Figure S1

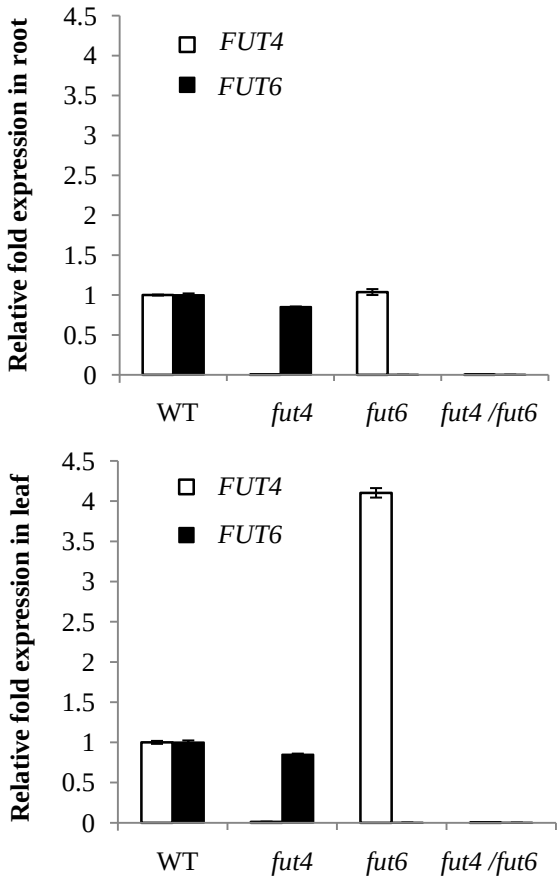


Figure S1. RT-qPCR analysis of *FUT4* and *FUT6* mRNA level in root and leaf tissues of Arabidopsis wild type and *fut4*, *fut6* and *fut4/fut6* double mutant plants.

Figure S2

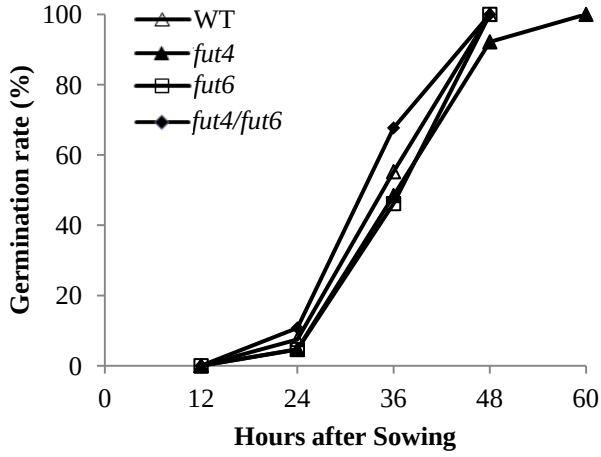


Figure S2. Germination rate of Arabidopsis *fut4*, *fut6* and *fut4/fut6* double mutant and wild type plants. Plant seeds were sown on MS plates containing 0.5% sucrose. Over 50 seeds were analyzed for each line.

Figure S3

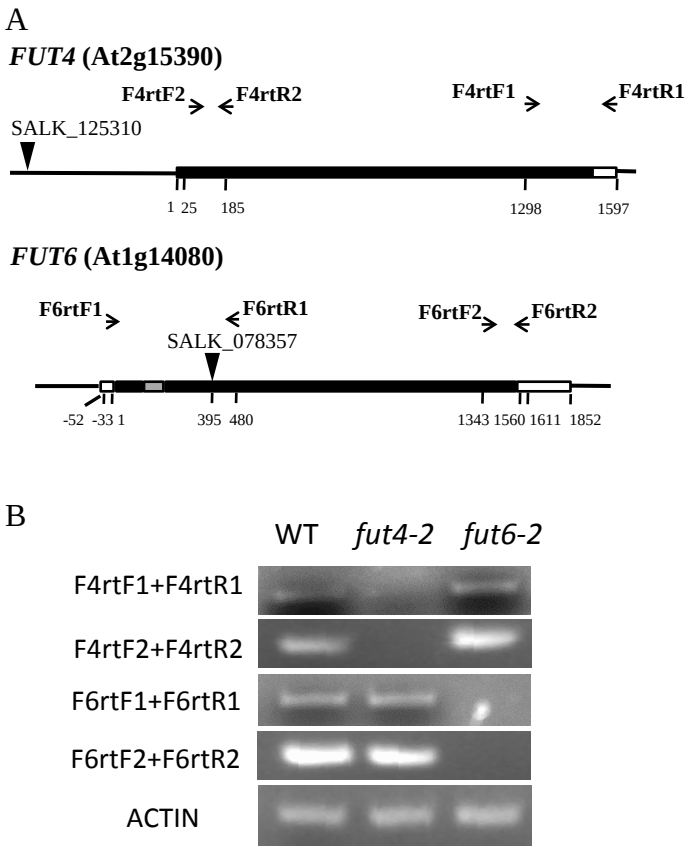


Figure S3. RNA transcript levels of *FUT4* and *FUT6* genes in homozygous *fut4-2*, *fut6-2* mutant and wild type seedlings. A, Schematic diagrams of mutant *FUT4* and *FUT6* genes with T-DNA insertions. Black box, grey box and white box represent exons, introns and untranslated regions, respectively. B, RT-PCR of total RNAs isolated from Arabidopsis seedlings 15 DAG. Positions of the RT-PCR primers are shown in A with arrows. *ACTIN* was used as a control for loading.

Figure S4

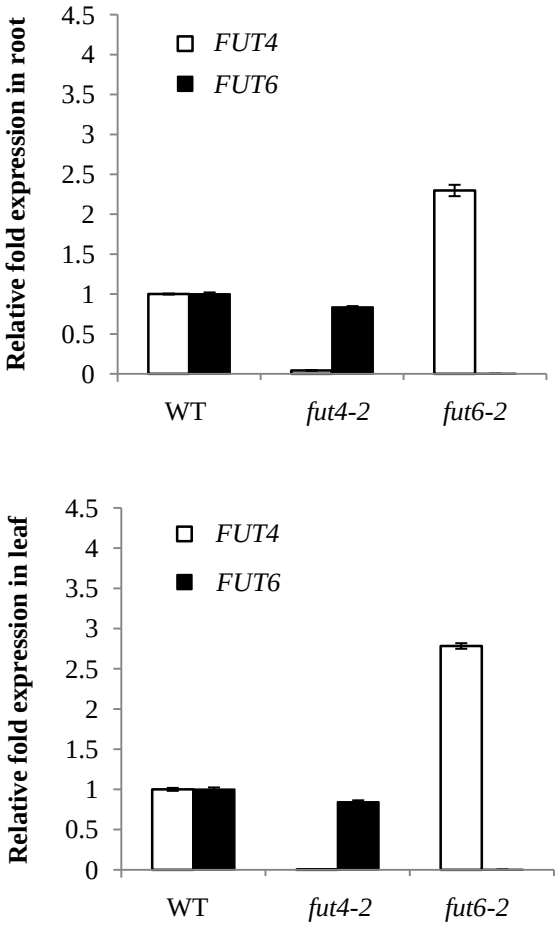


Figure S4. RT-qPCR analysis of *FUT4* and *FUT6* mRNA level in root and leaf tissues of Arabidopsis wild type and *fut4-2* and *fut6-2* mutant plants.

Figure S5

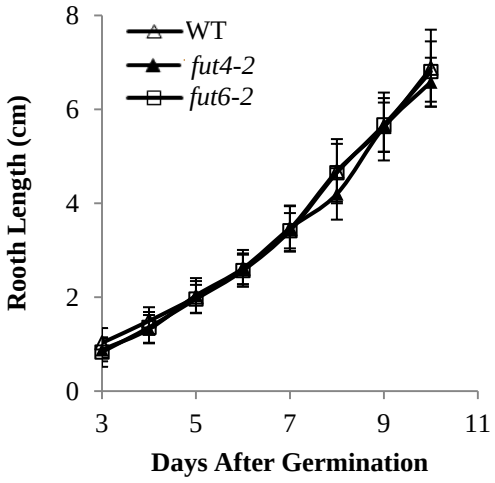


Figure S5. Root growth of Arabidopsis wild type, *fut4-2, fut6-2* mutant plants. Plants were grown on MS plates containing 0.5% sucrose. Root length was measured daily as a function of time from 3-10 DAG. Values shown were averages of data from over 24 individual plants per line, with standard errors shown as error bars.

Figure S6

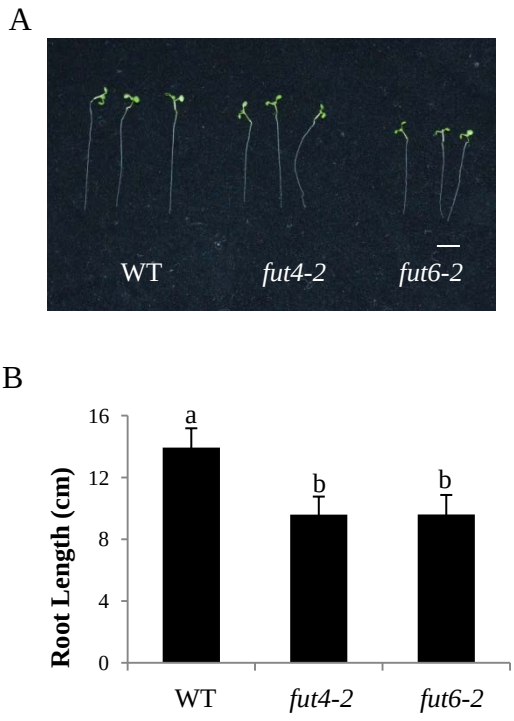


Figure S6. Root length measurement of Arabidopsis *fut4-2*, *fut6-2* and wild type plants grown under salt stress. Arabidopsis seeds were germinated on NaCl-free MS plates and then transferred to MS plates containing 150 mM NaCl on the 3 DAG. A, Seedling images of wild type, *fut4-2* and *fut6-2* mutant plants on the 10th day after transfer. Three representative seedlings of each plant line were photographed. Scale bar, 3 cm. B, Measurement of primary root length on the 10th day after transfer. Data and error bars represent mean $\pm$ SD (n = 31). Values annotated with different letters are significantly different ($P < 0.01$; Tukey honestly significant difference test).

Table S1

Table S1. Sequence and annealing temperatures of the primers used in this work

Purpose	Name	Primer Sequences (5'→3')	Annealing
Absence of insertion of *FUT4*	F4LP	CCATGTAGTTACATTCCCAACCG	54° C
	F4RP	CCACGTCGATGGAGCCTTGTTT	
Presence of insertion 1 in SAIL_284_B05	LB3	TAGCATCTGAATTTCATAACCAATCTCGATACAC	49° C
	F4RP	GAACATGTTTTCAGAGCGAGC	
Presence of insertion 2 in SAIL_284_B05	LB3	TAGCATCTGAATTTCATAACCAATCTCGATACAC	54° C
	F4LP	CCATGTAGTTACATTCCCAACCG	
Absence of insertion of *FUT6*	F6LP	CACATCTTTCAGATCTCCAGCG	55° C
	F6RP	CTTTCTTGTAAGCATCCGTGC	
Presence of insertion 1 in SALK_099500	LBa1	TGGTTCACGTAGTGGGCCATCG	54° C
	F6RP	CTTTCTTGTAAGCATCCGTGC	
Presence of insertion 2 in SALK_099500	LBa1	TGGTTCACGTAGTGGGCCATCG	54° C
	F6LP	TGTTTTGCTAGCAACGAAAGC	
RT -PCR for *FUT4* 3' end primers	F4rtF1	TGGAGGATTAAAGCCATGGTTAC	52° C
	F4rtR1	AATGAAAAAGGAAGATATATAACA	
RT -PCR for *FUT6* 5' end primers	F6rtF1	TCCAGCGAAGTTTTCAGAGC	52° C
	F6rtR1	CGCAACCCACACAATGTATC	
RT -PCR for *FUT4* 5' end primers	F4rtF2	GCGAAGTTATCAAGGGTTTGGG	58° C
	F4rtR2	CTTGTATCGCAAGCCTTCACC	
RT -PCR for *FUT6* 3' end primers	F6rtF2	TGGAGGATTAAAGCCATGGTTAC	58° C
	F6rtR2	GGATTGTGAGTTATTGAAACAGAGA	
RT -PCR for *ACTIN*	Actin F	GTCGTACTACCGGTATTGTGCTCG	58° C
	Actin R	CGGCGATTCCAGGGAACATTGTGG	
Ubiquitin 10 for RT-qPCR	Ubi F	GTCGACCCTTCACTTGGTGT	58° C
	Ubi R	ATCCTCAAGCTGCTTTCCAG	

Table S2

Table S2. Statistic analysis for comparisons of root length measurements among wild type and *fut4*, *fut4-2*, *fut6*, *fut6-2*, *fut4/fut6* mutant plants grown under salt stress.

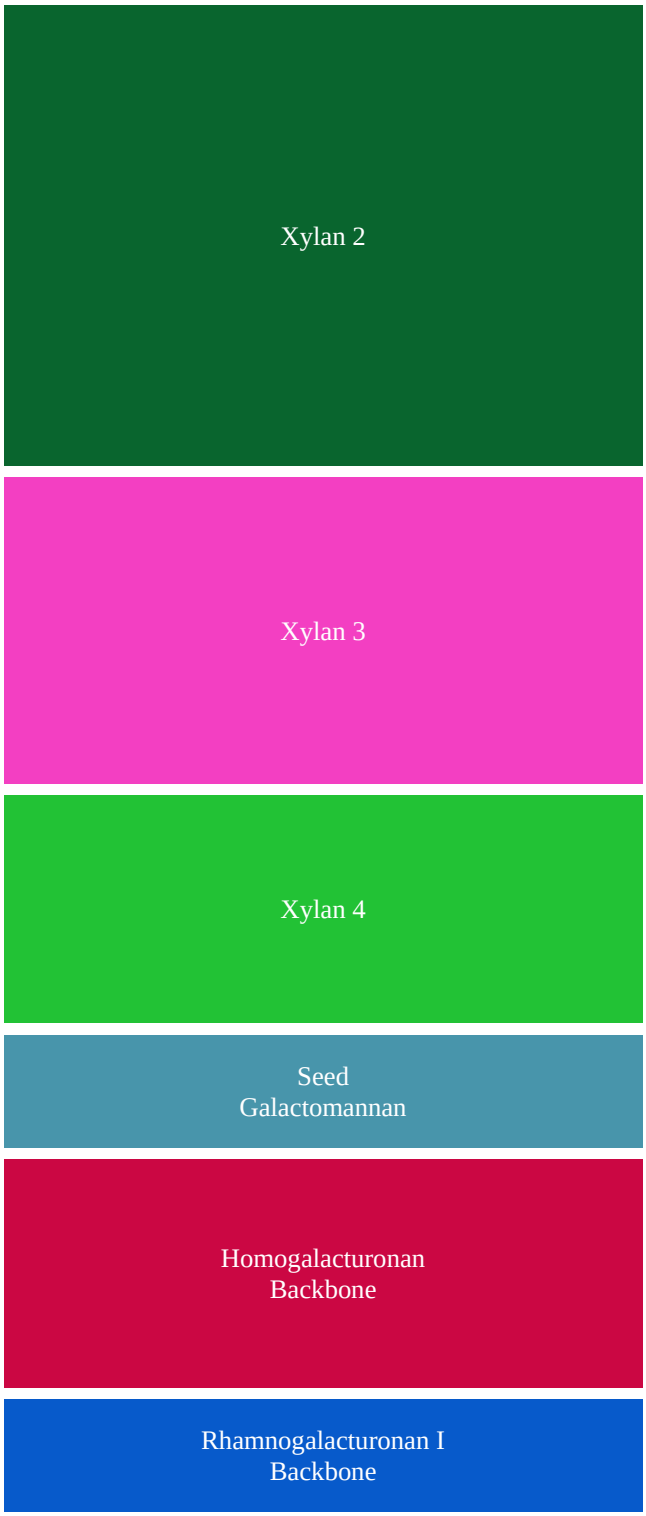
P [a]	WT	*fut4*	*fut4-2*	*fut6*	*fut6-2*	*fut4/fut6*
WT	-	$<10^{-4}$	$<10^{-4}$	$<10^{-4}$	$<10^{-4}$	$<10^{-4}$
fut4	$<10^{-4}$	-	0.9462	0.9909	0.9382	0.0013
fut4-2	$<10^{-4}$	0.9462	-	0.9997	1.0000	$<10^{-4}$
fut6	$<10^{-4}$	0.9909	0.9997	-	0.9995	$<10^{-4}$
fut6-2	$<10^{-4}$	0.9382	1.0000	0.9995	-	$<10^{-4}$
fut4/fut6	$<10^{-4}$	0.0013	$<10^{-4}$	$<10^{-4}$	$<10^{-4}$	-

[a]One-way ANOVA was performed using JMP software and showed significant difference ($P<0.0001$) in root lengths among wild type and mutant lines grown under salt stress (150 mM NaCl). Significant levels of differences in root lengths were subsequently analyzed by Tukey honestly significant difference test as presented in this table. For root measurement data and plant growth conditions see Fig. 5 and Fig. S6.

Table S3

Table S3. Expanded list of all plant cell wall glycan-directed monoclonal antibodies (mAbs) used in this study for glycome profiling (Fig. 7 and Fig. 8).

Glycan Group Recognized	mAb Name[a]
Non-Fucosylated Xyloglucan	CCRC-M54
	CCRC-M48
	CCRC-M49
	CCRC-M96
	CCRC-M50
	CCRC-M51
	CCRC-M53
	CCRC-M100
	CCRC-M103
	CCRC-M58
	CCRC-M86
	CCRC-M55
	CCRC-M52
	CCRC-M99
	CCRC-M95
	CCRC-M101
	CCRC-M104
	CCRC-M89
	CCRC-M93
	CCRC-M87
	CCRC-M88
	CCRC-M57
	CCRC-M90
Fucosylated Xyloglucan	CCRC-M102
	CCRC-M39
	CCRC-M106
	CCRC-M84
	CCRC-M1
Xylan 1/XG	CCRC-M111
	CCRC-M108
	CCRC-M109



CCRC-M119
CCRC-M115
CCRC-M110
CCRC-M105
CCRC-M117
CCRC-M113
CCRC-M120
CCRC-M118
CCRC-M116
CCRC-M114
CCRC-M154
CCRC-M150

CCRC-M160
CCRC-M137
CCRC-M152
CCRC-M149
CCRC-M144
CCRC-M146
CCRC-M145
CCRC-M155

CCRC-M153
CCRC-M151
CCRC-M148
CCRC-M140
CCRC-M139
CCRC-M138

CCRC-M75
CCRC-M70
CCRC-M74

CCRC-M131
CCRC-M38
JIM5
JIM136
JIM7
CCRC-M34

CCRC-M69
CCRC-M35
CCRC-M36

CCRC-M14
CCRC-M129
CCRC-M72
CCRC-M40
CCRC-M98
CCRC-M94
CCRC-M5
CCRC-M2
CCRC-M23
CCRC-M17
CCRC-M19
CCRC-M18
CCRC-M56
CCRC-M16
JIM137
JIM101
CCRC-M61
CCRC-M30
CCRC-M60
CCRC-M41
CCRC-M80
CCRC-M79
CCRC-M44
CCRC-M33
CCRC-M32
CCRC-M13
CCRC-M42
CCRC-M24
CCRC-M12
CCRC-M7
CCRC-M77
CCRC-M25
CCRC-M9
CCRC-M128
CCRC-M126
CCRC-M134
CCRC-M125

CCRC-M123
CCRC-M122
CCRC-M121
CCRC-M112
CCRC-M21
JIM131
CCRC-M22
JIM132
JIM1
CCRC-M15
CCRC-M8
MH4.3E5
JIM16

JIM93
JIM94
JIM11
MAC204
JIM20

JIM14
MAC207
JIM19
JIM12
CCRC-M133
CCRC-M107

JIM4
CCRC-M31
JIM17
CCRC-M26
JIM15
JIM8
CCRC-M85
CCRC-M81
MAC266
PN 16.4B4

JIM133
JIM13
CCRC-M92
CCRC-M91

	CCRC-M78
Unidentified	MAC265 CCRC-M97

[a]The majority of listings link to the Wall*Mab*DB plant cell wall monoclonal antibody database (http://www.wallmabdb.net) that provides detailed descriptions of each mAb, including immunogen, antibody isotype, epitope structure (to the extent known), supplier information, and related literature citations.