

(a)

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TL/Ag      ATGTGGCCCGACGTCGCATGCTCCCCGCACG--GCG-CCGCGGGAATTCGATTCCTTCA 56
P76        ATGGGGCCCGACGCCCGCTGCTCCCCGGACGATGGCGGCCGCGGGAATTCGATTCCTTCA 60
          *** ***** ** . ***** ** ** *****

TL/Ag      AGGAACAGCTCCAGGCAGCATGTGCGCGTCCACGCCATGGAGGCGGTGATGGCCTGCTGG 116
P76        AGGAACAGCTCCAGGCAGCATGTGCGCGTCCACGCCATGGAAGCGGTGATGGCCTGCTGG 120
          ***** . *****

TL/Ag      >>>>>>>>>
P76        GAGCTCGAGCAAACCTGTCAGAGTCTTACAGGGGCATCTCCTGGTGAAGGCACCGGGGCA 176
          GAGCTCGAGCAGACTTTGTCAGAGTCTTACAGGGGCATCTCCTGGTGAAGGCACCGGGGCA 180
          ***** . ** *****

TL/Ag      ACTATGTCCGATGACGAAGACAATCCGGTGCACAGTGAGAGCAACATGTTTCGACGGGAA 236
P76        ACTATGTCTGATGATGAAGACAATCCGGTGCACAGTGAGAGCAACATGTTTCGATGGAAA 240
          ***** ** ** ***** ** **

TL/Ag      CGATGTGTCAGATGGCATGGGCTTCGGAATGCTAACCGAGGGTGAGAGATCCTTGGTCTGA 296
P76        TGATGTGTCAGATGGCATGGGCTTTGGGATGCTAACCGAGGGTGAGAGATCCTTGGTCTGA 300
          ***** ** . *****

TL/Ag      GCGCGTGAGGCAAGAGCTGAAGCATGAGCTTAAACAGGGGTATAGAGAAAAGCTTGTGGA 356
P76        GCGCGTAAGGCAAGAGCTGAAGCATGAGCTTAAACAGGGGTACAGAGAAAAGCTTGTGGA 360
          ***** . *****

TL/Ag      CATCAGGGAGGAGATACTGCGGAAGCGAAGAGCCGGAAAGCTCCAGGGGACACG-CGTC 415
P76        CATCAGGGAGGAGATGCTGAGGAAGCGAAGAGCCGGAAAGCTCCAGGAGACACGGCGTC 420
          ***** . ** . *****

TL/Ag      TACCCTGAAAGCTTGGTGGCAAGCCCACGCCAAATGGCCGTACCCAACCTGAGGAGGACAA 475
P76        TACTCTGAAGGCTTGGTGGCAAGCCCACGCCAAATGGCCGTACCCAACCTGAGGAGGACAA 480
          ** ***** . *****

TL/Ag      GGC GCGGCTGGTGCAGGAGACGGGGCTGCAGCTGAAGTAGATCAACAACCTGGTTCATCAA 535
P76        GGC GCGGCTGGTTCAGGAAACAGGGCTGCAGCTGAAGCAGATCAACAACCTGGTTCATCAA 540
          ***** ***** . *****
          <<<<<<

TL/Ag      CCAGCGCAAGCGGAACTGGCACAGCAACCCTACCTCGTCCTCGTCAGACAAGAGCAAGAG 595
P76        CCAGCGCAAGCGGAACTGGCACAGCAACCCTACCTCGTCCTCATCAGACAAGAGCAAGAG 600
          ***** ***** . *****

TL/Ag      AAAAAAGGAACAATGCAGGTGAGGGCAACGCCGAGCAGTCCTGGTAG 641
P76        AAAAAAGGAACAATGCAGGTGACGGCAACGCCGAGCAGTCCTGGTAG 646
          ***** *****

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(b)

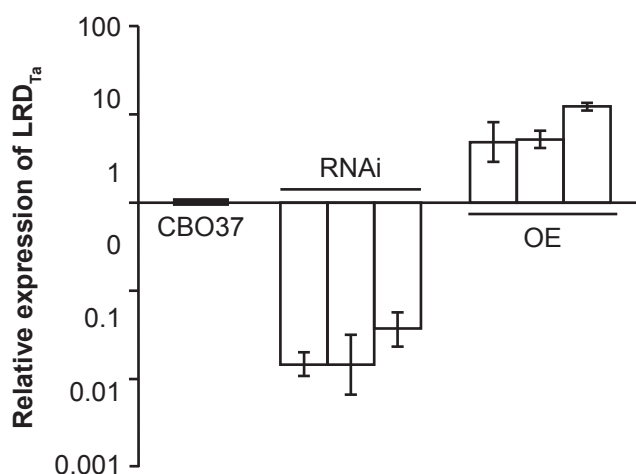


Figure S1. (a) Multiple sequence alignment of $LRD_{TL/Ag}$ and LRD_{P76} coding sequences. (b) Confirmation of altered expression of LRD_{Ta} in the RNAi and OE plants.

Figure S2

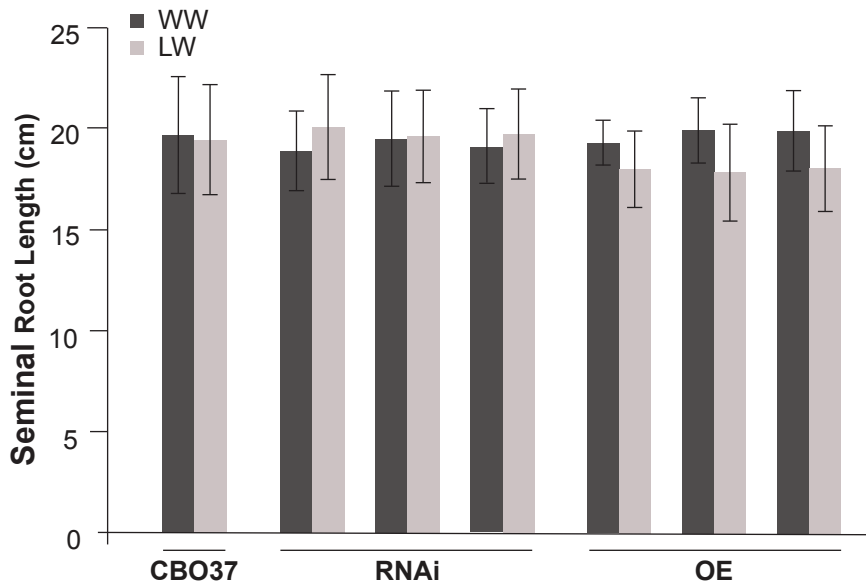


Figure S2 Maximum seminal root length of wild type (CBO37), 3 RNAi and 3 overexpression 6 d old seedlings grown in cigar-rolls under well-watered (WW) and limited water (LW) conditions.

Figure S3

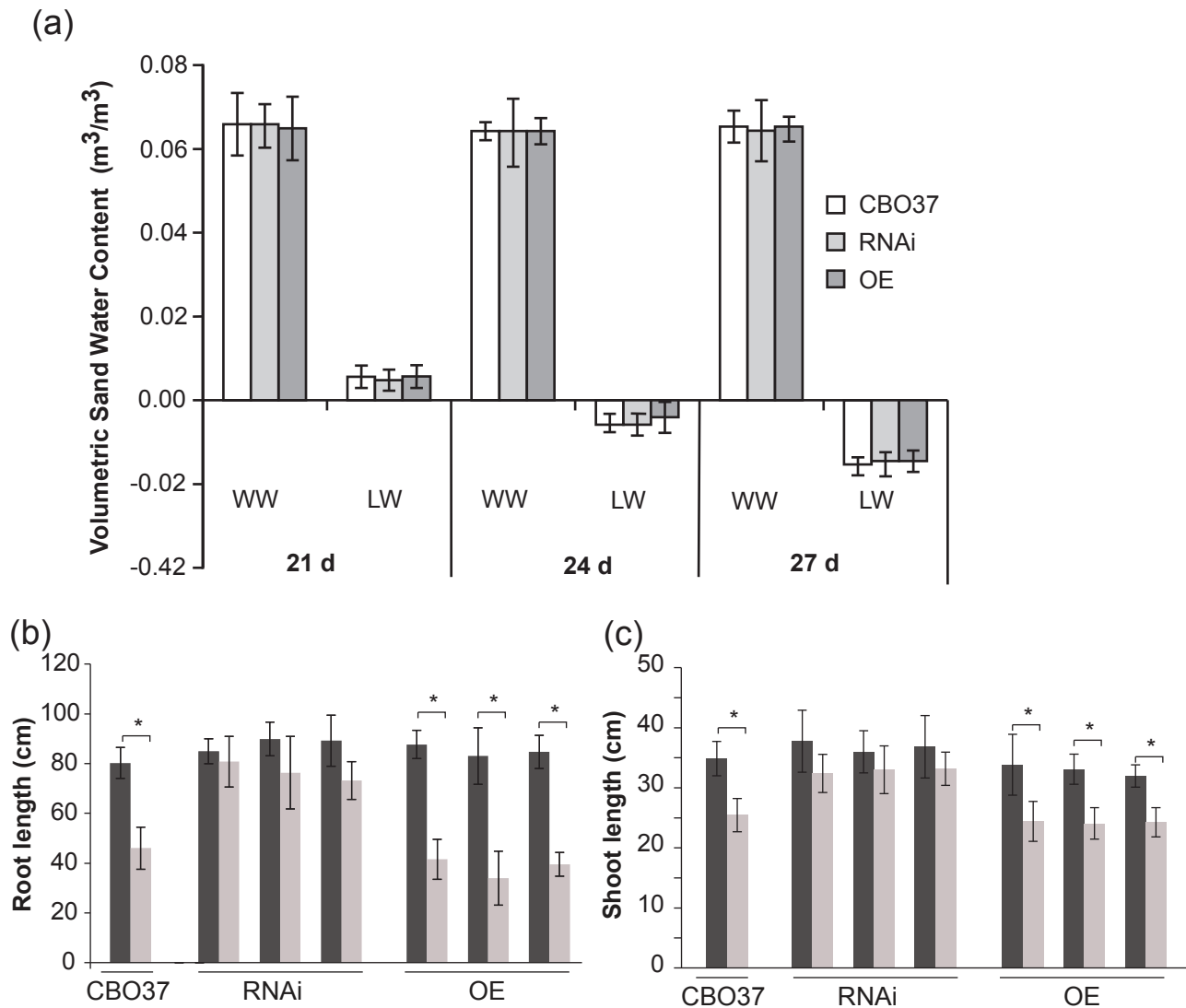


Figure S3. (a) Sand moisture content in the pre-tillering water stress experiment. (b-c) Shoot (b) and root (c) length of pre-tillering stage CBO37, RNAi and OE plants grown in greenhouse under WW or LW conditions. “*” indicates a significant difference between WW and LW treatment at $p < 0.05$.

Figure S4

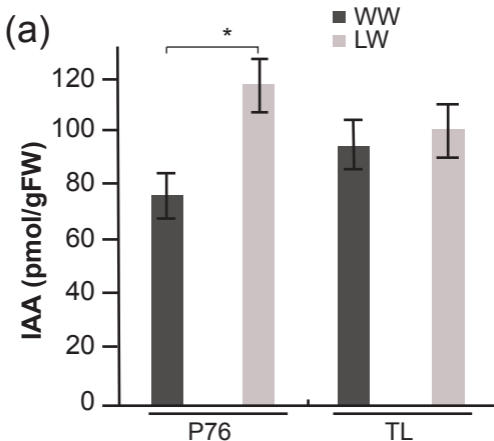


Figure 4 Auxin levels in P76 and TL root tips under WW and LW. “*” indicates a significant difference between WW and LW treatment at $p < 0.05$.

Table S1. Effect on GA bio-synthesis inhibitor Paclobutrazol (PAC) on root traits.

Genotypes, Treatments	Primary Root Length (cm)	Number of Lateral Roots	Lateral Root Density (cm⁻¹)
P76, WW	25.2 ± 2.4	24 ± 3	0.93 ± 0.1
P76, WW (+ PAC)	25.3 ± 3.0	11 ± 2 [#]	0.45 ± 0.1 [#]
P76, LW	20.3 ± 1.3 [*]	13 ± 3 [*]	0.55 ± 0.1 [*]
P76, LW (+ PAC)	24.2 ± 2.9	5 ± 2 [#]	0.22 ± 0.1 [#]
TL, WW	26.9 ± 3.1	25 ± 5	0.91 ± 0.2
TL, WW (+ PAC)	22.7 ± 2.4	11 ± 2 [#]	0.49 ± 0.1 [#]
TL, LW	26.0 ± 6.0	24 ± 7	0.87 ± 0.2
TL, LW (+ PAC)	23.9 ± 2.6	10 ± 1 [#]	0.41 ± 0.1 [#]

Roots traits were measured on 6 d old seedlings. “*” indicates a significant difference between WW and LW treatment for P76 at $p < 0.05$ and “#” indicates a significant difference between non-PAC and PAC-treated roots of each genotype at $p < 0.05$. The lateral root density and lateral root number were measured on primary root.

Table S2. Primer sequences used for qRT-PCR. The underline indicate the sequence differences between LRD_{Ta} and LRD_{Ag}				
Wheat Gene ID	Gene Annotation	Left Primer (5' to 3')	Right Primer (5' to 3')	Product size (bp)
<i>LRD</i>	<i>LRD</i>	CCTTCAAGGAACAGCTCCAG	CTCTCACTGTCGACCGGATT	166
<i>LRD</i>	<i>LRD_{Ta}</i>	GTTT <u>G</u> A <u>C</u> G <u>G</u> GAA <u>C</u> GATGT	<u>A</u> TACCCCTGTTTAAGCTC	114
<i>LRD</i>	<i>LRD_{Ag}</i>	GTTC <u>G</u> A <u>T</u> GG <u>A</u> AA <u>T</u> GATGT	<u>G</u> TACCCCTGTTTAAGCTC	151
<i>Traes_3B_7ABEA6AAD</i>	<i>GA2Ox</i>	GTTCAAGAGCGTGGAAGCACA	GTACTCGCCCCATGTGAAGT	163
<i>Traes_7DL_06A129B0D</i>	<i>GA20Ox</i>	ACATCGACGACACCTTCTCC	ATCCAGGGTCCTCCAGTCAG	251
	<i>Internal Control</i>	TGAGGTTGTCAAGCAACAGG	CATAAGACCAGCCCAAGCAT	152

Table S3. Primers pairs used for the construction of the LRD RNAi lines in CBO37 background.

Primer Name	Primer Sequence	Description of lower case bases
PUbi-Int-F	5' TTTTaaagcttGGTGCAGCGTG 3'	HindIII site
PUbi-Sma-R	5' TTTTcccgggTTCTCGAGCGACCTGCAGAAG 3'	SmaI site
T35S-SmaI-F	5' TTTTcccgggTAGAGTCCGCAAAAATCACC 3'	SmaI site
T35S-EcoRI-R	5' TTTTgaattcGCAGGTCACTGGATTTTGGTT 3'	EcoRI site
K369-BH1-F	5' TTTTggatccGCTGGGAGCTCGAGCAAA 3'	BamHI site
K369-Xb1-R	5' TTTtctagaGCGCCTTGTCCTCCTCAGT 3'	XbaI site
K369-SmaI-R	5' TTTTtctagaccgggGCGCCTTGTCCTCCTCAGT 3'	XbaI and SmaI sites

Table S4. Dosage dependent effects on GA₃ on wheat root traits .

Genotypes, GA₃ Concentration	Primary Root (cm)	Lateral Root Number	Lateral Root Density (cm⁻¹)
P76, 0	27.2 ± 2.2	17 ± 5	0.58 ± 0.1
TL, 0	26.3 ± 2.5	17 ± 5	0.66 ± 0.2
P76, 0.01	27.1 ± 2.0	20 ± 6	0.74 ± 0.2
TL, 0.01	26.1 ± 4.4	21 ± 6	0.82 ± 0.2
P76, 0.1	27.7 ± 2.2	17 ± 6	0.62 ± 0.2
TL, 0.1	29.2 ± 2.3	31 ± 7*	1.04 ± 0.2
P76, 1.0	28.4 ± 2.3	19 ± 7	0.67 ± 0.2
TL, 1.0	28.9 ± 3.4	34 ± 8*	1.18 ± 0.2*
P76, 10	28.9 ± 3.2	23 ± 9	0.80 ± 0.3
TL, 10	29.1 ± 2.5	24 ± 10	0.83 ± 0.3

Roots traits were measured on 6 d old seedlings under limited water (LW). “*” indicates a significant difference between non-treated and GA₃-treated roots of each genotype at $p < 0.05$. The lateral root density and lateral root number were measured on primary root.