Supplementary data

Table S1. Phenotypic performance for grain yield (GY), Plant height (PH), Number of grain per spike (GNS), 1000 kernel weight (TKW), Spike length (SL), Number of spike per m^2 (SM), Biomass (BIO) and Harvest index (HI) for recombinant inbred lines and their parents across all environments under irrigated and water deficit conditions.

Trait	Location	Water condition	# 49	Yecora Rojo	RIL Population	
					Mean	Range
GY	Mahabad	Irrigated	237.86	208.02	228.26	148.44–324.21
		Water deficit	187.41	154.86	140.16	63.15–214.38
	Miandoab	Irrigated	266.23	213.13	235.39	159.74–337.95
		Water deficit	205.43	163.98	147.49	73.2–217.56
	Tabriz	Irrigated	186.05	211.03	199.78	75.58–333.77
		Water deficit	145.56	166.51	137.08	59.22–218.63
PH	Mahabad	Irrigated	64.88	48.30	58.71	37.6–82.25
		Water deficit	51.84	38.73	47.44	32.85–66.03
	Miandoab	Irrigated	68.78	46.06	60.06	37.83–82.47
		Water deficit	57.50	39.71	48.76	34.2–66.47
	Tabriz	Irrigated	74.48	43.66	58.01	39.9–78.22
		Water deficit	60.61	41.19	52.27	35.77–74.32
NGS	Mahabad	Irrigated	27.00	21.45	20.75	15.5–26.42
		Water deficit	18.10	17.80	15.74	10.7–20.8
	Miandoab	Irrigated	28.55	23.53	21.78	16.75–28.2
		Water deficit	18.35	18.25	16.86	12.1–21.13
	Tabriz	Irrigated	29.02	24.78	23.36	13.05–34.02
		Water deficit	18.49	19.88	19.21	11.22–27.05
TKW	Mahabad	Irrigated	58.11	59.09	55.71	36.02–74.88
		Water deficit	51.73	49.53	47.70	35.25–57.81
	Miandoab	Irrigated	57.70	61.17	57.27	32.6–76.05
		Water deficit	49.35	45.46	48.80	30.81–61.47
	Tabriz	Irrigated	32.50	27.94	30.39	20.87–38.85
		Water deficit	27.58	25.11	27.69	18.9–33.97
SL	Mahabad	Irrigated	8.49	7.23	7.70	6.46–8.9
		Water deficit	7.43	6.83	6.57	5.42–7.73
	Miandoab	Irrigated	8.26	7.26	8.01	6.77–-9.2
		Water deficit	7.11	6.59	6.73	5.7–7.8
	Tabriz	Irrigated	7.45	7.39	6.93	5.32–8.63
		Water deficit	6.50	6.48	6.40	4.94–8.28
SM	Mahabad	Irrigated	292.00	221.00	264.80	191–342
		Water deficit	249.00	192.00	211.04	128–295
	Miandoab	Irrigated	286.00	196.00	257.56	184–329
		Water deficit	232.00	167.00	209.65	150–275
	Tabriz	Irrigated	357.88	393.60	415.42	235.29–567.21
		Water deficit	323.64	309.95	323.98	181.89–436.47
BIO	Mahabad	Irrigated	483.86	413.54	468.98	365.31–622.76
		Water deficit	329.15	299.05	337.42	221.81–510.7
	Miandoab	Irrigated	441.76	385.16	483.80	343.5–617.5
		Water deficit	364.46	317.92	350.50	225.29-436.84

	Tabriz	Irrigated	710.44	609.69	618.57	378.62–868.36
		Water deficit	560.58	448.57	458.66	286.737–638.93
HI	Mahabad	Irrigated	49.20	50.87	49.18	32.83–65.68
		Water deficit	55.97	51.88	42.14	24.43–62.82
	Miandoab	Irrigated	60.45	56.62	50.11	30.63–72.58
		Water deficit	56.31	51.91	43.23	22.28–62.52
	Tabriz	Irrigated	26.19	35.20	32.20	18.8–40.77
		Water deficit	26.22	36.77	29.75	17.89–37.56

Table S2. Coincidences of significant QTLs in this study with QTL regions reported previously.

Chromosome	Trait	Physical interval	QTL Reported in the same interval
1B	TKW	639043667-646178536	TKW [1], GY [2], GL [3]
2A	GY, SL	20237446-33006222	PH [4–6], GY [5]
2A	HI	2810448-13880947	KN [7]
2B	PH, SM	770220812-780595416	PH [6]
2B	SM	493650087-548651192	GY, PH [8,9]
3A	GNS, SL	695611958-707999079	GY [2]
3B	SL	37637136- 44847766	SL [10]
3B	HI	122826152-190473903	KW [11]
3B	HI	411269889-452490772	DM [12]
3D	PH, HI	453986741-459223201	HI [2]
4A	GY, PH, BIO	612444080-621401013	GY [13–15], PH [16,17], DSI [14], TKW [18,19], NSS [19], SSN [17]
4A	GNS, SL	632236000-684909655	GNS [20], PH [9], TKW [20], KW [9]
4B	PH, TKW	21573518-37529724	PH [10,21], SL [22,3], GY and NGS [20]
4D	PH	112074829-342791800	PH [23,24], GY [25], CL [26], BIO [27], TKW [28]
5A	SM	581488651-589302806	PH [6], DTH and DTA [29]
5B	TKW	360428982- 445174230	TKW [27,20], GY [30], CHl-10 [20], ShL [31]
6B	TKW,PH	659589376-676681142	TKW [32], SM [25], NDVI [29]
7A	PH	15533539-28556096	BIO/CID/SG [33]
7B	PH	648784533-657872523	PH [6]
7B	TKW	693025970-703983881	TKW [1], PH [34], GNS and NSS [19]
7D	GNS, SL	89311202-105089647	GY [25], GNS [10,19], PH [6], TKW [35,1]
7D	PH	451622823-554279150	ClF [36]

GY: grain yield, TKW: 1000 kernel weight, PH: plant height, HI: harvest index, GNS: grain number per spike, SM: spike number per m2, SL: spike length, BIO: biomass, GL: grain length, KN: kernel number, KW: kernel width, DM: Dry mass accumulation, DSI: drought susceptibility index, NSS: number of spikelet per spike, SSN: Sterile spikelet number, CL: Coleoptile length, DTH: days to heading, DTA: days to anthesis, ShL: Shoot length, CID: carbon isotope discrimination, SG: stay green, NDVI: normalized differential vegetative index, ClF:Chlorophyll fluorescence.

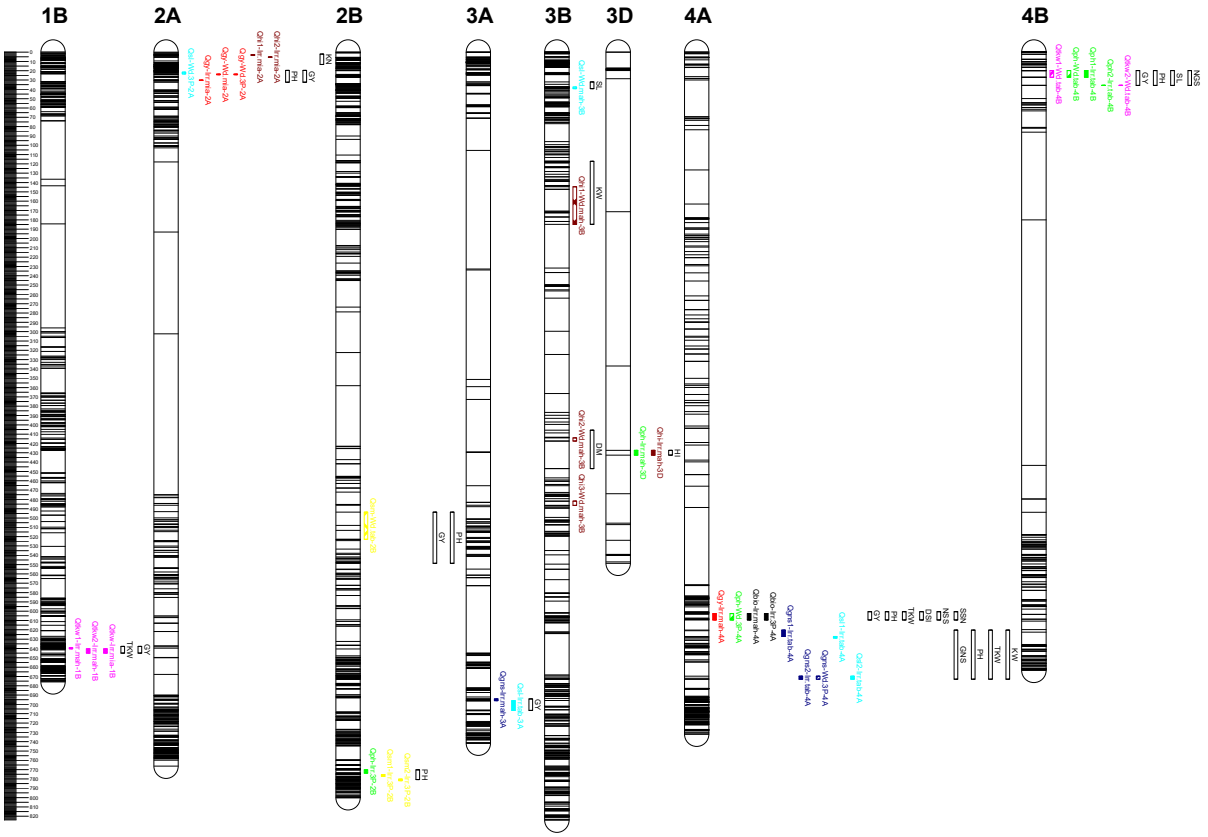

Figure S1. Coincidences of significant QTLs in this study with QTL regions reported previously. Each chromosome is represented by physical positions Mb (on the left) and identified QTLs (on the right). QTL names indicate the trait, trail (water condition+ environment) and chromosome name along with different colors: GY (red), PH (green), SM (yellow), TKW (pink), GNS (blue), SL (light blue), BIO (black), HI (brown). Identified QTLs under irrigated and water deficit conditions are represented by solid filled and stripes filled box, respectively. QTL regions reported by previous studies are shown by non-filled black box. KN: kernel number, KW: kernel width, DM: Dry mass accumulation, DSI: drought susceptibility index, NSS: number of spikelet per spike, SSN: Sterile spikelet number, CL: Coleoptile length, DTH: days to heading, DTA: days to anthesis, ShL: Shoot length, CID: carbon isotope discrimination, SG: stay green, NDVI: normalized differential vegetative index, ClF:Chlorophyll fluorescence.

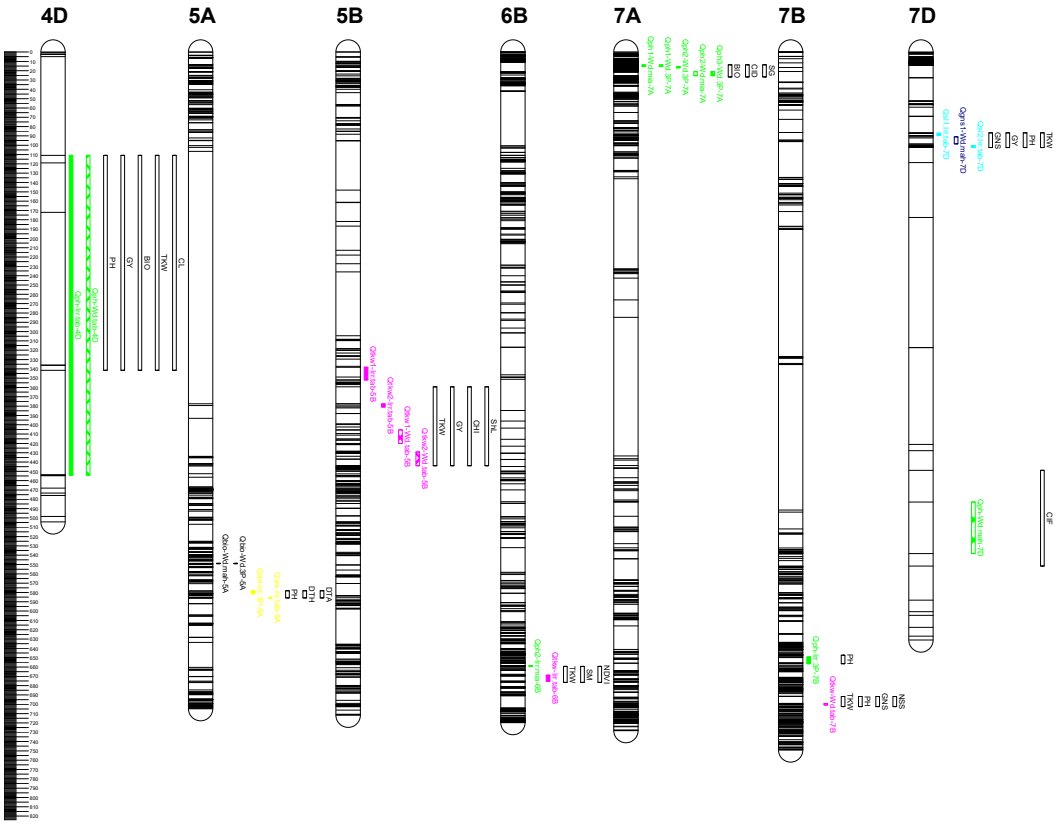

Figure S1. Continued.

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