

1 Supplementary Table 1. Summer labeled and unlabeled $\delta^{13}\text{C}$ means and standard deviations of PLFA biomarkers (n=3). ND indicates
 2 marker values that were not detected. Bold values indicate a significant difference between labeled and unlabeled ^{13}C . AMF=
 3 arbuscular mycorrhizal fungi, G- = gram negative bacteria, G+ = gram positive bacteria.
 4

	0-10 cm		10-30 cm		30-60 cm		60-90 cm		90-120 cm		120-150 cm	
	unlabeled	labeled	unlabeled	labeled	unlabeled	labeled	unlabeled	labeled	unlabeled	labeled	unlabeled	labeled
Actinomycetes												
10ME16:0	-16.9 + 0.5	-16.7 + 0.3	-16.7 + 7.1	-16.4 + 0.1	-14.3 + 0.5	-14.7 + 0.2	-16.4 + 0.3	-16.5 + 0.5	-16.6 + 0.5	-17.1 + 0.4	-17.7 + 0.1	-17.6 + 0.5
10ME17:0	-17.9 + 0.6	-17.7 + 0.1	-16.9 + 0.4	-17.0 + 0.1	-15.9 + 0.5	-16.1 + 0.4	-16.8 + 0.7	-17.1 + 0.5	-16.9 + 0.8	-16.7 + 0.8	-18.0 + 0.7	-17.9 + 1.5
10ME18:0	-16.1 + 0.6	-17.8 + 0.7	-16.1 + 1.5	-16.4 + 0.8	-13.2 + 1.51	-14.2 + 1.1	-12.2 + 1.1	-14.0 + 0.3	-12.7 + 0.7	-14.0 + 1.2	-14.0 + 0.1	-14.4 + 1.4
AMF												
16:1w5	-14.8 + 0.7	-10.5 + 1.7	-14.8 + 1.3	-12.3 + 0.7	-13.5 + 0.4	-13.0 + 1.2	-15.6 + 0.7	-14.8 + 0.62	-17.2 + 0.9	-15.3 + 2.4	-18.0 + 0.6	-18.1 + 1.3
20:1	-16.8 + 1.1	-14.9 + 3.1	-18.3 + 2.4	-18.3 + 0.4	-19.8 + 2.1	-19.6 + 0.9	-19.3 + 2.2	ND	-18.3 + 2.7	-22.1 + 0.1	ND	ND
20:4w3	-15.6 + 0.8	-14.0 + 0.5	-17.0 + 2.7	-16.2 + 0.9	-15.9 + 0.6	ND	ND	ND	ND	ND	ND	ND
20:4w6	-16.0 + 0.5	-17.8 + 0.4	-18.4 + 3.5	-18.5 + 0.9	-16.3 + 0.1	-18.7 + 0.2	-16.7 + 0.6	ND	ND	ND	ND	ND
Bacteria												
14:0	-16.2 + 0.2	-16.4 + 1.2	-17.8 + 0.5	-18.6 + 1.3	-15.4 + 0.2	-16.9 + 1.9	-19.5 + 0.3	-18.8 + 1.5	-20.7 + 1.1	-18.5 + 0.1	-20.1 + 2.4	-19.9 + 1.6
15:0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-17.3 + 0.5	-18.9 + 1.3
17:0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
18:0	-16.4 + 0.4	-15.3 + 0.2	-16.7 + 1.0	-16.2 + 0.6	-14.4 + 0.6	-14.7 + 0.4	-17.0 + 0.4	-16.4 + 1.5	-17.6 + 0.6	-16.3 + 1.9	-18.7 + 1.0	-20.6 + 2.1
Saprotrophic Fungi												
18:2w9,12	-16.0 + 0.7	-9.1 + 2.9	-17.4 + 2.4	-13.6 + 3.1	-18.1 + 1.7	-14.2 + 2.6	-19.4 + 3.5	-18.5 + 3.4	-20.2 + 1.9	-18.5 + 1.0	-19.6 + 0.8	-21.4 + 3.0
18:3w3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
c18:1w9	-15.3 + 0.2	-13.1 + 0.6	-16.7 + 1.3	-14.7 + 0.2	-14.7 + 1	-13.9 + 0.6	-15.9 + 0.5	-15.1 + 1.7	-16.6 + 0.5	-15.2 + 2.1	-17.8 + 0.8	-17.8 + 0.8
G-												
16:1w7	-18.2 + 0.2	-16.1 + 0.9	-19.4 + 1.5	-18.9 + 0.7	-18.5 + 0.3	-18.2 + 1.3	-20.9 + 1.3	-19.6 + 2.0	-22.7 + 0.7	-20.2 + 3.4	-23.0 + 0.8	-21.4 + 1.6
17:0cy	-16.7 + 0.4	-16.2 + 0.7	-16.9 + 0.4	-16.7 + 1.2	-15.8 + 1.6	-15.0 + 0.4	-18.5 + 1.8	-17.9 + 1.3	-18.7 + 1.6	-17.6 + 0.1	-19.2 + 0.2	-17.5 + 1.9
19:0cy	-19.1 + 0.5	-19.6 + 0.9	-18.9 + 0.4	-19.5 + 0.1	-17.3 + 0.3	-17.9 + 0.3	-19.1 + 0.5	-18.3 + 1.4	-19.8 + 0.5	-20.1 + 0.6	-20.1 + 1.3	-21.2 + 0.6
c18:1w7	-16.7 + 0.2	-13.4 + 0.5	-18.7 + 0.1	-16.6 + 0.7	-17.1 + 2.3	-15.2 + 1.2	-17.0 + 0.4	-14.8 + 1.7	-16.9 + 1.2	-14.5 + 3.6	-18.0 + 0.2	-16.6 + 1.1
G+												
a-15:0	-14.1 + 0.3	-12.9 + 0.5	-14.4 + 0.8	-13.3 + 0.6	-11.9 + 1.1	-12.1 + 0.8	-13.5 + 0.9	-13.2 + 1.6	-14.9 + 0.6	-15.6 + 4.0	-15.8 + 0.3	-15.0 + 0.9
a-17:0	-14.8 + 0.3	-14.2 + 0.4	-14.4 + 0.7	-14.0 + 0.5	-13.0 + 0.6	-12.9 + 0.2	-14.3 + 0.4	-14.1 + 0.4	-14.7 + 0.7	-14.0 + 0.3	-15.9 + 0.3	ND
i-15:0	-15.8 + 0.1	-15.6 + 0.7	-16.9 + 0.4	-15.9 + 0.4	-14.9 + 0.1	-15.0 + 0.4	-16.6 + 0.3	-17.1 + 0.3	-18.0 + 0.6	-17.7 + 1.3	-18.9 + 1.4	-19.4 + 1.6
i-16:0	-15.7 + 0.4	-15.1 + 0.6	-16.0 + 1.0	-16.1 + 0.5	-14.1 + 0.7	-15.0 + 0.7	-15.9 + 0.3	-16.1 + 0.5	-16.4 + 0.5	-16.2 + 1.7	-17.4 + 0.6	-17.2 + 0.3
i-17:0	-16.7 + 0.2	-16.4 + 0.4	-17.2 + 0.5	-16.5 + 0.3	-15.8 + 0.7	-15.8 + 0.2	-17.4 + 0.6	-17.8 + 0.5	-18.3 + 0.7	-19.3 + 0.7	-20.8 + 0.3	-22.6 + 3.5

Universal

C16:0

-16.2 + 0.2

-11.3 + 1.8

-16.5 + 0.8

-14.3 + 0.3

-15.0 + 0.6

-14.1 + 0.9

-16.5 + 0.6

-16.4 + 0.3

-17.3 + 0.6

-16.5 + 1.3

-18.3 + 0.0

-17.7 + 1.1

1 Supplementary Table 2. Kanlow labeled and unlabeled $\delta^{13}\text{C}$ means and standard deviations of PLFA biomarkers (n=3). ND indicates
 2 marker values that were not detected. Bold values indicate a significant difference between labeled and unlabeled ^{13}C . AMF=
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	0-10 cm		10-30 cm		30-60 cm		60-90 cm		90-120 cm		120-150 cm	
	unlabeled	labeled	unlabeled	labeled	unlabeled	labeled	unlabeled	labeled	unlabeled	labeled	unlabeled	labeled
Actinomycetes												
10ME16:0	-16.9 + 0.5	-16.7 + 0.3	-16.6 + 7.1	-16.4 + 0.1	-14.3 + 0.5	-14.7 + 0.2	-16.4 + 0.3	-16.5 + 0.5	-16.6 + 0.5	-17.1 + 0.4	-17.6 + 0.1	-17.6 + 0.5
10ME17:0	-17.9 + 0.6	-17.7 + 0.1	-16.9 + 0.4	-17.0 + 0.1	-15.9 + 0.5	-16.1 + 0.4	-16.8 + 0.7	-17.1 + 0.5	-16.9 + 0.8	-16.7 + 0.8	-18.0 + 0.7	-17.9 + 1.5
10ME18:0	-16.1 + 0.6	-17.8 + 0.7	-16.1 + 1.5	-16.4 + 0.8	-13.2 + 1.5	-14.2 + 1.1	-12.2 + 1.1	-14.0 + 0.3	-12.7 + 0.7	-14.0 + 1.2	-13.9 + 0.1	-14.4 + 1.4
AMF												
16:1w5	-14.8 + 0.7	-10.5 + 1.7	-14.8 + 1.3	-12.3 + 0.7	-13.5 + 0.4	-13.0 + 1.2	-15.6 + 0.7	-14.8 + 0.6	-17.2 + 0.9	-15.3 + 2.4	-18.0 + 0.6	-18.1 + 1.1
20:1	-16.8 + 1.1	-14.9 + 3.1	-18.3 + 2.4	-18.3 + 0.4	-19.8 + 2.1	-19.6 + 0.9	-19.3 + 2.2	ND	-18.3 + 2.7	-22.1 + 0.1	ND	ND
20:4w3	-15.6 + 0.8	-14.0 + 0.5	-17.0 + 2.7	-16.2 + 0.9	-15.9 + 0.6	ND	ND	ND	ND	ND	ND	ND
20:4w6	-16.0 + 0.5	-17.8 + 0.4	-18.4 + 3.5	-18.5 + 0.9	-16.3 + 0.1	-18.7 + 0.2	-16.7 + 0.6	ND	ND	ND	ND	ND
Bacteria												
14:0	-16.2 + 0.2	-16.4 + 1.2	-17.8 + 0.5	-18.6 + 1.3	-15.4 + 0.2	-16.9 + 1.9	-19.5 + 0.3	-18.8 + 1.5	-20.7 + 1.1	-18.5 + 0.1	-20.1 + 2.4	-19.9 + 1.6
15:0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-17.3 + 0.5	-18.9 + 1.3
17:0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
18:0	-16.4 + 0.3	-15.3 + 0.2	-16.7 + 1.0	-16.2 + 0.6	-14.4 + 0.6	-14.7 + 0.4	-17.0 + 0.4	-16.4 + 1.5	-17.6 + 0.6	-16.5 + 1.9	-18.7 + 1.0	-20.6 + 2.1
Saprotrophic Fungi												
18:2w9,12	-16.0 + 0.7	-9.0 + 2.9	-17.4 + 2.0	-13.6 + 3.1	-18.1 + 1.7	-14.2 + 2.6	-19.4 + 3.5	-18.5 + 3.4	-20.2 + 1.9	-18.5 + 1.0	-19.6 + 0.8	-21.4 + 3.0
18:3w3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
c18:1w9	-15.3 + 0.2	-13.1 + 0.6	-16.7 + 1.3	-14.7 + 0.2	-14.7 + 1.0	-13.9 + 0.6	-15.9 + 0.5	-15.1 + 1.7	-16.6 + 0.5	-15.2 + 2.1	-17.8 + 0.8	-17.8 + 0.8
G-												
16:1w7	-18.2 + 0.2	-16.1 + 0.9	-19.4 + 1.5	-18.9 + 0.7	-18.5 + 0.3	-18.2 + 1.3	-20.9 + 1.3	-19.6 + 2.0	-22.7 + 0.7	-20.2 + 3.4	-23.0 + 0.8	-21.4 + 1.6
17:0cy	-16.7 + 0.4	-16.2 + 0.7	-16.9 + 0.4	-16.7 + 1.2	-15.8 + 1.6	-15.0 + 0.4	-18.5 + 1.8	-17.9 + 1.3	-18.7 + 1.6	-17.6 + 0.1	-19.2 + 0.2	-17.5 + 1.9
19:0cy	-19.1 + 0.5	-19.6 + 0.9	-18.9 + 0.4	-19.5 + 0.1	-17.3 + 0.3	-17.9 + 0.3	-19.1 + 0.5	-18.3 + 1.4	-19.8 + 0.5	-20.1 + 0.6	-20.1 + 1.3	-21.2 + 0.6
c18:1w7	-16.7 + 0.2	-13.4 + 0.5	-18.7 + 0.1	-16.6 + 0.7	-17.1 + 2.3	-15.2 + 1.2	-17.0 + 0.4	-14.8 + 1.7	-16.9 + 1.2	-14.5 + 3.6	-18.0 + 0.2	-16.6 + 1.1
G+												
a-15:0	-14.1 + 0.3	-12.9 + 0.5	-14.4 + 0.8	-13.3 + 0.6	-11.9 + 1.1	-12.1 + 0.8	-13.5 + 0.9	-13.2 + 1.6	-14.9 + 0.6	-15.6 + 4.0	-15.8 + 0.3	-15.0 + 0.9
a-17:0	-14.8 + 0.3	-14.2 + 0.4	-14.4 + 0.7	-14.0 + 0.5	-13.0 + 0.6	-12.9 + 0.2	-14.3 + 0.4	-14.1 + 0.4	-14.7 + 0.7	-14.0 + 0.3	-15.9 + 0.3	ND
i-15:0	-15.8 + 0.1	-15.6 + 0.7	-16.9 + 0.4	-15.9 + 0.4	-14.9 + 0.1	-15.0 + 0.4	-16.6 + 0.3	-17.1 + 0.3	-18.0 + 0.6	-17.7 + 1.3	-18.9 + 1.4	-19.4 + 1.6
i-16:0	-15.7 + 0.4	-15.1 + 0.6	-16.0 + 1.0	-16.1 + 0.5	-14.1 + 0.7	-15.0 + 0.7	-15.9 + 0.3	-16.1 + 0.5	-16.4 + 0.5	-16.2 + 1.7	-17.4 + 0.6	-17.2 + 0.3
i-17:0	-16.7 + 0.2	-16.4 + 0.4	-17.2 + 0.5	-16.5 + 0.3	-15.8 + 0.7	-15.8 + 0.2	-17.4 + 0.6	-17.8 + 0.5	-18.3 + 0.7	-19.3 + 0.7	-20.8 + 0.3	-22.6 + 3.5

Universal

C16:0 **-16.2 + 0.2** **-11.3 + 1.8** **-16.5 + 0.8** **-14.3 + 0.3** **-15.0 + 0.6** **-14.1 + 0.9** -16.5 + 0.6 -16.4 + 0.3 -17.3 + 0.6 -16.5 + 1.3 -18.3 + 0.0 -17.7 + 1.1
