.94		3194.15	4811.52	3509.13	
<i>P</i> -value T		0.647				0.053			
<i>P</i> -value tissue		0.187				< 0.001			
<i>P</i> -value T x tissue		0.002				0.047			
January 2015					January 2016				
Control		5082.88	7653.46	NA ^e	6368.17 a	11805.00 aA	3325.35 aB	NA	7565.13
CT		7491.82	6854.24	NA	6279.88 a	1087.02 bA	4656.12 aA	NA	2871.57
ELR-3		4424.63	6811.72	NA	5618.18 ab	422.91 bA	3467.77 aA	NA	1945.34
ELR-5		3837.58	6332.02	NA	5084.80 b	95.85 bA	4054.94 aA	NA	2075.19
Mean (tissue)		4762.65 B	6912.86 A	NA		3352.67	3875.94	NA	
<i>P</i> -value T		0.012				0.110			
<i>P</i> -value tissue		< 0.001				0.770			
<i>P</i> -value T x tissue		0.259				0.060			
April 2015					April 2016				
Control		3927.43	8053.17	4369.01	5449.87 ab	4597.82	9745.35	6481.58	6941.58
CT		4777.04	6685.48	4383.74	5282.09 b	4119.50	7133.29	8251.83	6501.54
ELR-3		6212.00	3089.53	5171.93	6121.14 a	4816.04	6427.99	6062.51	5768.85
ELR-5		4148.57	7184.32	5293.05	5541.98 ab	3799.80	26819.00	6750.22	12456.00
Mean (Tissue)		4547.30 A ^b	7444.58 B	4804.43 A		4333.29 B	12531.00 A	6886.54 A	
<i>P</i> -value T		0.090				0.198			
<i>P</i> -value tissue		< 0.001				0.025			
<i>P</i> -value T x tissue		0.107				0.107			

^aCT = cluster thinning at E-L 31 (Coombe 1995); ELR-3 = 3 leaves removed at E-L, 19; ELR-5 = 5 leaves removed at E-L 19

^bMain effects means followed by different letters are significantly different (Tukey's HSD test, $P < 0.10$).

^cDifferent lowercase letters indicate mean differences within each tissue for the treatment main effect (i.e., means between rows) at $P = 0.10$

^dDifferent uppercase letters indicate mean differences within each treatment for the tissue main effect (i.e., means between columns) at $P = 0.10$

^eNA: roots were not collected due to frozen soil

Table 11 Treatment effects on glucose concentration ($\mu\text{g g}^{-1}$ dry weight) of cane, trunk, and root tissue of Chancellor in 2014 and 2015. Data is separated by tissue type, month, and year due to significant interaction effects

Treatment ^a	Tissue	Trunk	Cane	Root	Mean (T)	Trunk	Cane	Root	Mean (T)
		($\mu\text{g g}^{-1}$)	($\mu\text{g g}^{-1}$)	($\mu\text{g g}^{-1}$)	($\mu\text{g g}^{-1}$)	($\mu\text{g g}^{-1}$)	($\mu\text{g g}^{-1}$)	($\mu\text{g g}^{-1}$)	($\mu\text{g g}^{-1}$)
November 2014					November 2015				
Control		6016.68 ab ^{cA} ^d	5191.74 bA	3870.85 aB	5026.42	2613.85 aA	2973.36 aA	927.3 aB	2171.50
CT		6323.16 aB	9131.82 aA	2150.95 bC	5868.64	1951.38 bA	2251.04 bA	329.47 bB	1510.63
ELR-3		5451.05 abA	5637.9 bA	3442.61 abB	4843.86	2592.37 aA	1678.75 cB	1067.97 aC	1779.70
ELR-5		4871.02 bA	5317.81 bA	2606.64 abB	4265.16	1901.09 bB	2471.55 abA	302.34 bC	1558.33
Mean (tissue)		5665.48	6319.82	3017.76		2264.67	2343.67	656.77	
<i>P</i> -value T		0.011				0.002			
<i>P</i> -value tissue		< 0.001				< 0.001			
<i>P</i> -value T x tissue		< 0.001				0.007			
January 2015					January 2016				
Control		8174.71 aA	6912.81 aA	NA ^e	7543.76	4968.96	12539.37	NA	8754.16
CT		6479.88 abA	7463.68 aA	NA	6971.78	3972.56	11216.27	NA	7594.41
ELR-3		6393.27 abA	7791.89 abA	NA	7092.58	4478.17	16184.53	NA	10331
ELR-5		5251.27 bB	8575.91 abA	NA	6913.59	2065.91	11263.14	NA	6664.52
Mean (tissue)		6574.78	7686.07	NA		3871.40 b	12800.82 a	NA	
<i>P</i> -value T		0.829				0.150			
<i>P</i> -value tissue		0.047				< 0.001			
<i>P</i> -value T x tissue		0.044				0.499			
April 2015					April 2016				
Control		2668.05 bA	1195.80 aC	1825.87 cB	1896.57	382.25	250.76	1215.15	616.05 ab
CT		3323.41 aA	1306.23 aC	2600.96 bB	2410.20	345.90	358.00	994.07	565.99 b
ELR-3		3345.76 aA	1099.11 aB	3206.70 aA	2550.52	816.33	412.15	1146.57	791.68 ab
ELR-5		908.16 cB	1439.2 aB	2378.19 bA	1575.18	683.77	559.99	1276.16	839.97 a
Mean (Tissue)		2502.93	1260.09	2502.93		557.06 B ^b	395.23 B	1157.99 A	
<i>P</i> -value T		< 0.001				0.037			
<i>P</i> -value tissue		< 0.001				< 0.001			
<i>P</i> -value T x tissue		< 0.001				0.485			

^aCT = cluster thinning at E-L 31 (Coombe 1995); ELR-3 = 3 leaves removed at E-L, 19; ELR-5 = 5 leaves removed at E-L 19

^bMain effects means followed by different letters are significantly different (Tukey's HSD test, $P < 0.10$).

^cDifferent lowercase letters indicate mean differences within each tissue for the treatment main effect (i.e., means between rows) at $P = 0.10$

^dDifferent uppercase letters indicate mean differences within each treatment for the tissue main effect (i.e., means between columns) at $P = 0.10$

^eNA: roots were not collected due to frozen soil

Table 12 Treatment effects on fructose concentration ($\mu\text{g g}^{-1}$ dry weight) of cane, trunk, and root tissue of Chancellor in 2014 and 2015. Data is separated by tissue type, month, and year due to significant interaction effects

Treatment ^a	Tissue	Trunk	Cane	Root	Mean (T)	Trunk	Cane	Root	Mean (T)
November 2014						November 2015			
Control		6539.24 aA	2604.04 cB	4681.66 aA	4607.98	2682.21 aB	3956.44 aA	2079.92 aC	2906.19
CT		6899.89 aB	9876.46 aA	1978.12 bC	6251.49	1960.75 bB	2952.64 bA	1338.73 bC	2084.04
ELR-3		6170.22 aA	6551.22 bA	4260.55 aA	5660.66	2535.11 abA	1582.27 cB	2329.71 aA	2149.03
ELR-5		5626.10 aA	6787.95 bA	2833.59 abB	5082.55	2021.38 abB	2756.4 bA	1407.8 bC	2061.86
Mean (tissue)		6308.86	6454.67	3438.48		2299.86	2811.94	1789.04	
<i>P</i> -value T		0.203				< 0.001			
<i>P</i> -value tissue		< 0.001				< 0.001			
<i>P</i> -value T x tissue		0.001				< 0.001			
January 2015						January 2016			
Control		7709.89 aA	8742.77 bA	NA ^e	8222.83	4449.96	10537.00	NA	7493.44
CT		7391.82 aB	9086.16 bA	NA	8238.99	3690.11	9406.29	NA	6548.20
ELR-3		7146.51 aB	10478.00 aA	NA	8812.47	3873.65	11719.00	NA	7796.37
ELR-5		6323.96 aB	11384.00 aA	NA	8853.83	2948.02	12825.00	NA	7886.48
Mean (tissue)		7141.05	9992.76	NA		3740.44 B	11122.00 A	NA	
<i>P</i> -value T		0.564				0.501			
<i>P</i> -value tissue		< 0.001				< 0.001			
<i>P</i> -value T x tissue		0.012				0.157			
April 2015						April 2016			
Control		4043.42 bcA	2767.87 aB	3449.14 bB	3420.14	1813.26	1304.64	2608.25	1908.38
CT		4694.72 bA	2518.35 aC	6532.58 aB	4581.88	1478.16	1364.24	2196.72	1679.71
ELR-3		6212.00 aA	3089.53 aB	7223.04 aA	5508.19	2377.22	1240.28	2562.75	2060.08
ELR-5		2560.34 cB	2965.90 aA	5703.40 aA	3743.21	1749.45	589.29	2847.16	1740.64
Mean (Tissue)		4377.62	2835.41	4377.62		1854.82 B ^b	1126.61 C	2560.47 A	
<i>P</i> -value T		< 0.001				0.449			
<i>P</i> -value tissue		< 0.001				< 0.001			
<i>P</i> -value T x tissue		< 0.001				0.275			

^aCT = cluster thinning at E-L 31 (Coombe 1995); ELR-3 = 3 leaves removed at E-L,19; ELR-5 = 5 leaves removed at E-L 19

^bMain effects means followed by different letters are significantly different (Tukey's HSD test, $P < 0.10$).

^cDifferent lowercase letters indicate mean differences within each tissue for the treatment main effect (i.e., means between rows) at $P = 0.10$

^dDifferent uppercase letters indicate mean differences within each treatment for the tissue main effect (i.e., means between columns) at $P = 0.10$

^eNA: roots were not collected due to frozen soil

Table 13 Treatment effects on stachyose concentration ($\mu\text{g g}^{-1}$ dry weight) of cane, trunk, and root tissue of Chancellor in 2014 and 2015. Data is separated by tissue type, month, and year due to significant interaction effects

Treatment ^a	Tissue	Trunk	Cane	Root	Mean (T)	Trunk	Cane	Root	Mean (T)
		($\mu\text{g g}^{-1}$)	($\mu\text{g g}^{-1}$)	($\mu\text{g g}^{-1}$)	($\mu\text{g g}^{-1}$)	($\mu\text{g g}^{-1}$)	($\mu\text{g g}^{-1}$)	($\mu\text{g g}^{-1}$)	($\mu\text{g g}^{-1}$)
November 2014					November 2015				
Control		836.73 a ^c B ^d	1053.82 aAB	1211.66 aA	1034.07	357.84	562.61	583.22	501.22 ab
CT		931.50 aA	996.47 abA	931.60 bA	953.19	483.40	694.27	733.85	637.17 a
ELR-3		331.04 bC	690.42 cB	1066.43 abA	695.96	291.47	477.36	694.94	487.92 b
ELR-5		419.33 bC	762.99 bcB	1271.99 abA	818.10	282.33	648.62	722.76	551.24 a
Mean (tissue)		629.65	875.92	1120.42		353.76 b	595.71 a	683.69 a	
<i>P</i> -value T		0.002				0.052			
<i>P</i> -value tissue		< 0.001				< 0.001			
<i>P</i> -value T x tissue		0.008				0.491			
January 2015					January 2016				
Control		436.15	1001.31	NA ^e	718.73	258.60	551.36	NA	404.98
CT		512.80	903.45	NA	708.13	279.85	566.84	NA	423.34
ELR-3		597.63	1021.24	NA	809.44	352.02	615.42	NA	483.72
ELR-5		477.95	1048.96	NA	763.46	274.28	807.56	NA	540.92
Mean (tissue)		506.13 B	993.74 A	NA		291.19 B	635.30 A	NA	
<i>P</i> -value T		0.483				0.221			
<i>P</i> -value tissue		< 0.001				< 0.001			
<i>P</i> -value T x tissue		0.472				0.203			
April 2015					April 2016				
Control		357.39	456.87	1089.99	634.75 ab	232.21	362.92	892.55	495.89 ab
CT		278.35	408.89	1038.82	575.35 b	239.63	272.06	970.09	493.93 b
ELR-3		391.76	564.02	1286.97	747.58 a	355.67	498.67	1050.07	634.80 a
ELR-5		246.92	653.64	1310.61	737.06 a	245.55	258.67	892.73	465.65 b
Mean (Tissue)		318.61 B	520.86 B	1181.60 A		268.26 B	348.08 B	951.36 A	
<i>P</i> -value T		0.034				0.034			
<i>P</i> -value tissue		< 0.001				< 0.001			
<i>P</i> -value T x tissue		0.893				0.894			

^aCT = cluster thinning at E-L 31 (Coombe 1995); ELR-3 = 3 leaves removed at E-L,19; ELR-5 = 5 leaves removed at E-L 19

^bMain effects means followed by different letters are significantly different (Tukey's HSD test, $P < 0.10$).

^cDifferent lowercase letters indicate mean differences within each tissue for the treatment main effect (i.e., means between rows) at $P = 0.10$

^dDifferent uppercase letters indicate mean differences within each treatment for the tissue main effect (i.e., means between columns) at $P = 0.10$

^eNA: roots were not collected due to frozen soil

Table 14 Treatment effects on raffinose concentration ($\mu\text{g g}^{-1}$ dry weight) of cane, trunk, and root tissue of Chancellor in 2014 and 2015. Data is separated by tissue type, month, and year due to significant interaction effects

Treatment ^a	Tissue				Tissue			
	Trunk ($\mu\text{g g}^{-1}$)	Cane ($\mu\text{g g}^{-1}$)	Root ($\mu\text{g g}^{-1}$)	Mean (T) ($\mu\text{g g}^{-1}$)	Trunk ($\mu\text{g g}^{-1}$)	Cane ($\mu\text{g g}^{-1}$)	Root ($\mu\text{g g}^{-1}$)	Mean (T) ($\mu\text{g g}^{-1}$)
	November 2014				November 2015			
Control	1238.77 a ^c A ^d	1300.34 aA	464.62 aB	1001.24	344.63	1149.39	381.19	625.07 ab
CT	1145.39 aA	1271.79 aA	218.56 bB	878.58	523.94	1327.83	514.91	788.89 a
ELR-3	161.40 bC	998.05 bA	413.00 abB	524.15	208.63	958.56	454.47	540.55 b
ELR-5	172.11 bC	791.04 bA	477.49 aB	480.21	246.21	1322.34	408.57	659.04 a
Mean (tissue)	679.42	1090.31	477.49		330.85 B	1189.53 A	439.78 A	
<i>P</i> -value T	< 0.001				0.009			
<i>P</i> -value tissue	< 0.001				< 0.001			
<i>P</i> -value T x tissue	< 0.001				0.192			
	January 2015				January 2016			
Control	255.60	1700.64	NA ^e	978.12	364.52 aB	872.13 bA	NA	618.32
CT	389.51	1708	NA	1048.75	257.03 aB	963.40 bA	NA	610.22
ELR-3	246.26	1669.93	NA	958.09	257.23 aB	922.94 bA	NA	590.09
ELR-5	316.28	1844.09	NA	1080.19	204.02 aB	1408.62 aA	NA	806.32
Mean (tissue)	301.91 B ^b	1730.67 A	NA		270.70	1041.77	NA	
<i>P</i> -value T	0.272				0.082			
<i>P</i> -value tissue	< 0.001				< 0.001			
<i>P</i> -value T x tissue	0.519				0.005			
	April 2015				April 2016			
Control	195.16 aC	1245.19 aA	897.54 bB	779.30	297.11	1029.05	566.14	630.77
CT	147.55 bC	807.65 aB	1133.91 abA	696.37	382.06	666.14	598.48	548.89
ELR-3	243.81 aB	1211.03 aA	1073.85 abA	842.90	339.7	793.27	623.89	585.62
ELR-5	203.65 aB	1174.86 aA	1230.37 aA	869.63	178.24	850.34	542.37	523.65
Mean (Tissue)	197.54	1109.68	1083.92		299.28 C	834.70 A	582.72 B	
<i>P</i> -value T	0.019				0.449			
<i>P</i> -value tissue	< 0.001				< 0.001			
<i>P</i> -value T x tissue	< 0.001				0.142			

^aCT = cluster thinning at E-L 31 (Coombe 1995); ELR-3 = 3 leaves removed at E-L, 19; ELR-5 = 5 leaves removed at E-L 19

^bMain effects means followed by different letters are significantly different (Tukey's HSD test, $P < 0.10$).

^cDifferent lowercase letters indicate mean differences within each tissue for the treatment main effect (i.e., means between rows) at $P = 0.10$

^dDifferent uppercase letters indicate mean differences within each treatment for the tissue main effect (i.e., means between columns) at $P = 0.10$

^eNA: roots were not collected due to frozen soil